

Hatch 2009-301

RO Answer Key

Answers

#	ID	0
1	201001K5.02 1	B
2	202001K4.07 1	A
3	203000G2.4.8 1	C
4	204000A4.09 1	B
5	205000K2.01 1	A
6	206000K5.08 1	D
7	206000K6.02 1	D
8	209001A4.04 1	A
9	209001A4.05 1	A
10	211000K4.03 1	A
11	212000A1.07 1	C
12	215001A3.03 1	D
13	215002K6.04 1	D
14	215003A1.03 1	C
15	215004K6.01 1	B
16	215005G2.1.20 1	D
17	215005G2.4.11 1	D
18	217000K2.03 1	B
19	218000K1.06 1	A
20	223001K3.09 1	B
21	223002K3.11 1	B
22	226001K2.02 1	B
23	233000G2.2.25 1	C
24	239001K5.09 1	B
25	239002A3.01 1	C
26	241000K1.25 1	A
27	259002A4.01 1	C
28	261000A2.12 1	D
29	262001K4.02 1	A
30	262001K4.05 1	A
31	262002K3.01 1	C
32	263000A2.02 1	A
33	264000K4.06 1	A
34	264000K5.06 1	B
35	268000A2.01 1	D
36	286000A1.01 1	C
37	295001AK2.03 1	A
38	295003G2.4.34 1	D
39	295004AA1.03 1	D
40	295005AK3.04 1	C
41	295006AK1.01 1	D
42	295010G2.2.22 1	D
43	295013AK2.01 1	A
44	295015G2.2.42 1	A
45	295016AA2.01 1	D
46	295018AK3.03 1	D
47	295019AA2.02 1	C
48	295020AK1.05 1	A

rec'd 5/4/09

Hatch 2009-301

RD Answer Key

Answers

#	ID	0
49	295021G2.4.35 1	D
50	295023AA1.04 1	D
51	295024EA2.06 1	B
52	295025G2.1.23 1	A
53	295026EK2.01 1	D
54	295028EA1.03 1	C
55	295030EK1.02 1	D
56	295031EA1.01 1	C
57	295032EA1.03 1	C
58	295035EA2.02 1	D
59	295037EK2.12 1	A
60	295038EK1.02 1	A
61	300000K1.03 1	B
62	400000K3.01 1	D
63	500000EK3.06 1	C
64	600000AK1.01 1	C
65	700000G2.4.4 1	A
66	G2.1.27 1	B
67	G2.1.31 1	D
68	G2.1.39 1	A
69	G2.2.15 1	A
70	G2.2.25 1	A
71	G2.2.39 1	C
72	G2.3.14 1	D
73	G2.3.13 1	A
74	G2.4.1 1	C
75	G2.4.9 1	A

Rec'd
5/4/09

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

Applicant Information

Name:

Date: April 30th, 2009

Facility/Unit: Plant E. I. Hatch

Region: I II III IV

Reactor Type: W CE BW GE

Start Time:

Finish Time:

Instructions

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

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

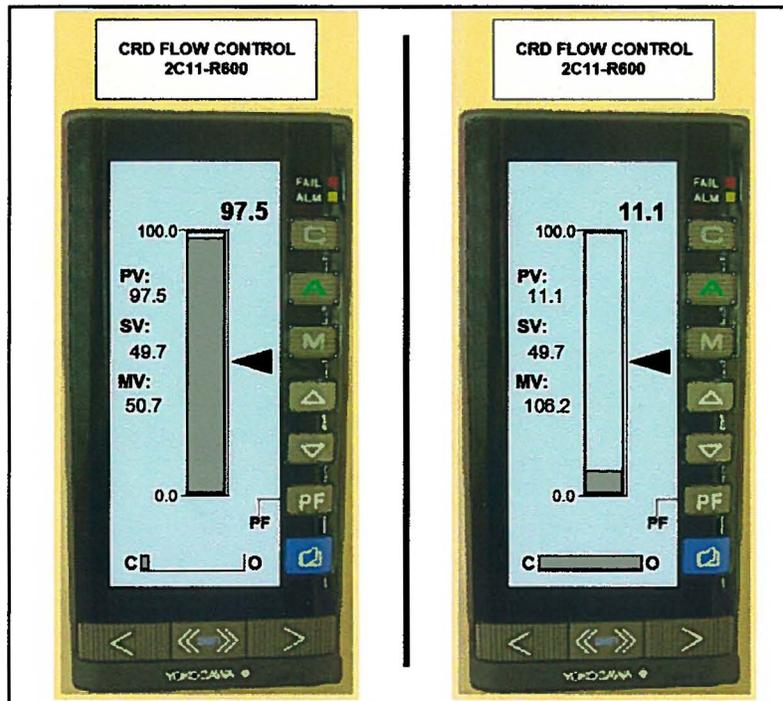
Applicant's Score _____ Points

Applicant's Grade _____ Percent

*Rec'd
5/4/09*

1.

Unit 2 was operating at 100% power when the reactor was manually scrammed.



(Figure A)

(Figure B)

Which ONE of the following choices completes the following statement?

The expected Control Rod Drive (CRD) Flow Controller flow indication IMMEDIATELY following the manual scram is shown on (1) and, based on this indication there is a potential for (2) to occur until the reactor scram is reset.

- A. (1) Figure A
(2) CRD pump runout
- B. (1) Figure A
(2) excessive reactor vessel bottom head cooldown
- C. (1) Figure B
(2) elevated CRDM temperatures
- D. (1) Figure B
(2) low drive water differential pressure (dp)

2.

Unit 1 is operating at 80% power.

- o Both Recirculation pumps are running at 78% speed
 - o All Condensate and Condensate Booster Pumps are in service
- 4160 VAC Bus "1C" is inadvertently de-energized.

Which ONE of the following describes how the Reactor Recirculation system will be affected?

- o The "1A" Recirc pump will _____ (1) _____.
 - o The "1B" Recirc pump will _____ (2) _____.
- A. (1) automatically trip
(2) automatically trip
- B. (1) automatically trip
(2) be running at 61% speed
- C. (1) be running at 61% speed
(2) be running at 61% speed
- D. (1) be running at 78% speed
(2) be running at 78% speed

3.

Unit 2 was operating at 100% power when a Loss Of Coolant Accident occurred.

These conditions exist:

- o The reactor has scrammed and all control rods fully inserted
- o RPV pressure 960 psig, increasing at 4 psig/minute
- o Drywell (DW) pressure ... 7 psig (decreasing)
- o BOTH RHR loops..... DW spray mode
- o RPV level -145 inches, decreasing at 2"/minute
- o 4160 VAC bus "2E" has de-energized and cannot be re-energized

Given these conditions, IAW 34AB-R23-001-2, "Loss of 600 Volt Emergency Bus", energizing 600 VAC bus "2C" using the 4160/600V "2CD" Transformer is _____.

- A. NOT allowed; the reactor must be in Mode 4
- B. NOT allowed; the "1B" Emergency Diesel Generator would be overloaded
- C. allowed; ALL low pressure ECCS will NOT inject at rated flow when reactor pressure decreases to below the shutoff head
- D. allowed; but is NOT needed since all low pressure ECCS will inject at rated flow when reactor pressure decreases to below the shutoff head

4.

Unit 2 is at 2% power performing a reactor heatup and pressurization.

The Reactor Water Cleanup (RWCU) system is aligned for vessel level control.

- o Reactor Water Level (RWL) begins to increase
- o Non-Regenerative Heat Exchanger (NRHX) Effluent temperature 138°F

Which ONE of the following completes both of these statements?

NRHX Effluent temperature is monitored at panel 2H11- (1).

IAW 34SO-G31-003-2, "Reactor Water Cleanup System," 2G31-R606, Manual Controller for 2G31-F033, "RWCU Blowdown Flow Control Valve" is required to be throttled (2).

- A. (1) P602, front panel
(2) OPEN
- B. (1) P602, front panel
(2) CLOSED
- C. (1) P614, back panel
(2) OPEN
- D. (1) P614, back panel
(2) CLOSED

5.

Unit 1 is in Mode 4 with "1C" and "1D" Residual Heat Removal (RHR) pumps running in Shutdown Cooling.

- o An over-current condition develops on Emergency Bus 4160VAC "1F" which causes it to de-energize.

Which ONE of the following predicts the status of the "1C" and "1D" RHR pumps?

- A. "1C" RHR Pump has stopped
"1D" RHR Pump has stopped
- B. "1C" RHR Pump is running
"1D" RHR Pump has stopped
- C. "1C" RHR Pump has stopped
"1D" RHR Pump is running
- D. "1C" RHR Pump is running
"1D" RHR Pump is running

6.

Unit 2 is operating at 100% power.

- o 34SV-E41-002-2, "HPCI PUMP OPERABILITY" has just been completed.
- o When the High Pressure Coolant Injection (HPCI) system is secured, BOTH HPCI Turbine Exhaust Vacuum Breaker check valves (2E41-F102 and F103) fail in the OPEN position.

Which one of the following identifies the potential impact of these check valve failures during a subsequent HPCI auto-initiation on low reactor water level AND whether control room indication is available for these check valves?

When the HPCI starts, a high potential for ___(1)___ will exist.

Position indication for these CHECK VALVES ___(2)___ available in the Control Room.

- A. (1) water hammer
(2) is
- B. (1) water hammer
(2) is NOT
- C. (1) high Torus pressure
(2) is
- D. (1) high Torus pressure
(2) is NOT

7.

Unit 2 is operating at 100%.

- o 2R24-S022, "250 VDC RX BLDG ESSEN. 2B" de-energizes (remains de-energized)
- o A transient results in a scram and a High Pressure Coolant Injection (HPCI) automatic initiation signal.

Which ONE of the following describes how the HPCI system will respond to the automatic initiation signal?

HPCI will _____.

