

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

**Applicant Information**

Name:	Region: II
Date: December 6, 2000	Facility/Unit: Turkey Point/3&4
License Level: SRO	Reactor Type: W
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	<u>100</u> Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

## WRITTEN EXAMINATION GUIDELINES

1. After you complete the examination, sign the statement on the cover sheet indicating that the work is your own and you have not received or given assistance in completing the examination.
2. To pass the examination, you must achieve a grade of 80.00 percent or greater; grades will not be rounded up to achieve a passing score. Every question is worth one point.
3. For an initial examination, the nominal time limit for completing the examination is five hours; extensions will be granted if anyone needs more time to complete the exam.
4. You may bring pens, pencils, and calculators into the examination room. Use black ink to ensure legible copies; dark pencil should be used only if necessary to facilitate machine grading.
5. Print your name in the blank provided on the examination cover sheet and the answer sheet. You may be asked to provide the examiner with some form of positive identification.
6. Mark your answers on the answer sheet provided and do not leave any question blank. Use only the paper provided and do not write on the back side of the pages. If you are using ink and decide to change your original answer, draw a single line through the error, enter the desired answer, and initial the change.
7. If you have any questions concerning the intent or the initial conditions of a question, do *not* hesitate asking them before answering the question. Ask questions of the NRC examiner or the designated facility instructor *only*. When answering a question, do *not* make assumptions regarding conditions that are not specified in the question unless they occur as a consequence of other conditions that are stated in the question. For example, you should not assume that any alarm has activated unless the question so states or the alarm is expected to activate as a result of the conditions that are stated in the question. Finally, answer all questions based on actual plant operation, procedures, and references. If you believe that the answer would be different based on simulator operation or references, you should answer the question based on the actual plant.
8. Restroom trips are permitted, but only one applicant at a time will be allowed to leave. Avoid all contact with anyone outside the examination room to eliminate even the appearance or possibility of cheating.
9. When you complete the examination, assemble a package including the examination questions, examination aids, answer sheets, and scrap paper and give it to the NRC examiner or proctor. Remember to sign the statement on the examination cover sheet indicating that the work is your own and that you have neither given nor received assistance in completing the examination. The scrap paper will be disposed of immediately after the examination.
10. After you have turned in your examination, leave the examination area as defined by the proctor or NRC examiner. If you are found in this area while the examination is still in progress, your license may be denied or revoked.
11. Do you have any questions?

Name: \_\_\_\_\_

1.

Unit 3 was operating at 100% when a single control rod in control bank D drops into the core. The SRO directs that the dropped rod be recovered.

Which one of the following prevents the remaining rods in the control rod bank from being withdrawn while the dropped rod is being recovered?

- A. The rod stop bypass is used to block control rod bank D outward movement.
- B. The "lift coil disconnect" disconnect switches are opened on control bank D rods that did not drop.
- C. The rod drop bistable actuated when the rod dropped and will prevent outward rod motion by control bank D.
- D. The "lift coil disconnect" disconnect switch is opened on the dropped rod to electrically isolate it from control bank D.

2.

Which one of the following reactivity values is correct if  $K_{eff}$  is equal to 0.95?

A. +2.053

B. -2.053

C. +0.053

D. -0.053

3.

Following an alarm on R-3-19, S/G blowdown liquid activity with the reactor at normal operating temperatures and pressures at power, which one of the following should an operator expect?

- A. DAM-1 S/G steamline monitor to decrease over time.
- B. DAM-1 S/G steamline monitor to increase over time.
- C. R-3-15, Air ejector radiation monitor to decrease over time.
- D. R-3-15, Air ejector and DAM-1 S/G steam line radiation monitor indications remain constant over time.

4.

Unit 3 experienced a station blackout and operators have implemented 3-EOP-ECA-0.0, Loss of All AC Power. The 3A1 and 3A2 Battery chargers are inoperable.

Step 1 of Attachment 3, 125V DC Bus Shedding, must be performed within \_\_\_\_\_

to ensure the 3A vital battery will supply vital loads for a minimum of \_\_\_\_\_.

Which one of the following combinations accurately completes the above statement?

A. 30 minutes, 2 hours

B. 30 minutes, 4 hours

C. 60 minutes, 2 hours

D. 60 minutes, 4 hours

5.

Unit 3 has just been tripped from 100% power due to a stuck open pressurizer safety valve. The crew has just tripped the reactor coolant pumps due to loss of subcooling. Pressurizer level is 70%. How would RVLMS respond when saturation conditions are reached in the RCS?

- A. Decrease, then increase.
- B. Decrease rapidly.
- C. Increase, then decrease.
- D. Increase rapidly.

6.

Unit 3 is operating at 100% power when the controlling S/G pressure transmitter fails low on the 3A S/G.

Which one of the following describes the effect this will have on the indicated steam flow of the controlling channel and the initial 3A FW Control Valve, FCV-478, response?

- A. Indicated steam flow will decrease. The FCV will open.
- B. Indicated steam flow will decrease. The FCV will close.
- C. Indicated steam flow will increase. The FCV will open.
- D. Indicated steam flow will increase. The FCV will close.



7.

Per 3-ONOP-041.1, "Reactor Coolant Pump Off-Normal," which one of the following requires stopping an RCP ?

- A. RCP horizontal motor vibrations equal 10 MILS
- B. RCP vertical shaft vibrations equal 10 MILS
- C. RCP stator winding temperature equals 225 degrees
- D. RCP pump bearing temperature equals 200 degrees

8.

Following an uncontrolled increase in the source range count rate while subcritical. Operators enter 3-ONOP-046.1, "Emergency Boration" and establish the following conditions:

- FI-3-110, Emergency Borate Flow, indicates 64 GPM.
- FI-3-122, Charging Line Flow, indicates 40 GPM.

Which one of the following describes the appropriate procedural actions to be taken per 3-ONOP-046.1?

- A. Start an additional Boric Acid Pump and align valves as necessary to establish emergency boration flow.
- B. Open CV-3-310B, Loop C Charging Isolation Valve, to increase emergency boration flow.
- C. Start an additional Charging Pump and align valves as necessary to establish emergency boration flow.
- D. Align Charging Pump Suction to the RWST.

9.

While in EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation" operators have successfully restored recirculation capability. What is the proper action at this point?

- A. Continue with this procedure until the procedure transitions out to another procedure.
- B. Suspend performance of EOP-ECA-1.1 and return to the procedure and step in effect.
- C. Go to EOP-E-1, "Loss of Reactor or Secondary Coolant," Step 1.
- D. Go to EOP-ES-1.3, "Transfer to Cold Leg Recirculation."

10.

Which one of the following statements describes the application of NOTES and/or CAUTIONS found within the body of an ONOP (for example, prior to step 4 of a 20 step ONOP)?

- A. CAUTIONS apply to the step which they precede and for the remainder of the procedure, unless otherwise stated.
- B. CAUTIONS only apply to the step which they precede, unless otherwise stated.
- C. NOTES apply to the step which they precede and for the remainder of the procedure, unless otherwise stated.
- D. NOTES continue to apply after transitioning to another procedure, unless otherwise stated.

11.

Unit 3 has experienced a simultaneous LOOP/LOCA.

Which one of the following describes the response of the Emergency Containment Cooler (ECC) Fan motors?

- A. Two ECCs start immediately upon receipt of the SI signal.
- B. Two ECCs start when sequenced on by the sequencers.
- C. If the 3B EDG fails to start, ECCs 3A and 3B will be powered from the 3A EDG.
- D. If the 3A EDG fails to start, ECCs 3B and 3C will be powered from the 3B EDG.

12.

"A" AFW pump is out of service. Operators have realigned the "C" AFW pump to train 1. Following a reactor trip and initiation of safety injection due to an unisolable fault on S/G B, conditions associated with AFW are:

- AFW pump C steam supply MOV failed to open
- AFW pump B discharge pressure = 10 psig
- AFW pump B RPM = 5900 RPM
- AFW flow to S/G A, B, & C = 0 gpm

Which one of the following is indicated?

- A. Steam binding of B AFW pump due to backleakage of steam through the discharge check valves.
- B. Air binding of B AFW pump due to inleakage of air through the mechanical seals.
- C. Inadequate NPSH for B AFW pump due to the suction valve failing shut on loss of air.
- D. Runout conditions on B AFW pump due to low pressure in B S/G.

13.

When transferring water from the SFP to the RWST, what is the flow limitation and what is the basis for this flow limitation?

- A. Flow is limited to 100 GPM because of the slow response of the RWST overflow instrumentation.
- B. Flow is limited to 100 GPM because it must pass through the demineralizer in the SFP purification loop.
- C. Flow must be greater than 200 GPM because of the Minimum Developed Head.
- D. Flow must be greater than 200 GPM because it must pass through the demineralizer in the SFP purification loop.

14.

Which one of the following describes why the discharge of the HHSI pumps is realigned 12 hours after a large break LOCA?

