FINAL SUBMITTAL

BROWNS FERRY 2000-301
50-259, 260, and 296/2000-301

JUNE 12 - 15, JUNE 27 - 29, AND
JUNE 30, 2000

FINAL AS ADMINISTERED

RO WRITTEN EXAMINATION

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

Applicant Information	
Name:	Region: II
Date: 6/30/00	Facility/Unit: Browns Ferry Nuclear Plant
License Level: RO	Reactor Type: 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. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five 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

Name: _____

1. With regard to the RWM, which one of the following describes the action(s) to be taken to allow manual rod insertion during an ATWS condition?

   A. Mannually substitute rod positions through the Integrated Computer System.

   B. Use the RWM Manual Bypass Switch.

   C. Remove control power fuses from RWM.

   D. Place Mode Switch in REFUEL, then use the EMERGENCY IN position of HS-85-47.

2. In addition to a ROD OVERTRAVEL annunciator, which one of the following is indication of an uncoupled control rod when fully withdrawing a control rod?

   A. Backlighting is red on the 4 rod-display, backlighting is not present on the full core display.

   B. Backlighting is not present on the 4 rod-display, backlighting is present on the full core display.

   C. Backlighting is red on the 4 rod-display, backlighting is present on the full core display.

   D. Backlighting is red and green on the 4 rod-display, backlighting is not present on the full core display.

3. While Reactor Recirculation Pump A is operating at 80%, a failure in the pump's individual Manual/Auto station occurs and a signal is sent to the Bailey Positioner, calling for a pump speed of zero.

   Which one of the following states the expected response of the pump?

   A. Speed will decrease to zero.

   B. Speed will decrease to 20%.

   C. Speed will decrease to 28%.

   D. The scoop tube will lock up and speed will remain at 80%.

4. Following a reactor trip the following conditions exist:

RPV water level at +19 inches.
Turbine exhaust pressure at 100 psig.
Steamline space temperature 150°F in the Torus Area.
Ambient temperature of 140°F HPCI Pump Room.
Suppression Pool Level High at +9 in.
RPV pressure at 300 psig (does not seal-in).
Pressure between HPCI rupture diaphragms at 3 psig.
Drywell pressure at 3.25 psig.

Based on these conditions, what is the status of the HPCI system?

A. OUTBD SUCT VLV, 2-FCV-73-27, and INBD SUCT VALVE, 2-FCV-73-26 open, HPCI System not running.

B. OUTBD SUCT VLV, 2-FCV-73-27, and INBD SUCT VALVE, 2-FCV-73-26 open, HPCI turbine tripped.

C. OUTBD SUCT VLV, 2-FCV-73-27, and INBD SUCT VALVE, 2-FCV-73-26 closed HPCI System isolated.

D. OUTBD SUCT VLV, 2-FCV-73-27, and INBD SUCT VALVE, 2-FCV-73-26 open, HPCI System running.

5. Conditions on Unit 2 exist that required the initiation of Standby Liquid Control (SLC).

Which one of the following would indicate on panel 9-5 that SLC is injecting?

A. The selected pump red light is ILLUMINATED, the blue SQUIB valve continuity lights are EXTINGUISHED, SLC pump discharge pressure is at 1100 psig, and the red flow light is ILLUMINATED.

B. The selected pump white light is ILLUMINATED, the RWCU System ISOLATED, and the Loss of Squib Valve Continuity annunciator is in ALARM.

C. The selected pump red light is ILLUMINATED, the blue SQUIB valve continuity lights are ILLUMINATED, and SLC pump discharge pressure is 1100 psig.

D. The selected pump white light is ILLUMINATED, the blue SQUIB valve continuity lights are ILLUMINATED, SLC pump discharge pressure is 1100 psig, and the red flow light is EXTINGUISHED.

6. Which one of the following choices describes the operation of the Unit 2 RHR pump torus suction valves with the RHR LOOP MODE SELECTOR (NORMAL/SHUTDOWN) switch in the SHUTDOWN position?

   A. Allows operation at breaker only but does not bypass in-line valve interlock.

   B. Allows operation from the Reactor MOV Boards only when the corresponding pump Shutdown Cooling suction valve is fully closed.

   C. Causes the valves to cycle full open (unless stopped locally or the Unit Operator placed the 9-3 control switch in the close position) and cycle back closed.

   D. Allows valve to be operated from the Control room or the Reactor MOV Boards.

7. The unit receives an inadvertent Group 6 Isolation while operating at power. The unit remains at power. The group 6 isolation signal cleared and the isolation reset switches on panel 9-4 were taken to the reset positions. What additional procedural actions must be taken to open all of the following valves?:

   - 64-17 DW / SUPPR CHMBR AIR PURGE ISOL VLV
   - 64-30 DRYWELL VENT OUTBD ISOL VLV
   - 64-33 SUPP CHMBR VENT OUTBD ISOL VLV
   - 76-24 PRI CTMT N2 PURGE OUTBD ISOL VLV

   A. Primary Containment Division II Run Mode Bypass switch on panel 9-3 is placed to the BYPASS position.

   B. Drywell/Torus Bypass switch on panel 9-3 is taken to the DRYWELL or TORUS position and verify any SGT fan is running.

   C. Drywell/Suppression Chamber Train A Vent keylock switch on panel 9-55 is placed to the SUPP CHBR position.

   D. Drywell/Suppression Chamber Train B Vent keylock switch on panel 9-54 is placed to the DRYWELL position.

8. When the drywell equipment drains sump automatic temperature controlled recirc loop senses a high temperature, it causes the recirc valve to open and discharge valves to close and routes the sump water through a heat exchanger. What is the purpose of this realignment?

   A. to prevent the high temperature to the D/W floor drain inbd/outbd isol valve FCV-77-2A/B and a subsequent inadvertent group 2 isolation.

   B. to prevent high temperature damage to the equipment drain integrator 2-FQ-77-16.

   C. to prevent high temperature damage to both the Flow integrators and pump fill rate timers used to determine leakage in the drywell.

   D. to prevent high temperature to damage to only the Radwaste components.

9. Unit 3 receives a primary containment isolation actuated by Low-Low-Low reactor water level. All MSIVs closed; however, only the inboard main steam line drain valves and the recirculation loop sample valves have closed.

   Which one of the following could have caused this condition?

   A. PCIS channels A1 and B1 tripped, PCIS channels A2 and B2 did not trip.

   B. PCIS channels A1, A2, and B1 tripped, PCIS channel B2 did not trip.

   C. PCIS channels A2, B1, and B2 tripped, PCIS channel A1 did not trip.

   D. PCIS channels A2 and B1 tripped, PCIS channels A1 and B2 did not trip.

10. A transient has occurred on Unit 2 requiring initiation of torus spray. Plant conditions are as follows:

- Reactor water level -132 inches (slowly lowering)
- Reactor pressure 600 psig (steady)
- Drywell pressure 2.0 psig (slowly rising)
- Drywell temperature 205 degrees

Which of the following should have occurred?

A. Drywell pressure switches initiate LPCI mode of RHR, interlock Containment Cooling/spray valves closed, initiate PCIS Group 2 isolation and initiate a reactor scram.

B. Drywell pressure switches provide pressure permissive signal to containment spray valves.

C. Drywell pressure switches operated LPCI relays in the RHR Logic system, but did not work thru Core Spray

D. Drywell pressure switches operated relays in the RHR Logic system and worked thru Core Spray

11. The following conditions exist on Unit 3:

Reactor power is 85%.
Load set is 100%.
Load Limit is 100%.
Maximum Combined Flow Limiter is set at 125%.

Which one of the following describes how the plant will respond if the Maximum Combined Flow Limiter setting is reduced to 75%?

A. Control valves close, turbine bypass valves open, and reactor pressure remains relatively constant.

B. Control valves close, turbine bypass valves remain closed, and reactor pressure increases.

C. Turbine bypass valves throttle open, control valve position remains relatively constant, and reactor pressure decreases.

D. Turbine bypass valves remain closed, control valves open, and reactor pressure lowers.

12. A refueling zone high radiation signal has just caused auto initiation of the Standby Gas Treatment (SGT) System.

Which one of the following is an ABNORMAL indication or lineup, given this radiation condition?

A. SGT Train A to Train B crosstie damper 65-22 shut.

B. SGT Train B charcoal temperature (TI-65-47) reading 125 DEG. F.

C. SGT Train C decay heat removal Damper 65-52 shut.

D. SGT Train C relative humidity heater outlet temperature (TI-65-62) reading 190 DEG. F.

13. Which of the following describes the consequences of losing the Unit 2 Panel 9-9 Cabinet 6 while operating at power?

A. The high reactor water level trip circuit for the main turbine and the reactor feed pump turbines will be de-energized. RCIC and HPCI AC control circuits will become de-energized rendering those systems inoperable.

B. The automatic reactor feedwater control system becomes inoperable and controls on the last known setpoint, there is a loss of power to the Control Rod Drive FCV-85-11 valves, In addition to normal power to panel 9-9 cabinet 5

C. The short cycle valves FCV-2-29A and -29B fail open and the reactor feedwater pumps may trip on low suction. In addition, all of the reactor feedwater pump minimum flow valves will fail open, resulting in decreased flow to the reactor.

D. The Raw Service Water head tank isolation valve closes. The temperature control valves for the main turbine lube oil, reactor recirculation pump MG sets, feedwater pump turbine lube oil, RBCCW, and Main Turbine EHC hydraulics will all fail.

14. Which one of the following would be affected if the 48 VDC system was lost?

A. Microwave communications.

B. Control Room Annunciators.

C. Emergency Diesel Generator Control and Logic.

D. 480V Shutdown Board Control.

15. Which of the following raises the rate of water decomposition?

A. Increase in the amount of freon, oil, or halogens in the Catalytic Recombiner.

B. Running the Off-gas system without the dehumidification coil in service.

C. Securing the Off-gas pre-heaters.

D. Removing Hydrogen Water Chemistry from service.

16. A barrel of trash was placed on the North side of Unit 2 Fuel Pool. The following conditions were noted on the Reactor and Refuel Zone Radiation Monitors:

Channel A:	Reactor Zone Detector A (2RM90142A)	85 MR/HR
	Reactor Zone Detector B (2RM90142B)	56 MR/HR
	Refuel Zone Detector A (2RM90140A)	67 MR/HR
	Refuel Zone Detector B (2RM90140B)	78 MR/HR
Channel B:	Reactor Zone Detector A (2RM90143A)	81 MR/HR
	Reactor Zone Detector B (2RM90143B)	62 MR/HR
	Refuel Zone Detector A (2RM90141A)	93 MR/HR
	Refuel Zone Detector B (2RM90141B)	84 MR/HR

Which one of the following describes the plant equipment response based on the above conditions?

A. Reactor zone supply and exhaust fans trip on Unit 3 only.

B. Reactor zone supply and exhaust fans are tripped on all units.

C. Drywell Control Air Compressor suction valves, FCV 32-62 and 32-63 close.

D. Isolates fresh air paths to Control Bay Elevation 3C.

17. While operating at 90% power the Unit 3 B Reactor Recirculation Field Breaker is tripped.

Immediately upon the field breaker trip the associated jet pump loop flow is:

A. subtracted from total core flow. This results in a severe lowering in indicated core flow, then as the tripped loop indicated flow decays toward zero, the core flow indication will rise toward the actual core flow value.

B. subtracted from total core flow. This results in a severe increase in indicated core flow, then as the tripped loop indicated flow decays toward zero, the core flow indication will rise toward the actual core flow value.

C. added to total core flow. This results in a severe lowering in indicated core flow, then as the tripped loop indicated flow will trend to the actual loop flow, the core flow indication will decay towards zero.

D. added to total core flow. This results in a severe increase in indicated core flow, then as the tripped loop indicated flow trend toward zero, the core flow indication will lower toward the actual core flow value.

18. During a level transient on Unit 2 the following events occurred:

- RPV water level decreased to -125 inches during the transient
- ADS actuated
- RHR Pump 2A and 2B started and injected to the reactor vessel
- RPV water level is now +25 inches and increasing
- No operator actions have been taken

Which one of the following statements describes the RHR system response to placing the RHR Pump 2A control switch to the STOP position?

A. RHR Pump 2A will stop and the amber light above the control switch will light.

B. No change; RHR Pump 2A will continue to run until the LOCA initiation signal is reset.

C. RHR Pump 2A will stop and the amber light above the control switch will extinguish.

D. RHR Pump 2A will stop and then restart when the switch is released. The amber light above the control switch will not change indication.

19. Initial Conditions:
Reactor pressure is approximately 1000 psig.
The Unit is slowly heating up.
The operating CRD Pump has tripped
Standby CRD Pump (1B) is AVAILABLE

You perform the following actions at Panel 2-9-5:

PLACE CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, in MAN at minimum setting.
START associated standby CRD PUMP 1B by using 2-HS-85-2A.
OPEN CRD PUMP 1B DISCH TO U2, using 2-HS-85-8A.

ADJUST CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, and establish the following conditions:

CRD CLG WTR HDR DP, 2-PDI-85-18A, approximately 20 psid.
CRD SYSTEM FLOWCONTROL, 2-FIC-85-11, at approximately 55 gpm.

Balance the CRD flow and place the CRD SYSTEM FLOW CONTROL, 2-FIC-85-11 in AUTO.

Charging Water pressure is stable at 900 psig.

What are your required IMMEDIATE ACTIONS?

A. Manually SCRAM the reactor and Place the mode switch in the refuel position.

B. Verify the CRD system flow controller is nulled and ensure the CRD SYSTEM FLOW CONTROL, 2-FIC-85-11, is PLACED in Balance.

C. CLOSE CRD PUMP 1B DISCH TO U2, using 2-HS-85-8A.

D. There are no additional IMMEDIATE ACTIONS required.

20. The Reactor Building ventilation exhaust duct radiation high signal has just been received on Unit 3.

Which one of the following describes the expected plant response?

A. Only the Reactor Zone isolates, SGT starts and aligns to the Reactor Zone only, and a Group 6 PCIS occurs, except the drywell air compressor suction valves remain open.

B. The Reactor and Refueling Zones isolate, SGT starts and aligns to Reactor and Refueling Zones, and a Group 6 PCIS occurs, except the drywell air compressor suction valves remain open.

C. Only the Reactor Zone isolates, SGT starts and aligns to the Reactor Zone only, and a complete Group 6 PCIS occurs.

D. The Reactor and Refueling Zones isolate, SGT starts and aligns to Reactor and Refueling Zones, and a complete Group 6 PCIS occurs.

21. Due to a fire in the turbine building, the electrically driven fire pumps automatically started. While the fire pumps were running, a loss of 161KV and 500KV offsite power occurred. The EDGs then started and powered their respective shutdown boards.

Which one of the following describes how the fire pumps become available to fight the fire?

A. No operator action is required; the pumps will automatically restart after the busses are re-energized by the EDGs.

B. Ensure the diesel driven fire pump is running; the motor driven fire pumps do not have a source of power available.

C. Place the NORMAL/EMERGENCY switch for the associated fire pumps to EMERGENCY and back to NORMAL; pumps will start automatically.

D. Place the NORMAL/EMERGENCY switch for the associated fire pumps to EMERGENCY and back to NORMAL; manually start the pumps at the associated pump breakers.

22. When performing technical procedure with a level of classification of "Reference Use Procedure" in a C-Zone.

A. The procedure must be performed as though it was classified as a "Continuous Use Procedures."

B. A QC holdpoint can be marked N/A with Nuclear Assurance Approval.

C. Each step of the procedure must be read before performing the step and acknowledgment of the step's completion is required before proceeding to the next step.

D. Each step of the procedure must be read before performing the step, however, acknowledgment of the step's completion is not required before proceeding to the next step.

23. Which one of the following conditions is a violation of the Unit 3 ITS Safety Limits?

A. Reactor water level at -175 inches with all MSIVs open.

B. Reactor pressure at 750 psig and reactor power at 25%.

C. Reactor power at 95% and MFLCPR = 0.98.

D. A Group 1 isolation occurs due to main steam tunnel temperature high and reactor pressure reaches 1262 psig.

24. Committed Effective Dose Equivalent (CEDE) is defined as:

A. The dose equivalent to organs or tissues that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

B. The derived limit for the amount of radioactive materials taken into the body of an adult worker by inhalation or ingestion in a year.

C. The sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues.

D. A numerical dose constraint established at a level below the regulatory limits set forth in 10CFR Part 20, which are established as a guideline to administratively control and help optimize individual and collective radiation exposure.

25. The shift manager has just informed you that the Operations Duty Specialist reports that a breach of Wheeler Dam has just occurred. Level is lowering in the intake structure. What are your required immediate actions?

A. Begin a controlled shutdown to mode 4.

B. Activate the Automatic Paging System, obtain a hand held radio, proceed to 4kV Shutdown Board A.

C. Manually trip the reactor and enter the EOIs.

D. Verify automatic actions, perform any automatic action that failed to occur.

26. Unit 2 is operating with only the 2B Recirc Pump (Single Loop Operation) at 60% power. The following alarms and conditions currently exist:

- Jet Pump Flow No. 11 Thru 20 (2-FI-68-46) 13 Mlbm/hr
- Jet Pump Flow No. 1 Thru 10 (2-FI-68-48) 57 Mlbm/hr
- TOTAL CORE FLOW Recorder (2-XR-68-50) 43.4 Mlbm/hr
- APRM FLOW 43.5%
- Mode Switch in RUN

DETERMINE how the Core Flow Indication and PRNM Systems are affected by these conditions.

A. The OPRM trip function is BYPASSED and the Total Core Flow Indication is correct.

B. The OPRM trip function is ENABLED and the Total Core Flow Indication is correct.

C. The OPRM trip function is BYPASSED and the Total Core Flow Indication may be inaccurate.

D. The OPRM trip function is ENABLED and the Total Core Flow Indication may be inaccurate.

27. Control Rod 38-23 has been selected for a single notch withdrawal from position 02 to position 04. The following response from the CRD system was observed:

- Insert light illuminates and goes out.
- Withdrawal light illuminates and goes out.
- Settle light illuminates and goes out.

The operator also observes and reports that the selected rod is now at position 06 and is continuing to drift out. A rod drift alarm is also present.

