

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

Name:	Region: III
Date: December 21, 2001	Facility/Unit: Palisades
License Level: SRO	Reactor Type: CE
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

Senior Reactor Operator

Question No. 1

During a LOCA recovery, which one of the following conditions would allow commencing a cooldown of the Primary Coolant System (PCS) PRIOR to verifying Shutdown Margin requirements?

- a. ALL four (4) Primary Coolant Pumps are operating.
- b. at least two (2) Primary Coolant Pumps are operating.
- c. emergency boration is in progress.
- d. ALL control rods are fully inserted.

Senior Reactor Operator

Question No. 2

During a Station Blackout, the ALLOWABLE discharge rate for each Station Battery becomes the LOWEST after what period of time?

- a. 4 hours
- b. 2 hours
- c. 30 minutes
- d. 10 minutes

Senior Reactor Operator

Question No. 3

A loss of which ONE of the following DC panels will result in the majority of the Control Room alarm panels losing power?

- a. D11-1
- b. D11-2
- c. D21-1
- d. D21-2

Senior Reactor Operator

Question No. 4

The solenoid valve on D/G 1-1 belly tank fill line has failed in the closed position, and the D/G is running. Per ONP-20, "Diesel Generator Manual Control", the fuel oil level in the belly tank can still be controlled by ...

- a. throttling the valve upstream of the solenoid valve.
- b. installing a red rubber hose from the day tank directly to the belly tank.
- c. manual readjustment of the level setpoint in order to force the solenoid valve open.
- d. throttling the solenoid valve manual bypass valve.

Senior Reactor Operator

Question No. 5

When unloading and stopping a diesel generator, the MINIMUM load allowed before opening the output breaker is approximately 50 kW. What is the reason for this load limitation?

- a. D/G trip circuit is energized below 25 kW.
- b. generator may motor if load is any LOWER.
- c. engine may overspeed if load is any HIGHER.
- d. breaker has a manual interlock above 75 kW.

Senior Reactor Operator

Question No. 6

A tornado has just been visually sighted approaching the site.

Which ONE of the following Diesel Generator operating strategies is employed for this condition?

- a. DG 1-1 should be paralleled to off-site power in PARALLEL mode. DG 1-2 should be running unloaded in UNIT mode.
- b. Both DGs should be paralleled to off-site power in PARALLEL mode.
- c. DG 1-1 should be running unloaded in UNIT mode. DG 1-2 should be paralleled to off-site power in PARALLEL mode.
- d. Both DGs should be running unloaded in UNIT mode.

Senior Reactor Operator

Question No. 7

Given the following conditions:

- Reactor at 100% power.
- Channel "A" RPS bistables trip.
- Channel "A" PZR Level Control in service.
- "A" TMM channel is deenergized.
- NI-05 is deenergized.
- Charging flow raises to 133 gpm.
- Letdown flow reduces to 0 gpm.
- Pressurizer Spray valves close.

Which ONE of the following events has occurred?

- a. Loss of Y-10.
- b. Loss of Y-20.
- c. Loss of Y-30.
- d. Loss of Y-40.

Senior Reactor Operator

Question No. 8

Given the following conditions:

- Preferred AC Bus Y-30 is being supplied by the Bypass Regulator.
- Following a seismic event, Vital Instrument Bus Y-01 de-energizes and isolates.
- Due to a loss of coolant accident, pressurizer pressure is at 1610 psia and lowering.

What is the effect of these events on the actuation capability of SIAS?

- a. Right Channel SIAS will automatically actuate.
Left Channel SIAS must be actuated by depressing PB1-1, INJECTION INITIATE, push button on C-13.
- b. Right Channel SIAS will automatically actuate.
Left Channel SIAS equipment must be manually started.
- c. Right Channel SIAS must be actuated by depressing PB1-2, INJECTION INITIATE, push button on C-13.
Left Channel SIAS will automatically actuate.
- d. Right Channel SIAS equipment must be manually started.
Left Channel SIAS will automatically actuate.

Senior Reactor Operator

Question No. 9

Given the following conditions:

- The plant is in MODE 3.
- Primary Coolant System (PCS) temperature is 450°F.
- Pressurizer pressure is 1200 psia.
- Charging Pump P-55A is operating.
- Charging Pumps P-55B and P-55C are in AUTO.
- Letdown flow is 40 gpm.
- Pressurizer level is at program level.
- VCT level is normal.

A loss of DC Bus D11-1 occurs and the following conditions are noted:

- Pressurizer level remains constant.
- Charging Pump operation remains the same.
- VCT level is lowering.
- Letdown flow indicates 0 gpm.
- Quench tank level is rising.

Which of the following actions should be taken and why?

- a. Close Letdown Stop Valves (CV-2003, CV-2004, CV-2005) to maintain containment integrity.
- b. Close Letdown Stop Valves (CV-2003, CV-2004, CV-2005) to isolate loss of inventory via Letdown Heat Exchanger Relief RV-2006.
- c. Close Letdown Containment Isolation Valve CV-2009 to maintain containment integrity.
- d. Close Letdown Containment Isolation Valve CV-2009 to isolate loss of inventory via Letdown Heat Exchanger Relief RV-2006.

Senior Reactor Operator

Question No. 10

Which of the following is the power supply breaker for the Containment Iodine Removal Fans?

- a. 52-131
- b. 52-211
- c. 52-945
- d. 52-1208

Senior Reactor Operator

Question No. 11

With the Y-50 ABT Bypass Handle in the "Emergency" position, what will happen upon a Loss of Bus 1D?

- a. The Instrument AC Bus (Y-01) will automatically receive power via the Bypass Regulator.
- b. The Instrument AC Bus (Y-01) will automatically swap back to the normal source.
- c. The Y-50 ABT will not reposition and the Instrument AC Bus (Y-01) will remain energized.
- d. The Y-50 ABT will not reposition and the Instrument AC Bus (Y-01) will de-energize.

(Refer to attached drawing of Y-50 ABT.)

Senior Reactor Operator

Question No. 12

Which of the following describes the power supplies for Service Water Pumps P-7A and P-7B?

- | | P-7A | P-7B |
|----|-------------|-------------|
| a. | Bus 1D | Bus 1D |
| b. | Bus 1C | Bus 1C |
| c. | Bus 1D | Bus 1C |
| d. | Bus 1C | Bus 1D |

Senior Reactor Operator

Question No. 13

Given the following conditions:

- P-7A and P-7C Service Water Pumps are operating
- P-7B is in Standby

Which ONE of the following conditions would result in P-7B automatically starting?

- a. 'A' Service Water pump discharge pressure lowers to 35 psig; then stabilizes at 38 psig.
- b. "B" Critical Service Water header pressure lowers to 35 psig; then stabilizes at 41 psig.
- c. 'C' Service Water pump discharge pressure lowers to 41 psig; then stabilizes at 45 psig.
- d. "A" Critical Service Water header pressure lowers to 41 psig; then stabilizes at 45 psig.

Senior Reactor Operator

Question No. 14

Given the following conditions:

- The plant is operating at 100% power.
- Service Water Pump P-7A is tagged out for maintenance.
- P-7B is in service with running amps = 80 amps.
- P-7C is in service with running amps = 83 amps.
- All systems are functioning normally for plant conditions.

A problem develops with the Service Water System. The NCO then notes the following indications:

- P-7B Service Water Pump amps indicates 86 amps.
- P-7C Service Water Pump amps indicates 93 amps.

NO operator actions have been taken.

Referring to attached Operator Aid OA-136 (Service Water System), which one of the following accounts for the above conditions?

- a. A pipe break between P-7C discharge and CV-0844.
- b. A loss of instrument air to CV-0844.
- c. A loss of instrument air to CV-1359.
- d. A partially plugged basket strainer at P-7C discharge.

Senior Reactor Operator

Question No. 15

Refer to the attached drawing.

If Service Water Flow Switch FS-0885 reaches its trip setting, this would be an indication of which one of the following?

- a. One of the Shield Cooling Heat Exchangers (tube side) has a leak.
- b. Recirculation Actuation Signal (RAS) has occurred after a large break LOCA inside containment.
- c. A Main Steam Line Break has occurred inside containment.
- d. At least one of the Containment Air Coolers has a leak in its Service Water cooling tubes.

Senior Reactor Operator

Question No. 16

Following a loss of Component Cooling Water while operating on Shutdown Cooling, explicit instructions are given to stop Charging Pump P-55A, if running. No instructions are given regarding the operation of P-55B and P-55C. (Assume NO Primary Coolant Pumps in service.)

Why is P-55A specifically mentioned?

- a. P-55A is the only Charging Pump permitted to be operated while on Shutdown Cooling.
- b. P-55B and P-55C have NO interface with Component Cooling Water.
- c. P-55B or P-55C operation will NOT result in overfilling the pressurizer when PCP bleedoff is isolated.
- d. P-55A fluid drive is cooled by Component Cooling Water and has a high temperature trip.

Senior Reactor Operator

Question No. 17

The plant is operating at full power with the following indications:

- P-55B - in manual control
- P-55C - in auto control
- Charging flow - 40 gpm
- Letdown flow - 40 gpm
- Pressurizer level cycling between 57% to 55% approximately every 30 minutes

Which ONE of the following conditions would account for the above indications?

- a. Anti Pump breaker lockout of P-55C has not been reset.
- b. Backpressure CV PIC-0202 improperly calibrated.
- c. Charging Pump P-55A is out of service.
- d. Backup PZR level control signal malfunction.

Senior Reactor Operator

Question No. 18

Given the following conditions:

- Reactor power is 8%.
- While performing a 50 gallon dilution, the operator mistakenly enters a value of 500 gallons on FIC-0210A, Primary Makeup Water Controller.
- Several minutes later, while the dilution is still occurring, the operator notes the error.
- Reactor power is rising.
- Primary Coolant System (PCS) temperatures are rising.

Which actions should be immediately performed?

Close CV-2165, Primary Makeup Water Control, and ...

- a. trip the Reactor.
- b. trip the Primary Makeup Water Pumps.
- c. commence emergency boration.
- d. stabilize power using control rods.

Senior Reactor Operator

Question No. 19

Given the following:

- The plant is at 100% power
- CVCS charging and letdown has been secured for approximately 1 hour to perform maintenance.
- Tave is maintained constant

Over the next hour (assuming NO additional operator action), which ONE of the following trends will be noted during this period?

	PZR Level	VCT Level
a.	LOWERS	RISES
b.	RISES	RISES
c.	LOWERS	LOWERS
d.	RISES	LOWERS

Senior Reactor Operator

Question No. 20

The plant is operating at full power with the following Pressurizer Level Control configuration:

- HS 1/LIC-0101, Heater Control Selector, is in the "A and B" position
- LIC-0101A is the IN SERVICE controller, selected for CASCADE mode
- LIC-0101B is in MANUAL, with its output set for 50%
- Charging Pump P-55A is operating, with P-55B and P-55C in AUTO
- All orifice block valves are in AUTO
- Backup Heaters are in MANUAL
- Pressurizer level is at program level

WITH NO OPERATOR ACTION, what is the effect of the diaphragm rupturing on LT-0101A?

- a. P-55A will lower to minimum speed, P-55B and P-55C will NOT be running, all orifice block valves will be open, and backup heaters will remain ON.
- b. P-55A will raise to maximum speed, P-55B and P-55C will be running, all orifice block valves will be closed, and backup heaters will remain ON.
- c. P-55A will raise to maximum speed, P-55B and P-55C will be running, only #1 orifice block valve will be open, and backup heaters will trip OFF.
- d. P-55A will lower to minimum speed, P-55B and P-55C will NOT be running, only #1 orifice block valve will be open, and backup heaters will trip OFF.

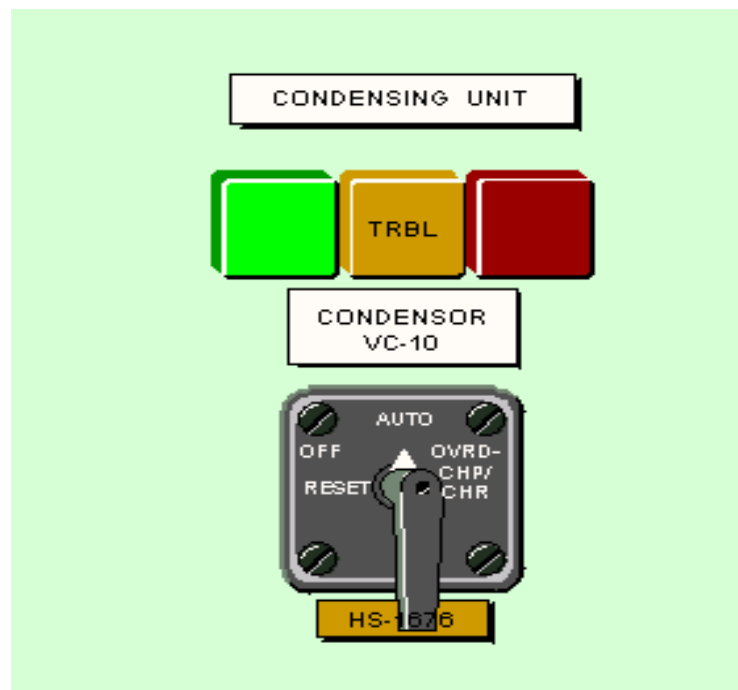
Senior Reactor Operator

Question No. 21

Refer to the drawing of the control switch for Control Room HVAC Condensing Unit VC-10.

What is the function of the “OVRD-CHP/CHR” position?

- a. Allows VC-10 to automatically start on a CHP or CHR signal.
- b. Overrides a CHP or CHR signal and allows VC-10 to run.
- c. Overrides load shed circuitry so that VC-10 can be manually started.
- d. Allows VC-10 to be manually started only if Air Handler V-95 is running.



Senior Reactor Operator

Question No. 22

Radiological Services personnel are responding to a Control Room HVAC (RIA-1818A/1818B) alarm. Which ONE of the following describes the required actions for the Control Room area?

- a. Area must be evacuated immediately and until the alarm is proven to be spurious.
- b. Area is evacuated after a gamma survey is performed that confirms alarm validity.
- c. For a valid alarm, NO action is required if an airborne survey has been performed in the last 30 days.
- d. For a valid alarm, action may be taken ONLY after consultation involving the Shift Supervisor and Duty HP person.

Senior Reactor Operator

Question No. 23

During the course of a major fire in the plant, the Shift Supervisor has ordered the Control Room evacuated.

- Actions are being taken outside the Control Room in accordance with ONP-25.2, Alternate Safe Shutdown Procedure.
- Neither Bus 1C or 1D is capable of being energized.
- The SS has ordered Auxiliary Feed Water Pump P-8B started per EOP Supplement 19, Alternate Auxiliary Feedwater Methods.
- SG 'A' level is stable at 25% with no feed flow.
- SG 'B' level is stable at 28% with no feed flow.

At what rate should the SGs be fed AND which concern is addressed by using this rate?