- A. This is done to prevent the possibility of boron precipitation due to the concentrating effects experienced during a cold leg break. The HHSI pumps are then run for hot leg recirculation.
- B. This is done to prevent the possibility of boron precipitation due to the concentrating effects experienced during a hot leg break. The HHSI pumps are then run for cold leg recirculation.
- C. This is done to prevent the loss of HHSI pump NPSH. The HHSI pumps then take suction from the containment sump and are run for hot leg recirculation.
- D. This is done to prevent the loss of HHSI pump NPSH. The HHSI pumps then take suction from the containment sump and are run for cold leg recirculation.



15.

Which one of the following defines the personnel who, under 0-ADM-200, "Conduct of Operations," have the authority to remove personnel from the control room?

Only the NPS and:

- A. ANPS
- B. ANPS, RCO
- C. ANPS, RCO, NWE
- D. ANPS, RCO, NWE, Shift Technical Advisor

16.

In accordance with 3-ONOP-030, "Component Cooling Water Malfunction," which one of the following IMMEDIATE ACTIONS must be performed if CCW surge tank level is decreasing and the CCW Surge Tank Makeup Valve, MOV-3-832, is fully open?

- A. Trip Reactor and stop all RCPs.
- B. Dispatch an operator to tie together the CCW headers.
- C. Operate the running charging pump at minimum speed.
- D. Dispatch an operator to split the CCW header.

17.

With reactor power at 50% and the pressurizer level control transfer switch in Position III (LT 461/460), a failure causes the following plant events to occur in the given sequence (assume no operator actions are taken):

1. Charging flow reduced to minimum.
2. Pressurizer level decreases.
3. Letdown secured and Pressurizer heaters off.
4. Pressurizer level increases until high level trip.

Which one of the following failures occurred?

- A. Level transmitter 460 failed low.
- B. Level transmitter 460 failed high.
- C. Level transmitter 461 failed low.
- D. Level transmitter 461 failed high.

18.

Which one of the following is indicative of an impending loss of natural circulation flow?

- A. RCS delta T at 57 degrees F and increasing
- B. RCS subcooling at 42 degrees F and increasing
- C. Source range detector counts decreasing
- D. RCS cold leg temperature slowly decreasing

19.

A reactor startup is in progress with Source Range counts indicating  $3.7 \text{ E}+4$  cps on N-31 and N-32. Intermediate Range Instrument N-35 indicates  $3 \text{ E}-11$  and N-36 indicates  $1 \text{ E}-11$ . What actions should be performed and why?

- A. Enter the ONOP for Intermediate Range Instrument malfunction, maintain power < P-6, N-35 is undercompensated.
- B. Enter the ONOP for Intermediate Range Instrument malfunction, maintain power < P-6, N-36 is failed low.
- C. Continue the startup, power is too low to determine if any Intermediate Range detector has failed.
- D. Enter the ONOP for Intermediate Range Instrument malfunction, continue the startup, adequate protection and monitoring is available with one Intermediate Range detector.

20.

The following conditions exist on Unit 3:

- Reactor trip and SI have automatically actuated.
- Operators are preparing to transition from EOP-E-1 "Loss of Reactor or Secondary Coolant."
- RCS pressure is stable at 700 psig.
- All S/G pressures are stable at 900 psig.
- RWST level is 310,000 gallons and decreasing slowly.
- Containment pressure peaked at 10 psig and is decreasing.

Which one of the following identifies the correct procedure to which operators will transition to?

- A. ES-1.1 "SI Termination"
- B. ES-1.2 "Post LOCA Cooldown and Depressurization"
- C. ES-1.3 "Cold Leg Recirculation"
- D. ES-1.4 "Hot Leg Recirculation"

21.

Given the following plant conditions:

- The reactor tripped 45 seconds ago.
- Turbine stop valves are closed.
- Megawatt meter at zero output.
- Mid and East GCBs are closed.

Which one of the following states the condition of the generator and the correct operator response?

- A. Generator is acting as a load on the grid, depressurize steam lines and MSRs.
- B. Generator is motoring, depressurize steam lines and MSRs.
- C. Generator is motoring, actuate the Emergency Gen Bkr Trip Switch.
- D. Generator exciter has failed, locally open 3A & 3B MG set supply breakers.

22.

Which ONE of the following Hi radiation alarms will initiate a Containment Purge System isolation?

- A. ARMS R2 (Containment Area)
- B. SPING4 (Special Particulate and Iodine Noble Gas)
- C. PRMS R12 (Containment Air Radioactivity)
- D. PRMS R14 (Plant Vent Gas)



23.

Which one of the following situations would require prior review by the ALARA review board as detailed in 0-ADM-600, "Health Physics Manual?"

- A. 1 person replacing a valve gasket that involves an exposure of 2.5 rem total.
- B. 2 persons removing a piping spool that involves an exposure of 4.5 rem total.
- C. 3 persons performing a surveillance test on an HVAC filter unit involving an exposure of 2.0 rem for each person.
- D. 5 people performing preventive maintenance on a pump which involves an exposure of .75 rem for each person.

24.

Which one of the following is the reason why AFW flow rate is procedurally restricted to less than 100 gpm when recovering a steam generator level if the level has fallen below 8% wide range indication?

- A. Ensure SG pressure transient condition does not occur which could result in an uncontrolled release through a safety valve.
- B. Ensure pressurizer level transient does not result in pressure transient that would actuate SI.
- C. Minimize thermal stress conditions on steam generator components.
- D. Minimize RCS cooldown rate which could result in an unacceptable positive reactivity addition.

25.

Given the following:

- Reactor startup in progress with the reactor critical.
- Intermediate Range Channels N35 and N36 power indicate 3E-11 and 5E-11 amps respectively.

Which one of the following describes the actions required if BOTH Source Range (SR) Instruments fail LOW in this situation?

- A. Manually insert all control and shutdown rods, then open the reactor trip breakers.
- B. Maintain current power level until at least one SR instrument is returned to service.
- C. Manually trip the reactor.
- D. Enter a 6 hour LCO then continue the startup.

26.

While operating in Mode 1, Annunciator H1/6 ,PRMS CHANNEL FAILURE alarms. On inspection, the fail light is found to be illuminated on PRMS channel 18, Waste Disposal System Liquid Effluent Monitor.

Which one of the following describes the correct operator response?

- A. Bypass the channel and direct chemistry to take periodic samples.
- B. Direct the SNPO to shut RCV-014 (gaseous release isolation valve).
- C. Stop liquid release if in progress.
- D. Refer to 0-OP-061.11, WDS Controlled Liquid Release to Circulating Water.

27.

During the performance of 3-EOP-ES-0.2, "Natural Circulation Cooldown," while cooling down the RCS at a rate of 25 degrees F/hour, water inventory in the Condensate Storage Tanks is lost.

Which one of the following describes the appropriate procedural actions?

- A. Remain in ES-0.2, "Natural Circulation Cooldown," and maintain the same cooldown rate.
- B. Remain in ES-0.2, "Natural Circulation Cooldown," and stop the cooldown.
- C. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Void in Vessel (With RVLMS,)" and increase the cooldown rate.
- D. Remain in ES-0.2, "Natural Circulation Cooldown," and increase the cooldown rate.

28.

The Instrument Air System controls and indications located at the Alternate Shutdown Panel (ASP) consist of air pressure indication and the \_\_\_\_\_.

Which one of the components below completes the above statement?

- A. Unit 3 & 4 air header cross connect isolation valve control switch.
- B. Containment Air Header Isolation Valve Normal/Isolate switch.
- C. Diesel air compressor start pushbutton.
- D. Electric air compressor start pushbutton.

29.

Operators are responding to a main steam line break inside containment and are attempting to secure the Containment Spray pumps (CSPs).

Which one of the following identifies the EOP-E-1 procedural criteria that must be satisfied to allow stopping the CSPs?

- A. Containment pressure <14 psig OR Containment temperature <122°F
- B. Containment pressure <14 psig AND Containment temperature <122°F
- C. Containment pressure <20 psig OR Containment temperature <180°F
- D. Containment pressure <20 psig AND Containment temperature <180°F

30.

Given the following:

- The unit is in Mode 6 with the core loading in progress.
- Power Range channel N42 is out of service for annual maintenance.
- The power supply for Power Range channel N41 power range channel fails.

Which one of the following describes the required action in this situation?

- A. No actions are required.
- B. Stop all fuel movement.
- C. Evacuate containment.
- D. Verify refueling cavity level is above 56'10".



31.

Which one of the following valves will remain open following a Phase A containment isolation actuation?

- A. MOV-381 RCP seal water return
- B. CV-855 Accumulator N2 supply
- C. MOV-730 RCP bearing water return
- D. CV-519A Primary water to containment isolation

32.

Refueling operations are in progress on Unit 3. An irradiated fuel assembly is in the transfer cart in containment when the following symptoms occur:

- Annunciator I 4/6, CNTMT SUMP HIGH LEVEL in alarm
- Annunciator G 9/5, CNTMT SUMP HIGH LEVEL in alarm
- Annunciator H 1/1, SPENT FUEL PIT LOW LEVEL in alarm
- Containment Radiation Monitor R-3-12 increasing

Which one of the following is a required IMMEDIATE ACTION based on the above symptoms?