Which one of the following has caused this condition?

A. The automatic sequence timer has failed.

B. Stuck open collet fingers.

C. Low CRDM cooling water pressure/flow.

D. Leaking scram outlet valve.

28. With the Rod Worth Minimizer keylock switch in NORMAL, which one of the following describes the effect of a loss of all control rod position signals from the RPIS?

A. Withdraw, insert, and select rod blocks will occur if power is less than the Low Power Alarm point.

B. Only withdraw and select rod blocks will occur if power is less than the Low Power setpoint.

C. Withdraw, insert, and select rod blocks will occur at any power level.

D. RWM-PROG lights on INOP-RESET pushbutton. This will occur at any power level.

29. With both reactor recirculation pump speeds matched and the reactor at 100% power, which one of the following is an indication of a reactor recirculation jet pump failure?

In the loop with the failed jet pump, if indicated recirculation loop flow:

A. decreases, indicated core pressure will increase.

B. increases, indicated main generator output will decrease.

C. decreases, indicated total core flow will increase.

D. increases, indicated core thermal power will increase.

30. By disconnecting the recirc pump motor from the generator rather than tripping the MG set supply breakers, which of the following occurs?

A. The recirc pump will coast down more quickly. Lower core flow causes more voiding. This lowers the slowing down length of fast neutrons which raises the thermal neutron flux. Higher thermal neutron flux results in more power.

B. The recirc pump will coast down more slowly. Higher core flow causes less voiding. This raises the slowing down length of fast neutrons which lowers the thermal neutron flux. Lower thermal neutron flux results in less fission and less power.

C. The recirc pump will coast down more slowly. Higher core flow causes less voiding. This lowers the slowing down length of fast neutrons which raises the thermal neutron flux. Higher thermal neutron flux results in more power.

D. The recirc pump will coast down more quickly. Lower core flow causes more voiding. This raises the slowing down length of fast neutrons which lowers the thermal neutron flux. Lower thermal neutron flux results in less fission and less power.

31. During the performance of RHR System MOV operability testing, the RHR pump torus suction valves were closed. Immediately thereafter, a LPCI initiation signal is received.

Assuming the LPCI initiation signal remains present, which one of the following statements is correct?

A. The suction valves will open automatically, and then the respective RHR pumps will auto start.

B. The suction valves will open automatically and then the respective RHR pump must be started manually.

C. The suction valves will not open automatically. They must be fully reopened manually, and then the respective RHR pumps will auto start.

D. The suction valves will not open automatically. The valves must be fully reopened manually, and then the pumps must be manually started.

32. On Unit 3, the Reactor Water Cleanup (RWCU) System is operating with RWCU Pump A running and the Filter/Demineralizer B in service with 130 gpm flow.

Which one of the following choices describes the expected automatic response of the RWCU system if Filter/Demineralizer B is inadvertently valved out of service?

A. Filter/Demineralizer B holding pump will start. RWCU Pump A trips when system flow decreases to less than 56 gpm for 35 seconds.

B. Filter/Demineralizer B BYPASS valve will automatically open to maintain at least 90 gpm and RWCU Pump A will continue to operate.

C. Filter/Demineralizer A automatically returns to service when Filter/Demineralizer B dp exceeds 20 psid.

D. The system automatically isolates and Pump A trips when system flow decreases to less than 40 gpm for 7 seconds.

33. The Unit 2 reactor is in cold shutdown with RHR Loop B in the Shutdown Cooling (SDC) mode when reactor water level rapidly decreases to -130.0 inches. Which one of the following correctly describes the operation of the RHR System?

A. The LPCI Inboard Injection valves automatically open and the operator must wait 5 minutes before throttling flow.

B. The LPCI Inboard Injection valves automatically close and the operator must wait 5 minutes before manually opening the valve.

C. The operator must depress the SDC isolation reset pushbuttons on panel 9-3 before the LPCI Inboard Injection valves automatically open.

D. The operator must manually open the LPCI Inboard Injection valves after resetting the PCIS isolation using the reset switches on panel 9-4.

34. The following conditions exist during a loss of all A/C power (Onsite and Offsite):

- The high pressure coolant injection (HPCI) system was started in response to a valid actuation signal.
- A valid HPCI isolation signal is subsequently generated.

Which one of the following is the expected result?

A. The HPCI pump will continue to operate with the mini-flow valve open.

B. The steam supply inboard isolation Valve 73-2 will close, and the turbine will trip.

C. The steam supply outboard isolation Valve 73-3 will close, and the turbine will trip.

D. A full HPCI system isolation will occur, and the turbine will trip.

35. During a Unit 2 LOCA, the following plant conditions exist:

- Reactor water level is dropping at a rate of 20 inches per minute.
- RPV level is currently at -132 inches.
- RPV pressure is 468 psig.
- Drywell pressure is 2.5 psig.

Which one of the following describes the expected status of the Core Spray System?

A. The Core Spray System has not initiated.

B. The Core Spray pumps have started, but the injection valves are CLOSED.

C. The Core Spray pumps have started, and the injection valves are OPEN, but pump flow is dead headed against the closed check valve.

D. Core Spray pumps have started and are injecting into the RPV.

36. Unit 3 is operating at power with Diesel Generator 3A under clearance. A transient occurs resulting in a reactor scram signal and an ATWS. The SLC control switch is taken to the START PUMP B position. Plant conditions are as follows:

Reactor power	10%
480v S/D bd 3A	De-energized (A/C only)
SLC switch	NOR-AFT-START

How will the SLC system respond?

A. SLC squib valve A fires, no SLC pump starts.

B. SLC squib valve B fires, no SLC pump starts.

C. SLC squib valves A and B fire, one SLC pump starts.

D. SLC squib valve B fires, both SLC pump starts.

37. During main turbine stop valve testing, the No. 2 Stop Valve would not close. The Unit Supervisor directs placing the Stop Valve No. 2 input to the Reactor Protection System (RPS) in a tripped condition.

Which one of the following describes the impact of this action on the RPS?

No. 2 Stop Valve provides input to:

A. only RPS Channel A, and placing the inputs in a tripped condition will cause a half scram.

B. only RPS Channel B, but placing the inputs in a tripped condition will NOT cause a half scram.

C. both RPS Channels A and B, and placing the inputs in a tripped condition will cause a full scram.

D. both RPS Channels A and B, but placing the inputs in a tripped condition will NOT cause a half scram.

38. While walking down the control room panels on a tour, the Unit 2 Unit Supervisor notices the F5 fuse indicator for the TIP channel B Valve Control Monitor is de-energized.

Which one of the following statements correctly describes the information provided by this condition?

A. The TIP shear valve will not fire.

B. The TIP ball valve will not open when the TIP is out of the shield.

C. The TIP channel will not respond to a automatic scan.

D. The TIP channel will not respond to a containment isolation signal.

39. A traversing in-core probe (TIP) trace is being performed on Unit 2. With the probe in core, a spurious Group 8 isolation occurs.

Which one of the following describes how the TIP system responds to the isolation signal?

A. No response; the TIP system only responds to a Group 2 isolation signal.

B. The TIP drive withdraws at fast speed and the ball valve closes once the probe has withdrawn to the shield chamber.

C. The TIP drive withdraws at slow speed until the core bottom is cleared, then shifts to fast speed, withdraws from the core and the ball valve closes when the probe has withdrawn to the indexer.

D. The TIP drive withdraws at fast speed and if the probe is not in the shield within 30 seconds, the shear valve fires to cut the cable and seal the tube.

40. A unit 3 IRM channel is set to range 5 and reading 60. Which one of the following is correct if the IRM range selector switch is turned to range 6?

A. A different preamplifier circuit is put into service and the reading should be about 6.

B. A different preamplifier circuit is put into service and the reading should be about 19.

C. The same preamplifier circuit remains in service and the reading should be about 6.

D. The same preamplifier circuit remains in service and the reading should be about 19.

41. A reactor startup is in progress on Unit 3 with reactor power at 20%. APRM 1 is bypassed due to failing high. Then, IRM A fails high.

Which one of the following describes the response of the RPS to the IRM upscale trip?

A. No RPS trip action

B. A rod block

C. A half scram

D. A full scram

42. Unit 2 is operating at 100% power, when a loss of RPS B power occurs.

Which one of the following describes the type of fault detected for BOTH the RBM and APRM channels?

A. A critical fault is generated in both the RBM channels, and in all of the APRM channels.

B. A non-critical fault is generated in both the RBM channels, and in all of the APRM channels.

C. A critical fault is generated in RBM Channel B, and in APRM Channels 2 and 4.

D. A critical fault is generated in RBM Channel B, and non-critical faults are generated in all of the APRM channels.

43. Which one of the following describes a characteristic of a fill oil leak from a Rosemount transmitter?

A. The instrument readings repeatedly drift in both directions over a period of time.

B. The instrument exhibits an inability to follow plant transients over a period of time.

C. The instrument responds normally until the isolating diaphragm contacts the convolution plate, when it fails to function properly.

D. The instrument responds more slowly until the isolating diaphragm contacts the convolution plate, when it fails to function properly.

44. The following Unit 2 plant conditions are given:

Reactor power is 65%
Suppression Pool temperature is 78 degrees
Suppression Pool temperature is increasing by 2 degrees every 12 minutes
Suppression Pool cooling is in service providing maximum cooling
The time is 12:00 noon.

2-SR-3.5.3.3, RCIC SYSTEM RATED FLOW AT NORMAL OPERATING PRESSURE is in progress.

Which one of the following is the latest time the test may be conducted before Technical Specifications limits would be exceeded?

A. 1:42 pm

B. 2:42 pm

C. 3:12 pm

D. 5:24 pm

45. Which one of the following would occur if power is lost to 250VDC RMOV Board 3B?

A. The ADS logic will not operate after automatic transfer to the alternate power supply.

B. The ADS logic will not operate, however, TWO of the six ADS valves can be operated manually.

C. The ADS logic will not operate, however, FOUR of the six ADS valves can be operated manually

D. The ADS logic will not operate, however, the SIX ADS valves can be operated manually.

46. Which one of the following gives the two PCIS groups **NOT** affected by RPV water level?

A. Groups 1 and 4

B. Groups 4 and 5

C. Groups 5 and 6

D. Groups 6 and 8

47. Given the following conditions:

RPV level -190 inches
RPV Pressure 920 psig
Drywell pressure 2.95 psig
A valid LPCI initiation signal is present

Which one of the following are required to be completed in conjunction with **ONLY** placing the RHR Containment Spray select switch XS-74-1-121/129 in Select to open the Containment Spray valves?

A. Raise RPV level to -180 inches only.

B. Reduce drywell pressure to 1.6 psig only.

C. Raise RPV level >-120" AND reset the LPCI initiation signal.

D. Raise RPV level to >-120 inch reactor level AND reduce drywell pressure to 1.6 psig.

48. A trip of the 480 V Shutdown Board 1A will have which of the following effects on the spent fuel pool system?

A. Trips Fuel Pool Circulating Pump 1A.

B. Trips Fuel Pool Circulating Pump 1B.

C. Isolates the fuel pool water flow to the fuel pool heat exchanger.

D. Isolates the RBCCW to the fuel pool heat exchangers.

49. Both MSRV vacuum breakers (the 10 inch and the 2 1/2 inch) on each relief line have failed closed. Some water from the suppression pool was siphoned into the relief line upon completion of blowdown when the steam in the relief line condensed.

What are the potential consequences of future MSRV operation?

A. Insufficient flow through the relief line.

B. Uneven heating of the suppression pool.

C. Direct pressurization of the drywell air space.

D. Overpressurize the relief line.

50. The following plant conditions exist:

- The reactor is operating at 100% power and 1000 psig.
- A turbine control valve malfunction resulted in reactor safety relief valve (SRV) 1-4 lifting and failing to reseat.

Which one of the following SRV tailpipe temperatures would you expect to see on the SRV that failed to close? (References attached)

A. 212 degrees Fahrenheit

B. 290 degrees Fahrenheit

C. 345 degrees Fahrenheit

D. 545 degrees Fahrenheit

51. The following conditions exist on Unit 2:

Turbine Steam Throttle Press: 990 psig
Pressure setpoint: 970 psig
Load Limit: 100%
Load Setpoint: 100%

Which one of the following describes the EHC Pressure Regulating System response, and the effect on RPV pressure, if the turbine steam throttle pressure transmitter input to Pressure Regulator A failed upscale to 1100 psig?

A. Pressure Regulator B takes over; RPV pressure increases.

B. Pressure Regulator B takes over; RPV pressure decreases.

C. Pressure Regulator A remains in control; RPV pressure increases.

D. Pressure Regulator A remains in control; RPV pressure decreases.

52. Which one of the following states the reason why the condensate pump header pressure should be between 100 and 150 psig during a reactor startup?

A. To minimize thrust on the condensate pump motor bearings.

B. To ensure adequate condensate flow for the steam jet air ejectors.

C. To ensure adequate flow through the condensate demineralizers.

D. To maximize condensate pump efficiency.

53. Which one of the following is an acceptable method for reducing thermal duty on RPV feedwater nozzles during low power and/or hot standby operation?

A. Minimize reactor power.

B. Increase reactor pressure.

C. Maximize RWCU flow.

D. Reduce CRD flow.

54. A full scram from 100% power occurred on Unit 2 as a result of a fault in the main turbine EHC system. After the SCRAM, the following conditions exist: (Assume no operator actions have occured)

All three Reactor Feed Pumps (RFPs) are in AUTO
Master Level Controller is in AUTO
Reactor water level is at 10 inches and rising
Scram Response logic is not inhibited

Which one of the following describes the Reactor Feed System response to this situation?

A. RFPs A and B are available for AUTO or MANUAL mode of operation and may be taken to 5600 rpm.

B. RFPs A and B are set at 600 rpm, and cannot be raised to >600 rpm until the Scram Response logic is reset.

C. RFPs A and B are available for MANUAL mode only and will be limited to 3900 rpm until the Scram Response logic is reset.

D. RFPs A and B are available for AUTO or MANUAL mode of operation but are limited to 3900 rpm until the Scram Response logic is reset.

55. Unit 2 and 3 are operating normally and are tied to the grid. Which one of the following would occur if a DG control switch was taken to start and the output breaker was closed? (Assume the diesel generator speed setpoint is higher than grid frequency and no other operator actions were performed)

A. The speed regulator will keep lowering the fuel supply to the diesel in order to try and lower grid/DG output voltage to the governor's setpoint. The DG will trip on under voltage.

B. The zero droop governor will keep advancing the fuel supply to the diesel in order to try and raise grid/DG output frequency to the governor's setpoint. This will cause the DG to overspeed.

C. The zero droop governor will keep advancing the fuel supply to the diesel in order to try and raise grid/DG output frequency to the governor's setpoint. This will cause the diesel to overload.

D. The speed regulator will keep lowering the fuel supply to the diesel in order to try and lower grid/DG output frequency to the governor's setpoint. This will cause the DG to trip on reverse current.

56. On Unit 2, the operator is attempting a manual fast transfer of the 4kV Shutdown Board C normal power supply to the first alternate power supply. The following conditions are in effect:

- The Emergency Control Transfer Switch (ECTS) is in NORMAL.
- The Shutdown Board C AUTO TO MANUAL TRIP pushbutton was depressed, and the amber light extinguished.
- The alternate breaker synchronizing selector switch is in the OFF position.
- The operator is holding the alternate power supply breaker control switch in the CLOSED position.

Which one of the following describes the plant equipment response when the operator next trips the normal supply breaker?

A. A fast transfer to the alternate supply occurs.

B. A slow transfer to the alternate supply occurs.

C. The alternate breaker trips and Shutdown Board C is locked out.

D. The alternate breaker trips and Emergency Diesel Generator C starts and ties to Shutdown Board C.

57. Diesel Generator 3A is synchronized to 4KV Shut Down Board 3A. The instrumentation readings for the diesel generator are as follows:

voltage: 4160 VAC
frequency = 59.8
current = 340 amps
vars = 1600 Kvars
watts = 2585 KW

What actions are required if the diesel is expected to be operated for an extended period?

A. The operator must take the voltage regulator control switch to raise to avoid excessive stator currents.

B. The operator must take the voltage regulator control switch to lower to avoid excessive stator currents.

C. The operator must take the governor control switch to raise to avoid excessive field current.

D. The operator must take the governor control switch to lower to avoid excessive field current.

58. Which one of the following describes the response of the Main Steam Line Radiation Monitoring System when a level of 3 times normal full power background radiation is reached?

A. The system will trip the mechanical condenser vacuum pump and close the condenser vacuum pump discharge valves.

B. The system will trip the mechanical condenser vacuum pump, close the condenser vacuum pump suction valves, scram the reactor, and initiate a PCIS Group 1 isolation.

C. The system will trip the mechanical condenser vacuum pump and close the condenser vacuum pump suction valves.

D. The system will trip the mechanical condenser vacuum pump, close the condenser vacuum pump discharge valves, scram the reactor, and initiate a PCIS Group 1 isolation.

59. The 3B Raw Service Water (RSW) pump has automatically started to increase level in the RSW storage tanks. Subsequently, Fire Pump A receives an automatic start signal.

Which one of the following describes the response of the RSW storage tank isolation valves and the RSW pump to this situation?

A. The 3B RSW pump immediately trips. The RSW storage tank isolation valves CLOSE but will automatically REOPEN when the fire pump stops. The 1A RSW pump will automatically start if the tank level demand signal is still present.

B. The 3B RSW pump immediately trips. The RSW storage tank isolation valves CLOSE. When the fire pump stops, one of the isolation valves automatically REOPENS; however, the backup isolation valve must be manually REOPENED. The 1A RSW pump can then automatically start if the tank level demand signal is still present.

C. The 3B RSW pump continues running in support of the fire pump. The RSW storage tank isolation valves CLOSE, and will automatically REOPEN when the fire pump stops. When the tank is filled, the 3B RSW pump stops.

D. The 3B RSW pump continues running in support of the fire pump. The RSW storage tank isolation valves CLOSE. When the fire pump stops, the 3B RSW pump stops. Both tank isolation valves remain CLOSED until manually reopened, and normal tank level control will then resume.