<u>FEED RATE</u>	<u>CONCERN</u>
a. Maximum available	potentially limited feedwater supply
b. Maximum available	ensuring adequate PCS subcooling
c. Gradually	pressurizer insurges and outsurges
d. Gradually	thermal stresses on the SG tube bundle

Senior Reactor Operator

Question No. 24

Given the following plant conditions:

- The plant is at full power.
- P-8A Aux Feedwater (AFW) Pump is out of service.
- "A" Steam Generator level lowers to 20% on all four safety channels.

Based on the above plant conditions, which of the following describes the operation of P-8C Aux Feedwater Pump and associated AFW flow controllers? (Assume no operator action.)

	Flow Controller Mode	AFW Flow to EACH S/G
a.	AUTO	100 GPM
b.	CASCADE	165 GPM
c.	AUTO	165 GPM
d.	CASCADE	100 GPM

Question No. 25

Given the following plant conditions:

- Steady state operation at 100% power
- Primary Coolant System (PCS) pressure is 2061 psia
- The PZR pressure selected controller set point is inadvertently changed to 2240 psia (step change)
- Pressurizer pressure control is in automatic

Which ONE of the following will be the IMMEDIATE response of the system?

- a. Pressurizer spray valves open.
- b. Pressurizer spray valves close.
- c. Proportional heaters go to minimum output.
- d. Backup heaters deenergize.

Question No. 26

On lowering Main Condenser vacuum, the Turbine Bypass Valve is prohibited from opening in order to ...

- a. maintain adequate vacuum to keep the turbine on line.
- b. protect the condenser from an overpressure condition.
- c. maintain adequate vacuum to keep the Main Feed Pumps on line.
- d. minimize the use of turbine exhaust hood spray.

Senior Reactor Operator

Question No. 27

Given the following conditions:

- A reactor trip has occurred from 100% power.
- Tave is currently 536 °F and lowering.
- Main steam pressure is 930 psia and lowering.
- The Turbine Bypass Valve (TBV) and Atmospheric Dump Valves (ADVs) have responded properly.

What is the expected positions of the TBV and ADVs under these conditions?

	<u>TBV</u>	<u>ADVs</u>
a.	Full Open	Modulating
b.	Full Open	Full Open
c.	Modulating	Full Open
d.	Modulating	Modulating

Question No. 28

During a Steam Generator Tube Leak/Rupture, why do we use the turbine bypass valve (TBV) instead of the atmospheric dump valves?

- a. Minimizes the release of radioactivity.
- b. Ensures availability of Steam Driven Aux Fd. Pp. P-8B.
- c. Minimizes PCS shrinkage due to excess cooldown.
- d. Ensures finer control over PCS temperature and pressure.

Senior Reactor Operator

Question No. 29

The plant is in a normal cooldown and preparing for a refueling outage. A misoperation of the Atmospheric Dump Valves causes the cooldown rate to exceed Technical Specification limits.

Which of the following actions is required and what is the BASIS for the required action?

- a. Restore cooldown rate to Tech. Spec. limits within 30 minutes to provide adequate margin from brittle failure of the Reactor vessel.
- b. Restore cooldown rate to Tech. Spec. limits within 1 hour to provide adequate margin from ductile failure of the Reactor vessel.
- c. Stop any further cooldown for 6 hours to allow temperature stabilization throughout the vessel wall.
- d. Stop any further cooldown for 12 hours to allow temperature stabilization throughout the vessel wall.

Senior Reactor Operator

Question No. 30

A catastrophic failure of the Utility Water Storage Tank T-91 occurs such that a large volume of radiologically contaminated water is suddenly released. NO planned radwaste release is in progress.

Which pair of radiation monitors would be useful to aid in diagnosing that the release has occurred?

- a. RIA-1323, Circulating Water Discharge Monitor AND RIA-0833, Service Water Monitor.
- b. RIA-1323, Circulating Water Discharge Monitor AND RIA-5211, Turbine Bldg Sump Disch.
- c. RIA-5211, Turbine Bldg Sump Disch AND RIA-0833, Service Water Monitor.
- d. RIA-5704, Evaporator Control Panel Area AND RIA-0833, Service Water Monitor

Question No. 31

Which ONE of the following would be a symptom of a fuel cladding failure?
(Assume NO other off-normal conditions.)

- a. S/G Blowdown Hi Radiation alarm
- b. CCW Hi radiation alarm
- c. Stack Gas Hi radiation alarm
- d. Service Water Hi radiation alarm

Question No. 32

You have just received a "COMPONENT COOLING WATER MONITOR" RIA-0915 alarm. What automatic action is initiated by this condition?

- a. Isolates the Regenerative Heat Exchanger from the CCW system.
- b. Starts the standby CCW pump to raise flow in the system.
- c. Automatic fill to the CCW surge tank is automatically terminated.
- d. CCW Surge Tank Vent shifts to the vent gas collection header.

Question No. 33

What is the result of removing from service (key operated bypass switch to OUT position) the containment refueling area radiation monitors (RIA-2316 and RIA-2317)?

- a. Lowers the trip setpoints of the four containment high radiation monitors to 25R/hr.
- b. The containment isolation function of the monitors would be bypassed.
- c. Allows either refueling area radiation monitor to cause containment isolation on a high alarm.
- d. Allows a containment isolation signal to change the Spent Fuel Pool ventilation flowpath.

Senior Reactor Operator

Question No. 34

Given the following:

- A liquid radwaste batch is being released.
- The following alarm then annunciates:

EK-1365, "PROCESS LIQ MONITORING HIGH RADIATION"

- The NCO verifies RIA-1049 in alarm.

Which ONE of the following automatic actions will occur?

- a. Sends a CLOSE signal to both CV-1049 (3" discharge isolation valve) and CV-1051 (1" discharge isolation valve).
- b. Starts P-76A Canal Sample Pump so determination can be made for manual termination of the batch by closing MV-CRW172 (Discharge to Lake).
- c. Trips the in-service Main Exhaust Fan (V-6A/V-6B) and associated dampers.
- d. Trips V-10 (Radwaste Area Supply Fan) and associated dampers.

Question No. 35

Which ONE of the following describes the effect of a Waste Gas Decay Tank (WGDT) pressure rising to 135 psig?

- a. A rupture disc will relieve pressure to containment.
- b. A rupture disc will relieve pressure to the Waste Gas Surge Tank.
- c. A relief valve will relieve pressure to containment.
- d. A relief valve will relieve pressure to the Waste Gas Surge Tank.

Senior Reactor Operator

Question No. 36

Given the attached drawing of the Gaseous Effluent Monitor RGEM, RE-2325 (RGEM Iodine Monitor), RE-2326 (RGEM Noble Gas Monitor) and RE-2327 (RGEM Noble Gas Monitor - high range) and the following conditions:

- The controls on both the RGEM unit and on C-11A are aligned properly.
- The Range Selector switch is in NORMAL.
- The Grab Sample Selector switch in OFF.

Which of the following will have automatically occurred once an ALERT and subsequent HIGH ALARM condition has been sensed by RE-2326?

- a. RE-2326 sends trip signal to in-service Main Exhaust Fan (V-6A or B).
- b. RE-2326 initiates a Containment Isolation Signal.
- c. RE-2327 will be placed in service, and a grab sample WILL have been drawn.
- d. RE-2327 will be placed in service; NO grab sample will have been drawn.

Senior Reactor Operator

Question No. 37

Source/Wide Range NI - 1/3A must be taken out of service.

Prior to removing NI - 1/3A from service, which of the following conditions regarding the High SUR Trip RPS channels would be acceptable? (Assume all other Technical Specification requirements are met.)

	RPS 'A'	'RPS 'B'	RPS 'C'	RPS 'D'
a.	NORMAL	BYPASS	NORMAL	TRIP
b.	BYPASS	NORMAL	TRIP	NORMAL
c.	TRIP	NORMAL	NORMAL	BYPASS
d.	NORMAL	TRIP	BYPASS	NORMAL

Senior Reactor Operator

Question No. 38

During refueling operations both Source Range NIs become inoperable. Which one of the following is **NOT** an immediate action required by Technical Specifications?

- a. Suspend core alterations.
- b. Suspend positive reactivity additions.
- c. Initiate actions to restore one (1) Source Range operable.
- d. Provide alternate means of Control Room audible indication.

Senior Reactor Operator

Question No. 39

Given the following indications:

- Delta T power indicates 68%.
- Nuclear power (NI) indicates 66.5%

Which ONE of the following are the new Variable High Power (VHP) Pre-trip and Trip setpoints when the VHPT RESET button is depressed on Panel C-02?

	VHP Pre-trip	VHP Trip
a.	80%	81.5%
b.	79.5%	81.5%
c.	81%	83%
d.	81.5%	83%

Senior Reactor Operator

Question No. 40

The Containment High Pressure (CHP) RPS trip setpoint has been exceeded due to an Excess Steam Demand Event inside containment, and an Anticipated Transient Without Scram (ATWS) has occurred. Contingency actions to insert control rods were NOT successful.

Which of the following describes Reactivity Control requirements for this ATWS condition, and which procedure should be entered after completion of EOP-1.0?

- a. Emergency Boration is sufficient to satisfy Reactivity Control requirements; proceed to EOP-6.0.
- b. Emergency Boration is NOT sufficient to satisfy Reactivity Control requirements; proceed to EOP-9.0.
- c. Safety Injection is NOT sufficient to satisfy Reactivity Control requirements; proceed to EOP-6.0.
- d. Safety Injection is sufficient to satisfy Reactivity Control requirements; proceed to EOP-9.0.

Senior Reactor Operator

Question No. 41

Given the following conditions:

- A LOCA has occurred inside Containment.
- A Recirculation Actuation Signal (RAS) has been received.
- 2400 V Bus 1C is de-energized and isolated due to a fault.
- HPSI Pump P-66A is operating.
- The operators are aligning for recirculation in accordance with EOP-4.0, Loss of Coolant Accident Recovery.

Which of the following alignments would provide the MAXIMUM permissible spray flow and subcooling flow?

- a. ONE Containment Spray Valve open
ONE HPSI Subcooling Valve open
- b. ONE Containment Spray Valve open
BOTH HPSI Subcooling Valves open
- c. BOTH Containment Spray Valves open
ONE HPSI Subcooling Valve open
- d. BOTH Containment Spray Valves open
BOTH HPSI Subcooling Valves open

Senior Reactor Operator

Question No. 42

Which ONE of the following Safety Injection Tanks (SIT) is capable of delivering its required volume (by design) of borated water to the Primary Coolant System (PCS) for a large break LOCA?

	SIT	LEVEL (narrow range)	PRESSURE
a.	T-82A	80%	202 psig
b.	T-82B	20%	195 psig
c.	T-82C	60%	224 psig
d.	T-82D	40%	181 psig

Question No. 43

When performing a depressurization of Containment, the operator is directed to make an entry in the Control Room Logbook when the Containment Purge Exhaust Isolation Valves (CV-1805 / 1806 / 1807 / 1808) are opened and closed.

The reason for recording this information is to ...

- a. supply data for EM-09-10, Palisades ILRT/LLRT Program.
- b. track the length of time entry has been made into TS 3.6.3, Containment Isolation Valves.
- c. determine the amount of radioactivity released from Containment.
- d. ensure that the valves are open for no more than one hour.

Senior Reactor Operator

Question No. 44

Given the following conditions:

- Plant is in MODE 4 with Primary Coolant System (PCS) temperature at 250°F.
- PCS boron concentration is being raised.

Which of the following could be performed without violating Containment Integrity requirements?

- a. A Maintenance repair worker removes a blind flange on a length of Containment penetration piping.
- b. Entering through outer Containment airlock door to repair the inoperable inner Containment airlock door.
- c. Manually opening an inoperable automatic Containment isolation valve to pump Primary System Drain Tank.
- d. Removing all but four bolts on the Containment equipment hatch.

Question No. 45

ONP-17, Loss of Shutdown Cooling, Attachment 4, Alternate PCS/Core Heat Removal Method (PCS Integrity Not Established), prohibits the use of Containment Spray Pumps for shutdown cooling UNLESS:

- The PCS is vented by the equivalent of removing the Pressurizer manway.

This requirement ensures that ...

- a. Containment Spray Pump suction piping is not overpressurized.
- b. insoluble gases do not collect in the Containment Spray Pump.
- c. Containment Spray Pump cavitation does not occur.
- d. adequate flow rates exist for core cooling.

Senior Reactor Operator

Question No. 46

Given the following conditions:

- A reactor startup is being performed.
- The Estimated Critical Position calls for Group 4 rods to be at 30 inches at criticality.
- Criticality is actually achieved with Group 3 rods at 6 inches.

Which of the following actions is required?

- a. Maintain current rod position and commence emergency boration.
- b. Insert all regulating rods to the lower electrical limit and commence emergency boration.
- c. Trip the reactor and commence emergency boration.
- d. Withdraw regulating rods to the Estimated Critical Position while borating the PCS.

Senior Reactor Operator

Question No. 47

Given the following conditions:

- A plant startup is in progress.
- Main Turbine speed is at 1800 RPM.
- Both Main Generator output breakers are OPEN.
- Reactor power is at approximately 5%.
- The NCO starts withdrawing Group 4 control rods to raise Tave and to establish Turbine Bypass Valve opening per SOP-8, "Main Turbine and Generating Systems".

If Group 4 rods CONTINUE to withdraw after the NCO releases the "Raise-Lower" rod control (joystick), which ONE of the following actions should be used to mitigate this event?

- a. Place "Rod Control Group Select" switch from position "4" to "OFF".
- b. Commence Emergency Boration using the pumped feed method.
- c. Ensure the Reactor trips automatically on Variable High Power Trip.
- d. Place "Rod Control Mode Select switch from "MS" to "EM OFF".

Senior Reactor Operator

Question No. 48

Given the following conditions:

- The Dropped Rod annunciator has alarmed.
- Rod Position Deviation annunciators have alarmed.

Which ONE of the following conditions does **NOT** require the reactor to be tripped for this dropped rod condition?

- a. With reactor power at 90%, all ASI indications begin cycling from the positive to the negative limit and back on a 5 minute cycle.
- b. With reactor power at 80%, the Power Density screens of Thermal Margin Monitor (TMM) indicate "TRIP".
- c. With reactor at 70%, the Lower Electrical lights for rods 16 AND 31 are energized.
- d. With reactor low power physics testing in progress, the Lower Electrical Limit light for rod 16 is energized.

Senior Reactor Operator

Question No. 49

The plant is in MODE 1.

All of the following Control Rod problems require action per Technical Specifications 3.1, "Reactivity Control Systems", **EXCEPT...**

- a. Rod 45 (Part-Length Group) is 124" withdrawn and cannot be moved.
- b. Rod 3 (Shutdown Group A) is at 131" and is trippable, but cannot be moved.
- c. The PIP function for Rod 21 (Reg Group 1) has been declared to be inaccurate.
- d. The seal leak-off temperature for Rod 40 (Reg Group 4) indicates 280°F.

Senior Reactor Operator

Question No. 50

The plant is at 27% power and in the process of raising power to 100%. The NCO is withdrawing control rods when the following alarms annunciate:

- EK-0911, "ROD POSITION 4 INCHES DEVIATION"
- EK-0912, "ROD POSITION 8 INCHES DEVIATION"

The NCO verifies rod positions for Group 4 control rods and notes the following:

Rod No.	Position
38	43.2"
39	43.0"
40	43.4"
41	35.1"

Which ONE of the following describes the restrictions on any further movement of Group 4 rods AND the adverse condition that is prevented?