- A. automatically start and operate normally
- B. automatically start; however, only local control will be possible
- C. NOT automatically start, but can be manually started
- D. NOT automatically start and can NOT be manually started

8.

Unit 1 is at 100% power.

- o Both loops of Core Spray (CS) are in their normal standby lineup.
- o CS receives an automatic start signal

Which ONE of the following completes BOTH of these statements?

In their normal standby lineup, the CS Minimum Flow valves (2E21-F031A/B) are normally ____ (1) ____.

The CS Minimum Flow valves (2E21-F031A/B) will remain in their standby lineup until ____ (2) ____.

- A. (1) open
(2) discharge flow exceeds 950 gpm
- B. (1) open
(2) the CS pump motor breaker is closed
- C. (1) closed
(2) discharge flow exceeds 950 gpm
- D. (1) closed
(2) the CS pump motor breaker is closed

9.

Unit 2 is operating at 100% power, with HPCI tagged out for maintenance.

A trip of both reactor feedwater pumps results in a low reactor water level with conditions occurring as indicated in the following time line:

Time (minutes)

- +0 min. Reactor scram, all rods fully insert
- +5 min. Drywell pressure: 0.7 psig.
- +5 min. Reactor water level: -110 inches, decreasing at 0.5 inch/minute.
- +5 min. Reactor pressure: 960 psig.
- +6 min. Both Core Spray (CS) systems are in their normal standby lineups.

Which ONE of the following describes the MINIMUM required operator actions (if any)?

- A. manually start both CS pumps (only)
- B. manually start both CS pumps and manually open discharge valves 2E21-F004A & F004B (only)
- C. manually start both CS pumps and manually open discharge valves 2E21-F005A & F005B (only)
- D. no manual operation of CS is required at this time, continue to monitor until system operation is required

10.

Concerning the **Unit 2** Standby Liquid Control (SLC) system:

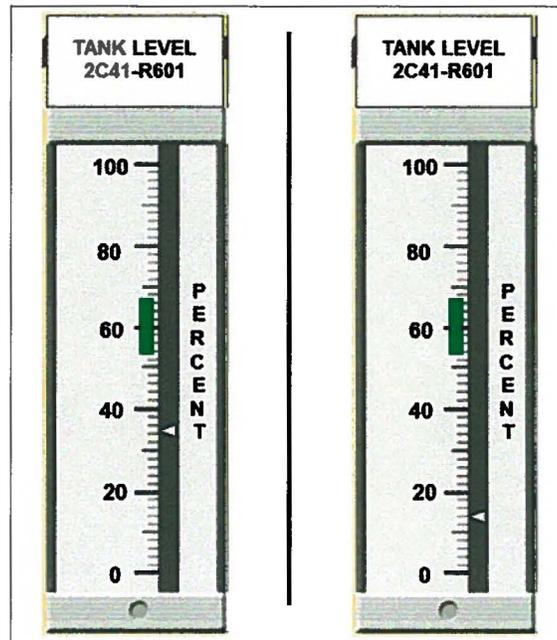


Figure A

Figure B

Which ONE of the following completes both of these statements?

During normal operation, the means by which Sodium Pentaborate is CONTINUOUSLY maintained in solution inside the SLC tank is by the use of (1) .

Given the two figures shown above, and that SLC has been initiated during an ATWS, (2) indicates the **HIGHEST** SLC tank level which ensures that Hot Shutdown Boron Weight has been injected into the RPV.

- A. (1) tank heaters
 (2) Figure A
- B. (1) an air sparger
 (2) Figure A
- C. (1) tank heaters
 (2) Figure B
- D. (1) an air sparger
 (2) Figure B

11.

Unit 2 was operating at 30% power.

- o Control rod 26-35 is at notch position 48
- o The Rod Scram Switch for control rod 26-35, at 2H11-P610, is placed into the "DOWN (scram)" position
- o 2 seconds later, the switch is placed in the "UP (normal)" position.

Which ONE of the following is the expected Rod Position Indication on the 4-Rod Display at 2H11-P603 panel for control rod 26-35 after these actions are performed?

- A. blank (over-travel beyond full in)
- B. full in
- C. intermediate
- D. position 46

12.

Unit 1 is operating at 100% power with the "A" Traversing In-Core Probe (TIP) inserted in the core to perform 57CP-C51-010-0, "TIP Flux Probing Monitor".

A transient occurs on **Unit 1** with the following plant conditions:

Reactor pressure 900 psig and stable
Reactor level (lowest) -20 inches and slowly increasing
Drywell pressure 1.5 psig and stable
Drywell temperature 129°F

Which ONE of the following completes the statement below?

The "A" TIP will withdraw to the _____ and the Ball Valve position will be _____.

- A. Indexer (Parked) position;
open
- B. Indexer (Parked) position;
closed
- C. In Shield position;
open
- D. In Shield position;
closed

13.

Unit 2 is operating at 100% power with a centrally located control rod selected.

- o The operator bypasses APRM channel "B"

Which ONE of the following identifies the effect this action will have on the RBM "B" channel?

The "B" RBM will automatically use the _____ .

- A. "C" APRM channel to monitor the neutron flux in the locality of the selected rod
- B. "C" APRM channel to determine one of the three upscale setpoints
- C. "D" APRM channel to monitor the neutron flux in the locality of the selected rod
- D. "D" APRM channel to determine one of the three upscale setpoints

14.

A **Unit 1** Reactor Startup is in progress.

IRMs read as follows:

<u>IRM</u>	<u>Reading</u>	<u>Range</u>	<u>IRM</u>	<u>Reading</u>	<u>Range</u>
A	38/125	8	B	35/125	8

Which ONE of the following predicts how the plant will respond to the following switch manipulations?

- o IRM "A" range switch is placed in the RANGE 7 position.
- o IRM "B" range switch is placed in the RANGE 7 position.

The IRMs will _____.

- A. NOT initiate any automatic action
- B. initiate a rod block (only)
- C. initiate a rod block and a half scram (only)
- D. initiate a full scram

15.

Unit 1 is starting up.

- o All Intermediate Range Monitors (IRM) are on RANGE 4 (reading on-scale)
- o All Source Range Monitors (SRM) are all partially withdrawn and indicating 5×10^4 counts per second (cps)

The "1A" SRM chassis at Panel1H11-P606 experiences a failure that causes the voltage at the SRM detector to lower to 20 VDC. The SRM indication dropped to 10 cps.

Which ONE of the following choices completes the following statement?

A Control Rod Block ____ (1) ____ occur because ____ (2) ____.

- A. (1) will
(2) the SRM count rate is at the downscale setpoint
- B. (1) will
(2) the SRM Detector voltage is low
- C. (1) will NOT
(2) of the IRM range switch positions
- D. (1) will NOT
(2) the SRM count rate is still reading 10 cps

16.

Unit 1 is operating at 100% power with all OPRMs inoperable when the "1B" Reactor Recirc Pump trips.

Which ONE of the following actions is required, including the reason for this action?

- A. Manual Scram; all OPRMs are inoperable.
- B. Manual Scram; Reactor steam dome to bottom head delta-T will be exceeded.
- C. The APRM simulated thermal power (STP) high trip setpoint must be changed; all OPRMs are inoperable.
- D. The APRM simulated thermal power (STP) high trip setpoint must be changed; Two Recirc Loops are not operating.

17.

Unit 1 is operating at 40% power when a scram signal is received.

- o Some control rods do NOT fully insert
- o APRMs all indicating 2% (highest since scram 3%)
- o Reactor water level 37 inches (lowest since scram 9 inches)
- o Reactor pressure 930 psig (highest since scram 1050 psig)
- o Drywell pressure 0.3 psig (not changed since scram)
- o Both Reactor Recirculation pumps 22% speed

Which ONE of the following completes both of these statements IAW 34AB-C71-001-1, "Scram Procedure" and 34AB-C11-005-1, "Control Rod Insertion Methods"?

Overriding of ALL automatic scram signals to insert control rods is _____ (1) _____.
Tripping of the Reactor Recirculation pumps _____ (2) _____ required.

- A. (1) allowed
(2) is
- B. (1) allowed
(2) is NOT
- C. (1) NOT allowed
(2) is
- D. (1) NOT allowed
(2) is NOT

18.

Which ONE of the following is the power supply to the **Unit 2** RCIC flow controller?

- A. Vital AC (2R25-S063)
- B. DC Cabinet "2A" (2R25-S001)
- C. Instrument Bus "2A" (2R25-S064)
- D. Reactor Bldg ESS MCC "2B" (2R24-S022)

19.

Unit 2 has experienced a Loss of Offsite Power (LOSP).

The following conditions existed at 09:00 and remain unchanged for 5 minutes:

- o Reactor..... All rods in
- o All 4160 VAC buses..... De-energized
- o RPV Pressure..... 700 psig
- o RWL..... -135 inches
- o Drywell Pressure..... 3 psig
- o ADS Inhibit Switches..... "Normal" position

An operator starts the "2A" Emergency Diesel and the following events occur at 09:05:

- "2A" Core Spray (CS) pump starts.
- "2A" CS develops normal discharge pressure

Which ONE of the following identifies the EARLIEST time when the ADS valves will automatically open?

- A. 09:05
- B. 09:07
- C. 09:16
- D. 09:18

20.

Unit 2 scrammed from 90% power due to a complete loss of Drywell (D/W) Cooling.

Immediately after the scram, a complete loss of high and low pressure feed occurred.

- o Reactor pressure 900 psig
- o Reactor water level indications (all reading are uncompensated)
 - o 2B21-R623A, Fuel Zone - 305 inches
 - o 2B21-R623B, Fuel Zone - 295 inches
 - o 2B21-R623A, Wide Range - 145 inches
 - o 2B21-R623B, Wide Range - 135 inches

- o The following Drywell temperatures currently exist:

RTD GROUP 1 indicators

2T47-N001K 285°F
2T47-N010 290°F
2T47-N014 287°F

RTD GROUP 2 indicators

2T47-N001A 290°F
2T47-N002 288°F
2T47-N015 295°F

IAW with EOP Caution 1, which ONE of the following identifies a Reactor Water Level (RWL) instrument that can be used to determine RWL?