60. A small break LOCA on Unit 2 results in the following plant conditions:

- Reactor water level 12 inches above instrument zero.
- Drywell pressure 2.0 psig.
- Ventilation radiation:

  Reactor building 68 mR/hr.
  Refueling Zone 35 mR/hr.
  Air inlets to Control Room 200 cpm above background.

Which one of the following statements describes the expected status of the control room ventilation system under the above conditions?

A. The normal ventilation system is operating. The control room emergency ventilation (CREV) system is supplying filtered air from the control bay.

B. The normal ventilation system is supplying air to the control room from the control bay supply fans.

C. The CREV system is operating, supplying filtered outside air. The normal ventilation system is isolated.

D. The CREV system is operating, supplying filtered outside air. The normal ventilation system is NOT isolated.

61. The following plant conditions exist:

- Reactor mode switch: STARTUP/HOT STANDBY
- Main turbine: Shell warming
- Feedwater lineup: RFP A maintaining level in single element

Which one of the following statements describes the expected sequence of actions as a condensate system leak causes condenser vacuum to decrease from 24 inches Hg Vacuum to atmospheric pressure?

A. The Main turbine trips, then later, the RFP turbine trips and the main turbine bypass valves close at the same time.

B. The RFP turbine trips, then later, the turbine bypass valves close, followed by a reactor scram on low condenser vacuum.

C. The RFP turbine trips and the main turbine bypass valves close at the same time, then later, the main turbine trips

D. Main turbine trips and the reactor scrams in response to the turbine trip, then later, the RFP turbine trips and main turbine bypass valves close at the same time.

62. An accident has occurred concurrent with a partial loss of AC power on Unit 2 resulting in the following indications:

Drywell pressure	2.1 psig
RPV	-135 inches
Reactor pressure	490 psig

The diesel operator incorrectly diagnoses a loss of lube oil and initiates an emergency stop at panel 9-23. Which one of the following is required to reset the Diesel Generator Auto Start Lockout?

A. Both generator lockout relays (86 relays) AND the protective relay logic (74) must be manually reset.

B. The core spray initiation signal seal-ins on Panel 9-3 must be reset.

C. Both the core spray initiation signal seal-ins on Panel 9-3 must be reset and the DG control switch must be taken to RESET.

D. The DG control switch must be taken to RESET.

63. The following plant conditions exist:

- The plant is operating at 100% power.
- A loss of RPS 'B' power occurs.

Which one of the following isolation valve groups will close?

A. Group 1 Isolation Valves, Inboard Only

B. Group 2 Isolation Valves, Outboard only

C. Group 2 Isolation Valves, Inboard and Outboard

D. Group 3 Isolation Valves, Inboard and Outboard

64. A reactor startup is in progress and reactor power is on IRM Range 7, when the operator observes the following instrument failures:

- SRM Channels A and C fail downscale.
- IRM Channels A, C, and E fail downscale.

Which one of the following power supplies would have to be lost to cause such failures?

A. 24 VDC Power Distribution Panel

B. 48 VDC Power Distribution Panel

C. 125 VDC Power Distribution Panel

D. 120 VAC Instrument and Control Power Distribution Panel

65. Given the following plant conditions:

- Reactor power is 38% power.
- Main turbine load is 23%.
- Turbine bypass valves are partially open.
- Total main steam flow is 38%.

Which one of the following describes the response of the reactor if a main turbine trip occurs?

A. Reactor immediately scrams on turbine stop valve 10% closure.

B. Reactor scrams on high reactor pressure.

C. Reactor continues to operate at 38% power.

D. Reactor continues to operate and power decreases to 30%.

66. Unit 3 is operating at 100% power.

Which one of the following combinations of events will **ONLY** initiate a **half scram** signal?

A. Both MSIVs in steam lines "B" and "C" drift to less than 90% open.

B. Both MSIVs in steam lines "A" and "D" drift to less than 90% open.

C. PRMN voter #1 to test X relay

D. APRMs 3 and 4 trip on hi-hi flux.

67. Unit 2 is operating at 100 % power. Reactor pressure is being controlled by Pressure Regulator A.

If Pressure Regulator A fails down scale, which one of the following lists of symptoms is likely to occur? (Assume all systems respond as designed and no operator action.)

A. Reactor pressure will increase, reactor thermal power will increase, and generator output will increase.

B. Reactor pressure will increase, reactor thermal power will increase, but generator output will decrease.

C. Reactor pressure will decrease, reactor thermal power will decrease, and generator output will decrease.

D. Reactor pressure will decrease, reactor thermal power will decrease, but generator output will increase.

68. The following plant conditions exist:

- The reactor has scrammed from 100% power.
- HPCI and RCIC initiated due to a drop in reactor vessel level.

Which one of the following would result in a RCIC turbine trip and the Trip Throttle Valve, FCV 71-9, remaining open? (Assume no operator action.)

A. Electrical overspeed.

B. High Turbine exhaust pressure.

C. Manual Trip.

D. High Reactor Vessel Water Level.

69. Following a reactor feed pump trip from 100% thermal power, which one of the following reactor recirculation runback circuits seals in and must be manually reset?

A. 75% runback.

B. Core flow runback.

C. Mid power runback.

D. Upper power runback.

70. During a LOCA on Unit 3, it is determined that the drywell is in the action required region of the drywell spray initiation limit curve.

Which one of the following describes the proper use of drywell sprays in this condition?

Drywell sprays must:

A. be secured, if currently in use, to prevent exceeding the drywell/suppression chamber differential pressure limits.

B. remain in service, if currently in use, until drywell/suppression chamber differential pressure reaches -0.5 psid.

C. NOT be placed in service, if NOT currently in use, to prevent dropping below the drywell high pressure scram setpoint. If in use, drywell sprays may remain in use.

D. NOT be placed in service, if NOT currently in use, to prevent exceeding drywell/suppression chamber differential pressure limits. If in use, drywell sprays may remain in use.

71. Following a LOCA, the unit operator (board) notices that drywell pressure peaked at 52 psig and drywell temperature peaked at 290 degrees.

Which one of the following describes the conclusions that can be made from this information?

A. Both drywell design pressure and temperature were exceeded.

B. Only drywell design pressure was exceeded.

C. Only drywell design temperature was exceeded.

D. Neither the drywell design pressure nor temperature were exceeded.

72. Following a LOCA the following Containment characteristics exist.

Steam is condensing in the drywell and drywell pressure is steadily lowering and is approaching the external design pressure. Which one of the following has caused these conditions?

A. CS System Suction valve from CST failed open with the suction MOV from Torus open.

B. CS System Suction valve from CST failed open with the CS test valve open.

C. The torus-drywell vacuum breakers have failed open.

D. The torus-drywell vacuum breakers have failed closed.

73. The following conditions exist:

- Reactor power is 90%.
- A control rod initially at position 24 begins to drift out.

Per 2-AOI-85-6, which one of the following is the required IMMEDIATE action?

A. Select and insert the control rod to position 24.

B. Insert and maintain the control rod at position 00.

C. Reduce core flow to prevent a power increase.

D. Manually scram the reactor.

74. Unit 2 is operating at 100% power. The Unit Operator notes that three turbine stop valves have drifted to 80% open. No rod movement has occurred. You observe that the individual blue lights for each control rod on the full core display are illuminated. Also, the eight scram solenoid group indicating lights are extinguished.

Which one of the following describes the status of the RPS?

A. Both scram pilot valves have failed to open on all HCUs.

B. Only one RPS bus has deenergized.

C. Scram inlet and outlet valves have failed to open on all HCUs.

D. A hydraulic lock has occurred on the scram discharge volume.

75. Unit 3 is operating at full power with 3A and 3B RBCCW pumps running. 3B RBCCW pump trips due to an operator error. Discharge header pressure drops to 60 psig before the pump is restarted.

Which one of the following describes the response of FCV-70-48 (non-essential equipment loop Isolation valve) to the above condition?

A. FCV-70-48 will close and isolate the non-essential equipment loop. Operator action will be required to reopen the valve, which can ONLY be operated from the MCR.

B. FCV-70-48 will close and isolate the non-essential equipment loop. Operator action will be required to reopen the valve, which can ONLY be operated locally.

C. FCV-70-48 will close and isolate the non-essential equipment loop. Operator action will be required to reopen the valve from the MCR or locally.

D. FCV-70-48 will not close and the non-essential equipment loop will not isolate.

76. Which one of the following correctly describes the power supplies to the motors for Control Air Compressors "A" through "D?"

A. "A" and "B" are fed from 480V Common Board #1, and "C" and "D" from 480V Shutdown Boards 1B and 2B respectively.

B. "A" and "D" are fed from 480V Common Board #1, and "B" and "C" from 480V Shutdown Boards 1B and 2B respectively.

C. "A" is fed from 480V Shutdown Board 2A, "B" from 480V Common Board #3, "C" from 480V Shutdown Board 1A, and "D" from 480V Shutdown Board 2B.

D. "A" is fed from 480V Shutdown Board 1A, "D" from 480V Shutdown Board 2A, and "B" and "C" from 480V Common Board #1.

77. During calibration of Unit 2 temperature switches on the RWCU System, 2-TIS-69-11A (NonRegenerative Heat Exchanger outlet temperature switch) was inadvertently actuated.

Which one of the following will be the response of the RWCU System?

A. The system will isolate; the RWCU pumps will remain running for 30 seconds and then trip on low flow.

B. The system will isolate; the RWCU pumps will receive a trip signal on NRHX outlet temperature >140 degrees.

C. The system will isolate; the pumps will trip upon isolation valve closure.

D. The system will isolate; the pumps will trip on low flow (following a 7 second time delay).

78. Unit 2 is in Cold Shutdown for a short mid-cycle outage, when a complete loss of Shutdown Cooling occurs. Plant conditions are as follows:

- Reactor Recirculation pumps are out of service
- Reactor recirculation suction temperature is 140 degrees and slowly decreasing
- Shutdown cooling flow cannot be re-established in a timely manner

The Shift Manager has directed that RPV level be adjusted.

Which one of the following is the appropriate action and the basis for this action?

A. Verify level is 60 inches to aid in heat removal by injecting cold water.

B. Verify level is 80 inches, to provide natural circulation cooling for the reactor.

C. Verify level is 60 inches, to increase core submergence thereby preventing or minimizing localized fuel channel boiling.

D. Verify level is 80 inches, to reduce stratification so that more representative temperatures can be obtained to assess bulk reactor coolant temperature.

79. Operators are moving fuel assemblies within the RPV. Water level is 23½ feet above the top of the RPV flange.

Which one of the following describes the basis for a minimum RPV water level requirement during fuel handling operations according to ITS 3.9.6?

A. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a fuel handling accident.

B. An adequate water shield thickness is necessary to protect refueling personnel from excessive radiation exposure as they perform the refueling process.

C. To keep the vessel cavity walls and other contaminated surfaces wet and under water as much as possible during the refueling process to minimize airborne contamination.

D. To provide radiation protection to refueling personnel in the event of an inadvertent criticality event while moving fuel assemblies and control rods.

80. Which one of the following describes the basis for the Drywell Spray Initiation Limit Curve?

A. To prevent unstable steam condensation in the MSRV tailpipes from exerting excessive cyclic hydraulic loads on suppression pool structure.

B. To ensure that the torus to drywell delta P limit is maintained.

C. To prevent chugging in the drywell to torus downcomers from exerting excessive cyclic hydraulic loads on the suppression pool structure.

D. To ensure adequate noncondensibles remain in the drywell to prevent the torus to drywell vacuum breakers from opening during drywell steam condensation.

81. During a plant transient on Unit 2, a Group I isolation is caused by high temperature. Five control rods fail to insert. Suppression pool level is 12 feet and suppression pool temperature is 94 degrees.

Which one of the following identifies the systems available to help maintain pressure below 1073 psig?

A. HPCI and RCIC.

B. RCIC and RWCU.

C. RWCU and MSL drains.

D. MSL drains and HPCI.

82. Unit 3 is in an ATWS condition and EOI-2 (Primary Containment Control) has been entered.

Which one of the following describes the reason for injecting SLC prior to suppression pool temperature exceeding 110 degrees?

A. To ensure that "power chugging" does not occur within the reactor vessel during subsequent use of the MSRVs.

B. To ensure that hot shutdown boron weight is adequate to maintain the reactor subcritical under all hot shutdown conditions.

C. To ensure the reactor is subcritical prior to leaving the safe area of the heat capacity temperature limit curve.

D. To ensure the reactor is subcritical prior to leaving the safe area of the pressure suppression pressure curve.

83. Unit 2 has just experienced a small LOCA. Drywell pressure is 3 psig and increasing. Reactor pressure is 800 psig and steady. The increasing drywell temperature causes the most reliability concerns for which one of the following level instruments?

A. Emergency Range indicators.

B. Normal Range indicators.

C. Post Accident indicators.

D. Shutdown Flood-up indicator.

84. During an accident on Unit 2, suppression pool water level reaches 18 feet and continues to increase. Reactor pressure is 300 psig and decreasing.

Which one of the following containment components will NOT properly function at this point?

A. Normal control room suppression pool level instrumentation.

B. Suppression Chamber-to-Drywell vacuum breakers.

C. Suppression chamber spray nozzles.

D. MSRV tail pipes and/or supports.

85. Which one of the following is the MINIMUM suppression pool level at which the drywell-to-torus downcomers will be covered?

A. 9.75 feet.

B. 10.75 feet.

C. 11.75 feet.

D. 12.75 feet.

86. During an ATWS, conditions develop which require Emergency Depressurization.

Which one of the following describes the minimum number of Main Safety Relief Valves (MSRVs) required for Emergency Depressurization, and the basis for this number?

A. 6 ADS MSRVs, to reliably depressurize the reactor vessel as rapidly as possible, and to uniformly distribute the heat load to the suppression pool.

B. 6 MSRVs, which, if opened, will remove all decay heat from the core at a pressure sufficiently low that ECCS with the lowest head will be capable of making up for MSRV steam flow.

C. 4 ADS MSRVs, the least number of the most reliable MSRVs that correspond to a minimum alternate RPV flooding pressure sufficiently low that ECCS with the lowest head will be capable of making up MSRV steam flow.

D. 4 MSRVs, which, if opened, will remove all decay heat from the core at a pressure sufficiently low that ECCS with the lowest head will be capable of making up MSRV steam flow.

87. EOI-3, Secondary Containment control is being executed due to an unisolable RCIC steam line break in the reactor building. EOI-3 requires that EOI-1, RPV Control be entered and executed concurrently before which one of the following occur.

A. Any area temperature reached the maximum normal operating temperature.

B. Reactor zone ventilation exhaust reached 72 mr/hr.

C. Any area radiation level reached the maximum safe operating level.

D. At least two area temperature reached the maximum normal operating temperature.

88. The plant is operating at full power. The Reactor Building assistant unit operator reports there is about 6 inches of water accumulating on the floor in the RHR Room, SE area, and it appears to be from floor drains backing up.

Which one of the following is the first action the control room operators should taken in accordance with the EOIs?

A. Operate all available sump pumps to maintain the sump water level to less than 66 inches.

B. Enter EOI-1 and scram the reactor before RHR Room water level reaches 20 inches.

C. Isolate all systems discharging into the RHR Room, except those required for safe shutdown of the reactor.

D. Initiate a controlled shutdown of the reactor per 2-GOI-10012A.

89. The following conditions exist:

An ATWS has occurred.
Reactor water level is being lowered in accordance with C-5, Level/Power Control.
SLC has been initiated.

Which one of the following conditions would require RPV level to be restored to normal?

A. SLC Tank level drops to 41%.

B. SLC Tank level drops to 48%.

C. Reactor power drops below 5%.

D. All MSRVs remain closed with drywell pressure below 2.4 psig.

90. Given the following switch positions for the control air compressors.

A - second lead
B - third lead
C- standby
D- standby
G-lead

- A loss of Common Board 1 occurs
- A small system leak causes control air pressure to drop to drop to 94 psig

Which one of the following describes all of expected control air compressors expected to be in operation?

A. G will be running at full load. A will be running at half load

B. G will be running at full load. B will be running at half load.

C. A and G will be running at full load. C will be running at half load.

D. A, and G will be running at full load. D will be running at half load.

91. Due to an accident condition, the following plant parameters exist:

- Drywell Hydrogen 5.4%
- Drywell Oxygen 6.0%
- Suppression Chamber Hydrogen 4.0%
- Suppression Chamber Oxygen 5.5%
- Suppression Pool Level 17 feet
- Drywell temperature 250 degrees
- Drywell Pressure 18 psig
- RPV Level +30 inches
- Torus and Drywell Sprays are in service

Which one of the following actions is required?
(Reference attached)

A. Perform Appendix 9 to determine and monitor Suppression Pool water level.

B. Stop Drywell Sprays.

C. Perform Appendix 14A, Nitrogen Make-up, to control containment hydrogen and oxygen levels.

D. Perform Emergency Depressurization.

92. Which one of the following positions represents the minimum level of approval required to make a currently approved operator aid permanent?

A. Site Engineering Labeling Coordinator.

B. Shift Manager.

C. Operations Superintendent.

D. Plant Manager.

93. Which one of the following choices describes the method used for verifying the position of a locked and throttled valve?

A. Remove the locking device, carefully close the valve counting the number of turns, then reopen the valve the same number of turns. Reapply a locking device to the valve and record the as left position.

B. Place "NA" in the verification signature space for this valve. Locked and/or throttled valves cannot be independently verified without disturbing the position.

C. Since the valve is already locked, the valve may be assumed to be throttled in the correct position. The verification may be signed off as complete.

D. Independent verification of this valve cannot be performed. Second party verification must be performed during initial valve positioning.

94. Unit 2 is in a refueling outage and RHR Pump 2A is tagged to replace the pump seal. Electrical Maintenance has determined that the motor must be replaced on the pump minimum flow valve which is part of the RHR Pump 2A clearance boundary.

Which one of the following statements describes how this additional work affects the clearance boundary?

A. The valve operator must have a collar installed to prevent motion before the clearance boundary can be modified.

B. The Shift Manager Representative can modify the clearance boundary with concurrence from the Maintenance Shift Supervisor.

C. All work under the clearance must be stopped while the clearance is modified and reissued.

D. An operator must be assigned to independently verify component positioning and tag replacement.

95. Which one of the following choices correctly describes the response of the Unit 2 and Unit 3 reactor recirculation pump (RRP) speed control to an increase in core differential pressure?