- A. Direct the refueling operator to close SFP Transfer Tube Gate Valve.
- B. Lay irradiated fuel assembly down but do not transfer to the spent fuel pool.
- C. Sound the containment Evacuation alarm.
- D. Lay irradiated fuel assembly down and transfer to the spent fuel pool.

33.

Which one of the following represents a means of inadvertent criticality prevention, as described in 0-ADM-035, "Limitations and Precautions for Handling Fuel Assemblies?"

- A. The minimum boron concentration while fuel is stored in the spent fuel pool is 1925 ppm.
- B. Burnup limits are placed on fuel located in Region I of the spent fuel pool.
- C. Enrichment limits are placed on the fuel located in Region I of the spent fuel pool.
- D. Fuel assembly enrichment shall not exceed 3.5 weight per cent of U-235 in the spent fuel pool storage racks.

34.

Unit 3 was at 100% steady state power when the following events occurred:

- Unit 3 suffered a small break LOCA and tripped from 100% power.
- Offsite power was lost coincident with the reactor trip but has NOT been restored.
- The operators are now at step 3 of 3-EOP-ES-1.2, "Post-LOCA Cooldown and Depressurization."
- Pressurizer level is now 25%.

Which one of the following describes the local actions required to enable the RCO to energize pressurizer backup group heaters?

- A. To restore A and B group heaters, reset their respective lockout relays.
- B. To restore A and B group heaters, take their respective keylock switches to emergency.
- C. To restore the A group heaters take the respective keylock switch to emergency. To restore the B group heaters, reset the lockout relay.
- D. To restore the A group heaters, reset the lockout relay. To restore the B group heaters take the respective keylock switch to emergency.

35.

3-EOP-ECA 1.2, "LOCA Outside Containment" step 3, states:

**"Check If Break Is Isolated."**

What indications do you use to accomplish this and based on these indications, where do you transition?

- A. If RCS temperature is increasing then go to 3-EOP-E-1, "Loss of Reactor or Secondary Coolant." If RCS temperature is decreasing then go to 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation."
- B. If RCS temperature is increasing then go to 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation." If RCS temperature is decreasing then go to 3-EOP-E-1, "Loss of Reactor or Secondary Coolant."
- C. If RCS pressure is increasing then go to 3-EOP-E-1, "Loss of Reactor or Secondary Coolant." If RCS pressure is decreasing then go to 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation."
- D. If RCS pressure is increasing then go to 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation." If RCS pressure is decreasing then go to 3-EOP-E-1, "Loss of Reactor or Secondary Coolant."

36.

Given the following:

- The Unit is critical.
- Three reactor coolant loops are in operation.

Which one of the following sets of conditions represents a violation of a technical specification safety limit?

- A. Power = 50%, Pressure = 1975 psig, Tavg = 605°F
- B. Power = 80%, Pressure = 2250 psig, Tavg = 640°F
- C. Power = 10%, Pressure = 2400 psig, Tavg = 655°F
- D. Power = 90%, Pressure = 2000 psig, Tavg = 595°F

37.

Following a loss of offsite power,  $T_c$  is within 35 deg. F of  $T_{sat}$  for S/G pressure. This is a positive indication of which one of the following?

- A. single phase flow in the RCS loops
- B. two phase flow in the RCS loops
- C. safety Injection has occurred
- D. safety Injection has not occurred

38.

Which one of the following will result if a Charging Pump is operated at maximum speed without component cooling water?

- A. temperature of the coupling oil will exceed limits.
- B. temperature of the thrust bearing will exceed limits.
- C. charging pump will cavitate within 1 minute.
- D. temperature limits are expected to remain within specification limits indefinitely.



39.

The plant is stable at 90 % power. Which one of the following is most likely to cause an entry into EOP-E-0 ?

A. Loss of 3P06.

B. Loss of 3P07.

C. Loss of 3P08.

D. Loss of 3P09.

40.

The operating charging pump fails resulting in a loss of normal charging while operating at 100% power.

Which one of the following is the required action after unsuccessful attempts to start a charging pump?

- A. Fully open CV-3-310B, alternate charging valve.
- B. Close CV-3-204, letdown isolation valve.
- C. Close CV-3-200 A/B/C, letdown orifice isolation valve(s).
- D. Fully open HCV-3-121, charging flow to Regenerative heat exchanger.

41.

A fire hydrant on the main fire header is opened, resulting in decreasing fire main pressure.

As pressure continues to drop, which one of the following identifies the correct automatic starting order of fire system pumps?

The first fire pump to autostart would be the:

- A. Diesel Fire pump followed by the Electric Fire pump.
- B. Diesel Fire pump followed by the Jockey Fire pump.
- C. Electric Fire pump followed by the Diesel Fire pump.
- D. Electric Fire pump followed by the Jockey Fire pump.

42.

In Step 3 of 3-EOP-E-3, "Steam Generator Tube Rupture," operators are directed to Check ruptured S/G steam dump to atmosphere – CLOSED.

Which one of the following describes how the RCO can verify the Steam Dump to Atmosphere (SDTA) valve is closed?

- A. The SDTA controller demand position needle is at 0%.  
The ERDADS mimic displays a filled in valve.
- B. The SDTA controller demand position needle is at 0%.  
The ERDADS mimic displays an unfilled valve.
- C. The SDTA controller demand position needle is at 100%.  
The ERDADS mimic displays a filled in valve.
- D. The SDTA controller demand position needle is at 100%.  
The ERDADS mimic displays an unfilled valve.

43.

The following conditions exist:

- A Gas Decay Tank release is in progress.
- PRMS R-15, Condenser Air Ejector monitor, has alarmed.
- PRMS R-14, Plant Vent monitor, has alarmed.

Which one of the following describes a correct operator response?

- A. Enter ONOP-041.3, "Excessive RCS Leakage."
- B. Enter ONOP-071.1, "Secondary Chemistry Deviation from Limits."
- C. Verify automatic isolation of the Gas Decay Tank release has occurred.
- D. Verify automatic isolation of steam generator blowdown has occurred.

44.

Which one of the following identifies the AFW steam supply valve(s) that may be deenergized in the event of a loss of vital DC power?

- A. MOV-1403, 3A Stm. Supply to Aux. Feedwater Pumps  
MOV-1404, 3B Stm. Supply to Aux. Feedwater Pumps
- B. MOV-1403, 3A Stm. Supply to Aux. Feedwater Pumps  
MOV-1405, 3C Stm. Supply to Aux. Feedwater Pumps
- C. MOV-1404, 3B Stm. Supply to Aux. Feedwater Pumps  
MOV-1405, 3C Stm. Supply to Aux. Feedwater Pumps
- D. MOV-1403, 3A Stm. Supply to Aux. Feedwater Pumps  
MOV-1404, 3B Stm. Supply to Aux. Feedwater Pumps  
MOV-1405, 3C Stm. Supply to Aux. Feedwater Pumps

45.

The DAM1 steam line radiation monitor has alarmed. Which one of the following describes how DAM1 can be used to determine which S/G is the source of the radiation?

- A. Sample line isolation valves must be operated locally.  
DAM1 readings can be monitored locally and on ERDADS.
- B. Sample line isolation valves must be operated locally.  
DAM1 readings can be monitored locally and in the Primary Sample Room.
- C. Sample line isolation valves may be operated from the Control Room.  
DAM1 readings can be monitored locally and on ERDADS.
- D. Sample line isolation valves may be operated from the Control Room.  
DAM1 readings can be monitored locally and in the Primary Sample Room.

46.

A control rod has dropped while at 100% power.

Which one of the following describes the control rod's status and the basis for this determination?

The dropped control rod is:

- A. inoperable. To limit the effects of rod misalignment on accident analysis.
- B. inoperable. To ensure minimum shutdown margin is maintained.
- C. operable. Accident analysis is not affected by rod misalignment.
- D. operable. Shutdown margin requirements are not affected by rod misalignment.



47.

Unit 4 is in Mode 1 when CV-4-3700, Main Steam Supply valve to SJAE, fails closed.

Which one of the following combinations of megawatt load and condenser vacuum will require the operators to manually trip the reactor and turbine?

- A. 300 MWe, 23"Hg
- B. 600 MWe, 23"Hg
- C. 300 MWe, 25"Hg
- D. 600 MWe, 25"Hg

48.

With Pressurizer pressure initially at 2235 psig, a PORV opened and remained open.

Which one of the following identifies the expected PORV tailpipe temperature as seen on TI-3-463 (VPA) when PRT pressure equals 50 psig?

A. 212° F

B. 281° F

C. 298° F

D. 315° F

49.

In the event of a fire, which one of the following completes the below requirement regarding the Fire Brigade Program per 0-ADM-016.2, "Fire Brigade Program" ?

IF a qualified fire brigade operator is available, THEN a Fire Brigade member shall turn over his fire brigade duties to the qualified fire brigade operator prior to:

- A. going to the switchyard.
- B. going to the Nuclear Admin Building.
- C. entering the switchgear room.
- D. using a self contained breathing apparatus.

50.

The detector for Component Cooling Water Monitor, channel R-17A has failed high and is now alarming. Which one of the following are the consequences of this failure?