REFERENCE PROVIDED

- A. 2B21-R623A, Fuel Zone
- B. 2B21-R623B, Fuel Zone
- C. 2B21-R623A, Wide Range
- D. 2B21-R623B, Wide Range

21.

Unit 2 is at 100% power and the "2A" Reactor Protection System (RPS) M/G Set trips.

Which ONE of the following completes both of these statements?

After RPS M/G Set "2A" trips, the Main Control Room Environmental Control (MCREC) system will automatically align to the _____ mode.

In this mode, outside air _____ be drawn into the MCREC system.

- A. Isolation; will
- B. Pressurization; will
- C. Isolation; will NOT
- D. Pressurization; will NOT

22.

Unit 1 was operating at 100% power with the Alternate Supply Breaker to 4160VAC bus "1E" tagged out.

A loss of Startup Transformer (SAT) "1D" occurred.

- o Torus Pressure reaches 3 psig during the transient.
- o "1A" and "1B" RHR pumps are running in the Torus Spray Mode.

The power supply for the 4160 VAC bus to the "1A" RHR Pump is (1) and to the "1B" RHR Pump is (2) .

- A. (1) SAT "1C"
 (2) SAT "1C"
- B. (1) its associated EDG
 (2) SAT "1C"
- C. (1) SAT "1C"
 (2) its associated EDG
- D. (1) its associated EDG
 (2) its associated EDG

23.

Fuel movement is in progress in the Fuel Pool on **Unit 1**.

IAW with Tech Spec Limiting Condition for Operation (LCO) 3.7.8, Spent Fuel Storage Pool Water Level, which ONE of the following is the LOWEST level that will still meet the LCO 3.7.8 requirements WITHOUT entering a Required Action Statement (RAS)?

- A. 23.1 feet
- B. 22.1 feet
- C. 21.1 feet
- D. 20.1 feet

24.

Unit 2 was at 100% power when a reactor scram occurred.

The operators have completed all steps of the following placards IAW 34AB-C71-001-2, "Scram Procedure."

- RC-1, IMMEDIATE SCRAM REACTIVITY CONTROL ACTIONS
- RC-2, FEEDWATER CONTROL ACTIONS FOLLOWING SCRAM
- RC-3, IMMEDIATE RPV PRESSURE CONTROL ACTIONS FOLLOWING A SCRAM
- TC-1, IMMEDIATE TURBINE TRIP RESPONSE ACTIONS

Which ONE of the following identifies a component that will still be contributing to the RPV cooldown?

- A. Reactor feed pump low pressure steam supply.
- B. Reactor feed pump high pressure steam supply.
- C. Moisture Separator Reheater first stage steam supply.
- D. Moisture Separator Reheater second stage steam supply.

25.

Unit 1 has experienced a transient and the Automatic Depressurization System (ADS) automatically actuated.

- o Reactor pressure decreases from 1000 psig to 39 psig
- o No ADS control switches have been manipulated

Which ONE of the following predicts which ADS valve light indications are ILLUMINATED at panel 2H11-P602?

- A. ONLY the Red light is illuminated.
- B. ONLY the Red and Green lights are illuminated.
- C. ONLY the Red and Amber lights are illuminated.
- D. The Red, Amber, and Green lights are ALL illuminated.

26.

Unit 2 was operating at 35% power, with the Main Generator at 7000 amps.

At Time T = 0, the following alarms were received:

"GENERATOR PROTECTION CKT ENERGIZED" (651-206)

"GENERATOR INLET PRESS LOW," (651-202)

"GENERATOR OUTLET TEMP HIGH," (651-204)

At Time T = 3.5 minutes, the Main Generator is at 6600 amps.

Which ONE of the following identifies the component that began automatically closing to lower generator amps and predicts the Turbine status at time T = 3.5 minutes?

- A. Turbine Control Valves;
Turbine is Tripped
- B. Turbine Control Valves;
Turbine remains on line
- C. Turbine Combined Intermediate Valves (CIVs);
Turbine is Tripped
- D. Turbine Combined Intermediate Valves (CIVs);
Turbine remains on line

27.

Unit 2 is at 50% power, performing a Startup.

- o Reactor Feed Pump Turbine (RFPT) "2B" is in service in automatic control.

Due to intermittent problems with the "2A" RFPT M/A station, 2C32-R601A, Maintenance has taken 2C32-R601A to the maintenance shop for repair.

The Shift Supervisor directs placing the "2A" RFPT in service IAW 34SO-N21-007-2, "Condensate and Feedwater System", section 7.3.7, "RFPT Alternate Startup."

Which ONE of the following choices completes the following statements for this mode of RFPT operation?

The reason that the "2A" RFPT speed will initially be stopped at 1000 RPM is to ____ (1) ____.

In this mode of operation the Speed Setter switch ____ (2) ____ allow speed to be raised above 2100 RPM.

- A. (1) slowly introduce feedwater into the RPV
(2) will
- B. (1) slowly introduce feedwater into the RPV
(2) will NOT
- C. (1) allow oil temperature to increase
(2) will
- D. (1) allow oil temperature to increase
(2) will NOT

28.

Unit 2 is in a Refueling Outage with fuel movement in progress.

Minor damage to a fuel bundle results in an increase in Refueling Floor radiation levels.

The "Refueling Floor Vent Exhaust" monitors are reading:

- o 2D11-K634A - 19 mRem/hr
- o 2D11-K634B - 18 mRem/hr
- o 2D11-K634C - 15 mRem/hr
- o 2D11-K634D - 14 mRem/hr

Which ONE of the following predicts BOTH the impact of these conditions on the Unit 1 and Unit 2 Standby Gas Treatment Systems (SBGT) and the procedural requirements?

The total number of SBGTs trains that will automatically start is (1).

The operator is required to enter (2).

- A. (1) two (ONLY)
(2) ONLY 34AB-J11-001-1, "Irradiated Fuel Damage During Handling"
- B. (1) four
(2) ONLY 34AB-J11-001-1, "Irradiated Fuel Damage During Handling"
- C. (1) two (ONLY)
(2) BOTH 34AB-J11-001-1, "Irradiated Fuel Damage During Handling" AND 34AB-T22-003-2, "Secondary Containment Control"
- D. (1) four
(2) BOTH 34AB-J11-001-1, "Irradiated Fuel Damage During Handling" AND 34AB-T22-003-2, "Secondary Containment Control"

29.

Unit 2 is at 90% power.

- o 4160 VAC bus "2A" is being powered from its alternate source due to maintenance activities.
- The "2G" 4160 VAC normal supply breaker trips open due to an internal breaker fault.
- Two minutes later the Main Turbine Trips.

Which ONE of the following predicts the FINAL status of the "2A" and "2G" buses?

- A. ONLY 4160 VAC bus "2G" will be energized.
- B. ONLY 4160 VAC bus "2A" will be energized.
- C. BOTH 4160 VAC buses "2A" AND "2G" will be energized.
- D. NEITHER 4160 VAC bus "2A" NOR "2G" will be energized.

30.

Unit 1 is in Mode 3.

The Shift Supervisor has directed that the "1A" EDG be paralleled to its associated bus IAW 34SO-R43-001-1, "Diesel Generator Standby AC System," Section 7.2.2 "Synchronizing Diesel Generator to an Energized Bus."

Which ONE of the following choices completes this statement?

In order to close the EDG output breaker, the "1A" EDG Mode Switch _____ required to be in the "TEST" position and the synchroscope lights are approaching the _____ point.

- A. is; dimmest
- B. is; brightest
- C. is NOT; dimmest
- D. is NOT; brightest

31.

Unit 2 is at 100% power when a loss of 2R25-S063, "Vital AC" occurs.

Which ONE of the following completes this statement?

The Feedwater Master Controller _____ lose power and the Feedwater Level Control system will _____.

- A. will;
remain in 3 element control
- B. will NOT;
remain in 3 element control
- C. will;
shift to single element control
- D. will NOT;
shift to single element control

32.

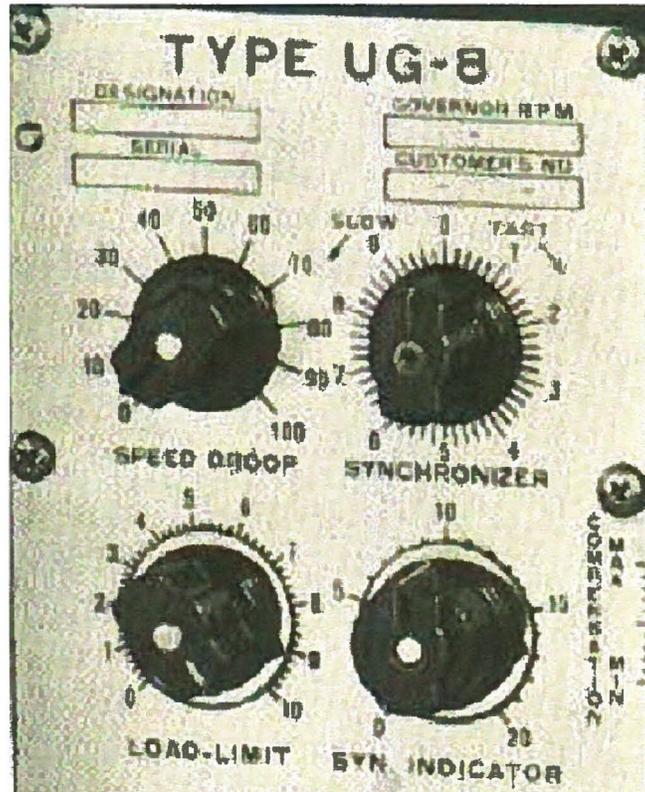
Unit 2 is operating at 100% power, with the "2A" and "2B" 125/250VDC Station Service Batteries on equalize charge, when the Control Building ventilation is lost.