Rod movement of Group 4 rods shall be limited to within ...

- 4 inches of Rod 41 position to prevent excessive power peaking.
- 8 inches of Rod 41 position to prevent excessive power peaking.
- 4 inches of Rod 41 position to prevent inadequate Shutdown Margin.
- 8 inches of Rod 41 position to prevent inadequate Shutdown Margin.

Senior Reactor Operator

Question No. 51

Given the following conditions:

- A valid Containment High Pressure signal has been generated due to a Main Steam Line Break inside containment.
- The Primary Coolant Pumps (PCPs) are operating, but are experiencing elevated bearing temperatures.

For the above plant conditions, which one of the following types of procedures would provide guidance for these PCP elevated bearing temperatures?

- a. Emergency Operating Procedure
- b. Alarm Response Procedure
- c. System Operating Procedure
- d. General Operating Procedure

Question No. 52

What is the BASIS for the requirement to ensure that the temperature in the steam generators is less than or equal to the temperature in the Primary Coolant System (PCS) cold leg PRIOR to directing initial starts of Primary Coolant Pumps?

- a. Ensures an available heat sink for the PCS when securing shutdown cooling.
- b. Ensures that heat energy addition to the PCS from the steam generators does not occur.
- c. To limit the thermal stresses experienced by the steam generator tubes.
- d. Prevents a rapid depressurization of the steam generators due to a cooldown.

Question No. 53

During a loss of feedwater event, which ONE of the following describes the reason for the Immediate Action to manually RAISE feed pump speed using the individual feed pump speed controller?

- a. The speed will rise faster with the individual feed pump speed controller than with the combined speed controller.
- b. The speed will rise more slowly with the individual feed pump speed controller than with the combined speed controller.
- c. The combined speed controller will not raise the speed of the remaining pump if one is tripped.
- d. The feed pump speed will rise too rapidly if the combined feed pump speed controller is used.

Senior Reactor Operator

Question No. 54

Given the following conditions:

- The plant is operating at 100% power when Condensate Pumps P-2A and P-2B trip.

What is the effect of the Condensate Pumps tripping, and what actions should be taken?

- a. BOTH Main Feedwater Pumps ramp to minimum speed; take manual control to raise speed of both pumps to stabilize Steam Generator levels.
- b. BOTH Main Feedwater Pumps ramp to minimum speed; manually trip the reactor and perform post-trip Immediate Actions.
- c. Both Main Feedwater Pumps will trip; commence a rapid downpower to avoid a Steam Generator Low Level Reactor trip.
- d. Both Main Feedwater Pumps will trip; manually trip the reactor and perform post-trip Immediate Actions.

Senior Reactor Operator

Question No. 55

Given the following:

- The plant is operating at full power for 38 days when a faulty Main Generator protection relay causes a Main Generator trip.
- ALL other equipment functions as designed.

During the performance of EOP-1.0, "Standard Post-Trip Actions," if the NCO-Turbine does NOT manually ramp down the speed of the Main Feed Pumps to MINIMUM speed, which ONE of the following would be a consequence?

- a. Main Feed pump turbine damage due to steam generator water carryover.
- b. Primary Coolant System (PCS) overcooling transient due to steam generator overfeeding.
- c. MSIVs will automatically close, resulting in loss of PCS heat removal capability.
- d. Reactor return to criticality due to negative moderator temperature coefficient.

Question No. 56

Which ONE of the following is NOT a direct Control Room indication of pressurizer PORV position?

- a. PORV position indicating RED and GREEN lights
- b. Quench Tank parameters
- c. An acoustic monitor
- d. PORV tail pipe temperature

Senior Reactor Operator

Question No. 57

Given the following conditions:

- The plant is being heated up and is currently at 510°F.
- An attempt to cycle PRV-1043B, Pressurizer Power Operated Relief, has just been performed.
- The PORV indicates that it FAILED to close.

The crew must ...

- a. cooldown the plant to less than 200°F.
- b. cooldown the plant to between 200°F and 430°F.
- c. close the associated block valve within one (1) hour.
- d. ensure associated LTOP channel in DEFEAT within one hour.

Senior Reactor Operator

Question No. 58

The plant is at 100% power and the following alarms have annunciated:

- EK-1101, "CONTAINMENT INSTR AIR LO PRESS"
- EK-1102, "INSTRUMENT AIR LO PRESS"
- EK-1103, "SERVICE AIR LO PRESS"

You have entered the appropriate procedure and verified auto actions. Instrument air pressure reads 42 psig. Which ONE of the following conditions is used to determine if the Reactor should be manually tripped?

- a. Any of the plant deluge or sprinkler systems are operating.
- b. CV-2083 closes and PCP Controlled Bleedoff to the VCT is lost.
- c. CV-1359 (Non-Critical Service Water Isolation) starts closing.
- d. Service Air has isolated.

Senior Reactor Operator

Question No. 59

Given the following conditions:

- The plant is at 38% power with a power escalation in progress.
- P-1A Main Feedwater Pump is in service.
- Plant Air Compressors C-2A and C-2C are in service.

The Reactor NCO is monitoring panels and reports that C-2C has TRIPPED. He also reports that Instrument Air System pressure is LOWERING. The NCO then performs the following actions:

- NCO manually starts C-2B.
- NCO reports Instrument Air System pressure CONTINUES to lower at a slightly slower rate.

For these conditions, ONP-7.1, Loss of Instrument Air directs opening CV-1221 (Air from Feedwater Purity). What is the BASIS for using the Feedwater Purity Air Compressors for this condition?

- a. The capacity of the Feedwater Purity Air Compressors is more than adequate to supply the Plant Instrument Air System.
- b. The power supply of the Feedwater Purity Air Compressors is from a highly reliable source (Safeguards Transformer).
- c. In the event of a loss of AC power, the Feedwater Purity Air Compressors can be used without overloading the Diesel Generators.
- d. The capacity of the Feedwater Purity Air Compressors is adequate to supply the Instrument Air System PROVIDED Service Air has isolated.

Senior Reactor Operator

Question No. 60

Refer to the attached drawing and locate the component labeled "ST-0523".

For which ONE of the following events would a malfunctioning (stuck closed) ST-0523 be a concern?
(Assume only ONE of the following events.)

- a. Steam Generator Tube Rupture
- b. Small Break LOCA
- c. Loss of Forced Circulation
- d. Station Blackout

Senior Reactor Operator

Question No. 61

Given the following conditions:

- The plant is operating at 100% power.
- Annunciator EK-1309, SPENT FUEL POOL LO LEVEL, goes into alarm.
- An Auxiliary Operator confirms that the level of the pool has appeared to drop approximately 2" since last checked, but CANNOT determine where the water has gone.
- Spent Fuel Pool temperature is stable.
- Spent Fuel Pool boron concentration is 1810 ppm.

Makeup to the Spent Fuel Pool should be provided from the ...

- a. Safety Injection Refueling Water Tank.
- b. Fire Water System.
- c. Utility Water Storage Tank.
- d. Primary Makeup Water Tank.

Senior Reactor Operator

Question No. 62

Given the following conditions:

- The plant is at full power
- The crew notes that Main Condenser vacuum has lowered slightly (from 29.5" to 28.7").
- No alarms are annunciating.
- ONP-14, "Loss of Condenser Vacuum" is consulted for guidance.
- It is believed that the Steam Jet Air Ejectors are malfunctioning.

Which additional conditions would result from the malfunctioning Steam Jet Air Ejectors?

- a. Rising Off-Gas count rate.
- b. More condensate depression.
- c. Lowering condenser hotwell level.
- d. Rising pressure in Gland Seal steam header.

Senior Reactor Operator

Question No. 63

Given the following conditions:

- At full power a fire occurs which requires manually tripping the Reactor and evacuating the Control Room.
- Alternate Safe Shutdown Panels C150/C150A are to be placed in service.

No one on the operating crew remembers the position that the AVG TEMP DISPLAY SELECT SWITCH was left in prior to evacuation. Which ONE of the following would be an indication that the switch had been left in the "LOOP 2" position?

- a. When Panels C-150/C-150A are placed in service, Steam Generator pressures are noted to remain STABLE by observing Steam Generator pressure indicators on Panel C-150A.
- b. An operator stationed at Panel C-33 observes that Steam Generator pressures remain STABLE when Panels C-150/C-150A are placed in service.
- c. When Panels C-150/C-150A are placed in service, Steam Generator pressures are noted to be LOWERING by observing Steam Generator pressure indicators on Panel C-150A.
- d. An operator stationed at Panel C-33 observes that Steam Generator pressures begin LOWERING when Panels C-150/C-150A are placed in service.

Question No. 64

A reactor trip and loss of offsite power have occurred. Natural circulation has been established. If the rate of steaming were RAISED, how would natural circulation flow be affected?

Natural Circulation flow would ...

- a. REDUCE due to the reduction in subcooling.
- b. RISE due to the reduction in decay heat rate.
- c. RISE due to the higher thermal gradient.
- d. REDUCE due to the higher density of the cold leg.

Senior Reactor Operator

Question No. 65

Given the following conditions:

- While operating at 100% power, a loss of offsite power occurs.
- A transition has been made from EOP-1.0 to EOP-8.0, Loss of Offsite Power/Forced Circulation Recovery.

Assuming adequate subcooling exists and loop temperatures are lowering, which ONE of the following sets of parameters would indicate that Natural Circulation has been established?

	T-COLD	T-HOT	CET AVG
a.	534° F	555° F	568° F
b.	520° F	528° F	555° F
c.	510° F	555° F	565° F
d.	535° F	552°F	570° F

Senior Reactor Operator

Question No. 66

With the plant at 56% power, Primary Coolant Pump P-50D experiences a seized rotor. When the Reactor trips, ALL offsite power is lost. NO other component failures are noted.

Following EOP-1.0, "Standard Post-Trip Actions", which procedural guidance applies?

- a. EOP-2.0, "Reactor Trip Recovery"
- b. EOP-3.0, "Station Blackout Recovery"
- c. EOP-8.0, "Loss of Offsite Power/Forced Circ Recovery"
- d. EOP-9.0, "Functional Recovery Procedure"

Question No. 67

The Safety Functions Status Checks for EOP-8.0, "Loss of Offsite Power/Forced Circulation Recovery" require that CETs be at least 25°F subcooled.

What is the BASIS for this requirement?

- a. To remove more heat from the fuel.
- b. To minimize the occurrence of steam voiding.
- c. To reduce the possibility of inadvertent criticality.
- d. To prevent thermal shocking of PCS piping.

Senior Reactor Operator

Question No. 68

Given the following conditions:

- A loss of ALL feedwater has occurred.
- The reactor is tripped.
- Action has been taken to start all available HPSI pumps and Charging Pumps, open all HPSI injection valves, open both PZR PORV block valves, and open both PZR PORVs.

This action would be directed by which one of the following procedures?

- a. ONP-3, "Loss of Main Feedwater" Immediate Actions.
- b. ONP-3, "Loss of Main Feedwater" Subsequent Actions.
- c. EOP-9.0, "Functional Recovery Procedure" - HR-1, "PCS and Core Heat Removal via S/G with SIS NOT in Operation".
- d. EOP-9.0, "Functional Recovery Procedure" - HR-3, "PCS and Core Heat Removal via Once-Through-Cooling".

Senior Reactor Operator

Question No. 69

What effect (if any) does a Small Break LOCA have on the Steam Generators (S/G) AND what actions will help mitigate the event? (Assume degraded containment conditions.)

- a. Due to changing containment conditions, some decalibration of S/G level indications may occur. S/G levels should be maintained between 60% and 70%.
- b. The Steam Generators are not affected, since adequate Primary Coolant System (PCS) heat removal occurs through the pipe break.
- c. Nitrogen gas from the Safety Injection Tanks would cause the S/G tubes to become gas bound. S/G pressures should be maintained high in the control band to avoid this condition.
- d. Void formation in the S/G U-tubes may occur if there are no Primary Coolant Pumps operating. S/G pressures should be maintained HIGHER than PCS pressure to avoid this condition.

Senior Reactor Operator

Question No. 70

Given the following plant conditions:

- From full power, the plant has had a LOCA.

Considering ONLY the heat removal mechanism listed, which one of the following represents adequate core heat removal?

- a. For a Small Break LOCA, reflux boiling provides adequate heat removal.
- b. For a Small Break LOCA, fluid flow out the break provides adequate heat removal.
- c. For a Large Break LOCA, reflux boiling provides adequate heat removal.
- d. For a Large Break LOCA, fluid flow out the break provides adequate heat removal.

Senior Reactor Operator

Question No. 71

Given the following:

Initial plant conditions:

- At 0220 hours, the Reactor tripped from 96% power.
- SV AND/OR PORV OPEN alarm actuated
- At 0223 hours the Quench Tank High Pressure alarm actuated.

Subsequent plant conditions:

- The Control Room Supervisor completed EOP-1.0, "Reactor Trip", and entered EOP-4.0, "Loss of Coolant Accident Recovery".
- Safety Injection automatically actuated, per design.
- During EOP-4.0, the Primary Coolant Pumps were all manually tripped, as required by plant conditions.

Plant conditions at 0235 hours:

- Pressurizer level indicates 98%.
- Pressurizer pressure is 1200 psia and **SLOWLY** rising.
- Charging flow is 132 gpm.
- The first set of EOP-4.0 Safety Function Status Checks has been started, but NOT completed.
- The safety valve reseats and safety injection begins refilling the PCS.

Which one of the following describes the correct procedural transition?

- a. Complete EOP-4.0, and then transition to GOP-9, "MODE 3 \geq 525°F to MODE 4 or MODE 5, since the safety valve has reseated.
- b. Immediately transition to EOP-2.0, "Reactor Trip Recovery", since the safety valve has reseated; and then transition to GOP-9.
- c. Immediately transition to EOP-9.0, "Functional Recovery Procedure" since NO Primary Coolant Pumps are operating.
- d. Complete EOP-4.0, and then transition to EOP-2.0, "Reactor Trip Recovery" since the safety valve has reseated.

Senior Reactor Operator

Question No. 72

Given the following conditions:

- The plant is at 75% power steady state.
- Total uncorrected Primary Coolant System (PCS) leakage has been confirmed to be 11.3 gpm.

Other data available:

- 1.6 gpm - leakage into the Quench Tank
- 1.1 gpm - leakage into the Primary System Drain Tank
- 1.9 gpm - leakage past check valves from PCS to SI system
- 1.8 gpm - CRDM leakoff rate
- 2.7 gpm - charging pump leakage
- 0.2 gpm - leakage into the 'A' S/G

Which ONE of the following identifies the PCS leakage that requires the plant to be shutdown per Technical Specifications?

- a. Unidentified leakage.
- b. Identified leakage.
- c. Pressure boundary leakage.
- d. Primary to secondary leakage.