- A. RCV-3-609, CCW Head Tank Vent Valve, closes.
- B. There is a local alarm only, and there are no automatic actions associated with this channel alarm.
- C. The MOV for sample from R-17A in the Primary Sample Room closes, and the MOVs downstream of R-17B must be used to throttle and balance flow to obtain a sample to confirm the detector failure.
- D. RCV-3-014 cannot be opened until the alarm has been reset and RCV-3-014 hand loader setting has been decreased to zero.

51.

Which one of the following is correct concerning excore nuclear instrumentation?  
The excore detectors are encased in:

- A. lead which slows down the leaking fast neutrons and brings them into thermal equilibrium with the target boron.
- B. polyethylene which slows down the leaking fast neutrons which causes them to have a higher potential energy than the target helium.
- C. polyethylene which slows down the leaking fast neutrons and brings them into thermal equilibrium with the target boron.
- D. lead which slows down the leaking fast neutrons and brings them into thermal equilibrium with the target helium.

52.

A large break LOCA has occurred on Unit 4.

The containment sump is full.

SI has been reset.

Which one of the following describes the effect on the containment sump pumps and the containment sump pump discharge valves when Phase A containment isolation is reset?

- A. The sump pumps will start and the discharge valves will open.
- B. The sump pumps will start and the discharge valves will remain closed.
- C. The sump pumps will remain off and the discharge valves will open.
- D. The sump pumps will remain off and the discharge valves will remain closed.

53.

The design basis of the spent fuel storage racks is to maintain Keff \_\_\_\_\_ provided the pool is \_\_\_\_\_

- A.  $K_{eff} < 1.0$  , flooded with 1950 PPM borated water.
- B.  $K_{eff} < 1.0$  , flooded with unborated water.
- C.  $K_{eff} < 0.95$ , flooded with 1950 PPM borated water.
- D.  $K_{eff} < 0.95$ , flooded with unborated water.

54.

Operators are performing 3-EOP-ES-1.1, "SI Termination." The following conditions exist:

- Containment radiation levels are  $1.5 \times 10^3$  R/hr.
- Containment temperature is 160°F.
- Pressurizer level is 33%.

Operators are unable to open CV-3-204, Letdown from Regen Heat Exchanger Isolation.

Which one of the following describes the correct operator response?

- A. Manually open the bypass around CV-3-204 and use one pressurizer PORV for subsequent RCS depressurization.
- B. Manually open the bypass around CV-3-204 and restore normal letdown flow when adverse containment conditions no longer exist.
- C. Establish excess letdown and continue attempts to establish normal letdown.
- D. Establish excess letdown and use auxiliary spray (CV-3-311) for subsequent RCS depressurization.



55.

Unit 3 is at 90% power with all rods fully withdrawn when the unit RCO receives the following annunciators:

- B 7/1 NIS/RPI ROD DROP/ROD STOP
- B 6/4 POWER RANGE CHANNEL DEVIATION
- B 9/3 SHUTDOWN ROD OFF TOP/DEVIATION
- B 2/2 POWER RANGE UPPER DET/AUTO DEFEAT
- B 2/3 POWER RANGE LOWER DET/AUTO DEFEAT

The RCO observes the RPI indicators and rod bottom lights and determines two rods in the same rod bank group have fully inserted.

Which one of the following describes the appropriate course of action to be taken ?

- A. Check QPTR to be less than OR equal to 2%.
- B. Trip the Reactor and enter 3-EOP-E-0, "Reactor Trip or Safety Injection."
- C. Increase reactor power to maintain Tave within 3 degrees of Tref.
- D. Increase turbine load to maintain Tave within 3 degrees of Tref.

56.

Which one of the following describes the effect of decreasing VCT pressure from 30 psig to 10 psig during RCS heatup in Mode 3?

- A. Charging Pumps will cavitate.
- B. RCP #2 seal flow decreases.
- C. Letdown flow increases.
- D. High RCP standpipe level alarm actuates.

57.

Which one of the following identifies the minimum number of Circulating Water Pumps that must be in operation to satisfy the interlock that allows a radioactive liquid release?

A. 0

B. 1

C. 2

D. 3

58.

Plant conditions:

- A reactor trip with a loss of all AC power occurred 2 hours ago.
- Core exit thermocouples read approximately 650 degrees F and increasing.
- Steam generator pressure is stable at 815 psig.
- Steam generator steam flow is undetectable.

Which ONE of the following describes plant conditions?

- A. Loss of natural circulation flow has occurred.
- B. Natural circulation flow is increasing.
- C. The reactor core has uncovered and core damage is imminent.
- D. Reactor Coolant System subcooling margin is increasing.

59.

Unit 3 operators have entered FR-H.1 "Response to Loss of Secondary Heat Sink".

The following conditions exist:

- No Main Feedwater Pumps are available.
- No Auxiliary Feedwater Pumps are available.
- The RCP's are off.
- Annunciator E-2/6 HI-HI SG LVL TURBINE TRIP/FEEDWATER ISOLATION is in alarm.
- The operators are preparing to re-establish feedwater using the Standby Steam Generator Feedwater Pump.

Which one of the following identifies the minimum signals that must be reset to satisfy the interlocks to re-establish feed flow to the Steam Generators?

- A. Reset SI
- B. Reset Phase A
- C. Reset Feedwater Isolation
- D. Reset Feedwater Isolation and SI

60.

Unit 4 experienced a Design Basis LOCA. The 4B sequencer failed to operate.

Which one of the following describes the required operator response to verify Containment Spray operation?

- A. Manually start the 4B CSP. Manually open MOV-4-880B.
- B. Manually start the 4B CSP. Check MOV-4-880B automatically opened.
- C. Check autostart of the 4B CSP. Manually open MOV-4-880B.
- D. Check autostart of the 4B CSP. Check MOV-4-880B automatically opened.

61.

Which one of the following rod control interlocks (rod stops) and their coincidences is correct?

Rod Stops	Coincidence
A. Power range High Flux OPDT Setpoint matches Actual DT Coincidence	2/4 2/3
B. Power range High Flux OPDT Setpoint matches Actual DT Coincidence	1/4 2/3
C. Power range High Flux OPDT Setpoint matches Actual DT Coincidence	2/4 1/2
D. Power range High Flux OPDT Setpoint matches Actual DT Coincidence	1/4 1/2

62.

Operators are performing a reactor startup on Unit 3. The ECC predicts criticality at D-100.

Which one of the following identifies the rod height closest to the point at which operators will announce entry into Mode 2?

- A. C-93
- B. C-110
- C. D-83
- D. D-100



63.

The power supplied to AMSAC from both Vital Buses 3P06 and 3P07 has been lost. What effect will this have on AMSAC and its components?

- A. AMSAC will not actuate, and will not be capable of actuation, however, the RPS will perform its safety functions without interference from AMSAC.
- B. AMSAC will not actuate initially, however, it will automatically switch to an alternate power supply and will be fully functional.
- C. AMSAC will actuate, and the RPS will perform its safety functions without interference from AMSAC.
- D. AMSAC will not actuate and will not be capable of actuation, and the loss of the AMSAC will disarm any loss of Channel III and /or IV First Stage Turbine Pressure Signal (after 360 seconds).

64.

While in Mode 4 Unit 3 experienced a LOCA.

- Operators are performing 3-ONOP-041.7, "Shutdown LOCA [Mode 3 (Less than 1000 psig) or Mode 4]."
- One HHSI pump has been started.
- CET temperatures are stable and RCS Hot Leg temperatures are decreasing slightly.
- RVLMS Plenum indication is 0%.

Which one of the following identifies the required operator response and the reason for that response?

- A. Immediately start all HHSI pumps to fill the upper head.
- B. Immediately start all HHSI pumps to restore core cooling.
- C. Start additional HHSI pump(s) one at a time, as necessary to fill the upper head.
- D. Start additional HHSI pump(s) one at a time, as necessary to restore core cooling.

65.

Containment Air Particulate Monitor Channel (R-11) is reading erratically. The instrument technicians report that the lead for the power supply has come loose. As he reconnects the lead, the instrument momentarily goes off scale high and upon reconnecting the lead, the instrument returns to its normal value. What are the consequences of the instrument technicians actions?

- A. The containment purge supply and exhaust fans trip. The containment purge supply and exhaust isolation valves close. The control room ventilation is in recirculation mode.
- B. The containment purge supply and exhaust fans remain running. The containment purge supply and exhaust isolation valves close. The control room ventilation is in recirculation mode.
- C. The containment purge supply and exhaust fans trip. The containment purge supply and exhaust isolation valves remain open. The control room ventilation remains in normal alignment.
- D. The containment purge supply and exhaust fans remain running. The containment purge supply and exhaust isolation valves close. The control room ventilation remains in normal alignment.

66. Which one of the following identifies when AFW System Tech. Specs. are applicable and when operability is demonstrated?

	<u>Applicability</u>	<u>Demonstrate Operability</u>
A.	Modes 1 & 2	Prior to entering Mode 1
B.	Modes 1 & 2	Prior to entering Mode 2
C.	Modes 1, 2 & 3	Prior to entering Mode 1
D.	Modes 1, 2 & 3	Prior to entering Mode 3

67.