A. Both Unit 2 RRP and Unit 3 will automatically reposition the scoop tube to bring speed back to the setpoint.

B. Unit 2 will automatically reposition the scoop tube to bring speed back to the setpoint but on Unit 3 the RRP speed must be manually adjusted by the operator.

C. On Unit 2 the RRP speed must be manually adjusted by the operator but Unit 3 will automatically reposition the scoop tube to bring speed back to the setpoint.

D. Both Unit 2 and Unit 3 must be manually adjusted by the operator to bring speed back to the setpoint.

96. While off-loading fuel bundles from the reactor, fuel pool level begins to decrease uncontrollably.
Which one of the following describes a method available from the control room to add water to the fuel pool?

A. Align fuel pool cooling and cleanup heat exchanger RBCCW supply to the fuel pool to maintain level.

B. Start a condensate pump and inject to the reactor vessel to maintain fuel pool level.

C. Open emergency makeup supply valve from EECW to the fuel pool to maintain level.

D. Gravity drain the CST, to the main condenser hotwell, then inject to the reactor vessel with condensate booster pumps.

97. Given the following conditions at a work site.

Airborne activity: 3 DAC
Radiation level: 40 mr/hr
Radiation level with shielding: 10 mr/hr
Time to place shielding: 15 minutes
Time to conduct task with respirator: 1 hour
Time to conduct task without respirator: 30 minutes

Assume the following:

- the airborne dose with a respirator will be zero.
- a dose rate of 40 mr/hr will be received while placing the shielding.
- all tasks will be performed by one worker.
- shielding can be placed in 15 minutes with or without a respirator.

Which one of the following would result in the lowest whole body dose?

A. Place shielding while wearing respirator and conduct task with respirator.

B. Place shielding while wearing respirator and conduct task without respirator.

C. Conduct task with respirator and without shielding.

D. Conduct task without respirator or shielding.

98. Unit 2 startup is in progress with the reactor at 920 psig and 6% power. The Reactor Mode Switch is in STARTUP. Primary containment is being inerted with the purge filter fan in service.

Which one of the following statements is correct concerning inerting in this plant condition?

A. Turning the purge filter fan off will automatically close the drywell and suppression chamber exhaust valves.

B. Placing the Reactor Mode Switch in RUN will automatically close all valves required for inerting with the purge filter fan unless Bypass switches are placed in BYPASS on panel 9-3.

C. Placing the Reactor Mode Switch in RUN will give a Group 6 PCIS unless Bypass switches are placed in BYPASS on panel 9-3.

D. Placing the Reactor Mode Switch in RUN will automatically close the drywell and suppression chamber exhaust isolation valves unless the Drywell/Suppression Chamber Train A/B Vent keylock switches are positioned to DRYWELL.

99. EOI-1, RPV Control, is being executed following a scram due to a turbine trip at high power. During the initial phase of the transient, one of the SRV's stuck open. Suppression pool temperature has now (approximately 7 minutes after the turbine trip) reached 96 degrees.

Which one of the following states the Unit Supervisor's procedural response to this condition?

A. Re-enter EOI-1 at the beginning.

B. Re-enter EOI-1 at the beginning and simultaneously enter EOI-2.

C. Continue in EOI-1 and simultaneously enter EOI-2.

D. Continue in EOI-1.

100. During a plant startup on Unit 3, reactor power was passing through 80% RTP when there was a loss of power to the control room annunciators. Thirty minutes have passed, and power has not yet been restored. SPDS and ICS are available.

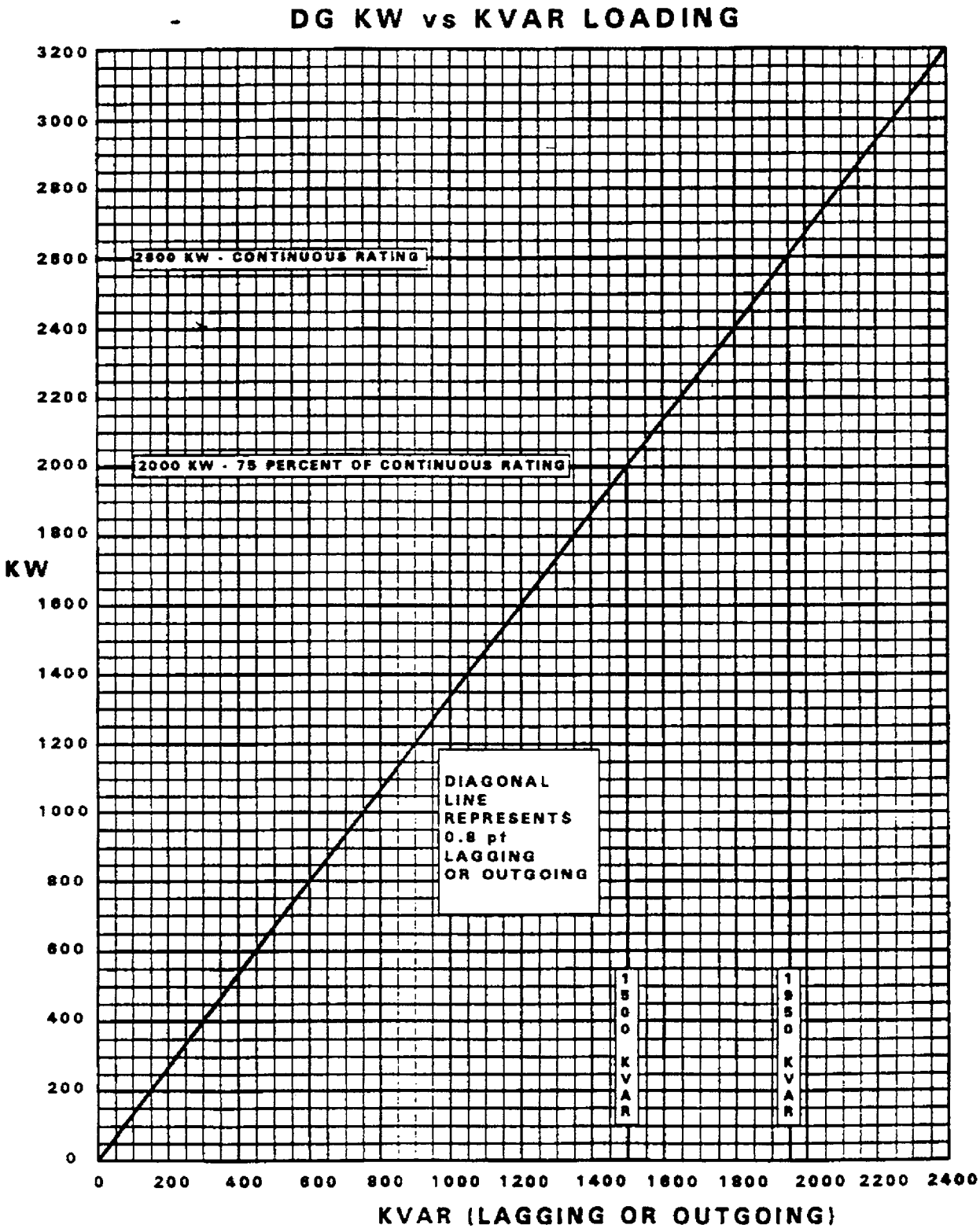
Which one of the following describes the required control room operators' response?

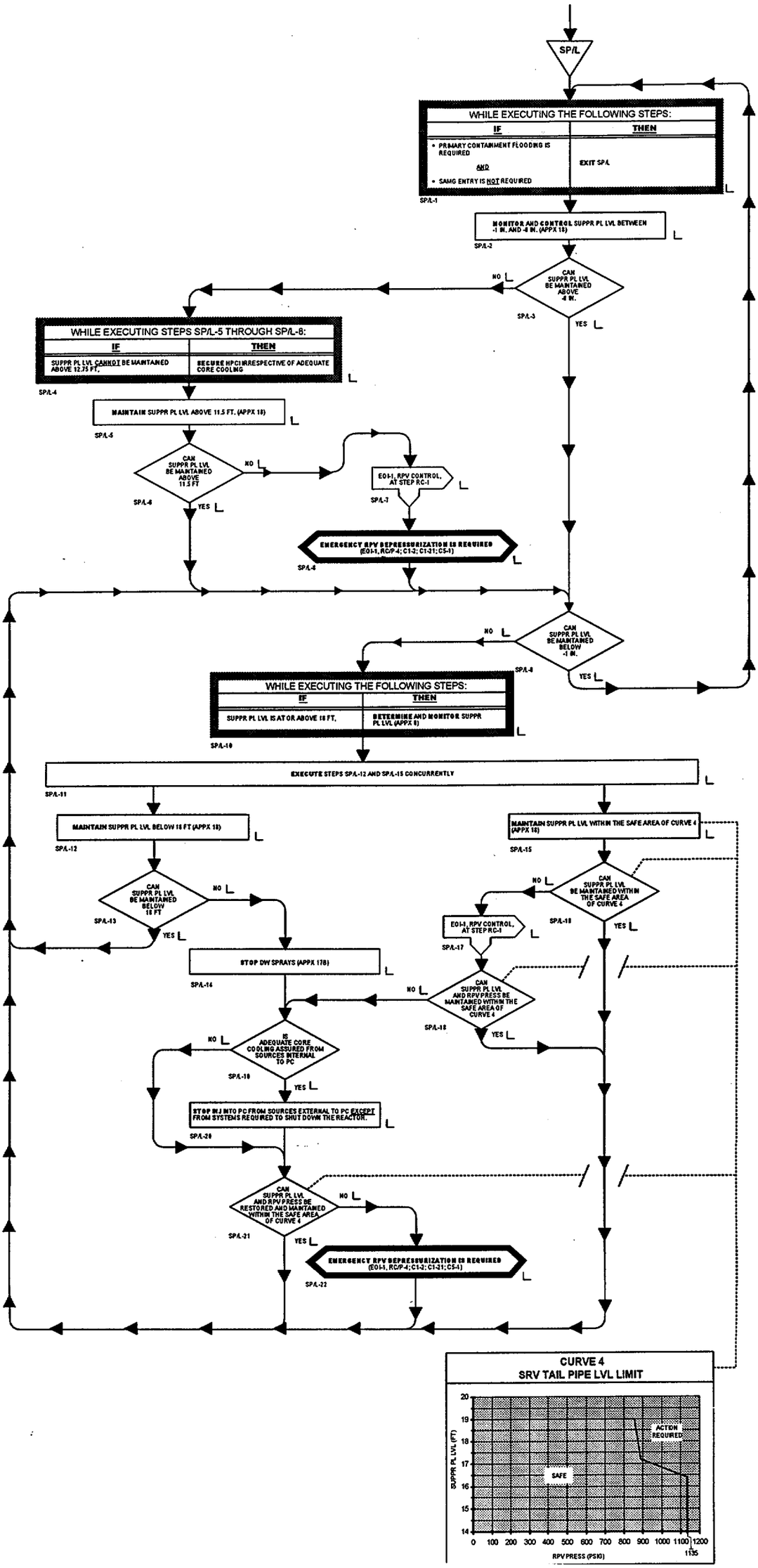
A. Commence a reactor shutdown, dispatch personnel for local monitoring of equipment.

B. Scram the reactor manually, dispatch personnel to monitor and manipulate plant equipment in response to the scram.

C. Suspend the power ascension and avoid any system manipulation, dispatch personnel for local monitoring of equipment.

D. Expedite maintenance activities to restore power while slowly continuing the ascension to full power, monitor equipment with SPDS and ICS.


DG KW vs KVAR LOADING
3200
3000
2800
2800 KW - CONTINUOUS RATING
2400
2200
2000 KW - 75 PERCENT OF CONTINUOUS RATING
1800
KW
1600
1400
1200
1000
800
600
400
200
0
DIAGONAL LINE REPRESENTS 0.8 pf LAGGING OR OUTGOING
1500 KVAR
1950 KVAR
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400
KVAR (LAGGING OR OUTGOING)


SP/L
WHILE EXECUTING THE FOLLOWING STEPS:
IF
THEN
• PRIMARY CONTAINMENT FLOODING IS REQUIRED
AND
• SAMG ENTRY IS NOT REQUIRED
EXIT SP/L
SP/L-1
MONITOR AND CONTROL SUPPR PL LVL BETWEEN -1 IN. AND -6 IN. (APPX 18)
SP/L-2
CAN SUPPR PL LVL BE MAINTAINED ABOVE -6 IN.
SP/L-3
NO
YES
WHILE EXECUTING STEPS SP/L-5 THROUGH SP/L-8:
IF
THEN
SUPPR PL LVL CANNOT BE MAINTAINED ABOVE 12.75 FT,
SECURE HPCI IRRESPECTIVE OF ADEQUATE CORE COOLING
SP/L-4
MAINTAIN SUPPR PL LVL ABOVE 11.5 FT. (APPX 18)
SP/L-5
CAN SUPPR PL LVL BE MAINTAINED ABOVE 11.5 FT
SP/L-6
NO
YES
EOI-1, RPV CONTROL, AT STEP RC-1
SP/L-7
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED (EOI-1, RC/P-4; C1-3; C1-31; CS-1)
SP/L-8
CAN SUPPR PL LVL BE MAINTAINED BELOW -1 IN.
SP/L-9
NO
YES
WHILE EXECUTING THE FOLLOWING STEPS:
IF
THEN
SUPPR PL LVL IS AT OR ABOVE 18 FT,
DETERMINE AND MONITOR SUPPR PL LVL (APPX 8)
SP/L-10
EXECUTE STEPS SP/L-12 AND SP/L-15 CONCURRENTLY
SP/L-11
MAINTAIN SUPPR PL LVL BELOW 18 FT (APPX 18)
SP/L-12
CAN SUPPR PL LVL BE MAINTAINED BELOW 18 FT
SP/L-13
NO
YES
STOP DW SPRAYS (APPX 17B)
SP/L-14
MAINTAIN SUPPR PL LVL WITHIN THE SAFE AREA OF CURVE 4 (APPX 18)
SP/L-15
CAN SUPPR PL LVL BE MAINTAINED WITHIN THE SAFE AREA OF CURVE 4
SP/L-16
NO
YES
EOI-1, RPV CONTROL, AT STEP RC-1
SP/L-17
CAN SUPPR PL LVL AND RPV PRESS BE MAINTAINED WITHIN THE SAFE AREA OF CURVE 4
SP/L-18
NO
YES
IS ADEQUATE CORE COOLING ASSURED FROM SOURCES INTERNAL TO PC
SP/L-19
NO
YES
STOP INJ INTO PC FROM SOURCES EXTERNAL TO PC EXCEPT FROM SYSTEMS REQUIRED TO SHUT DOWN THE REACTOR.
SP/L-20
CAN SUPPR PL LVL AND RPV PRESS BE RESTORED AND MAINTAINED WITHIN THE SAFE AREA OF CURVE 4
SP/L-21
NO
YES
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED (EOI-1, RC/P-4; C1-3; C1-31; CS-1)
SP/L-22
CURVE 4
SRV TAIL PIPE LVL LIMIT
SUPPR PL LVL (FT)
RPV PRESS (PSIG)
ACTION REQUIRED
SAFE
20
19
18
17
16
15
14
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1135

Answer Key

Test Name: RO.TST
Test Date: Wednesday, July 19, 2000

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	1	201002A2.04	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	2	201003K4.02	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	3	202002K3.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	4	206000A4.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	5	211000A3.05	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	6	219000A4.14	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	7	223001A1.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	8	223001K1.04	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	9	223002A1.02	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	10	230000A1.03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	11	245000K4.09	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	12	261000A2.13	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	13	262002K3.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	14	263000K2.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	15	271000G2.1.7	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	16	288000A3.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	17	295001G2.4.11	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	18	295009G2.1.31	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	19	295022AA2.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	20	295034EK3.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	21	600000AK3.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	22	G2.1.20	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	23	G2.2.22	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	24	G2.3.1	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	25	G2.4.49	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	26	0PL171.148	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	27	201001K3.03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	28	201006A1.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	29	202001K6.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	30	202002A4.09	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	31	203000K4.06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	32	204000A3.04	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	33	205000K6.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	34	206000K2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	209001K4.08	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	36	211000K2.02	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	37	212000K6.05	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	38	215001G2.1.32	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	39	215001K4.01	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	40	215003A4.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	41	215003K1.06	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	42	215005K6.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	43	216000G2.1.28	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	44	217000A2.19	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	218000K2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	46	223002K3.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	47	226001A4.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	48	233000A3.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	49	239002K4.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	50	239002K5.04	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C

Test Name: RO.TST
Test Date: Wednesday, July 19, 2000

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	51	241000K3.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	52	256000K5.10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	53	259001A1.02	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	54	259002A3.06	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	55	262001K1.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	56	262001K4.03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	57	264000G2.1.32	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	58	272000K3.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	59	286000A1.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	290003K1.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	61	295002AA1.06	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	62	295003AK2.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	63	295003AK3.06	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	64	295004AK2.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	65	295005AA2.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	66	295006AA2.06	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	67	295007AK2.02	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	68	295008AK2.06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	69	295009AK3.01	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	70	295010AK2.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	71	295012AA2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	72	295013AA1.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	73	295014AA1.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	74	295015AK2.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	75	295018AK3.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	76	295019AA1.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	77	295020G2.4.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	78	295021AK2.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	79	295023AA2.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	80	295024EK1.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	81	295025EA1.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	82	295026EK3.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	83	295028EA2.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	84	295029EK2.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	85	295030EK1.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	86	295031EK3.05	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	87	295032G2.4.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	88	295036EK3.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	89	295037G2.4.6	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	90	300000K2.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	91	500000EA2.03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	92	G2.1.1	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	93	G2.1.29	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	94	G2.2.13	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	95	G2.2.3	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	96	G2.2.30	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	97	G2.3.10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	98	G2.3.9	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	99	G2.4.14	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	100	G2.4.32	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D

FINAL SUBMITTAL

BROWNS FERRY 2000-301
50-259, 260, and 296/2000-301

JUNE 12 - 15, JUNE 27 - 29, AND
JUNE 30, 2000

FINAL AS ADMINISTERED

SRO WRITTEN EXAMINATION

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

Applicant Information			
Name:		Region:	II
Date:	6/30/00	Facility/Unit:	Browns Ferry Nuclear Plant
License Level:	SRO	Reactor Type:	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. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected five 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

Name: _____

1. Which one of the following is the purpose of the Maximum Extended Load Line Limit Analysis (MELLLA) region of the Power-to-Flow map?