Which ONE of the following predicts (1) a consequence of losing the Control Building ventilation and also (2) identifies a required action IAW 34AB-T41-001-2, "Loss Of ECCS, MCREC Or Area Ventilation Systems"?

- A. (1) Hydrogen concentration will rise in the battery rooms;
(2) Start Emergency Exhaust Fans 2Z41-C014 and 2Z41-C015.
- B. (1) Hydrogen concentration will rise in the battery rooms;
(2) Open DC breakers to minimize loads on 2R22-S016 and 2R22-S017.
- C. (1) Battery Chargers will trip on high temperature;
(2) Start Emergency Exhaust Fans 2Z41-C014 and 2Z41-C015.
- D. (1) Battery Chargers will trip on high temperature;
(2) Open DC breakers to minimize loads on 2R22-S016 and 2R22-S017.

33.

Which ONE of the following knobs can be used to completely shut off the fuel supply to a running Plant Hatch Emergency Diesel Generator?



- A. LOAD LIMIT
- B. SYN INDICATOR
- C. SPEED DROOP
- D. SYNCHRONIZER

34.

Following a LOCA/LOSP on **Unit 1**, the following sequence occurs:

- o The "1A" and "1B" EDGs start
- o The "1C" EDG fails to start

When the EDG output breakers close, pumps start in this sequence:

- o Time = 0 sec "1A" Core Spray pump starts
- o Time = 0.5 sec "1C" RHR pump starts
- o Time = 10 sec "1D" PSW pump starts
- o Time = 12 sec "1A" and "1D" RHR pumps start
- o Time = 22 sec "1A" PSW pump starts

Which ONE of the following correctly completes both of the statements below concerning the proper load sequencing of the "1A" and "1B" EDGs?

The "1A" EDG load sequence was _____ (1) _____.

The "1B" EDG load sequence was _____ (2) _____.

- A. (1) correct
(2) correct
- B. (1) correct
(2) NOT correct
- C. (1) NOT correct
(2) correct
- D. (1) NOT correct
(2) NOT correct

35.

Unit 2 experiences a rupture on the "2A" Core Spray (CS) suction piping in the Torus Area of the Reactor Building.

The following annunciators are alarming (not a complete list of all alarming annunciators)

- o **TORUS S-E AREA INSTR SUMP LVL HIGH** (657-089-2)
- o **RB S-E DIAGONAL FLOOR DRN SUMP LEVEL HIGH-HIGH** (657-034-2)

The following valve alignment exists:

- o 2T45-F002 "Torus N-E and S-E Outboard Sump Isol Valve" is open
- o 2T45-F003 "Torus N-E and S-E Inboard Sump Isol Valve" is open

Which ONE of the following completes BOTH of these statements?

If NO operator action is taken, the flow of water to the Radwaste facility ____ (1) ____ automatically isolate as Torus area water levels continue to increase.

IAW 34AR-657-034-2, "RB S-E DIAGONAL FLOOR DRN SUMP LEVEL HIGH-HIGH", 2T45-F002, "Torus N-E and S-E Outboard Sump Isol Valve" is required to be ____ (2) ____.

- A. (1) will
(2) open
- B. (1) will
(2) closed
- C. (1) will NOT
(2) open
- D. (1) will NOT
(2) closed

36.

A Turbine Building fire protection sprinkler system actuation causes the fire main header pressure to lower to 98 psig.

Assuming that this is the LOWEST pressure achieved, which ONE of the following predicts how the fire pumps respond?

- A. Only the electric fire pump starts.
- B. Only the "A" and "B" diesel fire pumps start.
- C. Only the electric fire pump and the "A" diesel fire pump starts.
- D. "A" and "B" diesel fire pumps and the electric fire pump starts.

37.

Unit 1 is operating at 63% power with both Reactor Feedwater pumps in service.

- o Recirculation pump speeds are both at 63%
- o Steam flow is 7.56 Mlbm/hr
- o The "1A" Condensate Booster pump (CBP) trips
- o The "1C" CBP automatically starts.
- o The "1A" Reactor Feedwater pump trips due to low suction pressure.
- o The "1B" Reactor Feedwater pump continues to operate.
- o +23 inches is the lowest Reactor Water Level during the transient

With no operator action, the final speed of the Reactor Recirculation pumps will be _____.

- A. 33%
- B. 53%
- C. 61%
- D. 63%

38.

Unit 1 is experiencing a Loss of Offsite Power (LOSP).

The following conditions exist:

- o The "1A" Emergency Diesel Generator (EDG) failed to start
- o An operator is dispatched to locally start the "1A" EDG
- o All "Control Power On" lights on 1R43-P003A are illuminated

Which ONE of the following choices completes the following statements for locally starting the EDG and flashing the generator field using the 1R43-P003A EDG Control Switch IAW 34AB-R43-001-1, Diesel Generator Recovery.

The "1A" EDG Control Switch must be placed in the (1) position prior to depressing the "START" push-button.

The EDG Control Switch must be in the (2) position to enable the Generator Field Flash circuit.

- A. (1) "REMOTE"
 (2) "AT ENG"
- B. (1) "REMOTE"
 (2) "REMOTE"
- C. (1) "AT ENG"
 (2) "AT ENG"
- D. (1) "AT ENG"
 (2) "REMOTE"

39.

Unit 2 was operating at 100% power.

- o A loss of 2R22-S016 (125/250VDC "A") occurs
- o Subsequently a Main Turbine trip occurs

Which ONE of the following completes both of these statements?

The Main Generator PCBs (1) .

The station service 4160 VAC buses (2) transfer to their alternate source.

- A. (1) will still automatically open
(2) will still automatically
- B. (1) must be manually opened
(2) will still automatically
- C. (1) will still automatically open
(2) will NOT automatically
- D. (1) must be manually opened
(2) will NOT automatically

40.

Unit 1 is at 100% power.

- o The Main Turbine automatically trips due to a problem with the turbine lube oil system.

When the Main Turbine trips, the Main Generator will trip (1).

This Main Generator trip arrangement protects the turbine from (2).

- A. (1) immediately
(2) overspeeding
- B. (1) immediately
(2) bearing damage
- C. (1) seconds later
(2) overspeeding
- D. (1) seconds later
(2) bearing damage

41.

Unit 2 was operating at 100% for one year when a spurious scram occurred due to surveillance testing.

The following conditions exist five minutes after the scram:

- o All rods fully inserted
- o MSIVs open
- o Auxiliary steam loads still in service

Which ONE of the following is the expected main turbine bypass valve position and the corresponding inventory makeup that is required to maintain level constant within the normal level band?

- A. 1 bypass valve will be fully open.
The required makeup is within the capacity of one CRD pump.
- B. 1 bypass valve will be fully open.
The required makeup exceeds the capacity of one CRD pump.
- C. 1 bypass valve will be controlling, varying between 0 - 50% open.
The required makeup is within the capacity of one CRD pump.
- D. 1 bypass valve will be controlling, varying between 0 - 50% open.
The required makeup exceeds the capacity of one CRD pump.

42.

Unit 2 is operating at 90% power

- o **Unit 2** Drywell (DW) pressure is 0.5 psig.
- o At 10:00 DW pressure begins going up at 0.05 psig/minute

Which ONE of the following completes the following statement IAW Tech Spec Limiting Condition for Operation (LCO) 3.6.1.4, Drywell Pressure?

The EARLIEST time that an entry into a Required Action Statement (RAS) based on DW pressure is required is (1) and DW pressure is required to be restored to within limit no later than (2) from entering the RAS.

- A. (1) 10:03
(2) 15 minutes
- B. (1) 10:03
(2) 1 hour
- C. (1) 10:26
(2) 15 minutes
- D. (1) 10:26
(2) 1 hour

43.

Unit 1 is operating at 90% power.

- o A Safety Relief Valve (SRV) inadvertently opened causing Suppression Pool water temperature to increase
- o Suppression Pool water temperature reaches 97°F before operators are able to close the SRV

IAW 34AB-T23-003-1, "Torus Temperature Above 95°F, which ONE of the following describes the required Residual Heat Removal (RHR) Suppression Pool Cooling alignment?"

- A. Place only one loop of RHR in Suppression Pool cooling, and the RHR heat exchanger is required to be isolated prior to starting the RHR pump.
- B. Place only one loop of RHR in Suppression Pool cooling, and the RHR heat exchanger is NOT required to be isolated prior to starting the RHR pump.
- C. Place all available RHR loops in Suppression Pool cooling, and the RHR heat exchanger is required to be isolated prior to starting the RHR pumps.
- D. Place all available RHR loops in Suppression Pool cooling, and the RHR heat exchanger is NOT required to be isolated prior to starting the RHR pump.

44.

Unit 2 is in an Anticipated Transient Without a Scram (ATWS), with reactor water level (RWL) being controlled between -155 to -185 inches and reactor pressure is at 900 psig.

Which ONE of the following identifies if a Safety Limit value has been exceeded and if adequate core cooling exists?

A Tech Spec Safety Limit value ___(1)___ been exceeded and IAW Plant Specific Technical Guidelines (EOP Bases), adequate core cooling ___(2)___ exist.

- A. (1) has
(2) does
- B. (1) has
(2) does NOT
- C. (1) has NOT
(2) does
- D. (1) has NOT
(2) does NOT

45.

An evacuation of the Main Control room has occurred.

- o The **Unit 1** reactor was not scrammed prior to leaving the Control Room.
- o SPDS is NOT available.