Senior Reactor Operator

Question No. 73

The plant is operating at power and the following conditions exist:

- Reactor power = 56%
- Primary Coolant System (PCS) pressure = 2060 psia
- Tave = 547°F
- S/G levels = 67%
- Turbine load = 440 MW
- Steam pressure = 795 psia
- Containment pressure = 0.2 psi

Five minutes later, the plant conditions are as follows:

- Reactor power = 58% and continuing to rise.
- PCS pressure = 2051 psia and continuing to lower.
- Tave = 542°F and continuing to lower.
- S/G levels = 69% and continuing to rise.
- Turbine power = 440 MW and steady.
- Steam pressure = 775 psia and continuing to lower.
- Containment pressure = approximately 1.8 psig and continuing to rise.

Based on the indications listed above, which event is in progress?

- a. PCS leak inside containment.
- b. Feed line break outside containment.
- c. Steam line break inside containment.
- d. Steam line break outside containment.

Senior Reactor Operator

Question No. 74

Given the following plant conditions:

- A steam line break has occurred on 'A' SG inside containment.
- The crew is responding in accordance with EOP-6.0, Excess Steam Demand Event.
- The MSIVs have been closed.
- All Primary Coolant Pumps are stopped.

Which one of the following is the required means of minimizing the overcooling AND Pressurized Thermal Shock (PTS) concerns in the Primary Coolant System?

- a. Maintain 'B' SG within 50 psid above 'A' SG until 'A' SG reaches $< - 125\%$, then control the steaming and feeding rate of 'B' SG.
- b. Maintain 'B' SG within 50 psid above 'A' SG until 'A' loop T-colds stabilize, then control the steaming and feeding rate of 'B' SG.
- c. Delay steaming 'B' SG until 'A' SG reaches $< - 125\%$, then control the steaming and feeding rate of 'B' SG.
- d. Delay steaming 'B' SG until 'A' loop T-colds stabilize, then control the steaming and feeding rate of 'B' SG.

Senior Reactor Operator

Question No. 75

Given the following conditions:

- The plant shut down on November 2.
- Today is November 23 and the plant is in MODE 6.
- LPSI Pump P-67A is in service.
- Reactor Vessel head has been removed.
- Primary Coolant System (PCS) has been drained to the level of the vessel flange (624' 6")
- PCS temperature is 95°F

Per the supplied reference, if P-67A trips, how long will it take for the PCS temperature to rise to 200°F?

- a. 40 minutes
- b. 50 minutes
- c. 60 minutes
- d. 70 minutes

Senior Reactor Operator

Question No. 76

Given the following plant conditions:

- The plant has been on Shutdown Cooling in MODE 5 for 5 days.
- Primary Coolant System (PCS) temperature is 140°F.
- Low Pressure Safety Injection Pump P-67B is in service.
- PCS level is at 618' 0".

The following alarm then annunciates:

- EK-1157, LO PRESS SI PUMPS P-67A & P-67B TRIP

After verifying the validity of the alarm, the Control Room Supervisor then directs implementation of ONP-17, "Loss of Shutdown Cooling". Why is starting the alternate LPSI Pump (P-67A) a Subsequent Action and NOT an Immediate Action?

This allows time for ...

- a. boration which will counter the effects of relatively dilute water from the idle LPSI piping.
- b. temperature soaking to counteract cool stagnant water from the idle LPSI piping.
- c. throttling Shutdown Cooling flow components to ensure P-67A does not become air bound, since PCS level is LOWER than the top of the hot leg.
- d. throttling Shutdown Cooling flow components to prevent overpressurization of the Reactor Vessel plenum since PCS level is GREATER than the top of the hot leg.

Senior Reactor Operator

Question No. 77

Given the following conditions:

- Operators are responding to a Steam Generator Tube Leak in accordance with ONP-23.2, implemented 15 minutes ago.
- Reactor power is stable at 99.6%; a power reduction has NOT been initiated.
- PZR level is stable at programmed value.
- RIA-0707, Steam Generator Blowdown Monitor is in alarm.
- RIA-0631, Condenser Off-gas Monitor indication has risen from an initial value of 5.00E+02 CPM to 7.00E+3 CPM and is stable.
- Air ejector flowrate is 4 CFM.
- PCS Gas Total Isotope is 6.0E-2 $\mu\text{Ci/cc}$ and stable as indicated by latest Chemistry sample.

What action is required?

- a. Maintain power level and wait for confirmations of a tube leak.
- b. Shutdown per GOP-8 at a rate determined by the SS, up to 30% per hour.
- c. Shutdown at >30% per hour per GOP-8.
- d. Trip the reactor and followup with EOP-5.0.

Senior Reactor Operator

Question No. 78

The plant was at 99.8% power when a Steam Generator Tube Rupture developed.

- The reactor was tripped and EOP-1.0, "Standard Post-Trip Actions" is completed.
- EOP-5.0, "Steam Generator Tube Rupture Recovery" is in progress.
- It has been determined that the affected S/G must be cooled down by draining it to the Primary Coolant System (PCS) via backflow.
- The operators are to determine if the resulting PCS dilution from the backflow will cause final PCS boron concentration to be less than the Required Shutdown Boron concentration.

Given these plant conditions:

- Required PCS Shutdown Boron concentration = 428 ppm
- Current level in the affected S/G = 90%
- Desired level in the affected S/G = 50%

What is the MINIMUM PCS boron concentration that must be present PRIOR TO draining the steam generator to ensure the Required Shutdown Boron concentration is maintained?

- a. 951 ppm
- b. 570 ppm
- c. 535 ppm
- d. 428 ppm

Senior Reactor Operator

Question No. 79

While operating at 100% power, a main steam line break occurs downstream of the Main Steam Isolation valves (MSIV). During the performance of EOP-1.0, the following conditions are noted:

- 'A' SG MSIV fails to close.
- Switchyard "R" bus is deenergized.
- Pressurizer pressure is 790 psia and lowering slowly.
- Primary Coolant System (PCS) temperature is 410°F and lowering slowly.
- 'A' SG pressure is 250 psia and lowering rapidly.
- 'B' SG pressure is 700 psia and lowering slowly.

Assuming all other components function properly, which ONE of the following contains safety functions where BOTH of the safety functions listed would be of concern for the above plant conditions?

- a. Containment Isolation due to containment overpressure.
 Maintenance of Vital Auxiliaries due to loss of instrument air.
- b. Reactivity Control due to positive reactivity from cooldown.
 Inventory Control due to the loss of PCS mass resulting from the excessive cooldown.
- c. Reactivity Control due to positive reactivity from cooldown.
 PCS Heat Removal due to potential loss of heat sink when 'A' SG completes blowdown.
- d. Containment Isolation due to containment overpressure.
 Inventory Control due to the loss of PCS mass resulting from the excessive cooldown.

Senior Reactor Operator

Question No. 80

Refer to the Table below.

For which ONE of the following conditions would this table be useful in providing guidance for actions that would help stabilize the plant?

- a. Dropped Rod
- b. Continuous Rod Withdrawal
- c. Xenon Oscillations
- d. Inadvertent Dilution

PARAMETER BEING CHANGED	CAUSE	CORE POWER WILL BE PUSHED TOWARDS	ASI WILL BECOME
PCS Temperature (with negative MTC)	Power Reduction	Top Half of Core	More negative or less positive
	Power Escalation	Bottom	More positive or less negative
Rod Position (ARO to Midpoint)	Withdrawal	Top	More negative or less positive
	Insertion	Bottom	More positive or less negative
PCS Boron	Boration	Top	More negative or less positive
	Dilution	Bottom	More positive or less negative

Question No. 81

A task is to be performed in the RCA in a room where the general area radiation levels are 3 Rem/hr. The task is estimated to require 35 minutes for completion. Which of the following are the minimum briefings required?

- a. An Informal ALARA Pre-Job Briefing AND a High Radiation Area Briefing.
- b. A Formal ALARA Pre-Job Briefing AND a High Radiation Area Briefing.
- c. A Formal ALARA Pre-Job Briefing only.
- d. A High Radiation Area Briefing only.

Senior Reactor Operator

Question No. 82

During a refueling outage several control rod drive packages were electrically disconnected and have subsequently been reconnected. Verification that the cable reconnections were made to the correct drive packages must be performed. Which ONE of the following methods of verification is NOT acceptable?

- a. An electrician takes an amp reading on the power cable to the motor that has been selected for operation. If adequate amps are indicated, proper connection is confirmed.
- b. An electrician disconnects the power cable to the selected motor. The Control Room then attempts to move the rod; movement of any control rod indicates improper connection.
- c. An operator with a CRDM location map goes out on the Reactor head, and places hand on package to be tested. Operator should feel clutch pickup and vibration when rod is moved.
- d. Control Room attempts to move the rod. As long as the SPI stalks are still connected, proper connection can be confirmed by verifying agreement between PIP and SPI indication.

Senior Reactor Operator

Question No. 83

Due to problems with a Cooling Tower Pump, turbine load has been reduced from 100% to 53%.

In addition to notifying the Electric Sourcing and Trading Trader, the Duty and Call Superintendent, and the Plant General Manager, which of the following must be subsequently notified of the derate within one hour?

- a. NRC Resident Inspector
- b. Radiological Services Supervisor
- c. Site Vice President
- d. Public Affairs Director

Senior Reactor Operator

Question No. 84

With the plant at full power, the following alarms annunciate:

- EK-0753 PRESSURIZER PRESSURE OFF-NORMAL HI-LO
- EK-0754 PRESSURIZER PRESSURE OFF-NORMAL HI-LO

The output signal for the in-service Pressurizer Pressure controller is 80% and STEADY. Pressurizer pressure is at 1990 psia and slowly lowering. Both Pressurizer Spray valves RED and GREEN lights are ON. No operator actions have been taken.

As the Control Room Supervisor, you should take which ONE of the following sequences of actions?

- a.
 - Direct tripping of the Reactor.
 - Direct tripping ALL PCPs.
 - Go to EOP-1.0, "Standard Post Trip Actions".
- b.
 - Go to ONP-18, "Pressurizer Pressure Control Malfunctions" .
 - Direct the NCO to manually LOWER Pressurizer Pressure controller output to restore Pressurizer pressure.
- c.
 - Direct tripping of the reactor.
 - Direct tripping of PCPs P-50B and P-50C.
 - Go to EOP-1.0, "Standard Post Trip Actions" .
- d.
 - Go to ONP-18, "Pressurizer Pressure Control Malfunctions".
 - Direct the NCO to manually RAISE Pressurizer Pressure controller output to restore Pressurizer pressure.

Senior Reactor Operator

Question No. 85

The plant is operating at 20% power when the following alarm annunciates:

EK-0905, "Shutdown Rod Position Abnormal"

The alarm is determined to be valid. Which one of the following documents provides the required actions on how to operate the Control Rod Drive System to correct this alarm condition?

- a. SOP-34, Plant Process Computer
- b. ONP-5.1, Control Rod Drop
- c. SOP-6, Reactor Control System
- d. Operating Requirements Manual

Senior Reactor Operator

Question No. 86

Given the following conditions:

- The plant was at 48% power when a Large Break LOCA inside containment occurred.
- As the Control Room Supervisor you are implementing EOP-4.0, "Loss of Coolant Accident Recovery".
- The Shift Engineer then reports that indications also exist that a steam line break is occurring on "A" S/G.
- After directing confirmation of this report, a Main Steam line break on "A" S/G is confirmed by the crew.

Which ONE of the following procedural actions should be taken?

- a. Go to EOP-9.0, "Functional Recovery Procedure" and direct actions per the procedure to address all safety functions.
- b. Complete appropriate actions in EOP-4.0; exit EOP-4.0 and transition to EOP-6.0, "Excess Steam Demand Event".
- c. Continue actions in EOP-4.0 and concurrently perform the actions as prescribed by EOP-6.0, "Excess Steam Demand Event".
- d. Go to EOP-6.0 section for isolating "A" S/G, isolate the "A" S/G, and then transition to EOP-9.0 to address remaining safety functions.

Question No. 87

Given the following plant conditions:

- Plant is in MODE 2 with reactor power at 4%.
- P-66B (HPSI) is declared inoperable at 0800 on Tuesday.
- Four (4) hours later at 1200, P-67A (LPSI) is also declared inoperable.
- P-66B is repaired and declared operable on Friday at 0700.

What is the LATEST time which P-67A must be declared operable?

- a. 0800 on Friday
- b. 1200 on Friday
- c. 0800 on the following Tuesday
- d. 1200 on the following Tuesday

Question No. 88

What is the Technical Specification requirement for the number of qualified CETs per core quadrant and the BASIS for the requirement?

- a. One per quadrant to provide indication of the approach to inadequate core cooling conditions.
- b. Four per quadrant to provide indication of the approach to inadequate core cooling conditions.
- c. One per quadrant to provide indication of Low Temperature Overpressure Protection entry conditions.
- d. Four per quadrant to provide indication of Low Temperature Overpressure Protection entry conditions.

Senior Reactor Operator

Question No. 89

Given the following conditions:

- The plant was at 75% power when ONE main feed pump tripped.
- Power is being reduced rapidly.
- A S/G level is 35% and starting to trend upward.
- B S/G level is 37% and starting to trend upward.
- A S/G feed flow is 3.4 E6 lbm/hr
- B S/G feed flow is 3.4 E6 lbm/hr
- A S/G steam flow is 3.3 E6 lbm/hr
- B S/G steam flow is 3.3 E6 lbm/hr

What is the appropriate course of action for the above conditions?

- a. Ensure reactor is tripped, since this should have already occurred automatically.
- b. Stop the power reduction and stabilize steam generator levels at current levels to avoid adding excessive positive reactivity.
- c. Stop the power reduction and return levels slowly to programmed levels to avoid adding excessive positive reactivity.
- d. Continue the power reduction until steam generator levels are back to programmed levels to avoid a low level trip.

Question No. 90

The reactor is being refueled when an irradiated fuel assembly becomes stuck approximately two feet above the core support assembly. In the process of trying to free the stuck assembly, it drops into the core. The IMMEDIATE action to evacuate the area has been performed.

Which procedure is being implemented?

- a. ONP-25.2, "Alternate Safe Shutdown Procedure"
- b. ONP-23.3, "Loss of Refueling Water Accident"
- c. ONP-11.2, "Fuel Handling Accident"
- d. ONP-11.1, "Fuel Cladding Failure"

Senior Reactor Operator

Question No. 91

Given the following conditions:

- The Primary Coolant System (PCS) is being heated up with Primary Coolant Pumps P-50A and P-50C in service.
- All required checklists have been completed.
- PCS cold leg temperatures are 222°F.
- Pressurizer water temperature is 250°F.
- All pressurizer heaters are energized.
- PCS heatup rate is 25°F/hour.

Which of the following actions should be taken?

- a. Slow the PCS heatup until the pressurizer is at least 50°F above PCS temperature.
- b. Slow the Pressurizer heatup until the PCS is within 25°F of the Pressurizer temperature.
- c. Secure the PCS heatup and notify the Shift Supervisor of the PCS heatup rate violation.
- d. Continue heatups, maintaining PCS temperature between 25°F and 50°F below Pressurizer temperature.

Question No. 92

What is the Safety Limit for PCS pressure for the plant in MODE 4?