   A. to prevent cavitation of the jet pumps and the recirculation pumps.

   B. to allow a maximum flow of 107.62 x 10E6 lbm/hr at 100% power and to lengthen the cycle when all rods are fully withdrawn.

   C. to prevent a temporary rise in water level, a lowering of power, and a higher flow on the operating pump when recirculation pump stops or when there are rapid recirculation flow reductions.

   D. to ensure that operation at the 100% Rod Line is easily achieved at full power and to take advantage of the neutron spectral shift which occurs at higher power/flow lines.

2. What is the effect of the failure to remove shorting links on SRM performance?

   A. Rod Block unless IRMs are on range 8 or higher.

   B. SRM high high scram is bypassed.

   C. Rod Block unless IRMs are on range 3 or lower.

   D. Detector full in bypassed.

3. During refueling activities, which one of the following conditions can cause a Fault lockout Light Status indicator to be lit?

   A. The boundary zone has been by-passed.

   B. The Bridge is over the core and a rod-out indication is detected.

   C. The Bridge and/or Trolley has exceeded a Travel Limit.

   D. There is demanded motion present when the refueling bridge motor is started.

4. Unit 2 drywell pressure exceeds 2.45 psig and a 480 volt load shed logic is initiated three minutes later. Which one of the following describes expected status of the Standby Gas Treatment system 30 seconds after the load shed?

   A. SGT trains A, B and C will be running.

   B. Only SGT trains A and B will be running.

   C. Only SGT train C will be running.

   D. No SGT trains will be running.

5. During RHR system surveillance testing, the 480V molded case breaker for Valve 2-FCV-74-61 trips immediately after closing.

   In addition to making an operability determination, which one of the following choices describes the proper response to this situation?

   A. One more attempt to close the breaker is permitted before notifying maintenance.

   B. One more attempt to close the breaker is permitted after inspection and adjustment (if necessary) of cell switches.

   C. Do not attempt to reclose the breaker until Electrical Maintenance is available at the breaker panel to observe.

   D. Do not attempt to reclose the breaker. Initiate a Work Request to have the breaker inspected.

6. Following a loss of all AC, which one of the following paths would restore one of the required qualified offsite circuits?

   A. From the 500kV switchyard, through USST 1A to 4.16kV Unit Board 2B, to 4.16kV Shutdown Bus 1, to 4.16kV Shutdown Boards C and D.

   B. From the 500kV switchyard, through USST 1B to 4.16kV Unit Board 1A, to 4.16kV Shutdown Bus 1, to 4.16kV Shutdown Boards A and B.

   C. From Athens 161kV transmission system, through CSST B to Unit Board 2B, to Start Bus 1A, to Shutdown Bus 2, to Shutdown Boards A and B.

   D. From Trinity 161kV transmission system, through CSST A to Unit Board 2A, to Start Bus 1A, to 4.16kV Shutdown Bus 2, to Shutdown Boards A and B.

7. Unit 2 is in refueling. You are the SRO on the refueling floor. Upon insertion of a new fuel assembly, there is an unexpected criticality. Your crew commences the immediate actions of 2-AOI-79-2, "INADVERTANT CRITICALITY DURING INCORE FUEL MOVEMENTS."

   The crew verifies the fuel grapple is latched onto the fuel assembly handle and immediately removes the fuel assembly from the reactor core. However, you cannot determine if the reactor is subcritical again with the indications available.

   Which one of the following describes the remaining immediate actions required by 2-AOI-79-2 for this situation?

   A. Place the fuel assembly in a spent fuel storage pool location with the least possible number of surrounding fuel assemblies, leaving the fuel grapple latched to the fuel assembly handle. Evacuate the refueling floor.

   B. Place the fuel assembly in a spent fuel storage pool location with the least possible number of surrounding fuel assemblies, and disengage the fuel grapple. Evacuate the refueling floor.

   C. Move the refueling bridge and fuel assembly away from the reactor core, preferably to the area of the cattle chute, and evacuate the refuel floor.

   D. If the Refueling Zone radiation monitors did not trip, instruct the control room operators to manually place the monitors in a tripped condition so that the Refueling Zone ventilation will isolate, SGT and CREV will actuate, and a Group 6 isolation will occur. Evacuate the refueling floor.

8. A fire has required evacuation of the Unit 2 control room. 2/3-SSI-001, "Safe Shutdown Instructions," has been implemented. The procedure directs a rapid depressurization of the RPV. Currently, only three MSRVs have been able to be opened. The following reactor pressures are recorded at the indicated times.

0000 750 psig
0015 510 psig
0030 390 psig
0045 300 psig
0100 210 psig

Which one of the following describes the correct operator actions?

A. Reduce the cooldown rate to less than 90 degrees per hour by periodically and sequentially closing MSRVs.

B. Increase cooldown rate if possible to 90 degrees per hour.

C. A fourth MSRV needs to be opened in order to provide sufficient blowdown to depressurize the RPV to allow LPCI injection.

D. No action is needed, adequate blowdown is available to depressurize the RPV to allow LPCI injection and no SSI cooldown limit requirements are being exceeded.

9. You are the Unit Supervisor on Unit 2. A chemistry technician taking routine samples reports that a sample from the roof vent monitored by RM-90-250 indicates there is a release of Xe133 from the roof of the reactor building. The sample had a total activity of 1.5E5 microcuries per cubic centimeter and no other gases or isotopes were detected.

Which one of the following states your required actions?

A. Direct the chemistry technician to continue routine monitoring.

B. Without delay, take appropriate actions to terminate the release.

C. Monitor the release and prepare to notify the NRC pursuant to 10 CFR 50.73.

D. Terminate the release within one hour and initiate a Special Report pursuant to the ODCM.

10. Fuel loading is in progress on Unit 2. A bundle is in transport from the SFSP to the core, when the fire alarm sounds. Which one of the following describes the correct actions to be taken?

A. Stop all fuel movement until determination of the fire's impact on refueling operations can be made.

B. Immediately lower the bundle to the closest location in the core and wait for determination of the fire's impact on refueling operations can be made.

C. Refueling SRO will monitor the Fire/Medical radio frequency and discontinue fuel movement only if the fire could adversely affect refueling.

D. Fire brigade team leader will determine if refueling operations could be adversely affected and direct the refueling SRO to discontinue fuel movement if necessary.

11. Which one of the following choices states the BASIS for Caution #1 in the EOIs?

A. Caution #1 is an accommodation for inaccuracies in RPV water level indication when plant conditions are different from those for which the instruments are calibrated.

B. Caution #1 defines conditions under which the value and trend of indicated level cannot be relied upon. Under extreme conditions, a high and increasing water level can be indicated when actual RPV level is decreasing.

C. Caution #1 defines conditions beyond the Environmental Qualification of the RPV level instrumentation. Excessive temperatures in the electronics make the indicated level and trend unreliable.

D. Caution #1 defines conditions under which drywell temperatures are high enough to interfere with the function of the condensing pots on the variable legs of the RPV level indicators.

12. Due to a LOCA and a subsequent loss of all RHR pumps, Standby Coolant is being used to spray the drywell per appendix 17B. Due to high pressure injection failures, reactor water level lowers to the point that the Unit Supervisor enters C-1, Alternate Level Control. No Injection Subsystems can be ligned up for injection. What is the required action required of the RHR standby coolant system.

A. Secure the standby coolant drywell spray and line up for injection immediately.

B. Standby coolant drywell sprays can continue provided that other Alternate Injections subsystems are capable of restoring RPV water level to >-162 inches.

C. Standby coolant drywell sprays can continue until RPV water level drops to -162 inches.

D. Standby coolant drywell sprays can continue until Emergency Depressurization is required.

13. During a small line break in the drywell, a controlled cooldown is being conducted per the guidance of EOI-1 RC/P leg.

What effect will the cooldown have on delta P (sensed by the wide range level instrument) and what effect will this have on indicated reactor vessel wide range level?

This will result in:

A. lower sensed delta P and indicated level lower than actual level.

B. higher sensed delta P and indicated level lower than actual level.

C. lower sensed delta P and indicated level higher than actual level.

D. higher sensed delta P and indicated level higher than actual level.

14. A RWCU Backwash Receiver Tank (BWRT) drain line has cracked during transfer to Radwaste and is spilling into the Reactor Building. Radiation levels in the Reactor Building are as follows:

Reactor Building Elevation 593	1200 mR/hr
Reactor Building Elevation 565 West	800 mR/hr
Reactor Building Elevation 565 East	850 mR/hr
Reactor Building Elevation 565 Northeast	1100 mR/hr
All other Reactor Building areas	NOT ALARMED

Per the EOIs, which one of the following is the required action that MUST be directed by the Unit Supervisor and/or Shift Manager?

A. Continue reactor operation and direct attempts to stop the tank drain line leakage.

B. Commence a normal reactor shutdown to Cold Shutdown.

C. Scram the reactor and commence a normal cooldown.

D. Scram the reactor and commence an emergency depressurization.

15. The following conditions have existed for 30 minutes:

- Plant Stack noble gas is 3.88E+8 uc/second.
- SI 4.8.B.1.a.1 release fraction is 2.7.
- Site boundary radiation reading is 28.7 mR/hr (gamma and beta).
- Site boundary I-131 is at 4.1E-8 uc/cc.

Which one of the following emergency classifications, if applicable, should be declared based on the above conditions? (Reference Material Provided)

A. None.

B. Unusual Event.

C. Alert.

D. Site Area Emergency.

16. Given the following conditions for Unit 2:

- All control rods have been inserted
- Drywell pressure is 2.1 psig
- Drywell temperature is 89 F
- Drywell hydrogen concentration is 3.1 percent
- RPV pressure is 1025 psig
- RPV water level is +16.2 inches
- Reactor Building ventilation exhaust radiation levels are 10 mR/hr
- Secondary containment temperatures are below maximum values
- Secondary containment sump water level is 56 inches
- Secondary containment area rad monitors are below maximum values
- Suppression pool temperature is 89 F
- Suppression pool level is - 4.3 inches

Based only on the above conditions, which one of the following describes the EOI flow paths you are REQUIRED to enter?

A. RC/P, RC/L and RC/Q.

B. PC/H, SP/L, SC/L, SC/T, DW/T, PC/P, SC/R and SP/T.

C. SC/L, SC/T, and SC/R.

D. DW/T, PC/P, SP/T, PC/H, AND SP/L.

17. A fire rated door listed in Table 9.3.11.E of the BFNP FIRE PROTECTION PLAN is about to become impaired by propping the door open. There is no fire detection equipment available to protect either side of the inoperable door. The door is located in a contamination zone.

Which one of the following is the MINIMUM action that must be taken to compensate for this impaired fire barrier?

A. Establish a roving hourly fire watch to monitor the area until the door is restored to an operable status.

B. If hot work is to be performed in either of the adjacent rooms, establish a continuous fire watch on either side of the open door.

C. Establish a continuous/dedicated fire watch to monitor the impaired fire door area until the door is restored to an operable status.

D. To reduce radiation exposures ALARA, establish a continuous/area fire watch to monitor the area at least once every 15 minutes until the door is restored to operable.

18. Given the following information about the total number of shifts worked during the first quarter of 2000:

SRO A worked:	One 12 hour shift as Shift Manager, two 12 hour shifts as Unit 1 / 2 supervisor, and two 12 hour shifts as Unit 3 Unit Supervisor. While assigned as Shift Manager, SRO A spent approximately 4 hours attending Plan-of-the-Day meetings and routine interface with the Operations Work Control Group.
RO B worked:	Three 8 hour shifts as Unit 2 Board UO, three 8 hour shifts as Unit 2 Desk UO, and one 8 hour shift as the Operations Representative in the Operations Work Control Group (Tagout Reviewer).

With regard to 10 CFR 55.53, "Conditions of Licenses," which one of the following describes the license status of the above operators?

A. Neither SRO A nor RO B have maintained an active license.

B. SRO A has maintained an active license, RO B has not maintained an active license.

C. RO B has maintained an active license, SRO A has not maintained an active license.

D. Both SRO A and RO B have maintained an active license.

19. During refueling operations a Portable floating work platform is being used and has been secured so that it is not free floating in the spent fuel pool (e.g. secured with tube lock or similar Attachment to pool wall, etc.).

According to 0-GOI-100-3C," FUEL MOVEMENT OPERATIONS DURING REFUELING," Work must stop and all personnel exit the portable floating work platform if which one of the following occurs?

A. Any testing of the neutron monitoring system.

B. Any time a control rod is not fully inserted in a control cell containing more than one fuel assemblies and the vessel head is removed.

C. Any time Fuel Handling Supervisor must leave the refuel floor without being properly relieved.

D. Any failure of the refueling floor CAM unit, that causes all three channels to be inoperable.

20. During abnormal or emergency conditions a UO shall not place an ECCS system in MANUAL unless directed by the Control Room Unit Supervisor/Shift Manager in compliance with EOIs or which of the following?

A. System misoperation in AUTOMATIC is confirmed by two independent indications.

B. Adequate core cooling is confirmed by at least one indication that meets REG Guide 1.97 requirements AND indications are approaching and cannot be prevented from exceeding an automatic action setpoint.

C. System misoperation in AUTOMATIC is confirmed by one indication AND adequate core cooling is confirmed by at least one indication that meets REG Guide 1.97 requirements.

D. Adequate core inventory is confirmed by at least two independent indications AND indications are approaching and cannot be prevented from exceeding an automatic action setpoint.

21. Liquid Radwaste Effluent Monitor RM-90-130 has been operating erratically. A release is scheduled for 10:00.

The following is the sequence of events:

09:58 Two independent samples of the tank being discharged were analyzed in accordance with the sampling and analysis program specified in the ODCM
10:00 Two qualified persons independently verified the release rate calculations and independently verified the valve line up prior to the release.
10:02 Commenced batch radwaste release
10:04 RM-90-130 fails

Which one of the following describes the MINIMUM actions required, if any?

A. Continue with the release. No additional actions are required for this situation.

B. Continue with the release. Within 1 hour, require an additional sample to confirm the original sample results. If the sample results confirm the previous results, complete the release. Require a qualified person to independently verify the release rate calculations.

C. Suspend the release. Require an additional sample to confirm the original sample results. If the sample results confirm the previous results, then resume the release.

D. Suspend the release. Require two additional independent samples of the tank being discharged. Require two qualified persons to independently verify the release rate calculations. If the sample results confirm the previous results and the release rate is confirmed, then resume the release.

22. Unit 3 is operating at 100% power.

Which one of the following is the reason for entering EOI-1 at Step RC1 if drywell temperature cannot be maintained below 200F per EOI-2?

A. To prevent exceeding the design temperature of the drywell structure.

B. To prevent exceeding the maximum normal operating temperature of the drywell with the reactor at power.

C. To ensure drywell temperature remains below the design temperature of the environmentally qualified drywell components.

D. To ensure the reactor is shutdown by control rod insertion should emergency depressurization be required.

23. While performing Steam Cooling, which one of the following describes the level at which Emergency Depressurization must be initiated and the reason for emergency depressurizing?

A. -190 inches to ensure adequate core cooling by core submergence.

B. -200 inches to ensure adequate core cooling by core submergence.

C. -190 inches to ensure the covered portion of the core will generate sufficient steam to prevent any fuel clad damage in the uncovered portion of the core.

D. -200 inches to ensure the covered portion of the core will generate sufficient steam to prevent any fuel clad damage in the uncovered portion of the core.

24. A chemistry sample has been directed due to steadily rising SJAE rad monitor readings. The following sequence of events occur at the times noted:

0855 Chemistry reports coolant activity of 4.3 µci/ml based on sample
0900 SM enters a 12 to Hot Shutdown LCO based on coolant activity
0905 SM declares an Unusual Event based on abnormal core conditions
0910 A plant shutdown is started to comply with Technical Specifications.

The NRC must be notified of events in progress no later than

A. 0955

B. 1000

C. 1005

D. 1010

25. Which one of the following has the authority for offsite recovery efforts during an emergency?

A. Site Emergency Director (SED)

B. Central Emergency Control Center (CECC) Director

C. State of Alabama

D. Nuclear Regulatory Commission

26. Unit 2 is operating with only the 2B Recirc Pump (Single Loop Operation) at 60% power. The following alarms and conditions currently exist:

- Jet Pump Flow No. 11 Thru 20 (2-FI-68-46) 13 Mlbm/hr
- Jet Pump Flow No. 1 Thru 10 (2-FI-68-48) 57 Mlbm/hr
- TOTAL CORE FLOW Recorder (2-XR-68-50) 43.4 Mlbm/hr
- APRM FLOW 43.5%
- Mode Switch in RUN

DETERMINE how the Core Flow Indication and PRNM Systems are affected by these conditions.

A. The OPRM trip function is BYPASSED and the Total Core Flow Indication is correct.

B. The OPRM trip function is ENABLED and the Total Core Flow Indication is correct.

C. The OPRM trip function is BYPASSED and the Total Core Flow Indication may be inaccurate.

D. The OPRM trip function is ENABLED and the Total Core Flow Indication may be inaccurate.

27. Control Rod 38-23 has been selected for a single notch withdrawal from position 02 to position 04. The following response from the CRD system was observed:

- Insert light illuminates and goes out.
- Withdrawal light illuminates and goes out.
- Settle light illuminates and goes out.

The operator also observes and reports that the selected rod is now at position 06 and is continuing to drift out. A rod drift alarm is also present.

Which one of the following has caused this condition?

A. The automatic sequence timer has failed.

B. Stuck open collet fingers.

C. Low CRDM cooling water pressure/flow.

D. Leaking scram outlet valve.

28. With the Rod Worth Minimizer keylock switch in NORMAL, which one of the following describes the effect of a loss of all control rod position signals from the RPIS?