Which ONE of the following choices completes both statements IAW 31RS-OPS-001-1, "Shutdown From Outside Control Room,"

Guidance is given to locally scram the reactor by tripping the Scram Discharge Volume (SDV) ____ (1) ____.

This procedure provides guidance to confirm Reactor shutdown by visually verifying that each ____ (2) ____.

- A. (1) Thermal Level Switches
(2) SDV Vent and Drain valve is CLOSED
- B. (1) Thermal Level Switches
(2) HCU Scram Inlet and Outlet valve is OPEN
- C. (1) Float Level Switches
(2) SDV Vent and Drain valve is CLOSED
- D. (1) Float Level Switches
(2) HCU Scram Inlet and Outlet valve is OPEN

46.

Unit 2 has a loss of RBCCW that results in **ONLY** one pump running.

Which **ONE** of the following identifies the reason that the 2P42-F033 and 2P42-F034 valves are directed to be closed IAW 34AB-P42-001-2, "Loss of RBCCW"?

Note: 2P42-F033, RBCCW Supply to 158' Elevation and Above Isolation"
2P42-F034, "RBCCW Supply to RBCCW Loads Below 158' Elevation Isolation"

These actions are required to ensure that _____ .

- A. the Control Rod Drive pump has cooling
- B. the Reactor Recirculation pumps are adequately cooled
- C. the RBCCW Surge Tank is isolated
- D. the RBCCW pump is protected from run-out conditions

47.

Unit 2 is operating at 100% power.

- o 2P52-F565, "Rx Bldg Inst N2 To Non-Int Air El 185 Isol Vlv", has been tagged in the closed position.
- o Unit 2 experiences a loss of all Unit 2 Station Service Air Compressors.
- o The air cross-tie valve between Unit 1 and Unit 2 cannot be opened due to a bent stem.

Which one of the following predicts the final MSIV positions with respect to the availability of a pneumatic supply?

- A. The Inboard and Outboard MSIVs will remain OPEN.
- B. The Inboard and Outboard MSIVs will eventually drift CLOSED.
- C. The Inboard MSIVs will remain OPEN;
The Outboard MSIVs will eventually drift CLOSED.
- D. The Inboard MSIVs will eventually drift CLOSED;
The Outboard MSIVs will remain OPEN.

48.

Unit 2 is operating at 100% power.

- o Nitrogen (N₂) is being added to the Unit 2 Drywell (DW) from the Unit 1 N₂ Storage Tank

34SO-T48-002-2, "Containment Atmosphere Control and Dilution System" section 7.3.1, "Alternate Primary Containment Nitrogen Makeup From CAD loop A, Unit 1 or Unit 2 N₂ Storage Tank" is being used to add the N₂.

- o 2T48-F113, "Nitrogen to DW isolation valve" is OPEN
- o 2T48-F114, "Nitrogen to DW isolation valve" is OPEN
- o DW venting using Standby Gas Treatment is in progress
- o A fault in 2C71-P001, "RPS Power Dist Panel" results in a loss of the "2A" Reactor Protection System (RPS) bus
- o It will take 8 hours to restore the "2A" RPS bus

If the operator stationed at the 2H11-P657 panel does NOT take any action, which ONE of the following describes the operational implications for the DW?

- A. N₂ addition to the DW will continue and a loss of DW cooling will eventually occur due to high DW pressure.
- B. N₂ addition to the DW will continue and DW cooling will remain in operation indefinitely.
- C. N₂ addition to the DW will automatically isolate and DW cooling will remain in operation indefinitely.
- D. N₂ addition to the DW will automatically isolate and a simultaneous loss of DW cooling will occur.

49.

Unit 2 was in Mode 5 when a Loss of Shutdown Cooling (SDC) occurred.

Which ONE of the following identifies a required local action from Attachment 4, "Shutdown Cooling Loop Preparation for Immediate Service", of 34AB-E11-001-2, "Loss of Shutdown Cooling" and the associated reason for that required action?

(Assume the "2A" loop of RHR is being place in SDC)

- A. OPEN the breaker for 2E11-F007A, "Minimum Flow Valve" to ensure a minimum flow path is available during pump start-up.
- B. OPEN the breaker for 2E11-F007A, "Minimum Flow Valve" to ensure that a flow path exists during the discharge piping flush.
- C. CLOSE the SDC Condensate flush supply valves, 2E11-F083 & 2E11-F084, when flow noise stops in the SDC suction pipe to ensure that the Suppression Pool level is NOT increased.
- D. CLOSE the SDC Condensate flush supply valves, 2E11-F083 & 2E11-F084, when flow noise stops in the SDC suction pipe because the suction piping is full of water.

50.

An irradiated fuel bundle is on the **Unit 2** Refueling Bridge Main Grapple, which is in the "FULL-UP" position, and can NOT be lowered due to an equipment malfunction.

- o The Fuel Pool Transfer Canal seals deflate which causes Fuel Pool water level to decrease to its lowest possible level
- o Only the 2D21-K601A and 2D21-K601M Area Radiation Monitors (ARM) red TRIP lights illuminate and these two ARMs will not reset.

Which ONE of the following predicts the Fuel Pool level and how the Main Control Room Environmental Control (MCREC) system is affected.

Fuel Pool Water level will ____ (1) ____ the top of the Fuel Bundle and the MCREC system will ____ (2) ____.

- A. (1) remain above
(2) remain in Normal Mode
- B. (1) remain above
(2) align to the Pressurization Mode
- C. (1) go below
(2) remain in Normal Mode
- D. (1) go below
(2) align to the Pressurization Mode

51.

A steam line break inside containment has occurred on **Unit 1**.

- o Drywell pressure is steady at 10.5 psig
- o Drywell or Torus sprays have NOT yet been initiated

Which ONE of the following describes the effect of the steam line break on Torus water temperature?

- A. The saturation temperature of the Torus water will be lower than at normal operating conditions because of the non-condensable gases.
- B. The Torus water temperature will initially heat up evenly throughout the Torus due to the design of the downcomers.
- C. The Torus water temperature will heat up directly under the area of the DW leak due to more energy is being distributed directly to the torus water in that area.
- D. The Torus water average temperature indication is unreliable until suppression pool cooling is established.

52.

31EO-EOP-107-2, "ALTERNATE RPV PRESSURE CONTROL" is in progress.

- o The HPCI system is being used to control reactor pressure.
- o The 2E41-R612, "HPCI flow controller," is in automatic, with the setpoint at 3000 gpm.

To INCREASE the reactor cooldown rate (CDR), the operator is required to use _____ and _____ IAW 31EO-EOP-107-2.

- A. 2E41-R612, "HPCI flow controller,"
RAISE the setpoint
- B. 2E41-R612, "HPCI flow controller,"
LOWER the setpoint
- C. 2E41-F011, "Test to CST VLV,"
throttle it in the CLOSE direction
- D. 2E41-F011, "Test to CST VLV,"
throttle it in the OPEN direction

53.

A transient has occurred on **Unit 2** with the following plant conditions:

- o RPV pressure 960 psig
- o RWL -80 inches
- o Drywell Pressure 1.2 psig
- o Torus water temperature .. 120°F

IAW the EOP PC flowchart and 34SO-E11-010-2, "RHR System," which ONE of the following completes the following sentence?

To place Suppression Pool Cooling in service, the Containment Spray Vlv Control (LOCA Override) switch _____ required to be placed to the MANUAL position and the MAXIMUM required loop flow through the heat exchanger is _____.

- A. is; 17,000 gpm
- B. is; 11,500 gpm
- C. is NOT; 17,000 gpm
- D. is NOT; 11,500 gpm

54.

Unit 2 was at 100% power when a pipe break occurred inside the Drywell (DW).

The following conditions now exist:

- o Drywell Pressure: 8 psig
- o Bulk Average Drywell Temperature: 245°F

Which ONE of the following completes the following statement?

IAW 31EO-EOP-100-2, "Miscellaneous Emergency Overrides", the "2A" DW Chiller _____.

- A. is NOT allowed to be restarted because overriding the high DW pressure isolation has the potential for increased off-site release rates
- B. is NOT allowed to be restarted because at this DW temperature the potential for a rupture in the DW coolers exist
- C. is allowed to be restarted. The operator must first place the LOCA override switch to "BYPASS" and then reset the 86 Lockout relay at the DW Chiller breaker
- D. is allowed to be restarted. The operator must first reset the 86 Lockout relay at the DW Chiller breaker and then place the LOCA override switch to "BYPASS"

55.

Unit 2 is operating at 100% power when a Loss of Coolant Accident occurs.

- o The High Pressure Coolant Injection system is being used to control RPV water level.
- o The "2A" RHR pump is placed in Suppression Pool Cooling
- o Torus level 135 inches
- o "2A" RHR pump flow 7,000 gpm
- o Torus temperature 225°F
- o Suppression Chamber Pressure 8 psig

Which ONE of the following choices completes this statement?

"2A" RHR pump operation is in the _____ region of the RHR NPSH Limit graph and _____.

Reference provided

- A. safe; flow must be maintained at or below its current flow rate
- B. safe; flow is required be increased to maximize suppression pool cooling
- C. unsafe; reducing flow will NOT restore operation to the safe area of the graph
- D. unsafe; reducing flow to 5,000 gpm will restore operation to the safe area of the graph

56.

Unit 2 was operating at 100% power, when a Loss of Coolant Accident (LOCA) occurred.

- o Drywell pressure: 3.7 psig.
- o Reactor pressure has decreased to 285 psig.

Which ONE of the following predicts the expected control panel flow indication IAW 31EO-EOP-010-2, "RC Flowchart"?

Based on these conditions, with no additional operator actions, _____ will have indication of flow to the reactor vessel.

- A. NEITHER Core Spray nor RHR
- B. BOTH Core Spray and RHR
- C. ONLY Core Spray
- D. ONLY RHR

57.

Unit 2 is operating at 100% power.