- a. 2235 psia
- b. 2375 psia
- c. 2650 psia
- d. 2750 psia

Question No. 93

Following a plant transient, EOP-9.0, "Functional Recovery Procedure" is entered. The following Safety Functions are determined to be JEOPARDIZED:

- Heat Removal (HR)
- Containment Atmosphere (CA)
- Pressure Control (PC)
- Inventory Control (IC)

All other Safety Functions are satisfied. The crew should first address ...

- a. Heat Removal (HR)
- b. Containment Atmosphere (CA)
- c. Pressure Control (PC)
- d. Inventory Control (IC)

Senior Reactor Operator

Question No. 94

A Main Steam Line Break outside of containment and upstream of the MSIV for "A" S/G has occurred and the "A" S/G has blown dry. An Auxiliary Operator has been directed to perform the actions outside the Control Room necessary for isolation of "**A**" S/G.

If the Auxiliary Operator mistakenly isolates "**B**" S/G, what effect will this action have on the Control Room's ability to mitigate this event?

- a. No effect due to the crosstie line between "A" and "B" main steam lines.
- b. No effect since the Control Room can use the Turbine Bypass Valve for PCS Heat Removal.
- c. The Control Room has lost the ability to control PCS temperature using the ADVs.
- d. The Control Room can no longer control PCS pressure.

Senior Reactor Operator

Question No. 95

A point source in the auxiliary building is reading 500 mrem/hr at distance of two (2) feet. Two options exist to complete rework on a valve near this radiation source.

Option 1: Operator X can perform the assignment in thirty (30) minutes working at a distance of four (4) feet from the point source.

Option 2: Operators Y and Z, who have been trained in the use of a special extension tool can perform the same task in seventy-five (75) minutes at a distance of eight (8) feet from the point source.

Which of the following options is preferable and consistent with the ALARA program?

- a. Option 1 since X' s exposure is 31.25 mrem.
- b. Option 1 since X' s exposure is 62.50 mrem.
- c. Option 2 since the exposure per person is 39.06 mrem.
- d. Option 2 since the exposure per person is 78.12 mrem.

Question No. 96

When the top two (2) feet of the Reactor Core becomes uncovered ...

- a. CETs will indicate that saturated conditions exist.
- b. CETs will indicate that superheated conditions exist.
- c. incore NI readings will indicate abnormally low.
- d. excore NI readings will indicate abnormally low.

Question No. 97

The purpose of the fusible link on a fire door is to ...

- a. allow opening and closing of the fire door without setting off the sprinklers.
- b. hold the fire door closed under normal conditions, but allow door to be opened during a fire.
- c. hold the fire door open under normal conditions, but allow door to close during a fire.
- d. ensure the fire door remains open for personnel escape during a fire in the area.

Question No. 98

Which of the following evolutions would be considered a "Core Alteration" by Technical Specifications?

- a. Removing the Upper Guide Structure from the Reactor Vessel.
- b. Removing the incore detectors from the Reactor vessel.
- c. Uncoupling all control rods in Shutdown Rod Group "B".
- d. Transferring a control rod between the Reactor vessel and Spent Fuel Pool.

Senior Reactor Operator

Question No. 99

Given the following conditions:

- A RESTORE TO SERVICE Switching and Tagging Order (STO) has been issued.
- The AO performing the STO reports that two (2) of the tags are inside a contaminated area.

Which of the following methods is prescribed by AP-4.10, Personnel Protective Tagging, to ensure that the correct tags have been removed?

- a. A second AO shall enter the contaminated area and verify tag removed from component.
- b. The tags shall be bagged and cleared out of the RCA for verification.
- c. The AO should read each removed tag verbatim to the NCO over the telephone.
- d. A Radiation Service Technician should enter the contaminated area and verify the tag removal.

Senior Reactor Operator

Question No. 100

An operator in the RCA exits via the SIRW roof to the Turbine Deck.

What are the normal contamination monitoring requirements when using this exit?

- a. Perform a hand and foot frisk AND proceed to Access Control to use the PCM-1B.
- b. Don shoe covers and gloves AND proceed to Access Control to use the PCM-1B.
- c. A frisk is NOT required, but proceed to Access Control to use the PCM-1B.
- d. Perform a whole body frisk when exiting and notify Health Physics technician.

WRITTEN QUESTION DATA SHEET

Question Number: 1**Tier/Group:** SRO RO

K/A: 000024 Emergency Boration / 1 K3.02
Knowledge of the reasons for the following responses as they apply to the Emergency Boration:
Actions contained in EOP for emergency boration.

Importance Rating: SRO 4.4 RO 4.2**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions and references, determine if the criteria of the in-use EOP Safety Function status checksheets are satisfied and any additional actions that would be required. (TBAA0A2.03)

References: EM-04-08, 7.6, rev 24 LP-TBAA LP-TBAF**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Plausible since there are Shutdown Margin restrictions based on the number of Primary Coolant Pumps operating. There are specific restrictions if less than four PCPs are operating.
- b. Plausible since there are Shutdown Margin restrictions based on the number of Primary Coolant Pumps operating. Candidate may believe that the "trip two, leave two" applies here.
- c. **Correct** - There are several locations in the EOPS that specifically allow commencing a cooldown only IF emergency boration is in progress, and even though SDM has not been verified.
- d. Plausible since control rods are a key factor in Reactivity Control. Candidate may believe that if all control rods are in, this would be the most appropriate verification of SDM.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 2**Tier/Group:** SRO RO

K/A: 000055 Station Blackout / 6 (PRA) K1.01
Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Effects of battery disch rates on capacity

Importance Rating: SRO 3.7 RO 3.3**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions, determine what actions are necessary to maintain the Station Batteries IAW EOP Supplements 7 and 8. (TBARG28.01)

References: EOP-3.0 Basis DBD-4.01**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly selects 4 hours, possibly due to 4 hours being the design time limit for batteries to provide power to required equipment.
- b. Candidate incorrectly selects 2 hours, possibly due to 2 hours being a time parameter given in EOP-3.0 for heat removal capability using a non-electrically powered means.
- c. **Correct**
- d. Candidate incorrectly selects 10 minutes, possibly due to 10 minutes being a decision point in EOP-3.0 on when and how to restore Diesel Generators.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 3**Tier/Group:** SRO RO**K/A:** 063 DC Electrical Distribution K3.02

Knowledge of the effect that a loss or malfunction of the DC electrical system will have on the following: Components using DC control power.

Importance Rating: SRO 3.7 RO 3.5**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions, identify the expected plant responses for the following: (TBAQG10.01)

c. Loss of DC Power

References: ONP-2.3**Source of Question:** Palisades Bank 5335 (direct)**DISTRACTOR ANALYSIS**

- a. May select since D-11-1 is one of the six vital DC buses.
- b. May select since D-11-2 is one of the six vital DC buses.
- c. May select since D-21-1 is one of the six vital DC buses.
- d. **Correct** - Most CR alarms are powered from this DC bus.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 4**Tier/Group:** SRO RO

K/A: 064 Emergency Diesel Generator K4.08
Knowledge of ED/G system design feature(s) and/or interlock(s) which provide for the following:
ED/G fuel isolation valves.

Importance Rating: SRO 3.5 RO 2.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given a diagram of the diesel generator fuel oil system with the status of the valves indicated, determine if the belly tank level is being controlled manually or automatically IAW SOP-22. (ISBBG12.02)

References: M-214, sh. 1 SOP-22, Att. 8 LP-ISBB, 6.3**Source of Question:** Palisades Bank 1483 Direct**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes throttling (closing or opening) a valve upstream may somehow correct the problem.
- b. While this method is physically possible, it is not procedurally allowed, nor would it provide a positive means of controlling level.
- c. Manual readjustment of the setpoint may be possible, however, it is not procedurally prescribed, nor would it provide a means of controlling level at the prescribed setpoint.
- d. **Correct** - A design feature that allows bypassing level control valve.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 5**Tier/Group:** SRO RO**K/A:** 062 AC Electrical Distribution A1.01

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the ac distribution system controls including: Significance of D/G load limits.

Importance Rating: SRO 3.8 RO 3.4**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Determine the consequences of failing to comply with SOP-22 Precaution and Limitation, or Plant Requirement section item. (ASAC0G7.09)

References: SOP-22, Caution on p. 33, rev 31 DBD-501, 3.2.1.1, DBD 5.06, 3.2.1, 3.2.5**Source of Question:** Palisades Bank 9093 (direct)**DISTRACTOR ANALYSIS**

- a. May select since trip circuitry does require power, however candidate incorrectly believes the diesel generator is the source of that power.
- b. **Correct** - Per SOP-22 CAUTION, generator may motor if load is any lower than 50 kW.
- c. Overspeed is a concern when unloading the diesel generator, however, candidate incorrectly concludes it is always a concern when above 50kW load.
- d. Candidate correctly understands there are interlocks associated with the diesel generator output breaker, but incorrectly applies them here.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 6**Tier/Group:** SRO RO**K/A:** 2.4.11 Knowledge of abnormal condition procedures**Importance Rating:** SRO 3.6 RO 3.4**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving a visual tornado sighting, visible sign of rising lake level or other communicated alert, respond IAW ONP-12. (TBAKT00.02) (IOTFT.46)

Given symptoms associated with a specific Off Normal event, describe the mitigating strategy and the basis for the mitigating strategy IAW the Off Normal Procedure. (IOTFK.05)

References: ONP-12, 4.2**Source of Question:** Palisades Bank PR2-29 (direct)**DISTRACTOR ANALYSIS**

- a. Neither should be paralleled.
- b. Neither should be paralleled.
- c. DGs should be ready to load in UNIT mode.
- d. **Correct** - DGs should be ready to load in UNIT mode, but not paralleled.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 7**Tier/Group:** SRO RO**K/A:** 004 Chemical and Volume Control K2.06
Knowledge of bus power supplies to the following: Control instrumentation.**Importance Rating:** SRO 2.7 RO 2.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given various plant conditions, one or more of the following annunciators in the alarmed condition.

(ASAB0G9.01)

- a. Identify the alternate 125 VDC, Preferred AC and Instrument AC System annunciators that can be used to verify a given alarm
- b. Describe the effect of valid alarm conditions on the operation of the 125 VDC, Preferred AC and Instrument AC System

Draw the Instrument and Preferred AC/DC Electrical System and Interfaces.

(ASAB0K1.01)

References: ONP-24.1**Source of Question:** Palisades Bank 5284 Direct**DISTRACTOR ANALYSIS**

- a. **Correct** - Y-10 loss would result in all these indications.
- b. Candidate improperly diagnoses failure of a Preferred AC Bus.
- c. Candidate improperly diagnoses failure of a Preferred AC Bus.
- d. Candidate improperly diagnoses failure of a Preferred AC Bus.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 8**Tier/Group:** SRO RO**K/A:** 013 Engineered Safety Features Actuation A2.04

Ability to:

- a. predict the impacts of the following malfunctions or operations of the ESFAS and
- b. based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions. Loss of Instrument Bus

Importance Rating: SRO 4.2 RO 3.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions and a failure, malfunction, or incorrect operation of any given Safety Injection System component, predict the impact on the operation of the Safety Injection System. ASHA0A2.01

References: ONP-24.3**Source of Question:** Palisades Bank 2000CERT Q64 (direct)**DISTRACTOR ANALYSIS**

- a. Left channel equipment must be manually operated. Select since depressing the left channel initiate pushbutton will work as long as power is available.
- b. **Correct** - SIAS actuation relays are energized to actuate. Since Y-30 supplies power to the left channel, these relays will not actuate automatically nor when the left channel initiate pushbutton is depressed.
- c. Y-30 supplies left channel. Select since this is similar to choice "a" except the opposite train.
- d. Y-30 supplies left channel. Select since this would be correct except for the opposite train.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 9**Tier/Group:** SRO RO

K/A: 000058 Loss of DC Power / 6 K3.02
knowledge of the reasons for the following response as they apply to the Loss of DC Power:
Actions contained in EOP for loss of dc power.

Importance Rating: SRO 4.2 RO 4.0**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions, determine the consequences of failing to perform any step or complying with any Caution within the applicable procedure for the following: (TBAQ0K6.01)

c. Loss of DC Power

References: ONP-2.3, 4.1.c M-201, sh. 1, sh. 1B**Source of Question:** Palisades Bank PR1-C50 (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly thinks containment isolation is the primary concern, when actually the containment isolation valve (CV-2009) has already isolated.
- b. **Correct** - The Letdown Stop Valves are upstream of RV-2006 and will isolate the RV.
- c. Candidate correctly recalls that CV-2009 is a containment isolation; however it has already failed closed on loss of DC. Further, a manual action to close CV-2009 (IF it were open) would only exacerbate this problem since RV-2009 is upstream of CV-2009.
- d. Candidate incorrectly believes that CV-2009 is upstream of RV-2006.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 10**Tier/Group:** SRO RO**K/A:** 027 Containment Iodine Removal K2.01
Knowledge of the bus power supplies to the following: Fans.**Importance Rating:** SRO 3.4 RO 3.1**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving a loss of AC power, DC power or Instrument Air to any given Purge and Ventilation System component and P&IDs and/or electrical schematics, predict the effects on the Purge and Ventilation System. (ASDB0K4.17)

References: SOP-24 E-4, sh. 1**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes that Iodine Removal Fans must be powered from the Left Channel safeguards power. (52-131 = the digit "1" indicates 480V left channel power.)
- b. Candidate incorrectly believes that Iodine Removal Fans must be powered from the Right Channel safeguards power. (52-211 = the digit "2" indicates 480V right channel power.)
- c. **Correct** - Candidate understands that this can be the only correct answer by recalling that a digit "9" indicates breakers on MCC-9 which is in containment. The Iodine Removal Fans are located in containment.
- d. Candidate incorrectly believes that Iodine Removal Fans are powered from a safety bus which does power some containment fans, but these are Containment Air Cooler fans (large motors which require 2400V system to operate). Iodine Removal Fans are smaller motors and require only 480V to operate.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 11

Tier/Group: RO

K/A: 000057 Loss of Vital AC Elec. Inst. Bus / 6 G 2.1.28
Knowledge of the purpose and function of major system components and controls

Importance Rating: SRO 3.3 RO 3.2

10CFR55 Content: SRO RO

Palisades Training Objective:

Given a loss of power to MCC-1 or MCC-2, explain how the Instrument AC bus Y-01 would remain powered. (ISBA0G4.07)

References: DBD 3.02, 3.2.4 SOP-30, 7.6.2 and Attachment 1**Source of Question:** Palisades Bank 11747 Direct**DISTRACTOR ANALYSIS**

- a. There is a "power-seeking" function on the Y-50 ABT, but the alternate power sought is NOT from the bypass regulator.
- b. There is a "power-seeking" function on the Y-50 ABT, but it is not functional in "Emergency" mode.
- c. Candidate incorrectly believes the "Emergency" power source is from the left channel (Bus 1C) safeguards power.
- d. **Correct** - "Emergency" power source is lost when Bus 1D de-energizes.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** SOP-30, Attachment 1 (drawing of Y-50 Automatic Transfer Sw.)