A. Withdraw, insert, and select rod blocks will occur if power is less than the Low Power Alarm point.

B. Only withdraw and select rod blocks will occur if power is less than the Low Power setpoint.

C. Withdraw, insert, and select rod blocks will occur at any power level.

D. RWM-PROG lights on INOP-RESET pushbutton. This will occur at any power level.

29. With both reactor recirculation pump speeds matched and the reactor at 100% power, which one of the following is an indication of a reactor recirculation jet pump failure?

In the loop with the failed jet pump, if indicated recirculation loop flow:

A. decreases, indicated core pressure will increase.

B. increases, indicated main generator output will decrease.

C. decreases, indicated total core flow will increase.

D. increases, indicated core thermal power will increase.

30. By disconnecting the recirc pump motor from the generator rather than tripping the MG set supply breakers, which of the following occurs?

A. The recirc pump will coast down more quickly. Lower core flow causes more voiding. This lowers the slowing down length of fast neutrons which raises the thermal neutron flux. Higher thermal neutron flux results in more power.

B. The recirc pump will coast down more slowly. Higher core flow causes less voiding. This raises the slowing down length of fast neutrons which lowers the thermal neutron flux. Lower thermal neutron flux results in less fission and less power.

C. The recirc pump will coast down more slowly. Higher core flow causes less voiding. This lowers the slowing down length of fast neutrons which raises the thermal neutron flux. Higher thermal neutron flux results in more power.

D. The recirc pump will coast down more quickly. Lower core flow causes more voiding. This raises the slowing down length of fast neutrons which lowers the thermal neutron flux. Lower thermal neutron flux results in less fission and less power.

31. During the performance of RHR System MOV operability testing, the RHR pump torus suction valves were closed. Immediately thereafter, a LPCI initiation signal is received.

Assuming the LPCI initiation signal remains present, which one of the following statements is correct?

A. The suction valves will open automatically, and then the respective RHR pumps will auto start.

B. The suction valves will open automatically and then the respective RHR pump must be started manually.

C. The suction valves will not open automatically. They must be fully reopened manually, and then the respective RHR pumps will auto start.

D. The suction valves will not open automatically. The valves must be fully reopened manually, and then the pumps must be manually started.

32. On Unit 3, the Reactor Water Cleanup (RWCU) System is operating with RWCU Pump A running and the Filter/Demineralizer B in service with 130 gpm flow.

Which one of the following choices describes the expected automatic response of the RWCU system if Filter/Demineralizer B is inadvertently valved out of service?

A. Filter/Demineralizer B holding pump will start. RWCU Pump A trips when system flow decreases to less than 56 gpm for 35 seconds.

B. Filter/Demineralizer B BYPASS valve will automatically open to maintain at least 90 gpm and RWCU Pump A will continue to operate.

C. Filter/Demineralizer A automatically returns to service when Filter/Demineralizer B dp exceeds 20 psid.

D. The system automatically isolates and Pump A trips when system flow decreases to less than 40 gpm for 7 seconds.

33. The Unit 2 reactor is in cold shutdown with RHR Loop B in the Shutdown Cooling (SDC) mode when reactor water level rapidly decreases to -130.0 inches. Which one of the following correctly describes the operation of the RHR System?

A. The LPCI Inboard Injection valves automatically open and the operator must wait 5 minutes before throttling flow.

B. The LPCI Inboard Injection valves automatically close and the operator must wait 5 minutes before manually opening the valve.

C. The operator must depress the SDC isolation reset pushbuttons on panel 9-3 before the LPCI Inboard Injection valves automatically open.

D. The operator must manually open the LPCI Inboard Injection valves after resetting the PCIS isolation using the reset switches on panel 9-4.

34. The following conditions exist during a loss of all A/C power (Onsite and Offsite):

- The high pressure coolant injection (HPCI) system was started in response to a valid actuation signal.
- A valid HPCI isolation signal is subsequently generated.

Which one of the following is the expected result?

A. The HPCI pump will continue to operate with the mini-flow valve open.

B. The steam supply inboard isolation Valve 73-2 will close, and the turbine will trip.

C. The steam supply outboard isolation Valve 73-3 will close, and the turbine will trip.

D. A full HPCI system isolation will occur, and the turbine will trip.

35. During a Unit 2 LOCA, the following plant conditions exist:

- Reactor water level is dropping at a rate of 20 inches per minute.
- RPV level is currently at -132 inches.
- RPV pressure is 468 psig.
- Drywell pressure is 2.5 psig.

Which one of the following describes the expected status of the Core Spray System?

A. The Core Spray System has not initiated.

B. The Core Spray pumps have started, but the injection valves are CLOSED.

C. The Core Spray pumps have started, and the injection valves are OPEN, but pump flow is dead headed against the closed check valve.

D. Core Spray pumps have started and are injecting into the RPV.

36. Unit 3 is operating at power with Diesel Generator 3A under clearance. A transient occurs resulting in a reactor scram signal and an ATWS. The SLC control switch is taken to the START PUMP B position. Plant conditions are as follows:

Reactor power	10%
480v S/D bd 3A	De-energized (A/C only)
SLC switch	NOR-AFT-START

How will the SLC system respond?

A. SLC squib valve A fires, no SLC pump starts.

B. SLC squib valve B fires, no SLC pump starts.

C. SLC squib valves A and B fire, one SLC pump starts.

D. SLC squib valve B fires, both SLC pump starts.

37. During main turbine stop valve testing, the No. 2 Stop Valve would not close. The Unit Supervisor directs placing the Stop Valve No. 2 input to the Reactor Protection System (RPS) in a tripped condition.

Which one of the following describes the impact of this action on the RPS?

No. 2 Stop Valve provides input to:

A. only RPS Channel A, and placing the inputs in a tripped condition will cause a half scram.

B. only RPS Channel B, but placing the inputs in a tripped condition will NOT cause a half scram.

C. both RPS Channels A and B, and placing the inputs in a tripped condition will cause a full scram.

D. both RPS Channels A and B, but placing the inputs in a tripped condition will NOT cause a half scram.

38. While walking down the control room panels on a tour, the Unit 2 Unit Supervisor notices the F5 fuse indicator for the TIP channel B Valve Control Monitor is de-energized.

Which one of the following statements correctly describes the information provided by this condition?

A. The TIP shear valve will not fire.

B. The TIP ball valve will not open when the TIP is out of the shield.

C. The TIP channel will not respond to a automatic scan.

D. The TIP channel will not respond to a containment isolation signal.

39. A traversing in-core probe (TIP) trace is being performed on Unit 2. With the probe in core, a spurious Group 8 isolation occurs.

Which one of the following describes how the TIP system responds to the isolation signal?

A. No response; the TIP system only responds to a Group 2 isolation signal.

B. The TIP drive withdraws at fast speed and the ball valve closes once the probe has withdrawn to the shield chamber.

C. The TIP drive withdraws at slow speed until the core bottom is cleared, then shifts to fast speed, withdraws from the core and the ball valve closes when the probe has withdrawn to the indexer.

D. The TIP drive withdraws at fast speed and if the probe is not in the shield within 30 seconds, the shear valve fires to cut the cable and seal the tube.

40. A unit 3 IRM channel is set to range 5 and reading 60. Which one of the following is correct if the IRM range selector switch is turned to range 6?

A. A different preamplifier circuit is put into service and the reading should be about 6.

B. A different preamplifier circuit is put into service and the reading should be about 19.

C. The same preamplifier circuit remains in service and the reading should be about 6.

D. The same preamplifier circuit remains in service and the reading should be about 19.

41. A reactor startup is in progress on Unit 3 with reactor power at 20%. APRM 1 is bypassed due to failing high. Then, IRM A fails high.

Which one of the following describes the response of the RPS to the IRM upscale trip?

A. No RPS trip action

B. A rod block

C. A half scram

D. A full scram

42. Unit 2 is operating at 100% power, when a loss of RPS B power occurs.

Which one of the following describes the type of fault detected for BOTH the RBM and APRM channels?

A. A critical fault is generated in both the RBM channels, and in all of the APRM channels.

B. A non-critical fault is generated in both the RBM channels, and in all of the APRM channels.

C. A critical fault is generated in RBM Channel B, and in APRM Channels 2 and 4.

D. A critical fault is generated in RBM Channel B, and non-critical faults are generated in all of the APRM channels.

43. Which one of the following describes a characteristic of a fill oil leak from a Rosemount transmitter?

A. The instrument readings repeatedly drift in both directions over a period of time.

B. The instrument exhibits an inability to follow plant transients over a period of time.

C. The instrument responds normally until the isolating diaphragm contacts the convolution plate, when it fails to function properly.

D. The instrument responds more slowly until the isolating diaphragm contacts the convolution plate, when it fails to function properly.

44. The following Unit 2 plant conditions are given:

Reactor power is 65%
Suppression Pool temperature is 78 degrees
Suppression Pool temperature is increasing by 2 degrees every 12 minutes
Suppression Pool cooling is in service providing maximum cooling
The time is 12:00 noon.

2-SR-3.5.3.3, RCIC SYSTEM RATED FLOW AT NORMAL OPERATING PRESSURE is in progress.

Which one of the following is the latest time the test may be conducted before Technical Specifications limits would be exceeded?

A. 1:42 pm

B. 2:42 pm

C. 3:12 pm

D. 5:24 pm

45. Which one of the following would occur if power is lost to 250VDC RMOV Board 3B?

A. The ADS logic will not operate after automatic transfer to the alternate power supply.

B. The ADS logic will not operate, however, TWO of the six ADS valves can be operated manually.

C. The ADS logic will not operate, however, FOUR of the six ADS valves can be operated manually

D. The ADS logic will not operate, however, the SIX ADS valves can be operated manually.

46. Which one of the following gives the two PCIS groups **NOT** affected by RPV water level?

A. Groups 1 and 4

B. Groups 4 and 5

C. Groups 5 and 6

D. Groups 6 and 8

47. Given the following conditions:

RPV level -190 inches
RPV Pressure 920 psig
Drywell pressure 2.95 psig
A valid LPCI initiation signal is present

Which one of the following are required to be completed in conjunction with **ONLY** placing the RHR Containment Spray select switch XS-74-1-121/129 in Select to open the Containment Spray valves?

A. Raise RPV level to -180 inches only.

B. Reduce drywell pressure to 1.6 psig only.

C. Raise RPV level >-120" AND reset the LPCI initiation signal.

D. Raise RPV level to >-120 inch reactor level AND reduce drywell pressure to 1.6 psig.

48. A trip of the 480 V Shutdown Board 1A will have which of the following effects on the spent fuel pool system?

A. Trips Fuel Pool Circulating Pump 1A.

B. Trips Fuel Pool Circulating Pump 1B.

C. Isolates the fuel pool water flow to the fuel pool heat exchanger.

D. Isolates the RBCCW to the fuel pool heat exchangers.

49. Both MSRV vacuum breakers (the 10 inch and the 2 1/2 inch) on each relief line have failed closed. Some water from the suppression pool was siphoned into the relief line upon completion of blowdown when the steam in the relief line condensed.

What are the potential consequences of future MSRV operation?

A. Insufficient flow through the relief line.

B. Uneven heating of the suppression pool.

C. Direct pressurization of the drywell air space.

D. Overpressurize the relief line.

50. The following plant conditions exist:

- The reactor is operating at 100% power and 1000 psig.
- A turbine control valve malfunction resulted in reactor safety relief valve (SRV) 1-4 lifting and failing to reseat.

Which one of the following SRV tailpipe temperatures would you expect to see on the SRV that failed to close? (References attached)

A. 212 degrees Fahrenheit

B. 290 degrees Fahrenheit

C. 345 degrees Fahrenheit

D. 545 degrees Fahrenheit

51. The following conditions exist on Unit 2:

Turbine Steam Throttle Press: 990 psig
Pressure setpoint: 970 psig
Load Limit: 100%
Load Setpoint: 100%

Which one of the following describes the EHC Pressure Regulating System response, and the effect on RPV pressure, if the turbine steam throttle pressure transmitter input to Pressure Regulator A failed upscale to 1100 psig?

A. Pressure Regulator B takes over; RPV pressure increases.

B. Pressure Regulator B takes over; RPV pressure decreases.

C. Pressure Regulator A remains in control; RPV pressure increases.

D. Pressure Regulator A remains in control; RPV pressure decreases.

52. Which one of the following states the reason why the condensate pump header pressure should be between 100 and 150 psig during a reactor startup?

A. To minimize thrust on the condensate pump motor bearings.

B. To ensure adequate condensate flow for the steam jet air ejectors.

C. To ensure adequate flow through the condensate demineralizers.

D. To maximize condensate pump efficiency.

53. Which one of the following is an acceptable method for reducing thermal duty on RPV feedwater nozzles during low power and/or hot standby operation?

A. Minimize reactor power.

B. Increase reactor pressure.

C. Maximize RWCU flow.

D. Reduce CRD flow.

54. A full scram from 100% power occurred on Unit 2 as a result of a fault in the main turbine EHC system. After the SCRAM, the following conditions exist: (Assume no operator actions have occured)

All three Reactor Feed Pumps (RFPs) are in AUTO
Master Level Controller is in AUTO
Reactor water level is at 10 inches and rising
Scram Response logic is not inhibited

Which one of the following describes the Reactor Feed System response to this situation?

A. RFPs A and B are available for AUTO or MANUAL mode of operation and may be taken to 5600 rpm.

B. RFPs A and B are set at 600 rpm, and cannot be raised to >600 rpm until the Scram Response logic is reset.

C. RFPs A and B are available for MANUAL mode only and will be limited to 3900 rpm until the Scram Response logic is reset.

D. RFPs A and B are available for AUTO or MANUAL mode of operation but are limited to 3900 rpm until the Scram Response logic is reset.

55. Unit 2 and 3 are operating normally and are tied to the grid. Which one of the following would occur if a DG control switch was taken to start and the output breaker was closed? (Assume the diesel generator speed setpoint is higher than grid frequency and no other operator actions were performed)

A. The speed regulator will keep lowering the fuel supply to the diesel in order to try and lower grid/DG output voltage to the governor's setpoint. The DG will trip on under voltage.

B. The zero droop governor will keep advancing the fuel supply to the diesel in order to try and raise grid/DG output frequency to the governor's setpoint. This will cause the DG to overspeed.

C. The zero droop governor will keep advancing the fuel supply to the diesel in order to try and raise grid/DG output frequency to the governor's setpoint. This will cause the diesel to overload.

D. The speed regulator will keep lowering the fuel supply to the diesel in order to try and lower grid/DG output frequency to the governor's setpoint. This will cause the DG to trip on reverse current.

56. On Unit 2, the operator is attempting a manual fast transfer of the 4kV Shutdown Board C normal power supply to the first alternate power supply. The following conditions are in effect:

- The Emergency Control Transfer Switch (ECTS) is in NORMAL.
- The Shutdown Board C AUTO TO MANUAL TRIP pushbutton was depressed, and the amber light extinguished.
- The alternate breaker synchronizing selector switch is in the OFF position.
- The operator is holding the alternate power supply breaker control switch in the CLOSED position.

Which one of the following describes the plant equipment response when the operator next trips the normal supply breaker?

A. A fast transfer to the alternate supply occurs.

B. A slow transfer to the alternate supply occurs.

C. The alternate breaker trips and Shutdown Board C is locked out.

D. The alternate breaker trips and Emergency Diesel Generator C starts and ties to Shutdown Board C.

57. Diesel Generator 3A is synchronized to 4KV Shut Down Board 3A. The instrumentation readings for the diesel generator are as follows:

voltage: 4160 VAC
frequency = 59.8
current = 340 amps
vars = 1600 Kvars
watts = 2585 KW

What actions are required if the diesel is expected to be operated for an extended period?

A. The operator must take the voltage regulator control switch to raise to avoid excessive stator currents.

B. The operator must take the voltage regulator control switch to lower to avoid excessive stator currents.

C. The operator must take the governor control switch to raise to avoid excessive field current.

D. The operator must take the governor control switch to lower to avoid excessive field current.

58. Which one of the following describes the response of the Main Steam Line Radiation Monitoring System when a level of 3 times normal full power background radiation is reached?

A. The system will trip the mechanical condenser vacuum pump and close the condenser vacuum pump discharge valves.

B. The system will trip the mechanical condenser vacuum pump, close the condenser vacuum pump suction valves, scram the reactor, and initiate a PCIS Group 1 isolation.

C. The system will trip the mechanical condenser vacuum pump and close the condenser vacuum pump suction valves.

D. The system will trip the mechanical condenser vacuum pump, close the condenser vacuum pump discharge valves, scram the reactor, and initiate a PCIS Group 1 isolation.

59. The 3B Raw Service Water (RSW) pump has automatically started to increase level in the RSW storage tanks. Subsequently, Fire Pump A receives an automatic start signal.

Which one of the following describes the response of the RSW storage tank isolation valves and the RSW pump to this situation?

A. The 3B RSW pump immediately trips. The RSW storage tank isolation valves CLOSE but will automatically REOPEN when the fire pump stops. The 1A RSW pump will automatically start if the tank level demand signal is still present.

B. The 3B RSW pump immediately trips. The RSW storage tank isolation valves CLOSE. When the fire pump stops, one of the isolation valves automatically REOPENS; however, the backup isolation valve must be manually REOPENED. The 1A RSW pump can then automatically start if the tank level demand signal is still present.

C. The 3B RSW pump continues running in support of the fire pump. The RSW storage tank isolation valves CLOSE, and will automatically REOPEN when the fire pump stops. When the tank is filled, the 3B RSW pump stops.

D. The 3B RSW pump continues running in support of the fire pump. The RSW storage tank isolation valves CLOSE. When the fire pump stops, the 3B RSW pump stops. Both tank isolation valves remain CLOSED until manually reopened, and normal tank level control will then resume.

60. A small break LOCA on Unit 2 results in the following plant conditions:

- Reactor water level 12 inches above instrument zero.
- Drywell pressure 2.0 psig.
- Ventilation radiation:

  Reactor building 68 mR/hr.
  Refueling Zone 35 mR/hr.
  Air inlets to Control Room 200 cpm above background.

Which one of the following statements describes the expected status of the control room ventilation system under the above conditions?

A. The normal ventilation system is operating. The control room emergency ventilation (CREV) system is supplying filtered air from the control bay.