The "A" Reactor Core Isolation Cooling (RCIC) Pump Room Cooler (2T41-B004A) is operating with its control switch in the "RUN" position.

When will the "2T41-B004B" RCIC Pump Room Cooler automatically start?

- A. ONLY when RCIC is started.
- B. ONLY due to high RCIC room temperature.
- C. It requires EITHER, a high RCIC room temperature OR a RCIC start.
- D. It requires BOTH, a high RCIC room temperature AND a RCIC start.

58.

Unit 2 is operating at 100% power.

- o 2T41-C007B, "Rx Bldg Vent Exhaust Fan," is tagged out
- o 2T41-C007A, "Rx Bldg Vent Exhaust Fan," Trips

With no operator action, which ONE of the following predicts how the Rx. Bldg differential pressure (DP) and Rx. Bldg monitored radioactive release rate will be affected?

The Rx. Bldg negative pressure will be (1) before the fan tripped.

The Rx. Bldg stack release rate will be (2) before the fan tripped

- A. (1) the same as
(2) higher than
- B. (1) the same as
(2) lower than
- C. (1) less than
(2) higher than
- D. (1) less than
(2) lower than

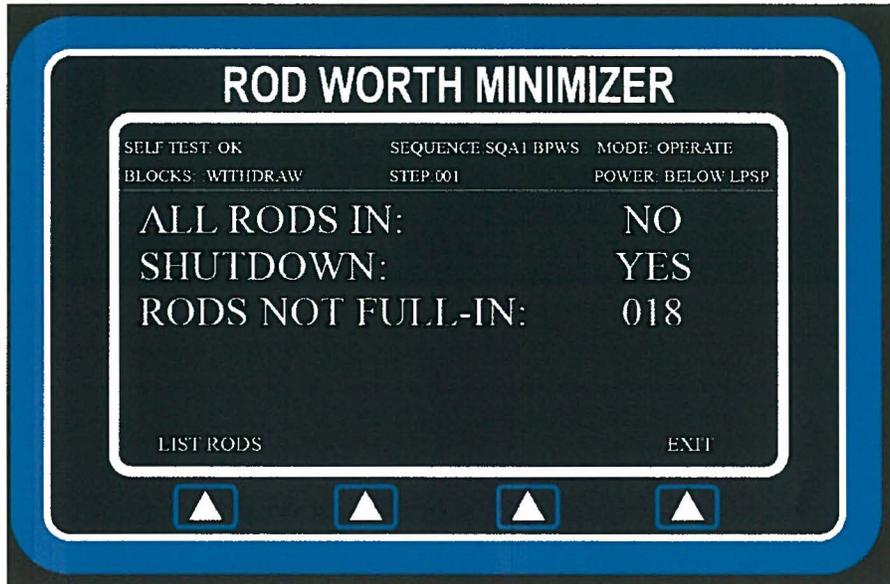
59.

Unit 1 was operating at 100% power when a reactor scram occurred.

IMMEDIATELY following the scram, the APRMs indicate reactor power is at 5%

- o Standby Liquid Control (SBLC) has NOT been injected.

10 minutes LATER Rod Worth Minimizer (RWM) displays the following:



Based on these conditions, which ONE of the following completes both of these statements?

IAW 31EO-EOP-103-1, "Control Rod Insertion Methods," RWM (1) required to be bypassed to insert control rods.

With the current control rod configuration, the reactor (2) remain subcritical under ALL conditions, without boron injection.

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

60.

Unit 1 is operating at 18% power.

The following alarms are received soon after a cold water injection into the reactor:

- o MAIN STEAM LINE RADIATION HIGH (601-425)
- o MAIN STEAM LINE RADIATION HIGH-HIGH/INOP (603-125)
- o Main Steam Line radiation levels are 6,000 mRem/hr (increasing)
- o Main Steam Isolation Valves are OPEN
- o 1B31-F019 and 1B31-F020, "Reactor Recirculation Sample Valves" are CLOSED

Which ONE of the following identifies whether all automatic actions have occurred and the required action(s) IAW 34AB-B21-001-1, "Main Steam Line High Radiation or Suspected Fuel Element Failure."

All automatic actions _____ occurred and the operator is required to _____

- A. have; scram the reactor and then close the MSIVs.
- B. have; perform a fast reactor shutdown IAW 34GO-OPS-014, "Fast Reactor Shutdown," and then close the MSIVs.
- C. have NOT; scram the reactor and then close the MSIVs.
- D. have NOT; perform a fast reactor shutdown IAW 34GO-OPS-014, "Fast Reactor Shutdown," and then close the MSIVs.

61.

Unit 2 is shutting down for a refueling outage.

- o Instrument Air has been aligned to the DW.
- o At 10:00 a pneumatics header line breaks inside the DW causing an air flow rate of 50 SCFM

Which ONE of the following choices completes this statement?

Air being supplied to the DW pneumatics header isolation valves (1) automatically isolate (2) .

- A. (1) will
 (2) immediately
- B. (1) will
 (2) following a 10 minute delay
- C. (1) will NOT
 (2) because the Instrument Air flow is below the DW Pneumatics isolation setpoint
- D. (1) will NOT
 (2) because the flow rate sensing point is upstream of where the Instrument Air ties into the DW Pneumatics header

62.

Unit 1 was operating at 100% power when a total loss of Reactor Building Closed Cooling Water (RBCCW) occurred.

With NO operator action, which ONE of the following describes how the Reactor Water Cleanup System (RWCU) will be affected?

_____ (1) _____ will automatically close when the RWCU Non-Regenerative Heat Exchanger outlet temperature increases to AT LEAST _____ (2) _____.

- A. (1) ONLY 1G31-F001, "Rx Water Cleanup Vlv"
(2) 130°F
- B. (1) ONLY 1G31-F004, "Rx Water Cleanup Vlv"
(2) 130°F
- C. (1) ONLY 1G31-F001, "Rx Water Cleanup Vlv"
(2) 140°F
- D. (1) ONLY 1G31-F004, "Rx Water Cleanup Vlv"
(2) 140°F

63.

Unit 1 has experienced an accident that results in these Primary Containment parameters:

- o Hydrogen concentration 8%
- o Oxygen concentration 7%
- o Drywell (DW) pressure 14 psig and slowly increasing
- o Torus level 280 inches (steady)

Which ONE of the following identifies a required action IAW 31EO-PCG- 001-1, "Primary Containment Gas Control" chart, and the reason for this action?

Given these conditions, the operator is required to _____.

- A. spray the DW to reduce the flammability AND scrub radionuclides
- B. spray the DW ONLY to reduce the flammability. Spray flow does NOT scrub radionuclides.
- C. vent the Suppression Chamber to reduce the flammability AND scrub radionuclides
- D. vent the Suppression Chamber ONLY to reduce the flammability. Venting through the Torus does NOT scrub radionuclides.

64.

A fire is reported on **Unit 1**, in the "1F" 4160VAC bus.

The fire suppression that is available in this room is _____.

- A. automatically actuated Carbon Dioxide agent
- B. automatically actuated Halon agent
- C. manually actuated Carbon Dioxide agent
- D. manually actuated Halon agent

65.

Which ONE of the following completes BOTH statements regarding degraded system voltage IAW 34AB-S11-001-0, "Operation With Degraded System Voltage"?

The normal minimum voltage at the 230KV bus with either Unit in Modes 1, 2, or 3 is _____.

IF the 4160VAC bus voltages can NOT be restored and maintained above a minimum of _____, THEN within 30 minutes start the Emergency Diesel Generators.

- A. 233KV;
3825 volts
- B. 233KV;
3255 volts
- C. 225KV;
3825 volts
- D. 225KV;
3255 volts

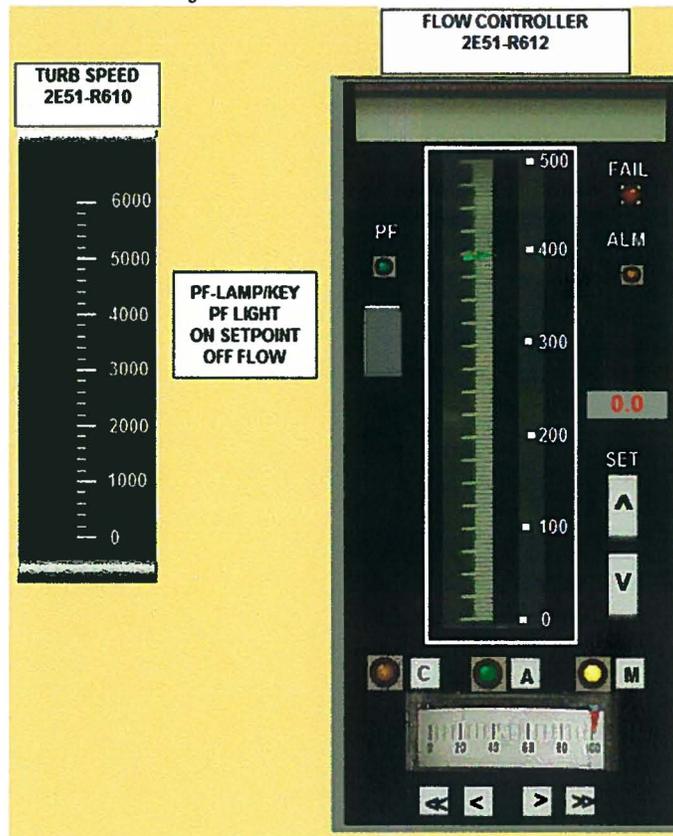
66.

Which ONE of the following defines the purpose of the Rod Worth Minimizer (RWM) IAW Technical Specifications.