WRITTEN QUESTION DATA SHEET

Question Number: 12**Tier/Group:** SRO RO**K/A:** 075 Circulating Water K2.03
Knowledge of bus power supplies to emergency/essential SWS pumps**Importance Rating:** SRO 2.7 RO 2.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

List the power supplies for the following: (ISDA0K2.01)

- a. Service Water Pumps P-7A/B/C.
- b. Seal Oil Service Water Booster Pump P-44 (references allowed).
- c. Service Water Booster Pumps P-25A/B/C (references allowed).

References: P&ID, E-1, sh.1**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly recalls power supplies.
- b. Candidate incorrectly recalls power supplies.
- c. **Correct** - P-7A is powered from Safety Bus 1D; P-7B is powered from the other train of safeguards power: Bus 1C.
- d. Candidate incorrectly recalls power supplies.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 13**Tier/Group:** SRO RO**K/A:** 076 Service Water A2.02

Ability to:

- a. predict the impacts of the following malfunctions or operations on the SWS
- b. based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: service water header pressure.

Importance Rating: SRO 3.1 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving a loss of Service Water and Control Room references, determine the cause of the loss including the location of any Service Water leaks, if applicable. 062AA2.03/02 (IOTFK.10)

References: ARP-7, 49 DBD-1.02, 3.3.6.2**Source of Question:** Palisades Bank 10820 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - Standby pump starts at 40 psig at pump discharge pressure.
- b. Candidate recognizes that 35 psig is below the Standby start pressure, however, with a header pressure of 35 psig, the pressure at the discharge of each running Service Water pump would be above the Standby auto start pressure.
- c. Candidate recognizes that 35 psig is below the Standby start pressure, however, with a header pressure of 35 psig, the pressure at the discharge of each running Service Water pump would be above the Standby auto start pressure.
- d. May select due to incorrect belief that this is the sensing location for the low pressure.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 14

Tier/Group: SRO RO

K/A: 000062 Loss of Nuclear Service Water / 4 A2.02
 Ability to determine and interpret the following as they apply to the Loss of Nuclear Service Water:
 The cause of possible SWS loss

Importance Rating: SRO 3.6 RO 2.9

10CFR55 Content: SRO RO

Palisades Training Objective:

Given Plant conditions involving a loss of Service Water, CCW, or Instrument Air (including system leaks) and Control Room references, determine: (TBAI0K6.01)
 The probable cause (including the location of the leak if applicable)

References: ONP-6.1, 4.2.b Operator Aid OA-136

Source of Question: Palisades Bank 8058 (significantly modified)

DISTRACTOR ANALYSIS

- a. **Correct** - This scenario was actually run using the Simulator and the amps match the break location.
- b. CV-0844 is the isolation valve for one of the SW critical headers, and is ALREADY open. Candidate may select thinking because the valve fails open on loss of air (fails safe), this would cause higher amps indication.
- c. CV-1359 fails closed on loss of instrument air. The effect, if any, would mean LESS work for the inservice Service Water pumps, and therefore reduced amps. Candidate may select mistakenly thinking this valve fails open on loss of air.
- d. A partially plugged basket strainer would mean reduced flow (and less work) through the pump, therefore fewer amps. Candidate may select incorrectly believing the pump is "having to do more work" due to a partially plugged strainer.

Difficulty Rating: 2

Cognitive Level: High ✓ Low

References Supplied to Candidate: Operator Aid OA-136

WRITTEN QUESTION DATA SHEET

Question Number: 15**Tier/Group:** SRO RO**K/A:** 022 Containment Cooling K1.02

Knowledge of the physical connections and/or cause-effect relationships between the CCS and the following systems: SEC/remote monitoring systems.

Importance Rating: SRO 3.5 RO 3.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**Given various Plant conditions and one or more of the following annunciators in the alarmed condition:
(ASBB0G9.02)

- Identify any alternate SW system indications that can be used to verify a given alarm.
- Describe the effect of valid alarm conditions on the operation of the SW System.
- Use applicable Control Room references to determine the required actions.

References: ARP-8, window 47 M-208, sh. 1A, 1B**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- Candidate correctly selects a component inside containment, however Shield Cooling is NOT cooled by Service Water.
- Candidate correctly selects a condition that requires more Service Water flow, however the flow is NOT in and out of containment (it is through the CCW Heat Exchangers).
- Candidate reasons that the Containment Air Coolers (which use Service Water) are designed to limit containment pressure during a MSLB, and therefore flow must be greater. However the function of FS-0885 is for leak detection (delta flow in and out of containment), not total system flow detection alone.
- Correct** - This instrument compares SW flow going in to Containment to going out.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** M-208, sh. 1A, 1B (excerpts) *Ensure FS-0885 is highlighted on the provided P&ID.*

SENIOR REACTOR OPERATOR

Palisades 2001 NRC Initial License Exam

WRITTEN QUESTION DATA SHEET

Question Number: 16

Tier/Group: SRO RO

K/A: 000026 Loss of Component Cooling Water / 8 (PRA) G 2.4.24
Knowledge of loss of cooling water procedures

Importance Rating: SRO 3.7 RO 3.3

10CFR55 Content: SRO 55.43(b) RO 55.41(b)

Palisades Training Objective:

Given Plant conditions involving the symptoms of a Loss of CCW, respond IAW ONP-6.2. TBAIT00.02

References: ONP-6.2 LP-TBAI DBD-1.04, 5.2.2

Source of Question: Palisades Bank 2000CERT28 (direct)

DISTRACTOR ANALYSIS

- a. Any charging pump can be operated. Plausible since P-55A is the charging pump normally used if plant is on Shutdown Cooling.
- b. P-55B and P-55C oil coolers are cooled by CCW. Select since only 5 gpm CCW flow is required.
- c. P-55A trips on high temperature. Select since pumps will cycle on and off to maintain level if in auto and level lowers.
- d. **Correct** - P-55A will trip on high fluid drive temperature of 150°F.

Difficulty Rating: 2

Cognitive Level: High ✓ Low

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

Question Number: 17**Tier/Group:** SRO RO**K/A:** 011 Pressurizer Level Control A4.01
Ability to manually operate and/or monitor in the control room: Charging pump and flow controls.**Importance Rating:** SRO 3.2 RO 3.5**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the two modes of CVCS operation for maintaining PZR level when the variable speed charging pump is out of service. (ASFAG12.04)

References: GOP-13, Att. 1 FSAR 9.10-12 & 13 SOP-2A, 7.3.5, Att. 2 DBD 1.04, p. 19-20**Source of Question:** Palisades Bank 4944 Direct**DISTRACTOR ANALYSIS**

- a. Candidate may select with an incorrect understanding of the anti-pump function, believing that P-55C is cycling on and off (which it is); however, if an anti-pump lockout has not been reset, then the pump would not run at all.
- b. Candidate may select, since PIC-0202 does affect letdown pressure/flow, but incorrectly applies it here. The distractor information is not specific enough to apply to the regular cycling of Pressurizer level given in the stem conditions.
- c. **Correct** - This is also known as Option 1 CVCS operation.
- d. Candidate may select, since the backup PZR level control program does affect Pressurizer level; however, the backup signal malfunction information is not specific enough to apply to the regular cycling of Pressurizer level given in the stem conditions.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 18**Tier/Group:** SRO RO**K/A:** 004 Chemical and Volume Control K6.13

Knowledge of the effect of a loss or malfunction on the following CVCS components: Purpose and function of the boration/dilution batch controller.

Importance Rating: SRO 3.3 RO 3.1**10CFR55 Content:** SRO RO**Palisades Training Objective:**

State the Immediate Actions for an uncontrolled primary coolant dilution as specified in ONP-BANG11.01

References: ONP-8**Source of Question:** Palisades Bank PRAC1 55 Direct**DISTRACTOR ANALYSIS**

- a. Reactor trip is not required and is not an immediate action.
- b. Stopping pumps is only performed if closing CV-2165 fails to stop dilution and is not an immediate action.
- c. Emergency boration is not required and is not an immediate action.
- d. **Correct** - Immediate actions per ONP-18 are to close CV-2165 and stabilize power with rods.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 19**Tier/Group:** SRO RO

K/A: 000022 Loss of Reactor Coolant Makeup / 2 A1.03
Ability to operate and/or monitor the following as they apply to the Loss of Reactor Coolant Pump Makeup: PZR level trend.

Importance Rating: SRO 3.2 RO 3.2**10CFR55 Content:** SRO RO**Palisades Training Objective:** ASFA0A2.01

Given Plant conditions and a failure, malfunction, or incorrect operation of any given CVCS System component, predict the impact on the operation of the CVCS System. (ASFA0A2.01)

References: SOP-2A, 7.3.1**Source of Question:** Palisades Bank 12129 Direct**DISTRACTOR ANALYSIS**

- a. **Correct** - PCP bleedoff goes into VCT, and exits PCS.
- b. Candidate incorrectly believes that since there is no charging and no letdown, Pressurizer level should remain stable. However, there is approximately 4 gpm leaving the PCS through Primary Coolant Pump seal bleedoff.
- c. Candidate correctly believes that inventory is leaving the PCS, but is incorrect in where that inventory is going.
- d. Candidate is correctly believes that the VCT is receiving inventory, but fails to make the connection that this inventory is coming from the PCS.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 20**Tier/Group:** SRO RO**K/A:** 000028 Pressurizer Level Malfunction / 2 K3.02

Knowledge of the reasons for the following responses as they apply to the Pressurizer Level Control Malfunctions: Relationships between PZR pressure increase and reactor makeup/letdown imbalance.

Importance Rating: SRO 3.2 RO 2.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions involving a malfunction of the Pressurizer Level Control System or its inputs:
(ASFD0A2.02)

- a. Determine the effect on Pressurizer level.
- b. Describe the actions required to maintain/control Pressurizer level.

References: SOP-2A ARP-4, window 61**Source of Question:** Palisades Bank 99NRC - 2 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - Must determine that a ruptured diaphragm on LT-0101A results in indicated level going high. This will cause indicated level to be greater than program, causing an increase in letdown and a decrease in charging. Backup heaters only receive a signal if in AUTO.
- b. Candidate incorrectly determines that pressurizer level will fail low with the ruptured diaphragm and selects the correct response to a low failure.
- c. Candidate incorrectly determines that pressurizer level will fail low and fails to recognize that if level failed low all orifice valves would close.
- d. Candidate incorrectly determines status of orifice block valves despite determining correct response of level to diaphragm failure.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 21**Tier/Group:** SRO RO

K/A: 072 Area Radiation Monitoring K1.04
Knowledge of the physical connections and/or cause-effect relationships between the ARM system and the following systems: control room ventilation.

Importance Rating: SRO 3.5 RO 3.3**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given a picture of the Control Room HVAC controls, describe the operation/function of any given Control Room HVAC System control. (ASHF0G4.03)

References: DBD 1.06, 3.3.14.1 SOP-24, p. 49-50, rev 32 LP-ASHF, p.13-14, rev 10**Source of Question:** Palisades Bank 8066 Direct**DISTRACTOR ANALYSIS**

- a. The most incorrect of all the distractors. Candidate may select, however, since there is a functional relationship between accidents resulting in a CHP or CHR, and the function of the Control Room HVAC system. Candidate misapplies this relationship.
- b. **Correct** - For CR HVAC and cooling.
- c. Candidate may select since the function of "override" given in the distractor is correct, and that a manual start is then available; however, candidate incorrectly believes that it is a load shed signal that caused VC-10 to trip.
- d. Candidate correctly determines the switch overrides a CHP/CHR signal, but applies an interlock requirement that does not exist.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 22**Tier/Group:** SRO RO**K/A:** 000061 ARM System Alarms / 7 A2.05

Ability to determine and interpret the following as they apply to the Area Radiation Monitoring (ARM) System Alarms: Need for area evacuation; check against existing limits.

Importance Rating: SRO 4.2 RO 3.5**10CFR55 Content:** SRO RO**Palisades Training Objective:**Given various plant conditions and one or more of the following annunciators in the alarmed condition:
(ASDC0G9.01)

EK-1366, Plant Area Monitoring High Radiation

References: HP-2.8, Sect. 5.7.2**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly applies what appears to be a conservative action.
- b. Candidate selects because a gamma survey appears to be a viable action, along with confirming the validity of an alarm.
- c. Candidate incorrectly applies an action that may apply for other plant situations, but fails to realize that conditions could change significantly in a period of 30 days.
- d. **Correct** - Must consult with SS and Duty HP before taking such drastic action as evacuating the Control Room.

Difficulty Rating: 4**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 23**Tier/Group:** SRO RO**K/A:** 000067 Plant Fire On-site / 9 K3.04Knowledge of the reasons for the following responses as they apply to the Plant Fire on Site:
Actions contained in EOP for plant fire on site**Importance Rating:** SRO 4.1 RO 3.3**10CFR55 Content:** SRO 55.43(b) RO 55.41(b)**Palisades Training Objective:**

Given plant conditions involving an Alternate Safe Shutdown, determine the consequences of failing to perform any given step contained within ONP-25.2. TBAM0K6.02

References: LP-TBAM ONP-25.2 EOP Supplement 19**Source of Question:** Palisades Bank 99NRC6 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes that station concerns with limited supplies of feedwater would be minimized if water was put in S/G as soon as possible.
- b. Candidate incorrectly believes that subcooling may become an issue due to natural circulation condition.
- c. **Correct** Pressurizer insurges and outsurges, due to feeding at maximum rates and then minimum rates when the S/G reaches the upper end of its level range (causing temperature swings in the PCS) would make PCS inventory and pressure control difficult.
- d. Candidate incorrectly believes that thermal stresses on the S/G are an issue, when they are more likely to be an issue only if a S/G had been allowed to dry out.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 24**Tier/Group:** SRO RO**K/A:** 061 Auxiliary/Emergency Feedwater A3.03

Ability to monitor automatic operation of the AFW, including: AFW S/G level control on automatic start.

Importance Rating: SRO 3.9 RO 3.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the function and operation of the following AFW controllers.