B. The normal ventilation system is supplying air to the control room from the control bay supply fans.

C. The CREV system is operating, supplying filtered outside air. The normal ventilation system is isolated.

D. The CREV system is operating, supplying filtered outside air. The normal ventilation system is NOT isolated.

61. The following plant conditions exist:

- Reactor mode switch: STARTUP/HOT STANDBY
- Main turbine: Shell warming
- Feedwater lineup: RFP A maintaining level in single element

Which one of the following statements describes the expected sequence of actions as a condensate system leak causes condenser vacuum to decrease from 24 inches Hg Vacuum to atmospheric pressure?

A. The Main turbine trips, then later, the RFP turbine trips and the main turbine bypass valves close at the same time.

B. The RFP turbine trips, then later, the turbine bypass valves close, followed by a reactor scram on low condenser vacuum.

C. The RFP turbine trips and the main turbine bypass valves close at the same time, then later, the main turbine trips

D. Main turbine trips and the reactor scrams in response to the turbine trip, then later, the RFP turbine trips and main turbine bypass valves close at the same time.

62. An accident has occurred concurrent with a partial loss of AC power on Unit 2 resulting in the following indications:

Drywell pressure	2.1 psig
RPV	-135 inches
Reactor pressure	490 psig

The diesel operator incorrectly diagnoses a loss of lube oil and initiates an emergency stop at panel 9-23. Which one of the following is required to reset the Diesel Generator Auto Start Lockout?

A. Both generator lockout relays (86 relays) AND the protective relay logic (74) must be manually reset.

B. The core spray initiation signal seal-ins on Panel 9-3 must be reset.

C. Both the core spray initiation signal seal-ins on Panel 9-3 must be reset and the DG control switch must be taken to RESET.

D. The DG control switch must be taken to RESET.

63. The following plant conditions exist:

- The plant is operating at 100% power.
- A loss of RPS 'B' power occurs.

Which one of the following isolation valve groups will close?

A. Group 1 Isolation Valves, Inboard Only

B. Group 2 Isolation Valves, Outboard only

C. Group 2 Isolation Valves, Inboard and Outboard

D. Group 3 Isolation Valves, Inboard and Outboard

64. A reactor startup is in progress and reactor power is on IRM Range 7, when the operator observes the following instrument failures:

- SRM Channels A and C fail downscale.
- IRM Channels A, C, and E fail downscale.

Which one of the following power supplies would have to be lost to cause such failures?

A. 24 VDC Power Distribution Panel

B. 48 VDC Power Distribution Panel

C. 125 VDC Power Distribution Panel

D. 120 VAC Instrument and Control Power Distribution Panel

65. Given the following plant conditions:

- Reactor power is 38% power.
- Main turbine load is 23%.
- Turbine bypass valves are partially open.
- Total main steam flow is 38%.

Which one of the following describes the response of the reactor if a main turbine trip occurs?

A. Reactor immediately scrams on turbine stop valve 10% closure.

B. Reactor scrams on high reactor pressure.

C. Reactor continues to operate at 38% power.

D. Reactor continues to operate and power decreases to 30%.

66. Unit 3 is operating at 100% power.

Which one of the following combinations of events will **ONLY** initiate a **half scram**signal?

A. Both MSIVs in steam lines "B" and "C" drift to less than 90% open.

B. Both MSIVs in steam lines "A" and "D" drift to less than 90% open.

C. PRMN voter #1 to test X relay

D. APRMs 3 and 4 trip on hi-hi flux.

67. Unit 2 is operating at 100 % power. Reactor pressure is being controlled by Pressure Regulator A.

If Pressure Regulator A fails down scale, which one of the following lists of symptoms is likely to occur? (Assume all systems respond as designed and no operator action.)

A. Reactor pressure will increase, reactor thermal power will increase, and generator output will increase.

B. Reactor pressure will increase, reactor thermal power will increase, but generator output will decrease.

C. Reactor pressure will decrease, reactor thermal power will decrease, and generator output will decrease.

D. Reactor pressure will decrease, reactor thermal power will decrease, but generator output will increase.

68. The following plant conditions exist:

- The reactor has scrammed from 100% power.
- HPCI and RCIC initiated due to a drop in reactor vessel level.

Which one of the following would result in a RCIC turbine trip and the Trip Throttle Valve, FCV 71-9, remaining open? (Assume no operator action.)

A. Electrical overspeed.

B. High Turbine exhaust pressure.

C. Manual Trip.

D. High Reactor Vessel Water Level.

69. Following a reactor feed pump trip from 100% thermal power, which one of the following reactor recirculation runback circuits seals in and must be manually reset?

A. 75% runback.

B. Core flow runback.

C. Mid power runback.

D. Upper power runback.

70. During a LOCA on Unit 3, it is determined that the drywell is in the action required region of the drywell spray initiation limit curve.

Which one of the following describes the proper use of drywell sprays in this condition?

Drywell sprays must:

A. be secured, if currently in use, to prevent exceeding the drywell/suppression chamber differential pressure limits.

B. remain in service, if currently in use, until drywell/suppression chamber differential pressure reaches -0.5 psid.

C. NOT be placed in service, if NOT currently in use, to prevent dropping below the drywell high pressure scram setpoint. If in use, drywell sprays may remain in use.

D. NOT be placed in service, if NOT currently in use, to prevent exceeding drywell/suppression chamber differential pressure limits. If in use, drywell sprays may remain in use.

71. Following a LOCA, the unit operator (board) notices that drywell pressure peaked at 52 psig and drywell temperature peaked at 290 degrees.

Which one of the following describes the conclusions that can be made from this information?

A. Both drywell design pressure and temperature were exceeded.

B. Only drywell design pressure was exceeded.

C. Only drywell design temperature was exceeded.

D. Neither the drywell design pressure nor temperature were exceeded.

72. Following a LOCA the following Containment characteristics exist.

Steam is condensing in the drywell and drywell pressure is steadily lowering and is approaching the external design pressure. Which one of the following has caused these conditions?

A. CS System Suction valve from CST failed open with the suction MOV from Torus open.

B. CS System Suction valve from CST failed open with the CS test valve open.

C. The torus-drywell vacuum breakers have failed open.

D. The torus-drywell vacuum breakers have failed closed.

73. The following conditions exist:

- Reactor power is 90%.
- A control rod initially at position 24 begins to drift out.

Per 2-AOI-85-6, which one of the following is the required IMMEDIATE action?

A. Select and insert the control rod to position 24.

B. Insert and maintain the control rod at position 00.

C. Reduce core flow to prevent a power increase.

D. Manually scram the reactor.

74. Unit 2 is operating at 100% power. The Unit Operator notes that three turbine stop valves have drifted to 80% open. No rod movement has occurred. You observe that the individual blue lights for each control rod on the full core display are illuminated. Also, the eight scram solenoid group indicating lights are extinguished.

Which one of the following describes the status of the RPS?

A. Both scram pilot valves have failed to open on all HCUs.

B. Only one RPS bus has deenergized.

C. Scram inlet and outlet valves have failed to open on all HCUs.

D. A hydraulic lock has occurred on the scram discharge volume.

75. Unit 3 is operating at full power with 3A and 3B RBCCW pumps running. 3B RBCCW pump trips due to an operator error. Discharge header pressure drops to 60 psig before the pump is restarted.

Which one of the following describes the response of FCV-70-48 (non-essential equipment loop Isolation valve) to the above condition?

A. FCV-70-48 will close and isolate the non-essential equipment loop. Operator action will be required to reopen the valve, which can ONLY be operated from the MCR.

B. FCV-70-48 will close and isolate the non-essential equipment loop. Operator action will be required to reopen the valve, which can ONLY be operated locally.

C. FCV-70-48 will close and isolate the non-essential equipment loop. Operator action will be required to reopen the valve from the MCR or locally.

D. FCV-70-48 will not close and the non-essential equipment loop will not isolate.

76. Which one of the following correctly describes the power supplies to the motors for Control Air Compressors "A" through "D?"

A. "A" and "B" are fed from 480V Common Board #1, and "C" and "D" from 480V Shutdown Boards 1B and 2B respectively.

B. "A" and "D" are fed from 480V Common Board #1, and "B" and "C" from 480V Shutdown Boards 1B and 2B respectively.

C. "A" is fed from 480V Shutdown Board 2A, "B" from 480V Common Board #3, "C" from 480V Shutdown Board 1A, and "D" from 480V Shutdown Board 2B.

D. "A" is fed from 480V Shutdown Board 1A, "D" from 480V Shutdown Board 2A, and "B" and "C" from 480V Common Board #1.

77. During calibration of Unit 2 temperature switches on the RWCU System, 2-TIS-69-11A (NonRegenerative Heat Exchanger outlet temperature switch) was inadvertently actuated.

Which one of the following will be the response of the RWCU System?

A. The system will isolate; the RWCU pumps will remain running for 30 seconds and then trip on low flow.

B. The system will isolate; the RWCU pumps will receive a trip signal on NRHX outlet temperature >140 degrees.

C. The system will isolate; the pumps will trip upon isolation valve closure.

D. The system will isolate; the pumps will trip on low flow (following a 7 second time delay).

78. Unit 2 is in Cold Shutdown for a short mid-cycle outage, when a complete loss of Shutdown Cooling occurs. Plant conditions are as follows:

- Reactor Recirculation pumps are out of service
- Reactor recirculation suction temperature is 140 degrees and slowly decreasing
- Shutdown cooling flow cannot be re-established in a timely manner

The Shift Manager has directed that RPV level be adjusted.

Which one of the following is the appropriate action and the basis for this action?

A. Verify level is 60 inches to aid in heat removal by injecting cold water.

B. Verify level is 80 inches, to provide natural circulation cooling for the reactor.

C. Verify level is 60 inches, to increase core submergence thereby preventing or minimizing localized fuel channel boiling.

D. Verify level is 80 inches, to reduce stratification so that more representative temperatures can be obtained to assess bulk reactor coolant temperature.

79. Operators are moving fuel assemblies within the RPV. Water level is 23½ feet above the top of the RPV flange.

Which one of the following describes the basis for a minimum RPV water level requirement during fuel handling operations according to ITS 3.9.6?

A. Sufficient water is necessary to retain iodine fission product activity in the water in the event of a fuel handling accident.

B. An adequate water shield thickness is necessary to protect refueling personnel from excessive radiation exposure as they perform the refueling process.

C. To keep the vessel cavity walls and other contaminated surfaces wet and under water as much as possible during the refueling process to minimize airborne contamination.

D. To provide radiation protection to refueling personnel in the event of an inadvertent criticality event while moving fuel assemblies and control rods.

80. Which one of the following describes the basis for the Drywell Spray Initiation Limit Curve?

A. To prevent unstable steam condensation in the MSRV tailpipes from exerting excessive cyclic hydraulic loads on suppression pool structure.

B. To ensure that the torus to drywell delta P limit is maintained.

C. To prevent chugging in the drywell to torus downcomers from exerting excessive cyclic hydraulic loads on the suppression pool structure.

D. To ensure adequate noncondensibles remain in the drywell to prevent the torus to drywell vacuum breakers from opening during drywell steam condensation.

81. During a plant transient on Unit 2, a Group I isolation is caused by high temperature. Five control rods fail to insert. Suppression pool level is 12 feet and suppression pool temperature is 94 degrees.

Which one of the following identifies the systems available to help maintain pressure below 1073 psig?

A. HPCI and RCIC.

B. RCIC and RWCU.

C. RWCU and MSL drains.

D. MSL drains and HPCI.

82. Unit 3 is in an ATWS condition and EOI-2 (Primary Containment Control) has been entered.

Which one of the following describes the reason for injecting SLC prior to suppression pool temperature exceeding 110 degrees?

A. To ensure that "power chugging" does not occur within the reactor vessel during subsequent use of the MSRVs.

B. To ensure that hot shutdown boron weight is adequate to maintain the reactor subcritical under all hot shutdown conditions.

C. To ensure the reactor is subcritical prior to leaving the safe area of the heat capacity temperature limit curve.

D. To ensure the reactor is subcritical prior to leaving the safe area of the pressure suppression pressure curve.

83. Unit 2 has just experienced a small LOCA. Drywell pressure is 3 psig and increasing. Reactor pressure is 800 psig and steady. The increasing drywell temperature causes the most reliability concerns for which one of the following level instruments?

A. Emergency Range indicators.

B. Normal Range indicators.

C. Post Accident indicators.

D. Shutdown Flood-up indicator.

84. During an accident on Unit 2, suppression pool water level reaches 18 feet and continues to increase. Reactor pressure is 300 psig and decreasing.

Which one of the following containment components will NOT properly function at this point?

A. Normal control room suppression pool level instrumentation.

B. Suppression Chamber-to-Drywell vacuum breakers.

C. Suppression chamber spray nozzles.

D. MSRV tail pipes and/or supports.

85. Which one of the following is the MINIMUM suppression pool level at which the drywell-to-torus downcomers will be covered?

A. 9.75 feet.

B. 10.75 feet.

C. 11.75 feet.

D. 12.75 feet.

86. During an ATWS, conditions develop which require Emergency Depressurization.

Which one of the following describes the minimum number of Main Safety Relief Valves (MSRVs) required for Emergency Depressurization, and the basis for this number?

A. 6 ADS MSRVs, to reliably depressurize the reactor vessel as rapidly as possible, and to uniformly distribute the heat load to the suppression pool.

B. 6 MSRVs, which, if opened, will remove all decay heat from the core at a pressure sufficiently low that ECCS with the lowest head will be capable of making up for MSRV steam flow.

C. 4 ADS MSRVs, the least number of the most reliable MSRVs that correspond to a minimum alternate RPV flooding pressure sufficiently low that ECCS with the lowest head will be capable of making up MSRV steam flow.

D. 4 MSRVs, which, if opened, will remove all decay heat from the core at a pressure sufficiently low that ECCS with the lowest head will be capable of making up MSRV steam flow.

87. EOI-3, Secondary Containment control is being executed due to an unisolable RCIC steam line break in the reactor building. EOI-3 requires that EOI-1, RPV Control be entered and executed concurrently before which one of the following occur.

A. Any area temperature reached the maximum normal operating temperature.

B. Reactor zone ventilation exhaust reached 72 mr/hr.

C. Any area radiation level reached the maximum safe operating level.

D. At least two area temperature reached the maximum normal operating temperature.

88. The plant is operating at full power. The Reactor Building assistant unit operator reports there is about 6 inches of water accumulating on the floor in the RHR Room, SE area, and it appears to be from floor drains backing up.

Which one of the following is the first action the control room operators should taken in accordance with the EOIs?

A. Operate all available sump pumps to maintain the sump water level to less than 66 inches.

B. Enter EOI-1 and scram the reactor before RHR Room water level reaches 20 inches.

C. Isolate all systems discharging into the RHR Room, except those required for safe shutdown of the reactor.

D. Initiate a controlled shutdown of the reactor per 2-GOI-10012A.

89. The following conditions exist:

An ATWS has occurred.
Reactor water level is being lowered in accordance with C-5, Level/Power Control.
SLC has been initiated.

Which one of the following conditions would require RPV level to be restored to normal?

A. SLC Tank level drops to 41%.

B. SLC Tank level drops to 48%.

C. Reactor power drops below 5%.

D. All MSRVs remain closed with drywell pressure below 2.4 psig.

90. Given the following switch positions for the control air compressors.

A - second lead
B - third lead
C- standby
D- standby
G-lead

- A loss of Common Board 1 occurs
- A small system leak causes control air pressure to drop to drop to 94 psig

Which one of the following describes all of expected control air compressors expected to be in operation?

A. G will be running at full load. A will be running at half load

B. G will be running at full load. B will be running at half load.

C. A and G will be running at full load. C will be running at half load.

D. A, and G will be running at full load. D will be running at half load.

91. Due to an accident condition, the following plant parameters exist:

- Drywell Hydrogen 5.4%
- Drywell Oxygen 6.0%
- Suppression Chamber Hydrogen 4.0%
- Suppression Chamber Oxygen 5.5%
- Suppression Pool Level 17 feet
- Drywell temperature 250 degrees
- Drywell Pressure 18 psig
- RPV Level +30 inches
- Torus and Drywell Sprays are in service

Which one of the following actions is required?
(Reference attached)

A. Perform Appendix 9 to determine and monitor Suppression Pool water level.

B. Stop Drywell Sprays.

C. Perform Appendix 14A, Nitrogen Make-up, to control containment hydrogen and oxygen levels.

D. Perform Emergency Depressurization.

92. Which one of the following positions represents the minimum level of approval required to make a currently approved operator aid permanent?

A. Site Engineering Labeling Coordinator.

B. Shift Manager.

C. Operations Superintendent.

D. Plant Manager.

93. Which one of the following choices describes the method used for verifying the position of a locked and throttled valve?

A. Remove the locking device, carefully close the valve counting the number of turns, then reopen the valve the same number of turns. Reapply a locking device to the valve and record the as left position.

B. Place "NA" in the verification signature space for this valve. Locked and/or throttled valves cannot be independently verified without disturbing the position.

C. Since the valve is already locked, the valve may be assumed to be throttled in the correct position. The verification may be signed off as complete.

D. Independent verification of this valve cannot be performed. Second party verification must be performed during initial valve positioning.

94. Unit 2 is in a refueling outage and RHR Pump 2A is tagged to replace the pump seal. Electrical Maintenance has determined that the motor must be replaced on the pump minimum flow valve which is part of the RHR Pump 2A clearance boundary.

Which one of the following statements describes how this additional work affects the clearance boundary?

A. The valve operator must have a collar installed to prevent motion before the clearance boundary can be modified.

B. The Shift Manager Representative can modify the clearance boundary with concurrence from the Maintenance Shift Supervisor.

C. All work under the clearance must be stopped while the clearance is modified and reissued.

D. An operator must be assigned to independently verify component positioning and tag replacement.

95. Which one of the following choices correctly describes the response of the Unit 2 and Unit 3 reactor recirculation pump (RRP) speed control to an increase in core differential pressure?

A. Both Unit 2 RRP and Unit 3 will automatically reposition the scoop tube to bring speed back to the setpoint.

B. Unit 2 will automatically reposition the scoop tube to bring speed back to the setpoint but on Unit 3 the RRP speed must be manually adjusted by the operator.