With both units initially at 100% power and normal system alignments, the switchyard deenergizes resulting in a Loss of Offsite Power to both units.

- Both Unit 3 EDGs locked out and cannot be restarted.
- Both Unit 4 EDGs automatically started and reenergized their respective 4kV buses.
- The ANPS directs the BOP to restore power to the 3A 4KV bus first.

Which one of the following identifies the source of power that operators will align to the 3A 4KV bus?

- A. 4A EDG via the 3D and 4D 4kV Buses.
- B. 4B EDG via the 3D and 4D 4kV Buses.
- C. 3C 4kV Bus.
- D. Unit 4 Startup Transformer.

68.

Operators are performing 3-OP-041.3, Section 7.2, "Reducing PRT Liquid Temperature." Annunciator A 7/1, PRT HI/LO LEVEL HI PRESS/TEMP, alarms.

The RCO observes the following PRT parameter values:

PRT Temperature: 105° F

PRT Level: 69 %

PRT Pressure: 12 psig

Which ONE of the following identifies correct operator response?

- A. Continue with Section 7.2, "Reducing PRT Liquid Temperature."
- B. Raise PRT level by performing Section 5.1, "Establishing Normal Conditions."
- C. Lower PRT level by performing Section 7.1, "Draining the PRT."
- D. Lower PRT pressure by performing Section 7.3, "Purging/Reducing PRT Pressure."

69.

Operators have successfully completed Immediate Actions in response to an uncontrolled rod withdrawal with reactor power initially at 85%.

The following stable conditions now exist:

Reactor Power: 87%

Tavg: 574°F

Tref: 570°F (same as pre-event value)

RCS boron Concentration: 270 ppm (same as pre-event value)

Which one of the following is correct regarding the effect of this event on the Moderator Temperature Coefficient (MTC) and the potential effect on subsequent operations?

- A. MTC has become more negative. A subsequent cooldown would add positive reactivity.
- B. MTC has become more negative. A subsequent cooldown would add negative reactivity.
- C. MTC has become less negative. A subsequent cooldown would add positive reactivity.
- D. MTC has become less negative. A subsequent cooldown would add negative reactivity.

70.

Operators have performed 3-EOP-ECA-1.1, "Loss of Emergency Coolant Recirculation" and are now responding to high containment pressure using 3-EOP-FRZ.1, "Response to High Containment Pressure." Both procedures have criteria for using containment spray. Which one of the following states which procedure has precedence and its basis?

The operation of the containment spray pumps indicated in procedure....

- A. 3-EOP-ECA-1.1 takes precedence over the guidance of 3-EOP-FR-Z.1 because it conserves RWST water, if possible, by stopping containment spray pumps.
- B. 3-EOP-ECA-1.1 takes precedence over the guidance of 3-EOP-FR-Z.1 because it ensures the maximum available heat removal system operability in order to reduce containment pressure.
- C. 3-EOP-FR-Z.1 takes precedence over the guidance of 3-EOP-ECA-1.1 because it conserves RWST water, if possible, by stopping containment spray pumps.
- D. 3-EOP-FR-Z.1 takes precedence over the guidance of 3-EOP-ECA-1.1 because it ensures the maximum available heat removal system operability in order to reduce containment pressure.



71.

Operators have entered 3-EOP-E-0 due to a Steam Line break. Step 13 of 3-EOP-E-0 states:

**"Check if Main Steam lines should be isolated."**

Which one of the following conditions would require closing the MSIVs in this situation?

- A. High steam flow and high Tavg
- B. Low steam flow and low Tavg
- C. Low Tavg and Hi Hi containment pressure
- D. Low Tavg and Low S/G pressure

72.

Operators are responding to a loss of offsite power and are preparing to perform a natural circulation cool down.

The following conditions exist:

- The main steam isolation valves are open.
- Tavg is 540 degrees F.
- Condenser vacuum is 19" Hg.
- The Steam Dump Mode selector switch is in MANUAL.
- The Steam Dump to Condenser control switch was placed in BYPASS when Tavg dropped below 543 degrees F.

The operator places the SDTC Hagan controller in MANUAL and raises controller output to 50%.

Which one of the following identifies howmany SDTC valves will open?

- A. 0
- B. 1
- C. 2
- D. 4

73.

Unit 3 is operating at 100% power with two ICW pumps running. One pump trips and flow through the remaining ICW Pump is 20,500 GPM. An attempt to adequately reduce ICW total flow by throttling the TPCW Hx Outlet ICW isolation valve and the CCW Hx Outlet Spool piece valve was unsuccessful.

Which one of the following describes your required actions?

- A. Reduce unit load using 3-GOP-103 to limit heat input into the TPCW system AND throttle ICW flow to the TPCW system heat exchangers using 3-50-401 until TPCW heat exchanger outlet temperature is less than 105 degrees and the total ICW flow is less than 19000 GPM.
- B. Reduce unit load using 3-GOP-103 to limit heat input into the TPCW until the TPCW heat exchanger outlet temperature is below 105 degrees. DO NOT throttle ICW flow to the TPCW system heat exchangers using 3-50-401 until the total ICW flow is less than 19000 GPM.
- C. Reduce unit load using 3-GOP-103 to limit heat input into the TPCW system AND adjust ICW flow to the TPCW system heat exchangers using 3-50-401 until the TPCW heat exchanger outlet temperature is below 120 degrees.
- D. Adjust ICW flow to the TPCW system heat exchangers using 3-50-401 until the TPCW heat exchanger outlet temperature is below 120 degrees, DO NOT reduce unit load.

74.

Upon declaration of an emergency, in accordance with 0-EPIP-20101, "Duties of the Emergency Coordinator," the Nuclear Plant Supervisor is designated to act as the initial Emergency Coordinator until the Technical Support Center is activated. If the NPS is unavailable, which one of the following is NOT authorized to act as the Emergency Coordinator prior to Technical Support Center activation?

Assume all positions listed have active licenses.

- A. Assistant Nuclear Plant Supervisor
- B. Nuclear Watch Engineer
- C. Reactor Control Operator
- D. Operations Supervisor

75.

Which one of the following is indicative of a feedwater heater tube leak?  
Feedwater heater level high and:

- A. alternate drain valve closed and extraction non-return valve closed.
- B. alternate drain valve closed and extraction non-return valve open.
- C. alternate drain valve open and extraction non-return valve closed.
- D. alternate drain valve open and extraction non-return valve open.

76.

According to 3-OP-038.1, "Preparation for Refueling Activities," which one of the following activities must be directly supervised by a Senior Reactor Operator in the containment who has no other collateral duties?

- A. Lifting the reactor vessel head
- B. Reactor vessel irradiated specimen removal
- C. Control rod latching
- D. Reinstallation of the reactor vessel head

77.

According to the Immediate Actions of 0-ONOP-013, "Loss of Instrument Air", which one of the following plant conditions would require an immediate plant trip and entry into 3-EOP-E-0, "Reactor Trip or Safety Injection?"

Actual Instrument Air pressure on PI-3-1444 is less than:

- A. 95 psig and random failures of equipment and components occur.
- B. 75 psig and the Nitrogen Backup systems cannot be maintained to the Pressurizer PORVs and Unit 3 MSIVs.
- C. 65 psig and the available Instrument Air compressor(s) are unable to restore pressure.
- D. 60 psig and the Nitrogen Backup systems cannot be maintained to the Letdown Isolation valves, Feedwater Regulator valves and Feedwater Bypass valves.

78.

Which of the following procedures contain steps that may delay entry into 3-EOP-FR-P.1?

- A. 3-EOP-FR-C-2, "Response to Degraded Core Cooling."
- B. 3-EOP-ECA-2.1, "Uncontrolled Depressurization of All Steam Generators."
- C. 3-EOP-E-2, "Faulted Steam Generator Isolation."
- D. 3-EOP-ES-1.2, "Post LOCA Cooldown and Depressurization."



79.

A Waste Gas Decay Tank is being released using the normal gaseous waste discharge path. The discharge path is isolated by RCV-014 due to the loss of both Auxiliary Building exhaust fans. How does RCV-014 reopen to restore the discharge path?

- A. One Auxiliary Building exhaust fan must be restarted and the manual loader for RCV-014 must be run to zero to reset the valve. Then the valve can be reopened.
- B. Both Auxiliary Building exhaust fans must be restarted and the manual loader for RCV-014 must be run to zero to reset the valve. Then the valve can be reopened.
- C. One Auxiliary Building exhaust fan must be restarted and RCV-014 will automatically open.
- D. Both Auxiliary Building exhaust fans must be restarted and the Gaseous Waste Disposal System isolation must be reset and then RCV-014 will automatically open.

80. A LOCA has occurred on Unit 3.

- containment pressure is 3.5 psig
- containment hydrogen concentration is 2.5% in air

Which one of the following is the correct operator response?

- A. Vent containment to atmosphere using the Post Accident Containment Ventilation system.
- B. Connect a portable Hydrogen Recombiner using 3-ONOP-094.3 "Hydrogen Recombiner Acquisition, Installation, and Operation".
- C. Start a waste gas compressor with suction aligned to the Post Accident Containment Ventilation system and discharging to the in service waste gas decay tank until waste gas decay tank capacities have been reached.
- D. Start a waste gas compressor with suction aligned to Post Accident Containment Ventilation system and discharging to the plant vent.