(ASLDG12.09)

- a. FIC-0727, 0749, 0736A, 0737A (C-01 panel)

References: LP-ASLD SOP-12, 4.7, 7.3.3 SOP-12, Attachment 2, 1.e DBD-1.03, p. 64**Source of Question:** Palisades Bank 8837 (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate believes "AUTO" function will control a set Aux Feed flow, but incorrectly selects 100 gpm as the amount of flow. May select since 100 gpm is a low flow auto start setpoint for the steam driven Aux Feed Pp.
- b. **Correct** - Design of the system controllers.
- c. Candidate selects the correct amount of design flow (165 gpm), but fails to realize the importance of having 165 gpm immediately and automatically selected as the auto flow control setpoint..
- d. Candidate correctly selects "CASCADE" as the mode of auto flow control, but incorrectly believes 100 gpm is adequate design Aux Feed flow. May select since 100 gpm is a low flow auto start setpoint for the steam driven Aux Feed Pp.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 25**Tier/Group:** SRO RO**K/A:** 010 Pressurizer Pressure Control A4.01
Ability to manually operate and/or monitor in the control room: PZR spray valve.**Importance Rating:** SRO 3.5 RO 3.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions, determine the response of the Pressurizer Pressure Control System to control PCS pressure at set point. (ASFE0A4.01)

References: FSAR 4.3.7**Source of Question:** Palisades Bank 8813 Direct**DISTRACTOR ANALYSIS**

- a. Candidate reverses the relationship between spray function and pressure response. Also may select, believing that since the setpoint is now 2240 psia, more spray is needed to reduce pressure.
- b. **Correct** - A higher pressure setpoint would cause the controller to call for less spray.
- c. May select, believing since the setpoint is now high (and pressure will be rising), that less heater input is required.
- d. May select, believing since the setpoint is now high (and pressure will be rising), that less heater input is required.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 26**Tier/Group:** SRO 1/1 RO 1/1**K/A:** 000051 Loss of Condenser Vacuum / 4 K3.01

Knowledge of the reasons for the following responses as they apply to the Loss of Condenser Vacuum: Loss of steam dump capability upon loss of condenser vacuum

Importance Rating: SRO 3.1 RO 2.8**10CFR55 Content:** SRO 55.43(b) RO 55.41(b)**Palisades Training Objective:**

State the purpose for the connection/relationship between the Main Steam System and the following:

e. Main Condenser Vacuum

ASJB0K1.01

References: SOP-7, 7.4.7 note prior to step a, rev 39
LP-ASJB, rev 10

DBD 1.09, p. 15, 44, rev 2

Source of Question: Palisades Bank PR1 - 45 (direct)**DISTRACTOR ANALYSIS**

- a. Turbine trips at pressure of approximately 21" Hg vac. TBV is still available.
- b. **Correct** Setpoint of 5" Hg vac protects the condenser from an overpressure condition.
- c. Feed pump trips at pressure of approximately 15" Hg vac. TBV is still available.
- d. Hood sprays are normally aligned. Not operated by condenser vacuum.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 27**Tier/Group:** SRO RO**K/A:** 039 Main and Reheat Steam K4.04

Knowledge of MRSS design feature(s) and/or interlock(s) which provide for the following:
Utilization of steam pressure program control when steam dumping through atmospheric relief/dump valves, including Tave limits.

Importance Rating: SRO 3.1 RO 2.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions and available Control Room references (when applicable): (ASJB0K4.04)

- a. Determine which of the following valves will open to relieve secondary steam pressure:
1. steam dump valves 2. turbine bypass valve 3. secondary code safeties

References: FSAR 7.5.1.5 LP-ASJB**Source of Question:** Palisades Bank PRAC1-89 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - TBV will be full open, lowering SG pressure to 900 psia. ADVs will be modulating closed as Tave approaches 535 oF.
b. ADVs will be modulating due to being near 535 oF.
c. TBV will be full open, lowering SG pressure to 900 psia.
d. TBV will be full open, lowering SG pressure to 900 psia.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 28**Tier/Group:** SRO RO**K/A:** 2.3.11 Ability to Control radiation releases**Importance Rating:** SRO 3.2 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving a SGTR, identify those factors which are to be considered when establishing priorities for mitigating the consequences of the event. (TBAFG31.01)

References: EOP-5.0 Basis, p. 64**Source of Question:** Palisades Bank 4009 Direct**DISTRACTOR ANALYSIS**

- a. **Correct** - TBV dumps steam to the condenser.
- b. Candidate is correct that this method would conserve condensate inventory, but incorrectly determines that this concern would override radiological release concerns.
- c. Candidate reasons that the TBV permits a "finer" control of cooldown, but incorrectly concludes that design of the ADVs is inadequate for a controlled cooldown, and incorrectly concludes these concerns would override any radiological release concerns.
- d. May select since this is similar to distractor "c", but more complete since it also includes finer control over PCS pressure. However, candidate incorrectly applies this, and incorrectly concludes that these perceived benefits override any radiological release concerns.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 29**Tier/Group:** SRO RO

K/A: 041 K5.02 Steam Dump/Turbine Bypass Control
Knowledge of the operational implications of the use of steam tables for saturation temperature and pressure as it applies to the Steam Dump System.
(Reselected K5.04) - Basis for plant cooldown rates

Importance Rating: SRO 3.1**10CFR55 Content:** SRO 43(b).2**Palisades Training Objective:**

ASEA0G8.02 - Explain the applicable Safety Analysis basis for the following: LCO 3.4.3

References: T.S. 3.4.3, including basis**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. **Correct** - Excessive cooldown is a concern with PTS, and aligns with requirements of Tech Specs.
- b. Candidate recognizes there is a concern with the Reactor vessel; however, candidate fails to apply the Tech Spec limit properly, and further misunderstands the mode of failure that is of concern.
- c. Candidate correctly identifies there is some type of concern with temperature throughout the vessel wall, and further, may select since 6 hours is one of the times included in the LCO 3.4.3 for heatup and cooldown rates; however, this is incorrectly applied.
- d. Candidate correctly identifies there is some type of concern with temperature throughout the vessel wall, but incorrectly recalls a 12 hour completion time.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 30**Tier/Group:** SRO RO

K/A: 000059 K2.01 Accidental Liquid RadWaste Rel. / 9
Knowledge of the interrelations between the Accidental Liquid Radwaste Release and Radioactive liquid monitors.

Importance Rating: SRO 2.8**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given various plant conditions and one or more of the following annunciators in the alarmed condition:
(ASDC0G9.01)

- 1) RIA-08332) RIA-1323
- Identify any alternate radiation monitoring indications which can be used to verify the validity of the alarm.
 - Describe the effect of a valid alarm on the Radiation Monitoring System or plant components.

References: FSAR 14.20 M-208, sh. 1A M-653, sh. 3**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- May select since Service Water discharge is into the Discharge Canal area, however, the RE-0833 is upstream and does not directly interface with canal liquids.
- Correct** - Both monitors are located such that water spillage (and activity) would be detected.
- May select since Service Water discharge is into the Discharge Canal area, however, the RE-0833 is upstream and does not directly interface with canal liquids.
- Candidate may select due to recalling that there is an interface between T-91 and the Aux. Bldg. Sump (which is very near the Evap Control Panel area). However, the interface is only that T-91 has an internal overflow which goes to the Aux Bldg Sump.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 31

Tier/Group: SRO RO

K/A: 000076 High Reactor Coolant Activity / 9 K2.01
Knowledge of the interrelations between the High Reactor Coolant Activity and the following:
Process radiation monitors

Importance Rating: SRO 3.0 RO 2.6

10CFR55 Content: SRO RO

Palisades Training Objective:

Given plant conditions, identify the expected plant responses for the following: (TBALG33.01)

c. High coolant activity

References: ONP-11.1 ARP-4, window 71 LP-TBAL

Source of Question: Palisades Bank 5888 Direct

DISTRACTOR ANALYSIS

- a. Candidate incorrectly concludes PCS activity has entered the secondary system. Given conditions specify NO other off-normal conditions.
- b. Candidate may select since CCW interfaces with several PCS boundary systems. However, given conditions specify NO other off-normal conditions.
- c. **Correct** - Containment and other ventilation would be monitored through the Stack Gas.
- d. Candidate may select since Service Water provides a major load inside containment. However, given conditions specify NO other off-normal conditions.

Difficulty Rating: 2

Cognitive Level: High Low ✓

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

Question Number: 32**Tier/Group:** SRO RO**K/A:** 073 Process Radiation Monitoring K1.01

Knowledge of the physical connections and/or cause-effect relationships between the PRM system and those systems served by PRMs.

Importance Rating: SRO 3.9 RO 3.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the automatic actions initiated by each of the following process monitors upon receipt of a high alarm. (ASDCG12.02)

- b. RIA-0915 (Component Cooling Water Monitor)

References: ARP-8, 65**Source of Question:** Palisades Bank 7735 Direct**DISTRACTOR ANALYSIS**

- a. Candidate may select since the regen heat exchanger is a potential source of contaminated water; however, the cooling medium is NOT CCW (it is charging flow).
- b. Candidate incorrectly believes a higher flow may flush the monitor to restore normal reading.
- c. Candidate incorrectly assumes the makeup source may be responsible for the condition.
- d. **Correct** - Swaps in order to prevent release.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 33**Tier/Group:** SRO RO

K/A: 034 Fuel Handling Equipment K6.02
Knowledge of the effect of a loss or malfunction on the following will have on the Fuel Handling System: Radiation monitoring systems.

Importance Rating: SRO 3.3 RO 2.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the automatic action initiated by the refueling area Monitors RIA-2316 and RIA-2317.
(ASDC0A3.02)

References: SOP-39, p. 10 LP-ASDC**Source of Question:** Palisades Bank 91NRC (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes there is some type of interlock between the monitors. May select, since both monitors perform a function in similar areas of the plant.
- b. **Correct** - When not refueling (cut OUT) a high alarm on these monitors will NOT cause a containment isolation.
- c. When not refueling (cut OUT) a high alarm on these monitors will NOT cause a containment isolation.
- d. Candidate may select and correctly apply a relationship between containment isolation and high radiation while refueling; however, the relationship is incorrectly limited to only Spent Fuel Pool ventilation.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 34**Tier/Group:** SRO RO

K/A: 068 Liquid Radwaste A4.03
Ability to manually operate and/or monitor in the control room: Stoppage of release if limits exceeded.

Importance Rating: SRO 3.8 RO 3.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given various plant conditions and one or more of the following annunciators in the alarmed condition:
(ASDC0G9.01)

- 6) RIA-1049
 - a. Identify any alternate radiation monitoring indications which can be used to verify the validity of the alarm.
 - b. Describe the effect of a valid alarm on the Radiation Monitoring System or plant components.

References: ARP-8, 65**Source of Question:** Palisades Bank 7736 Direct**DISTRACTOR ANALYSIS**

- a. **Correct** - Terminates the batch release.
- b. Candidate incorrectly believes a manual sample is required prior to the decision for terminating the batch.
- c. Candidate may select while recalling there is an interrelationship between the Main Exhaust system and radwaste release; however, it is procedural (certain batch release must be procedurally terminated if Main Exhaust fans trip), and not an interlock.
- d. Candidate may select since there is an automatic trip of V-10, but it is from an Area Radiation Monitor, and NOT from the process radiation monitor RIA-1049.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 35**Tier/Group:** SRO RO

K/A: 071 Waste Gas Disposal K4.06
Knowledge of design feature(s) and/or interlock(s) which provide for the following: sampling and monitoring of waste gas release tanks.

Importance Rating: SRO 3.5 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

State the function of the Waste Gas Processing System. (ISEB0G4.01)

References: SOP-18A M-211, sh. 3**Source of Question:** Palisades Bank 12138 Direct**DISTRACTOR ANALYSIS**

- a. Numerous tanks throughout the plant do have rupture discs, but this does not apply to the Waste Gas Decay Tanks.
- b. Numerous tanks throughout the plant do have rupture discs, but this does not apply to the Waste Gas Decay Tanks.
- c. Candidate correctly selects the type of relieving device, but incorrectly believes the pressure is relieved to containment. There is a portion of the Waste Gas System that does interface with Containment, but not on the Waste Gas Decay Tanks themselves.
- d. **Correct** - There is a relief valve on the tank.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 36**Tier/Group:** SRO RO

K/A: 000060 Accidental Gaseous Radwaste Rel. / 9 K2.01
Knowledge of the interrelations between the Accidental Gaseous Radwaste Release and the following: ARM system, including the normal radiation level indications and operability status.

Importance Rating: SRO 2.9 RO 2.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given a diagram of the RGEM Control Panel, state the function of any given control switch or indicator.
(ASDC0G4.06)

References: SOP-38**Source of Question:** Palisades Bank PRAC1 - C12 Direct**DISTRACTOR ANALYSIS**

- a. Plant exhaust fans continue to operate.
- b. RGEM is not relied upon to generate a Containment Isolation.
- c. **Correct** - RE-2325 and RE-2326 do not isolate.
- d. A high alarm on RE-2326 automatically aligns nearly all the flow through RE-2327 via a splitter, though some flow is maintained through RE-2324 and RE-2326, and a grab sample is automatically take for 15 seconds.

Difficulty Rating: 4**Cognitive Level:** High Low ✓**References Supplied to Candidate:** SOP-38, Attachment 4 (drawing of RGEM panel)

WRITTEN QUESTION DATA SHEET

Question Number: 37**Tier/Group:** SRO RO**K/A:** 000032 Loss of Source Range NI / 7 K2.01

Knowledge of the interrelations between the Loss of Source Range Nuclear Instrumentation and the following: Power supplies, including proper switch positions.

Importance Rating: SRO 3.1 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Remove an excore NI channel from operation IAW SOP-35.

(ASGAT00.03)

References: SOP-35, 7.1.2**Source of Question:** Palisades Bank 2000CERTC72 (direct)**DISTRACTOR ANALYSIS**

- a. NI-3A inputs RPS channels 'A' and 'C'. Select since a channel is placed in trip and a channel is placed in bypass.
- b. **Correct** - NI-3A inputs RPS channels 'A' and 'C'. One must be placed in trip and the other in bypass.
- c. NI-3A inputs RPS channels 'A' and 'C'. Select since a channel is placed in trip and a channel is placed in bypass.
- d. NI-3A inputs RPS channels 'A' and 'C'. Select since a channel is placed in trip and a channel is placed in bypass.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** Provide T.S. Page 3.9.2-1

WRITTEN QUESTION DATA SHEET

Question Number: 38**Tier/Group:** SRO RO**K/A:** 000033 Loss of Intermediate Range NI / 7 G 2.2.30

Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation

Importance Rating: SRO 3.3 RO 3.5**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given available Control Room references and conditions involving Nuclear Instrumentation (includes Quadrant Power Tilt), SELECT the required action(s) and surveillance(s) IAW the following (ASGA0G8.01)

- a. LCO 3.2.3 b. LCO 3.3.7 c. LCO 3.3.8 d. LCO 3.3.9
- e. LCO 3.9.2 f. ORM Table 3.17.6 items 12 and 15
- g. ORM Table 4.17.6 items 12 and 15

References: Tech Spec 3.9.1.1, 3.9.2**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. This action is required immediately by Tech Specs.
- b. This action is required immediately by Tech Specs.
- c. This action is required immediately by Tech Specs.
- d. **Correct** - This action is NOT required by Tech Specs.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 39**Tier/Group:** SRO RO

K/A: 012 Reactor Protection A1.01
Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits)
associated with operating the RPS controls including: Trip setpoint adjustment.

Importance Rating: SRO 3.4 RO 2.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

List the eleven automatic reactor trips and actual trip set points. (ASGC0G4.02)

References: SOP-36 ARP-21, Rack A #1**Source of Question:** Palisades Bank 12148 (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate may select since the VHP Pre-Trip setpoint is correctly 13.5% above reactor power and VHP Trip setpoint is correctly 15% above power, however, candidate selects the incorrect power indication used.
- b. Candidate may select since one of relationships between a value in the distractor (VHP Trip) and one of the reactor power levels given in the stem is a correct number (13.5%); however, the relationship is not applied correctly.
- c. Candidate may select since the VHP Trip value is 15% above the correct reactor power level indication to be used; however, candidate fails to determine the correct VHP Pre-Trip setpoint.
- d. **Correct** - VHP Pre-Trip setpoint is 13.5% above NI power OR delta T (whichever is higher), and the VHP Trip setpoint is 15% above NI power OR delta T (whichever is higher).