C. On Unit 2 the RRP speed must be manually adjusted by the operator but Unit 3 will automatically reposition the scoop tube to bring speed back to the setpoint.

D. Both Unit 2 and Unit 3 must be manually adjusted by the operator to bring speed back to the setpoint.

96. While off-loading fuel bundles from the reactor, fuel pool level begins to decrease uncontrollably.
Which one of the following describes a method available from the control room to add water to the fuel pool?

A. Align fuel pool cooling and cleanup heat exchanger RBCCW supply to the fuel pool to maintain level.

B. Start a condensate pump and inject to the reactor vessel to maintain fuel pool level.

C. Open emergency makeup supply valve from EECW to the fuel pool to maintain level.

D. Gravity drain the CST, to the main condenser hotwell, then inject to the reactor vessel with condensate booster pumps.

97. Given the following conditions at a work site.

Airborne activity: 3 DAC
Radiation level: 40 mr/hr
Radiation level with shielding: 10 mr/hr
Time to place shielding: 15 minutes
Time to conduct task with respirator: 1 hour
Time to conduct task without respirator: 30 minutes

Assume the following:

- the airborne dose with a respirator will be zero.
- a dose rate of 40 mr/hr will be received while placing the shielding.
- all tasks will be performed by one worker.
- shielding can be placed in 15 minutes with or without a respirator.

Which one of the following would result in the lowest whole body dose?

A. Place shielding while wearing respirator and conduct task with respirator.

B. Place shielding while wearing respirator and conduct task without respirator.

C. Conduct task with respirator and without shielding.

D. Conduct task without respirator or shielding.

98. Unit 2 startup is in progress with the reactor at 920 psig and 6% power. The Reactor Mode Switch is in STARTUP. Primary containment is being inerted with the purge filter fan in service.

Which one of the following statements is correct concerning inerting in this plant condition?

A. Turning the purge filter fan off will automatically close the drywell and suppression chamber exhaust valves.

B. Placing the Reactor Mode Switch in RUN will automatically close all valves required for inerting with the purge filter fan unless Bypass switches are placed in BYPASS on panel 9-3.

C. Placing the Reactor Mode Switch in RUN will give a Group 6 PCIS unless Bypass switches are placed in BYPASS on panel 9-3.

D. Placing the Reactor Mode Switch in RUN will automatically close the drywell and suppression chamber exhaust isolation valves unless the Drywell/Suppression Chamber Train A/B Vent keylock switches are positioned to DRYWELL.

99. EOI-1, RPV Control, is being executed following a scram due to a turbine trip at high power. During the initial phase of the transient, one of the SRV's stuck open. Suppression pool temperature has now (approximately 7 minutes after the turbine trip) reached 96 degrees.

Which one of the following states the Unit Supervisor's procedural response to this condition?

A. Re-enter EOI-1 at the beginning.

B. Re-enter EOI-1 at the beginning and simultaneously enter EOI-2.

C. Continue in EOI-1 and simultaneously enter EOI-2.

D. Continue in EOI-1.

100. During a plant startup on Unit 3, reactor power was passing through 80% RTP when there was a loss of power to the control room annunciators. Thirty minutes have passed, and power has not yet been restored. SPDS and ICS are available.

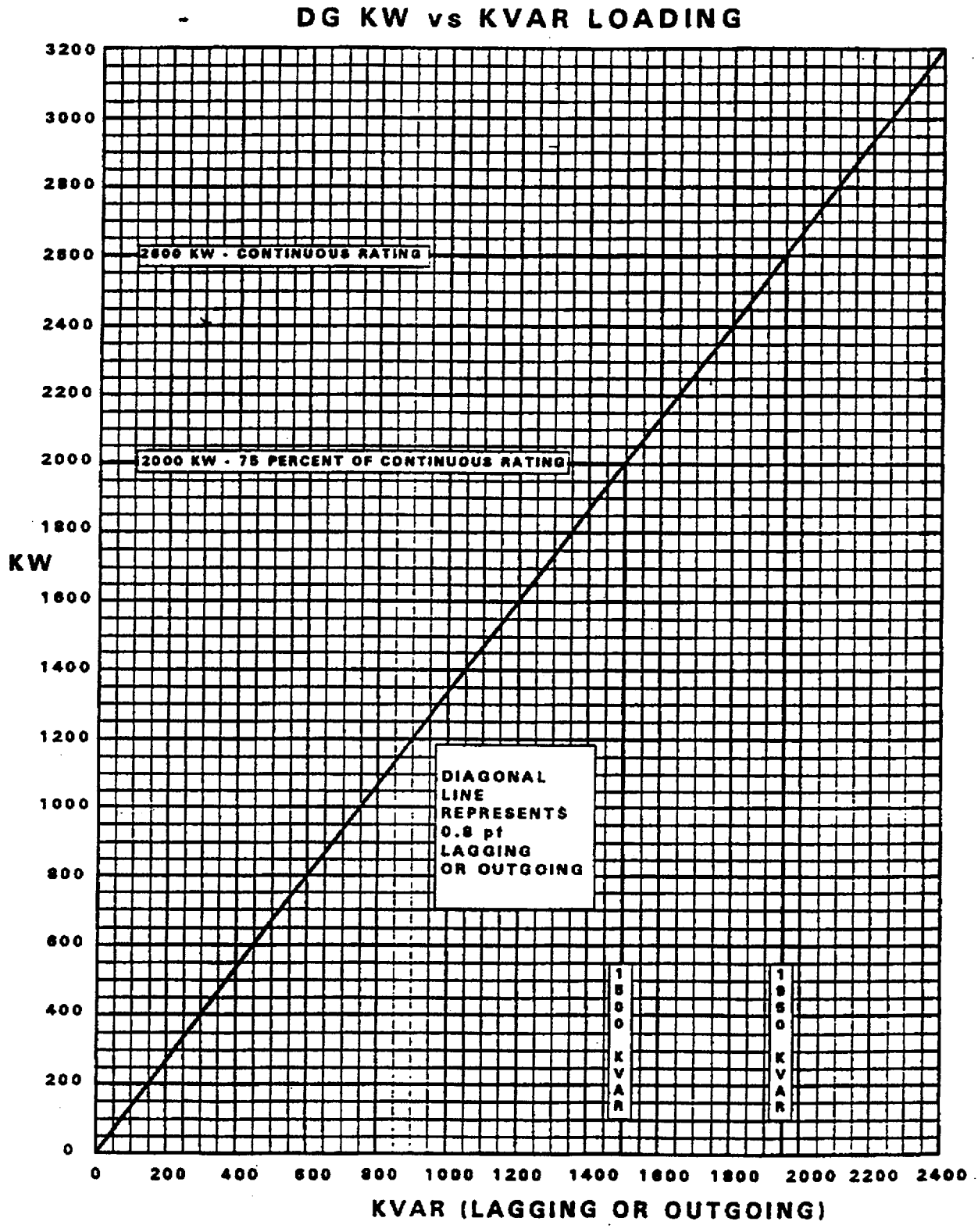
Which one of the following describes the required control room operators' response?

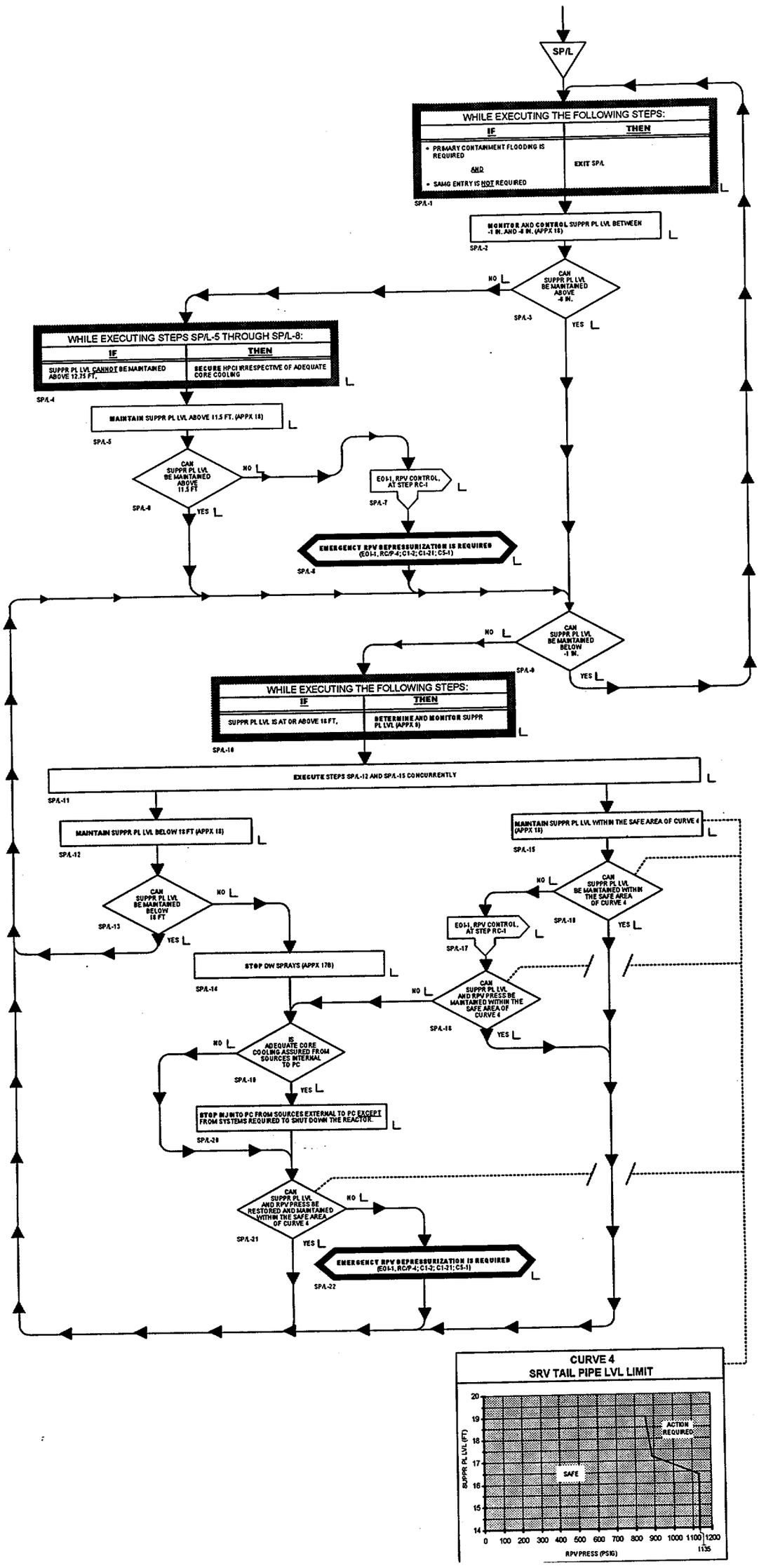
A. Commence a reactor shutdown, dispatch personnel for local monitoring of equipment.

B. Scram the reactor manually, dispatch personnel to monitor and manipulate plant equipment in response to the scram.

C. Suspend the power ascension and avoid any system manipulation, dispatch personnel for local monitoring of equipment.

D. Expedite maintenance activities to restore power while slowly continuing the ascension to full power, monitor equipment with SPDS and ICS.


DG KW vs KVAR LOADING
3200
3000
2800
2800
2400
2200
2000
1800
KW
1600
1400
1200
1000
800
600
400
200
0
2800 KW - CONTINUOUS RATING
2000 KW - 75 PERCENT OF CONTINUOUS RATING
DIAGONAL LINE REPRESENTS 0.8 pf LAGGING OR OUTGOING
1500 KVAR
1950 KVAR
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
KVAR (LAGGING OR OUTGOING)


SP/L
WHILE EXECUTING THE FOLLOWING STEPS:
IF
THEN
• PRIMARY CONTAINMENT FLOODING IS REQUIRED
AND
• SAMG ENTRY IS NOT REQUIRED
EXIT SP/L
SP/L-1
MONITOR AND CONTROL SUPPR PL LVL BETWEEN -1 IN. AND -6 IN. (APPX 18)
SP/L-2
CAN SUPPR PL LVL BE MAINTAINED ABOVE -6 IN.
SP/L-3
NO
YES
WHILE EXECUTING STEPS SP/L-5 THROUGH SP/L-8:
IF
THEN
SUPPR PL LVL CANNOT BE MAINTAINED ABOVE 12.75 FT,
SECURE HPCI IRRESPECTIVE OF ADEQUATE CORE COOLING
SP/L-4
MAINTAIN SUPPR PL LVL ABOVE 11.5 FT. (APPX 18)
SP/L-5
CAN SUPPR PL LVL BE MAINTAINED ABOVE 11.5 FT
SP/L-6
NO
YES
EOI-1, RPV CONTROL, AT STEP RC-1
SP/L-7
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED (EOI-1, RC/P-4; C1-2; C1-21; C5-1)
SP/L-8
CAN SUPPR PL LVL BE MAINTAINED BELOW -1 IN.
SP/L-9
NO
YES
WHILE EXECUTING THE FOLLOWING STEPS:
IF
THEN
SUPPR PL LVL IS AT OR ABOVE 18 FT,
DETERMINE AND MONITOR SUPPR PL LVL (APPX 9)
SP/L-10
EXECUTE STEPS SP/L-12 AND SP/L-15 CONCURRENTLY
SP/L-11
MAINTAIN SUPPR PL LVL BELOW 18 FT (APPX 18)
SP/L-12
CAN SUPPR PL LVL BE MAINTAINED BELOW 18 FT
SP/L-13
NO
YES
STOP DW SPRAYS (APPX 17B)
SP/L-14
MAINTAIN SUPPR PL LVL WITHIN THE SAFE AREA OF CURVE 4 (APPX 18)
SP/L-15
CAN SUPPR PL LVL BE MAINTAINED WITHIN THE SAFE AREA OF CURVE 4
SP/L-16
NO
YES
EOI-1, RPV CONTROL, AT STEP RC-1
SP/L-17
CAN SUPPR PL LVL AND RPV PRESS BE MAINTAINED WITHIN THE SAFE AREA OF CURVE 4
SP/L-18
NO
YES
IS ADEQUATE CORE COOLING ASSURED FROM SOURCES INTERNAL TO PC
SP/L-19
NO
YES
STOP INJ INTO PC FROM SOURCES EXTERNAL TO PC EXCEPT FROM SYSTEMS REQUIRED TO SHUT DOWN THE REACTOR.
SP/L-20
CAN SUPPR PL LVL AND RPV PRESS BE RESTORED AND MAINTAINED WITHIN THE SAFE AREA OF CURVE 4
SP/L-21
NO
YES
EMERGENCY RPV DEPRESSURIZATION IS REQUIRED (EOI-1, RC/P-4; C1-2; C1-21; C5-1)
SP/L-22
CURVE 4
SRV TAIL PIPE LVL LIMIT
SUPPR PL LVL (FT)
20
19
18
17
16
15
14
ACTION REQUIRED
SAFE
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
RPV PRESS (PSIG)
1135

Test Name: SRO.TST
Test Date: Thursday, June 22, 2000

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	1	202002A1.05	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	2	215004A2.02	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	3	234000A3.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	4	261000K6.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	5	262001G2.1.1	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	6	295003AA1.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	7	295014G2.1.7	002	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	8	295016AA2.06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	9	295017AA1.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	10	295023AA1.05	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	11	295028EK1.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	12	295031EA1.08	002	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	13	295031EK2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	14	295033G2.3.10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	15	295038EK1.02	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	16	500000EK1.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	17	600000AA2.15	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	18	G2.1.10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	19	G2.1.26	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	20	G2.1.6	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	21	G2.3.11	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	22	G2.4.1	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	23	G2.4.18	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	24	G2.4.30	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	25	G2.4.44	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	26	0PL171.148	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	27	201001K3.03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	28	201006A1.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	29	202001K6.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	30	202002A4.09	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	31	203000K4.06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	32	204000A3.04	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	33	205000K6.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	34	206000K2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	35	209001K4.08	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	36	211000K2.02	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	37	212000K6.05	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	38	215001G2.1.32	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	39	215001K4.01	002	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	40	215003A4.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	41	215003K1.06	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	42	215005K6.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	43	216000G2.1.28	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	44	217000A2.19	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	45	218000K2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	46	223002K3.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	47	226001A4.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	48	233000A3.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	49	239002K4.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	50	239002K5.04	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C

Test Name: SRO.TST
Test Date: Thursday, June 22, 2000

		Question ID		Type	Pts	Answer(s) 0	1	2	3	4	5	6	7	8	9
1:	51	241000K3.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	52	256000K5.10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	53	259001A1.02	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	54	259002A3.06	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	55	262001K1.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	56	262001K4.03	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	57	264000G2.1.32	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	58	272000K3.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	59	286000A1.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	60	290003K1.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	61	295002AA1.06	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	62	295003AK2.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	63	295003AK3.06	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	64	295004AK2.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	65	295005AA2.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	66	295006AA2.06	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	67	295007AK2.02	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	68	295008AK2.06	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	69	295009AK3.01	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	70	295010AK2.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	71	295012AA2.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	72	295013AA1.02	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	73	295014AA1.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	74	295015AK2.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	75	295018AK3.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	76	295019AA1.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	77	295020G2.4.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	78	295021AK2.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	79	295023AA2.02	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	80	295024EK1.01	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	81	295025EA1.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	82	295026EK3.04	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	83	295028EA2.03	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	84	295029EK2.05	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	85	295030EK1.01	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	86	295031EK3.05	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	87	295032G2.4.4	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	88	295036EK3.03	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	89	295037G2.4.6	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	90	300000K2.01	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	91	500000EA2.03	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	92	G2.1.1	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	93	G2.1.29	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	94	G2.2.13	001	MC-SR	1	D	A	B	C	D	A	B	C	D	A
1:	95	G2.2.3	001	MC-SR	1	A	B	C	D	A	B	C	D	A	B
1:	96	G2.2.30	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	97	G2.3.10	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	98	G2.3.9	001	MC-SR	1	B	C	D	A	B	C	D	A	B	C
1:	99	G2.4.14	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D
1:	100	G2.4.32	001	MC-SR	1	C	D	A	B	C	D	A	B	C	D