- A. Ensures that fuel enthalpy does not exceed 280 cal/gm during a control rod drop accident when power is $\geq 29\%$.
- B. Ensures that fuel enthalpy does not exceed 280 cal/gm during a control rod drop accident when reactor power is $< 10\%$.
- C. Ensures that the Minimum Critical Power Ratio remains greater than 1.08, while withdrawing control rods, when power is $\geq 29\%$.
- D. Ensures that the Minimum Critical Power Ratio remains greater than 1.08, while withdrawing control rods, when reactor power is $< 10\%$.

67.

Unit 2 RCIC has tripped with an Initiation Signal present. The trip condition has been corrected and RCIC is needed for injection.



NOTE: The light next to the "M" on the above controller is ILLUMINATED.

Which ONE of the following completes the following statements IAW 34SO-E51-001-2, "Reactor Core Isolation Cooling (RCIC) System"?

The controller (1) setup correctly for a manual RCIC start with an initiation signal present.

This controller is located on panel (2) .

- A. (1) is
 (2) 2H11-P601
- B. (1) is NOT
 (2) 2H11-P601
- C. (1) is
 (2) 2H11-P602
- D. (1) is NOT
 (2) 2H11-P602

68.

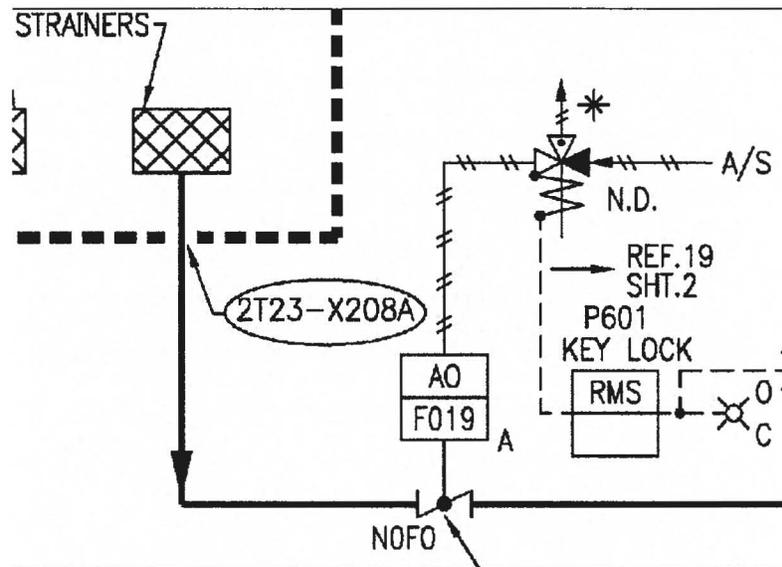
Which ONE of the following choices completes this CAUTION in 34GO-OPS-001-1, "Plant Startup"?

Extended operation _____ (1) _____ is undesirable. The decision to continue operation in this condition will require the approval of the manager Operations. If the startup is to be suspended for an extended period of time, the control rods will normally be _____ (2) _____.

- A. (1) just below or just above the point of criticality
(2) inserted to an all rods in condition to ensure subcriticality
- B. (1) just below or just above the point of criticality
(2) notched in and out to maintain power at the Point Of Adding Heat
- C. (1) in the OPRM ARMED region of the Power to Flow map
(2) withdrawn using the continuous withdraw method instead of raising Recirculation Flow to exit the region
- D. (1) in the OPRM ARMED region of the Power to Flow map
(2) restricted to the single notch withdrawal method instead of raising Recirculation Flow to exit the region

69.

The crew is implementing a tagout for the **Unit 2 Core Spray** system and the 2E21-F019A, "Torus Suction Valve" keylock control switch at panel P601 has been placed in the "CLOSED" position.



Which ONE of the following predicts how the valve and actuator will respond if the solenoid valve power is removed?

2E21-F019A will (1).

Air will be (2) the 2E21-F019A actuator.

- A. (1) stroke open
(2) vented off of
- B. (1) stroke open
(2) supplied to
- C. (1) remain closed
(2) vented off of
- D. (1) remain closed
(2) supplied to

70.

The MCPR fuel cladding integrity Safety Limit ensures that:

- A. during normal operation and transients at least 99.9% due NOT experience Transition Boiling.
- B. the peak cladding temperature during the design basis LOCA does not exceed the limits in 10CFR46.
- C. the calculated total oxidation of the cladding shall no where exceed 0.17 times the total cladding thickness before oxidation.
- D. fuel thermal-mechanical design limits are not exceeded any where in the core during normal operation.

71.

Unit 1 is at 100% power, late in core life.

- o The "1B" Control Rod Drive (CRD) pump is tagged out
- o All control rods are withdrawn

The following sequence of events occur:

- o 10:00 the "1A" CRD pump trips
- o 10:05 an operator attempts to restart the "1A" CRD pump and is NOT successful
- o 10:10 a System Operator reports several CRD scram accumulators are less than 940 psig

IAW with Tech Specs 3.1.5, which ONE of the following is the LATEST time that the Reactor Mode Switch MUST be in the Shutdown position?

- A. 10:00
- B. 10:10
- C. 10:30
- D. 11:00

72.

Unit 1 was at 35% power when the Hydrogen Injection System was placed in service in AUTOMATIC - EXTERNAL mode IAW 34SO-P73-001-1, "Hydrogen and Oxygen injection and Control for HWC" section 7.1.2, "Placing 1P73-R025, Hydrogen Controller, in EXTERNAL."

- o Power is raised from 35% power to 100% power
- o At 100% power hydrogen flow rate indicates 40 SCFM

Which ONE of the following answers both of these statements?

IAW 34SO-P73-001-1, "Hydrogen and Oxygen injection and Control for HWC", hydrogen injection flow rate is _____ the normal 100% power flow rate.

Radiation levels in the Condenser Bay will stabilize _____ expected normal full power radiation levels.

- A. above;
at
- B. below;
at
- C. below;
below
- D. above;
above

73.

Unit 1 is shutting down for a refueling outage.

- o A normal "Initial" Drywell (DW) entry at power is required.

Which ONE of the following completes the following statement IAW 31GO-OPS-005-0, "Primary Containment Entry."

Before a normal "Initial" DW entry is allowed, Oxygen (O₂) concentration must be at least _____ and reactor power must be less than or equal to _____.

- A. 19.5%;
10%
- B. 19.5%;
15%
- C. 23.5%;
10%
- D. 23.5%;
15%

74.

Unit 1 is operating at 70% power when a transient occurs.

Current plant conditions:

- o Reactor water level +5 inches (lowest level reached)
- o Reactor pressure 1080 psig (highest pressure reached)
- o Drywell pressure 1.90 psig (highest pressure reached)

Which ONE of the following completes both of these statements?

Entry conditions have been met or exceeded ____ (1) ____ Emergency Operating Procedure (EOP) flow chart(s).

IAW 34AB-C71-001-2, "Scram Procedure", performance of the RC-1, RC-2 and ____ (2) ____ placards are required IMMEDIATE actions.

- A. (1) ONLY for the Reactor Controls (RC)
(2) TC-1
- B. (1) ONLY for the Primary Containment (PC)
(2) RC-3
- C. (1) for BOTH the RC and PC
(2) RC-3
- D. (1) for BOTH the RC and PC
(2) TC-1

75.

Unit 2 is in Mode 3.

- o Reactor pressure 35 psig
- o Reactor Water Level 40 inches (stable)
- o Main Condenser Vacuum "0" in. Hg. Vac
- o The "2B" Residual Heat Removal (RHR) pump is operating in Shutdown Cooling (SDC)
- o The "2A" loop of RHR is tagged out

A Logic System Functional Test results in an inadvertent High Drywell pressure LOCA signal that can NOT be reset.

Which ONE of the following predicts BOTH the status of "2B" RHR pump and how reactor pressure will be controlled IAW 34SO-E11-010-001-2, "RHR System" and/or 34AB-E11-001-2, "Loss of SDC"?

The "2B" RHR pump ____ (1) ____ and reactor pressure will be controlled by ____ (2) ____.

- A. (1) remains running
(2) raising RWL to the Main Steam Lines (MSL) and opening the MSL drain valves, defeating the low vacuum trips as necessary.
- B. (1) remains running
(2) opening the MSIVs and using the Main Turbine Bypass Valves to send steam to the Main Condenser, defeating the low vacuum trips as necessary.
- C. (1) trips
(2) opening the MSIVs and using the Main Turbine Bypass Valves to send steam to the Main Condenser, defeating the low vacuum trips as necessary.
- D. (1) trips
(2) raising RWL to the Main Steam Lines (MSL) and opening the MSL drain valves, defeating the low vacuum trips as necessary.

HLT 4 NRC Written Exam
RO Index of References

1. 34AB-B21-002-2, "RPV Water Level Corrections" Page 7 of 12
2.
 - o Unit 2 EOP Graph 12A, "RHR Pump NPSH Limit," (Suppression Pool Water Level Below 146")
 - o Unit 2 EOP Graph 12B, "RHR Pump NPSH Limit," (Suppression Pool Water Level At or Above 146")

rec'd
x/12/09

DOCUMENT TITLE:

RPV WATER LEVEL CORRECTIONS

DOCUMENT NUMBER:

34AB-B21-002-2

VERSION No:

6.11

ATTACHMENT 1

TITLE: DRYWELL RTD GROUPS AND CAUTION 1 AND 2

Att. Pg.

3 of 3

CAUTION 1 (CONTINUED)

2. FOR THE FOLLOWING TABLE, THE WATER LEVEL INSTRUMENT READS ABOVE MINIMUM INDICATED LEVEL FOR THE ASSOCIATED MAXIMUM RUN TEMPERATURE MEASURED BY THE HIGHEST TEMPERATURE IN THE ASSOCIATED RTD GROUP.

- a. NARROW RANGE
(0 TO +60 IN.)