81.

Unit 3 operators have initiated an RCS cooldown while responding to a faulted/ruptured Steam Generator per 3-EOP-ECA-3.2 "SGTR With Loss of Reactor Coolant-Saturated Recovery Desired."

Which one of the following identifies the reason for rapid cooldown and depressurization of the RCS?

- A. Minimize leakage of reactor coolant and radiological releases from the ruptured Steam Generator.
- B. Increase the reactor coolant subcooling margin to prevent delaying SI termination.
- C. Minimize contamination of condenser tubing.
- D. Maximize Safety Injection Flow to the RCS.

82.

Nuclear Chemistry reports that in the past 24 hours, reactor coolant specific activity has increased from 65/E-BAR microcuries/gm to 75/E-BAR microcuries/gm. A second sample was taken and the results have been verified. Which one of the following describes your required actions?

- A. Be in at least Hot Standby with average reactor coolant temperature less than 500°F within 6 hours.
- B. Reduce power to maintain less than 90% of allowable TS 3.4.8 limits.
- C. Increase RCS cleanup flow to 120 gpm by placing additional letdown orifices and charging pumps in service.
- D. Notify NPS to consult 0-EPIP-20101, "Duties of Emergency Coordinator, for classification."

83.

Units 3 is in Mode 1 when Annunciator X1/1, DC LC 3A TROUBLE, alarms.

Which one of the following describes the consequences of a loss of Vital DC Bus 3A?

- A. Unit 3 reactor will automatically trip.  
Train 1 AFW is inoperable.  
Unit 3 Annunciators will lose power.
- B. Unit 3 reactor will not automatically trip.  
Train 2 AFW is inoperable.  
Unit 3 Annunciators will maintain power.
- C. Unit 3 reactor will not automatically trip.  
Train 1 AFW is inoperable.  
Unit 3 Annunciators will maintain power.
- D. Unit 3 reactor will automatically trip.  
Train 2 AFW is inoperable.  
Unit 3 Annunciators will lose power.

84.

Which one of the following conditions would prevent the use of the Post Accident Containment Vent (PACV) system to purge the containment atmosphere to the in-service Gas Decay Tank (GDT), following a LOCA?

- A. Containment temperature is 120 degrees F.
- B. In-service GDT Oxygen concentration is 1%.
- C. Containment pressure is 15 psig.
- D. In-service GDT Hydrogen concentration is 3%.

85.

The Lube Oil Sumps are full on all of the Unit 3 and Unit 4 EDGs. The lube oil in the EDG sumps was previously tested and proven to meet all specifications. You have just been informed by the Chemistry Lab that ALL of the remaining lube oil in the warehouse was sampled and found to not meet the minimum viscosity requirements for EDG sump pump oil. It must be returned to the supplier and a shipment of replacement oil will arrive in 5 days.

Which one of the following describes the current operability status of the EDGs per Technical Specifications?

- A. EDGs on Unit 3 are inoperable.
- B. EDGs on unit 4 are inoperable.
- C. EDGs on both unit 3 and 4 are inoperable.
- D. EDGs on both units are operable.

86.

Which one of the following required/automatic actions and alarms will annunciate if the in service gas decay tank becomes pressurized to approximately 95 PSIG?

- A. The control system will automatically open the inlet valve to the backup tank specified and the "GAS DECAY TANK STANDBY SELECTOR SWITCH REQUIRES REPOSITIONING" alarm located on the Waste-Boron Panel will annunciate.
- B. The control system will automatically open the inlet valve to the backup tank specified and the "RADWASTE BLDG PANEL C46 TROUBLE" alarm on panel X will annunciate.
- C. The inlet valve to the backup tank must be manually opened and the "GAS DECAY TANK STANDBY SELECTOR SWITCH REQUIRES REPOSITIONING" alarm located on the Waste-Boron Panel will annunciate.
- D. The inlet valve to the backup tank must be manually opened and the "RADWASTE BLDG PANEL C46 TROUBLE" alarm on panel X will annunciate.



87.

Unit 4 is at 100% power with the following equipment out of service:

- 4A RHR pump
- 4B TPCW pump
- 4B Containment Spray pump

The Plan of the Day has scheduled removing the 4C Emergency Containment Cooler (ECC) from service for preventative maintenance.

Which of the following describes the correct operator action?

- A. Do not remove the 4C ECC from service until the 4B TPCW pump is returned to service.
- B. Do not remove the 4C ECC from service unless the maintenance will be completed within 72 hours.
- C. Remove the 4C ECC from service only after PSA analysis has been satisfactorily performed.
- D. Remove the 4C ECC from service for the preventative maintenance without waiting for PSA analysis.

88.

An Area Radiation Monitor System (ARMS) channel has just alarmed. The Unit RCO verified the alarm by checking the high alarm setpoint against Attachment 1 of 0-ONOP-066, "High Radiation Monitoring System Alarm", had Health Physics survey the affected area, observed Process Radiation Monitors and other ARMS in the affected area, and then pressed the Alarm Acknowledge pushbutton. Why is the sequence of confirming the validity of an alarming channel and acknowledging the alarm important?

- A. The ARMS channel Digital information is lost when the Acknowledge pushbutton is depressed resetting the ARMS channel.
- B. Depressing the Acknowledge pushbutton will silence the local alarm before the validity of the Alarm can be assessed.
- C. Acknowledging an alarming channel prior to checking the high alarm setpoint places the module in the Accident mode, resetting the alarm setpoint 2.5 times higher than the normal setpoint.
- D. Health Physics will reset the local alarm after they survey the affected area then the RCO can depress the Acknowledge pushbutton to reset the Control Room alarm.

89.

Unit 3 is experiencing a LOCA. While performing step 2 of 3-EOP-E-1, Loss of Reactor or Secondary Coolant, the following annunciators are received:

- H 1/5 "CHRRMS HI RADIATION"
- H 5/1 "CNTMT HI-HI/HI PRESS"

Parameters associated with these annunciators indicate the following:

- Containment pressure is 22 psig.
- Containment radiation level is 1.6E5 R/Hr.

As ANPS, which one of the following is required of you?

- A. Direct a transition to FR-Z.1, "Response to High Containment Pressure" using adverse containment numbers.
- B. Direct a transition to FR-Z.3, "Response to High Containment Radiation Level" using adverse containment numbers.
- C. Direct a transition to FR-Z.1, "Response to High Containment Pressure" using non-adverse containment numbers.
- D. Direct a transition to FR-Z.3, "Response to High Containment Radiation Level" using non-adverse containment numbers.

90.

Which one of the following must occur before safety injection flow will occur during a LOCA?

The RCS pressure must be:

- A. below the developed head of the SI pumps minus the SI pump suction pressure.
- B. above the developed head of the SI pumps minus the SI pump suction pressure.
- C. below the sum of the developed head plus the SI pump suction pressure.
- D. above the sum of the developed head plus the SI pump suction pressure.

91. You have entered 0-ADM-115, "Notification of Plant Events." Which one of the following is correct regarding emergency notification or classification?

- A. This procedure, 0-ADM-115, shall not be used to report Emergency Classifications.
- B. All required notifications shall be made as soon as possible after the event investigation is complete.
- C. If contact cannot be made with an individual, then the alternate for that position must be notified, before the notification process can be continued.
- D. The Operations Supervisor may contact the NPS for clarification of specific event consequences before classifying the event. This should not interfere with the Operations Supervisor's expedient classification of an emergency and activation of the Emergency Plan.

92.

Unit 3 is at 100% power when Steam Generator cation conductivity reaches 1.5  $\mu\text{mho/cm}$  resulting in Action Level 2 conditions.

Which one of the following describes the required operator response?

- A. Increase S/G blowdown and reduce power to <30% within 8 hours.
- B. Increase S/G blowdown and shutdown the unit within 4 hours.
- C. Place the condensate polishing demineralizers in service and reduce power to <30% within 8 hours.
- D. Place the condensate polishing demineralizers in service and commence a unit shutdown within 4 hours.

93.

Which one of the following identifies circumstances that would require the use of Peer Checks?

- A. Placing safeguards equipment in pull-to-lock while performing ECA-0.0, "Loss of All AC Power."
- B. Opening MOV-350, Emergency Borate valve, while performing FR-S.1, "Response to Nuclear Power Generation/ATWS."
- C. Placing PAHMs in service while performing E-0, "Reactor Trip or Safety Injection."
- D. Stopping running HHSI pumps while performing ES-1.1, "SI Termination."

94.

The emergency containment filtering system is in service to reduce iodine concentration in the containment atmosphere following an accident. Low flow has been sensed by the flow switches installed at the fan discharge of one of the running fans. An ECF Fan, that was in service for ten minutes just tripped. One ECF spray valve white status light is dim and one is bright. Both the ECF spray valves red and green status lights are illuminated.

Which one of the following identifies a condition of the ECF spray valves that could result in the above indications?

- A. Both valves are fully closed.
- B. Both valves are partially open.
- C. One valve is fully closed, one is less than fully open.
- D. One valve is fully open, one is less than fully open.



95.

You are the NPS. A female SNPO appears pregnant, but has not officially notified FPL of her condition. Which one of the following guidelines apply to this worker?

- A. This operator shall not be assigned to work in the RCA.
- B. This operator may work in the RCA but shall be limited to 450 mrem total dose.
- C. This operator may work in the RCA but shall not be allowed to enter HI RAD areas.
- D. The same dose guidelines shall be applied equally to this operator as apply to other SNPOs.

96.

You are the NPS. Unit 3 is in the source range and a dilution is in progress to adjust boron concentration for reactor startup. An RCO trainee is in the control room. Which one of the following can you authorize the trainee to do?

- A. Withdraw rods while observed by a licensed operator.
- B. Relieve the RCO of the responsibility for monitoring the dilution.
- C. Place a CVCS demineralizer in service which differs from the RCS concentration by 15%.
- D. Use an approved procedure to assist in bypassing the High Flux at Shutdown Alarm.

97.

A dropped rod at 100% power has caused the Quadrant Power Tilt Ratio (QPTR) to be 1.03.

Which one of the following describes the reason for allowing up to two hours before QPTR or reactor power must be reduced?

To allow time:

- A. to retrieve the dropped rod.
- B. to perform a calorimetric calculation.
- C. for the NPS to notify the NRC.
- D. for the NIS High flux trip setpoints to be reduced.

98.

Which one of the following describes the characteristics of valve HCV-121, Charging Flow to Regenerative Heat Exchanger?

HCV-121, is a fail:

- A. closed valve which has a local control switch at the valve.
- B. open valve which has a local control switch at the valve.
- C. closed valve which has a transfer switch on the Alternate Shutdown Panel.
- D. open valve which has a transfer switch on the Alternate Shutdown Panel.

99.

Operators placed the AS Vital Inverter in service to replace the 3A Inverter, but failed to position the Alternate Source Transfer switch, 3Y01B, to the Backup to Spare Inverter (AS) position.

The AS Inverter subsequently failed.

Which one of the following describes the consequences of these events and the required operator response? Vital AC Panel 3P07 will:

- A. not transfer to the CVT and will be deenergized. Implement 3-ONOP-003.7, "Loss of 120V Vital Instrument Panel 3P07."
- B. not transfer to the CVT and will remain energized. Implement 3-OP-003.3, "120V Vital Instrument AC System."
- C. transfer to the CVT and will be deenergized. Implement 3-ONOP-003.7, "Loss of 120V Vital Instrument Panel 3P07."
- D. transfer to the CVT and will remain energized. Implement 3-OP-003.3, "120V Vital Instrument AC System."

100.

Which one of the following describes a situation in which the NPS would direct licensed personnel to record OTSC changes into affected procedures?

If the OTSC affects an:

- A. OP, the change shall be recorded in the Control Room procedure within 8 hours.
- B. ONOP, the change shall be recorded in the Control Room procedure within 8 hours.
- C. EOP, the change shall be recorded in the Control Room procedure within 24 hours.
- D. ARP, the change shall be recorded in the Control Room procedure within 24 hours.

RCO XIX  
NRC Written Examination

RO & SRO  
December 6, 2000

References

- I. Technical Specifications Figure 2.1-1, Reactor Core Safety Limit – Three Loops in Operation
- II. Plant Curve Book Section 2, Figure 5  
(Unit 3 Cycle 18 - 10,000 MWD/MTU)
- III. Steam Tables “Properties of Saturated and Superheated Steam”