<u>INSTRUMENT</u>	<u>RTD GROUP</u>
2C32-R606A & C	1
2C32-R606B	2

<u>MINIMUM INDICATED LEVEL (IN.)</u>	<u>MAXIMUM RUN TEMPERATURE (°F)</u>
0	UP TO 273
6	274 TO 350
9	351 TO 399
27	400 OR ABOVE

- b. WIDE RANGE
(-150 TO +60 IN)

<u>INSTRUMENT</u>	<u>RTD GROUP</u>
2B21-R604A & R623A	1
2B21-R604B & R623B	2

<u>MINIMUM INDICATED LEVEL (IN.)</u>	<u>MAXIMUM RUN TEMPERATURE (°F)</u>
- 150	UP TO 197
- 130	198 TO 350
- 122.5	351 TO 399
- 90	400 OR ABOVE

- c. FLOODUP RANGE

<u>INSTRUMENT</u>	<u>RTD GROUP</u>
2B21-R605 (0 TO +400 IN.)	1
2C32-R655 (0 TO +200 IN.)	2

<u>MINIMUM INDICATED LEVEL (IN.)</u>	<u>MAXIMUM RUN TEMPERATURE (°F)</u>
0	UP TO 190
16	191 TO 250
46	251 TO 350
60	351 TO 399
102	400 OR ABOVE

- d. FUEL ZONE
(-317 TO -17 IN.)

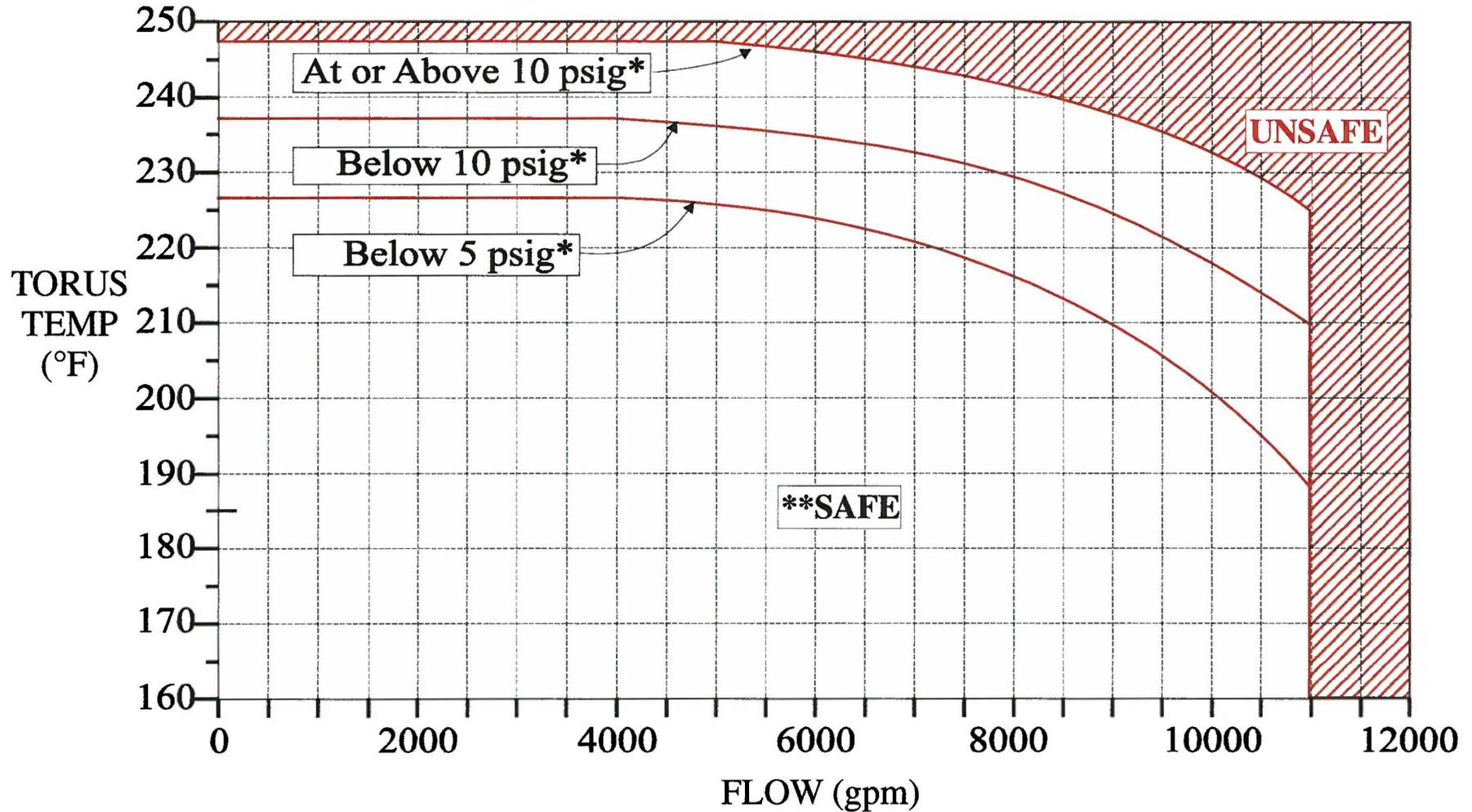
<u>INSTRUMENT</u>	<u>RTD GROUP</u>
2B21-R623B	2
2B21-R623A	1

<u>MINIMUM INDICATED LEVEL (IN.)</u>	<u>MAXIMUM RUN TEMPERATURE (°F)</u>
- 317	UP TO 280
- 299	281 AND ABOVE

GRAPH 12A

UNIT 2

RHR Pump NPSH Limit (Suppression Pool Water Level At or Above 146")



NOTE: May use SPDS Emergency Displays in place of this Graph.

* Suppression Chamber Pressure.

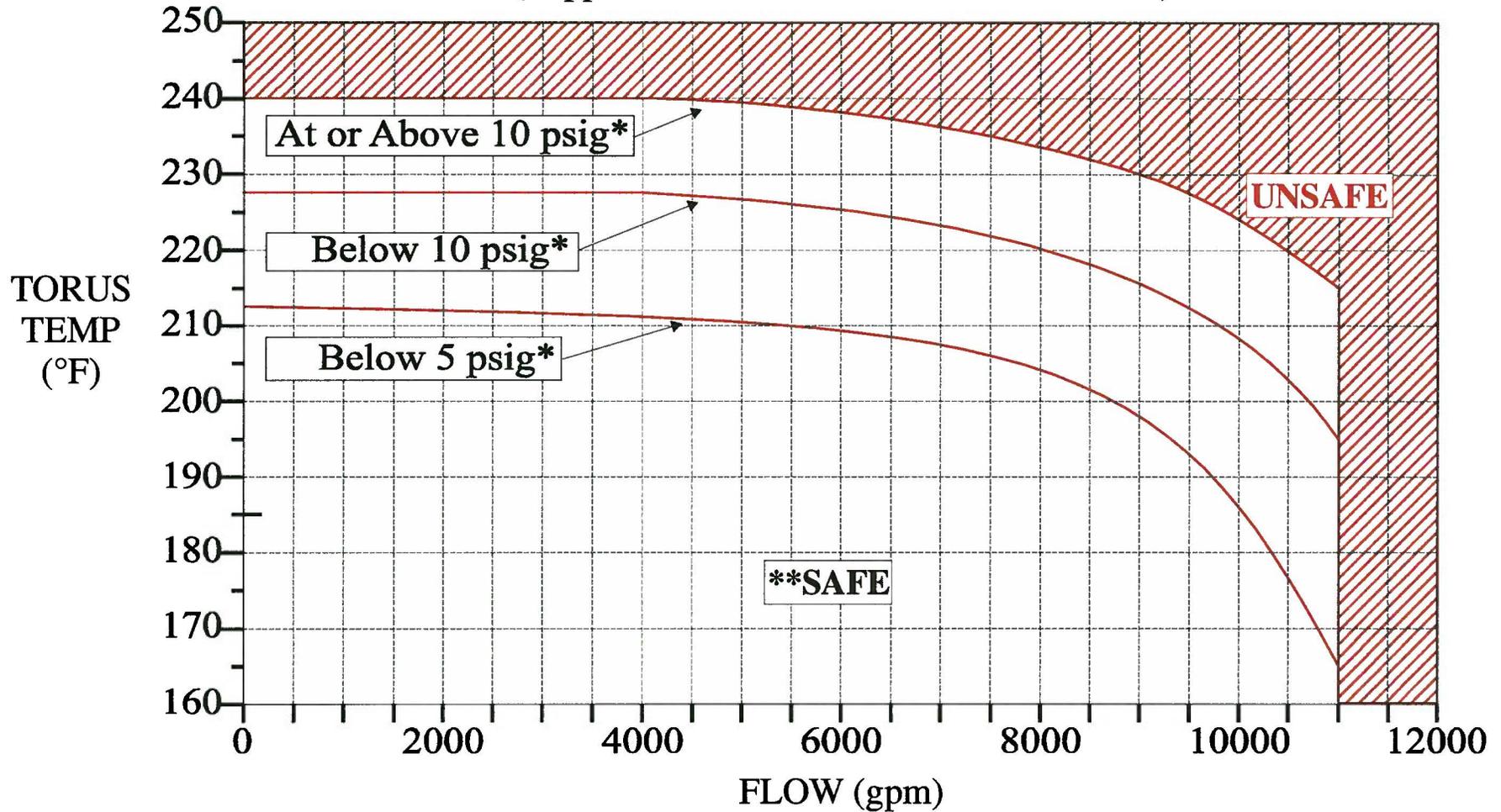
** Safe operating region is below the applicable pressure line.

10/2/11

GRAPH 12B

UNIT 2

RHR Pump NPSH Limit (Suppression Pool Water Level Below 146")



NOTE: May use SPDS Emergency Displays in place of this Graph.

* Suppression Chamber Pressure.

** Safe operating region is below the applicable pressure line.

10/16/05