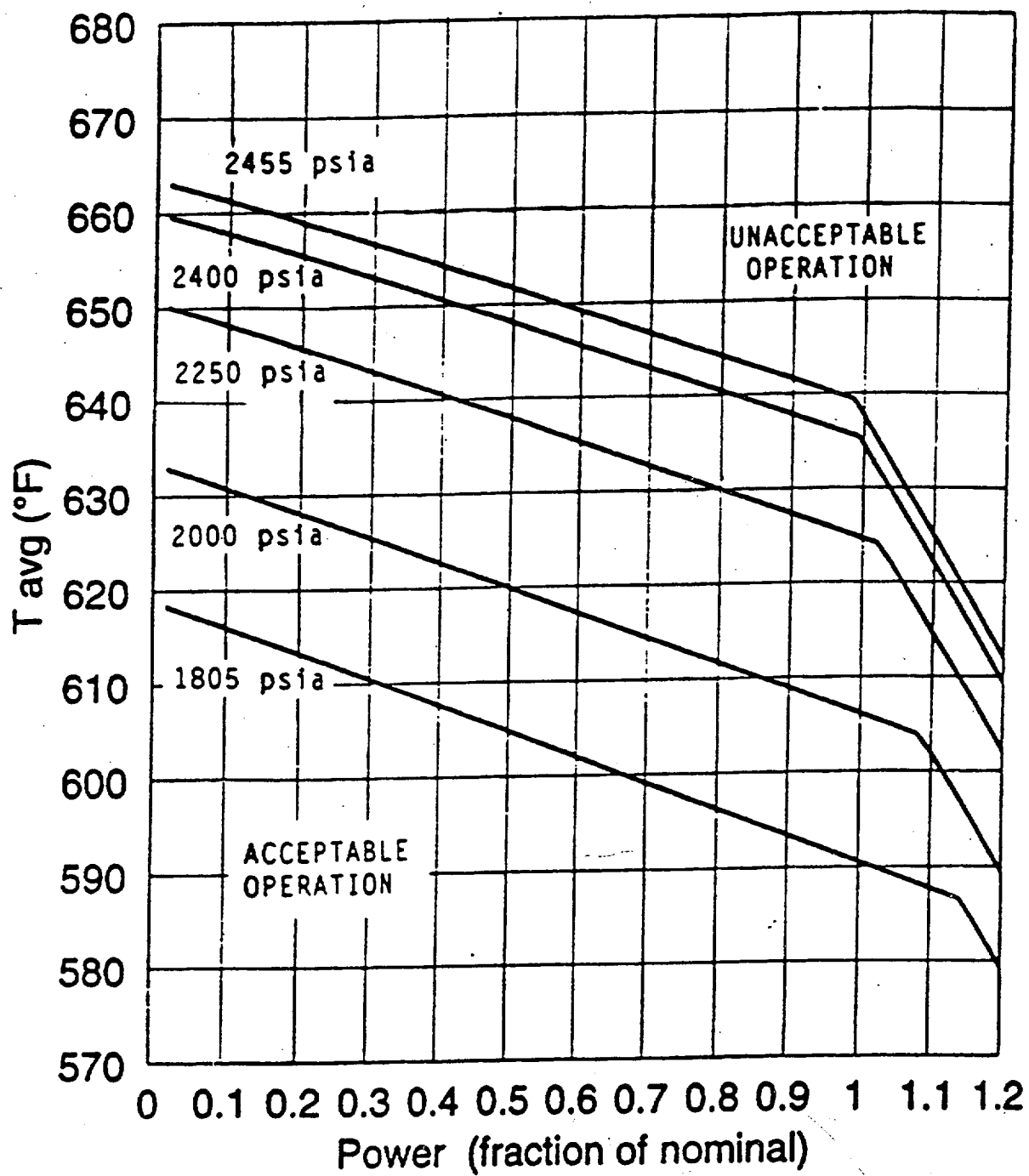


Figure 2.1-1 Reactor Core Safety Limit - Three Loops in Operation



## UNIT 3 CYCLE 18 - 10,000 MWD/MTU

## INTEGRAL ROD WORTH vs STEPS WITHDRAWN

C and D IN OVERLAP HZP - No Xe HFP - Eq Xe

BANKS		ROD WORTH (pcm)		BANKS		ROD WORTH (pcm)		BANKS		ROD WORTH (pcm)	
D	C	HZP	HFP	D	C	HZP	HFP	D	C	HZP	HFP
0	0	2047	2221	0	122	1372	1381	114	230	509	411
0	2	2047	2220	0	124	1361	1367	116	230	504	404
0	6	2047	2218	0	126	1349	1352	118	230	498	397
0	8	2047	2214	0	128	1339	1340	120	230	491	390
0	10	2046	2209	2	130	1328	1328	122	230	484	383
0	12	2045	2205	4	132	1316	1312	124	230	477	373
0	14	2043	2200	6	134	1304	1295	126	230	469	363
0	16	2043	2194	8	136	1291	1280	128	230	463	359
0	18	2042	2187	10	138	1277	1265	130	230	456	355
0	20	2042	2176	12	140	1264	1248	132	230	448	347
0	22	2042	2164	14	142	1250	1231	134	230	439	338
0	24	2038	2153	16	144	1234	1212	136	230	432	330
0	26	2034	2142	18	146	1218	1193	138	230	424	322
0	28	2033	2125	20	148	1203	1174	140	230	416	316
0	30	2031	2108	22	150	1188	1155	142	230	408	309
0	32	2028	2094	24	152	1170	1134	144	230	400	301
0	34	2025	2080	26	154	1152	1112	146	230	391	292
0	36	2019	2061	28	156	1133	1089	148	230	384	286
0	38	2013	2041	30	158	1114	1066	150	230	376	279
0	40	2006	2025	32	160	1097	1047	152	230	366	269
0	42	1998	2008	34	162	1080	1027	154	230	356	258
0	44	1988	1990	36	164	1059	1005	156	230	347	252
0	46	1978	1972	38	166	1038	982	158	230	338	246
0	48	1964	1953	40	168	1021	961	160	230	326	237
0	50	1950	1933	42	170	1004	940	162	230	314	228
0	52	1936	1920	44	172	985	919	164	230	304	220
0	54	1921	1907	46	174	965	897	166	230	294	212
0	56	1899	1886	48	176	947	876	168	230	284	204
0	58	1876	1864	50	178	929	855	170	230	273	196
0	60	1857	1848	52	180	910	836	172	230	263	187
0	62	1838	1831	54	182	890	816	174	230	252	177
0	64	1816	1814	56	184	872	794	176	230	240	169
0	66	1793	1796	58	186	853	771	178	230	228	160
0	68	1775	1780	60	188	835	753	180	230	215	151
0	70	1756	1764	62	190	817	735	182	230	201	141
0	72	1737	1749	64	192	797	715	184	230	189	133
0	74	1717	1734	66	194	777	694	186	230	177	124
0	76	1699	1715	68	196	759	676	188	230	165	115
0	78	1680	1695	70	198	741	657	190	230	152	106
0	80	1663	1682	72	200	721	639	192	230	140	98
0	82	1645	1668	74	202	701	620	194	230	128	89
0	84	1627	1651	76	204	684	603	196	230	117	83
0	86	1608	1634	78	206	667	585	198	230	106	76
0	88	1593	1620	80	208	651	570	200	230	92	66
0	90	1578	1605	82	210	635	555	202	230	78	55
0	92	1563	1590	84	212	621	541	204	230	67	48
0	94	1548	1575	86	214	607	526	206	230	55	40
0	96	1534	1561	88	216	596	513	208	230	44	32
0	98	1520	1547	90	218	585	500	210	230	33	24
0	100	1507	1534	92	220	577	493	212	230	26	19
0	102	1494	1521	94	222	568	485	214	230	18	14
0	104	1480	1505	96	224	562	475	216	230	13	10
0	106	1466	1488	98	226	555	464	218	230	7	6
0	108	1455	1475	100	228	551	460	220	230	5	5
0	110	1443	1462	102	230	546	455	222	230	3	3
0	112	1431	1447	104	230	539	447	224	230	2	2
0	114	1418	1432	106	230	532	438	226	230	1	1
0	116	1407	1419	108	230	527	432	228	230	1	1
0	118	1395	1405	110	230	522	425	230	230	0	0
0	120	1384	1393	112	230	516	418				

Test Name: TP\_SRO.TST

Test Date: Friday, December 01, 2000

Answer(s)

Question ID	Type	Pts	0
1: 1 005AK3.05	001 MC-SR	1	B
1: 2 029EK1.02	001 MC-SR	1	D
1: 3 037AA2.3	001 MC-SR	1	B
1: 4 055EK3.02	001 MC-SR	1	C
1: 5 074EK1.05	001 MC-SR	1	B
1: 6 059K1.04	001 MC-SR	1	B
1: 7 015/017AK2.10	001 MC-SR	1	A
1: 8 024AK2.03	001 MC-SR	1	C
1: 9 W/E11EA2.2	001 MC-SR	1	B
1: 10 G2.4.8	001 MC-SR	1	A
1: 11 022K2.01	001 MC-SR	1	B
1: 12 061K6.01	001 MC-SR	1	A
1: 13 002A4.06	001 MC-SR	1	B
1: 14 005K5.09	001 MC-SR	1	A
1: 15 G2.1.9	001 MC-SR	1	C
1: 16 008A2.02	001 MC-SR	1	A
1: 17 011A4.01	001 MC-SR	1	D
1: 18 035K3.01	001 MC-SR	1	A
1: 19 033AK3.01	001 MC-SR	1	B
1: 20 W/E03EA2.1	001 MC-SR	1	B
1: 21 007AK2.03	001 MC-SR	1	C
1: 22 W/E13G2.3.9	001 MC-SR	1	C
1: 23 G2.3.2	001 MC-SR	1	C
1: 24 054AK1.02	001 MC-SR	1	C
1: 25 032AG2.2.23	001 MC-SR	1	A
1: 26 068K6.10	001 MC-SR	1	C
1: 27 W/E09EA1.3	001 MC-SR	1	C
1: 28 078K3.01	001 MC-SR	1	B
1: 29 103A1.01	001 MC-SR	1	B
1: 30 034G2.4.48	001 MC-SR	1	B
1: 31 013K2.01	001 MC-SR	1	C
1: 32 036AK2.02	001 MC-SR	1	C
1: 33 G2.2.28	001 MC-SR	1	C
1: 34 009EG2.1.30	001 MC-SR	1	D
1: 35 W/E04EA2.1	001 MC-SR	1	C
1: 36 G2.2.22	001 MC-SR	1	B
1: 37 056AG2.4.21	001 MC-SR	1	A
1: 38 026EA2.04	001 MC-SR	1	D
1: 39 057EK3.01	001 MC-SR	1	D
1: 40 022AA1.01	001 MC-SR	1	C
1: 41 086A3.01	001 MC-SR	1	C
1: 42 038EA1.27	001 MC-SR	1	A
1: 43 071G2.4.46	001 MC-SR	1	C
1: 44 063K3.02	001 MC-SR	1	B
1: 45 039A1.09	001 MC-SR	1	A
1: 46 003AK3.08	001 MC-SR	1	A
1: 47 055K3.01	001 MC-SR	1	A
1: 48 010K5.01	001 MC-SR	1	C
1: 49 067EK1.02	001 MC-SR	1	A
1: 50 072A2.02	001 MC-SR	1	A

Test Name: TP\_SRO.TST

Test Date: Friday, December 01, 2000

						Answer(s)
Question ID	Type	Pts	0			
1: 51 015K5.14	001 MC-SR	1	C			
1: 52 068A3.02	001 MC-SR	1	D			
1: 53 033K4.05	001 MC-SR	1	B			
1: 54 W/E02EG2.4.12	001 MC-SR	1	C			
1: 55 001G2.1.2	001 MC-SR	1	A			
1: 56 003A1.10	001 MC-SR	1	B			
1: 57 075K1.02	001 MC-SR	1	B			
1: 58 017A1.01	001 MC-SR	1	A			
1: 59 W/E05EK2.1	001 MC-SR	1	C			
1: 60 026A2.03	001 MC-SR	1	B			
1: 61 014K4.05	001 MC-SR	1	B			
1: 62 G2.1.22	001 MC-SR	1	A			
1: 63 012K2.01	001 MC-SR	1	A			
1: 64 011EA1.17	001 MC-SR	1	C			
1: 65 073A2.02	001 MC-SR	1	A			
1: 66 G2.2.23	001 MC-SR	1	C			
1: 67 055EA2.01	001 MC-SR	1	B			
1: 68 007A2.02	001 MC-SR	1	D			
1: 69 001AK1.17	001 MC-SR	1	A			
1: 70 069EK3.01	001 MC-SR	1	A			
1: 71 040EG2.4.6	001 MC-SR	1	C			
1: 72 051AA1.04	001 MC-SR	1	A			
1: 73 062AA2.04	001 MC-SR	1	A			
1: 74 G2.4.39	001 MC-SR	1	C			
1: 75 059A2.02	001 MC-SR	1	C			
1: 76 G2.2.29	001 MC-SR	1	C			
1: 77 065AA2.05	001 MC-SR	1	C			
1: 78 W/E08EA2.1	001 MC-SR	1	A			
1: 79 060AA2.06	001 MC-SR	1	C			
1: 80 028A2.02	001 MC-SR	1	B			
1: 81 059AG2.3.10	001 MC-SR	1	A			
1: 82 076EG2.1.1	001 MC-SR	1	C			
1: 83 058AA2.02	001 MC-SR	1	A			
1: 84 G2.3.9	001 MC-SR	1	C			
1: 85 064G2.1.33	001 MC-SR	1	A			
1: 86 071G2.4.10	001 MC-SR	1	A			
1: 87 GEN 2.2.17	002 MC-SR	1	C			
1: 88 061AA2.03	001 MC-SR	1	B			
1: 89 W/E16G2.4.45	001 MC-SR	1	A			
1: 90 013A2.01	001 MC-SR	1	C			
1: 91 GEN 2.4.40	001 MC-SR	1	A			
1: 92 G2.1.34	001 MC-SR	1	A			
1: 93 GEN 2.1.1	001 MC-SR	1	D			
1: 94 027A2.01	001 MC-SR	1	D			
1: 95 GEN 2.3.4	001 MC-SR	1	D			
1: 96 GEN 2.1.2	001 MC-SR	1	D			
1: 97 003AG2.1.32	001 MC-SR	1	A			
1: 98 004G2.4.34	001 MC-SR	1	D			
1: 99 062A2.03	001 MC-SR	1	A			
1: 100 GEN 2.2.11	001 MC-SR	1	B			