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 40**Tier/Group:** SRO RO**K/A:** 000029 K1.03 Anticipated Transient w/o Scram / 1
Knowledge of the operational implications of the effects of boron on reactivity as it applies to the ATWS.**Importance Rating:** SRO 3.8**10CFR55 Content:** SRO 43(b).6**Palisades Training Objective:**

Given transient plant conditions which require a reactor trip and various factors affecting the severity of the transient, determine the impact those factors have on each safety function. TBAB0A2.01

References: EOP-1.0, Basis**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. May select since Emergency Boration is the last provided contingency action for Reactivity Control, and incorrectly believes that an optimal recovery procedure is appropriate.
- b. **Correct** - For the given conditions, reactivity control may not be satisfied, and Functional Recovery procedure entry is required.
- c. Candidate incorrectly interprets Safety Injection flow to be the primary method of delivering boron to the core, and does not understand the need to go to the Functional Recovery Procedure.
- d. May select since it is appropriate to enter the Functional Recovery Procedure, but misunderstands the function of Safety Injection in relation to Reactivity Control for the given plant conditions.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 41**Tier/Group:** SRO RO**K/A:** 026 Containment Spray K1.02

Knowledge of the physical connections and/or cause-effect relationships between the CSS and the following systems: Cooling water.

Importance Rating: SRO 4.1 RO 4.1**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions which require a Containment isolation from CHP, ensure proper actuation and then perform component verification IAW the in-use EOP and EOP Supplement 6. (ASHBT00.01)

References: EOP-4.0, step 50, including basis, rev 11**Source of Question:** Palisades Bank PR2-6 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - With only 1 CS Pump and 1 HPSI Pump capable of operating, only 1 CS valve and 1 HPSI subcooling valve are permitted to be open.
- b. Only 1 HPSI subcooling valve can be open.
- c. Only 1 CS valve can be open.
- d. Only 1 CS valve and 1 HPSI subcooling valve are permitted to be open.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 42**Tier/Group:** SRO RO**K/A:** 006 Emergency Core Cooling A3.01
Ability to monitor automatic operation of the ECCS, including: Accumulators.**Importance Rating:** SRO 3.9 RO 4.0**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions, predict the status of any specified SIS train or component. ASHAG12.02

References: SHO-1, 5.1.16, 17 and Attachment 1, items 16 and 17**Source of Question:** Palisades Bank 2000CERT 21 (direct)**DISTRACTOR ANALYSIS**

- a. Level is too high. Pressure is too low.
- b. Level is too low. Pressure is too low.
- c. **Correct** - Requirement is level between 174 and 200 inches (18%-62%), pressure above 200 psig.
- d. Level is too low. Pressure is too low.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 43**Tier/Group:** SRO RO**K/A:** 029 Containment Purge G 2.3.9
Knowledge of the process for performing a Containment Purge**Importance Rating:** SRO 3.4 RO 2.5**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the basis for any given SOP-24 (HVAC) Plant Requirement, Precaution or Limitation, Caution, or Note. ASDB0G7.02

References: SOP-24 LP-ASDB**Source of Question:** Palisades Bank PR1-74 (direct)**DISTRACTOR ANALYSIS**

- a. Used as part of calculation for release.
- b. Valves can only be opened when this TS is not applicable.
- c. **Correct** - Used as part of calculation for release
- d. SOP-24 specifies that the time be tracked, but does NOT specify that it be less than one hour.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 44**Tier/Group:** SRO RO

K/A: 000069 (W/E14) Loss of CTMT Integrity / 5 K2.03
Knowledge of the interrelations between the Loss of Containment Integrity and the following:
Personnel access hatch and emergency access hatch.

Importance Rating: SRO 2.9 RO 2.8**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving Containment Air Locks and Isolation valves , SELECT the conditions that would require an LCO action IAW the following: (ASHB0G5.01)
LCO 3.6.2 LCO 3.6.3 LCO 3.9.3

References: Tech Spec 3.6.2, 3.6.3, 3.9.3**Source of Question:** Palisades Bank Prac2 - 11 Direct**DISTRACTOR ANALYSIS**

- a. All nonautomatic containment isolation valves and blind flanges must be closed.
- b. **Correct** Entry and exit is permissible through a "locked" air lock door to perform repair on other air lock components.
- c. All automatic containment isolation valves must be operable or locked closed.
- d. The equipment hatch must be properly closed and sealed.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 45**Tier/Group:** SRO RO**K/A:** 005 K1.12 Residual Heat Removal

Knowledge of the physical connections and/or cause effect relationships between the SDC system and the safeguards pumps.

Importance Rating: SRO 3.4**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

State the requirements for using a containment spray pump in place of a LPSI pump during a loss of SDC event. (TBA00G4.02) (IOTFK.30)

References: ONP-17, Att. 4**Source of Question:** Palisades Bank 11926 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - Spray pumps are a higher head pump; venting alleviates overpressure concerns with the SDC system.
- b. Candidate may select due to a perceived concern for vapor binding of the Containment Spray Pump; however, candidate incorrectly believes this is the reason for ensuring the PCS is vented.
- c. Candidate may select due to a perceived concern for cavitation, possibly because of unvented gases in the PCS; however, candidate incorrectly believes this is the reason for ensuring the PCS is vented.
- d. May select due to an incorrect belief that if the PCS is not vented, adequate flow may not exist, possibly because of a misconception that shutdown cooling flow would be significantly affected by entrained gases or vapors.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 46**Tier/Group:** SRO RO**K/A:** 2.2.1 Ability to perform Pre-startup procedures for the facility, including operating those controls associated with plant equipment that could affect reactivity.**Importance Rating:** SRO 3.6 RO 3.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving premature criticality during a critical approach, determine the actions needed IAW EM-04-24. (RTA00A1.05)

References: EM-04-24**Source of Question:** Palisades Bank PR1-24 (direct)**DISTRACTOR ANALYSIS**

- a. Inadequate SDM may exist due to being below PDIL. Rods must be inserted.
- b. **Correct** - Rod insertion of the control rods to the lower electrical limit and emergency boration is required.
- c. Reactor trip is not procedurally required.
- d. Inadequate SDM may exist due to being below PDIL. Rods must be inserted.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** Tech Data Book curve 1.9, "Power Dependent Insertion Limits"
(This reference is also required for another Question Number:.)

WRITTEN QUESTION DATA SHEET

Question Number: 47**Tier/Group:** SRO RO

K/A: 000001 Continuous Rod Withdrawal / G 2.4.49
Ability to perform without reference to procedures those actions that require immediate operation of system components and controls.

Importance Rating: SRO 4.0 RO 4.0**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given various Plant conditions, one or more of the following annunciators in the alarmed condition:
(ASEE0G9.01)

- Identify any alternate system indications that can be used to verify a given alarm.
- Describe the effect of a valid alarm condition on the operation of the CRD System.
- Use applicable control room references to determine the actions required.
EK-0947 Emergency Rod Drive Power Interrupt

References: FSAR 14.2.1 ARP-5, #47 LP-TBAN, Sect. 6.10.A, rev 5 LP-ASEE**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- Candidate incorrectly believes that "Rod Control Group Select" switch will STOP rod motion, when it actually is used which rod group is selected for movement.
- Emergency boration would add negative reactivity to the core; however, this action is NOT the expeditious manual action that would be expected of the operator.
- The reactor would eventually trip on either VHPT or TM/LP per FSAR analysis, however, this is NOT the expeditious manual action that would be expected of the operator.
- Correct** - EM OFF is a feature of the rod control system that would be appropriate for this situation, since it immediately stops all rod motion.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 48**Tier/Group:** SRO RO**K/A:** 000003A1.03 Dropped Control Rod / 1

Ability to operate/monitor the rod control switches as they apply to a dropped rod.

Importance Rating: SRO 3.3**10CFR55 Content:** SRO 43(b).5
(Requires diagnosis and assessment of required actions)**Palisades Training Objective:**Given plant conditions involving symptoms of a dropped control rod, respond IAW ONP-5.1.
(TBANT00.02) (IOTFT.27)**References:** ONP-5.1, 4.1**Source of Question:** Palisades Bank 95NRC (direct)**DISTRACTOR ANALYSIS**

- a. Candidate may select due to failure to recognize anomalous reactor behavior.
- b. **Correct** - The TRIP function of TMM is not used at Palisades, except for alarm. There is no trip function.
- c. Candidate may select due to failure to recognize indications for two dropped rods.
- d. Candidate may select due to failure to recognize indications for only one dropped rod, and further fails to conclude that this is reactor trip criteria when doing low power physics testing.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 49**Tier/Group:** SRO RO

K/A: 000005 2.1.33 Inoperable/Stuck Control Rod / 1
Ability to recognize indications for system operating parameters which are entry level conditions for technical specifications.

Importance Rating: SRO 4.0**10CFR55 Content:** SRO 43(b).2**Palisades Training Objective:**

Given Plant conditions and all available references, determine the status of the Control Rod Drive System IAW the references. (ASEET00.03)

References: TS 3.1.4.**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate may select since Part-Length rods are not operated during normal plant operations.
- b. Candidate may select since the rod is trippable and for the current plant conditions is not required to be moved.
- c. PIP inoperable for any rod requires entry into Tech Specs.
- d. **Correct** - There is no Tech Spec entry required for this condition, especially since the only problem is that the thermocouple has failed or is failing (since the temperature indicates >250°F).

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 50**Tier/Group:** SRO RO**K/A:** 000005 Inoperable/Stuck Control Rod / 1 K3.04

Knowledge of the reasons for the following responses as they apply to the Inoperable/Stuck Control Rod: Tech Spec limits for inoperable rods.

Importance Rating: SRO 4.1 RO 3.4**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the basis for Tech Specs.

(ASEE0G5.12)

3.10.1.e	3.10.3	3.10.4	3.10.5	3.10.6	3.17.6.2
3.17.6.13	3.17.6.18				

References: ARP-5, #11, 12 Tech Spec 3.1.4.C Tech Spec 3.1.4 Basis**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Movement restriction is 8" of Rod 41 position.
- b. **Correct** - Movement restriction is 8" of Rod 41 position for the basis listed.
- c. Movement restriction is 8" of Rod 41 position.
- d. Power peaking is the concern for a single rod misaligned from the remainder of its group.

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 51**Tier/Group:** SRO RO**K/A:** 000009 A2.1

Ability to determine/interpret CCW temperature indication for PCP oil coolers as it applies to a small break LOCA.

Importance Rating: SRO 2.6**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given Plant conditions involving an SIAS, predict the effect on the CCW System. (ASCA0K4.10)

References: M-209, sh. 1, 3**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. EOP-6.0 does provide guidance for tripping PCPs, but it is based on PCS parameters (subcooling, etc.), but NOT on bearing temperatures.
- b. **Correct** - Alarm Response Procedure EK-0907, "Pri Coolant Pp Hi Temp Overload" prescribes tripping the PCP if bearing temperatures exceed a prescribed value.
- c. SOP-1 does contain guidance on starting and tripping PCPs, but does not contain any guidance on elevated PCP bearing temperatures.
- d. GOPs contain no guidance on elevated PCP bearing temperatures.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 52**Tier/Group:** SRO RO**K/A:** 003 2.1.32 Primary Coolant Pump
Ability to explain and apply all system limits and precautions.**Importance Rating:** SRO 3.8**10CFR55 Content:** SRO 43(b).2**Palisades Training Objective:**

ASED0G5.02 - Explain the applicable Safety Analysis Bases for the following: T.S. LCO 3.4.7.

References: SOP-1, p. 8**Source of Question:** Palisades Bank 9175 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate may select by reasoning that steam generators being equal to or cooler than the PCS would ensure that heat transfer will occur from the Primary to the Secondary, however, candidate fails to realize the concern for energy addition to the PCS.
- b. **Correct** - This is the correct basis per procedure.
- c. Candidate may reason that thermal stresses on steam generator tubes should be avoided and that ensuring there is only a small deltaT between the Primary and Secondary plant is a good way to ensure this; however, candidate fails to realize or understand the importance of the concern for energy addition to the PCS.
- d. May select by reasoning that if the steam generators are hotter than the PCS and a PCP is started, the Primary System will rapidly cool off the secondary system and cause and depressurization of the Steam Generators; however, candidate fails to realize the real concern of energy addition to the PCS.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 53**Tier/Group:** SRO RO**K/A:** 000054 (CE/E06) Loss of Main Feedwater / 4 G 2.1.2
Knowledge of operator responsibilities during all modes of plant operation**Importance Rating:** SRO 4.0 RO 3.0**10CFR55 Content:** SRO RO**Palisades Training Objective:**

State the immediate actions of a Loss of Feedwater event IAW ONP 3.

(TBAEG11.01)

References: ONP-3**Source of Question:** Palisades Bank 4146 Direct**DISTRACTOR ANALYSIS**

- a. **Correct** - Design of the feed pump speed controllers
- b. Candidate fails to recall the function of the individual speed controller, and incorrectly believes that a slow restoration of feed flow is desired.
- c. Candidate fails to recall the function of the combined speed controller.
- d. Candidate concludes that raising feed flow too quickly is undesirable (overcooling), but incorrectly recalls the response of the individual speed controllers.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 54

Tier/Group: SRO RO

K/A: 056 Condensate A2.04
Loss of Cond. Pumps effects on system
Ability to:

- predict the impacts of the following malfunctions or operations on the Condensate System, and
- based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. Loss of Condensate Pumps.

Importance Rating: SRO 2.8 RO 2.6

10CFR55 Content: SRO RO

Palisades Training Objective:

Given Plant conditions, determine the status of the Main Condensate and Feedwater System (ASLB0A3.01)

References: ARP-1, window 48, 60, rev 51 ONP-3, p. 1, 3, rev 18

Source of Question: NEW

DISTRACTOR ANALYSIS

- Candidate incorrectly believes that the effect is that feed pps. ramp to minimum speed.
- Candidate correctly understands that the reactor should be tripped; however, incorrectly determines that the feed pps. ramp to minimum speed.
- Correctly determines that both feed pps. will trip; but incorrectly determines the action to take in response.
- Correct** - When both Condensate Pps. trip, both Main Feed Pps. will trip on low suction pressure, and the reactor must be manually tripped.

Difficulty Rating: 2

Cognitive Level: High ✓ Low

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

Question Number: 55**Tier/Group:** SRO RO

K/A: 000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1 K2.02
Knowledge of the interrelations between the Reactor Trip Recovery and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.

Importance Rating: SRO 4.0 RO 3.5**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given conditions involving a reactor trip, determine the consequences of failing to perform any given EOP- 1.0 Action. (TBAB0A2.03)

References: EOP-1.0 EOP-1.0 Basis Step 2.b, c**Source of Question:** Palisades Bank 4873 Direct**DISTRACTOR ANALYSIS**

- a. Candidate may select thinking that steam generator levels will rise, which is true. However, the concern is due to PCS overcooling. The turbine will already have been tripped.
- b. **Correct** - Higher S/G levels means more cooling to PCS.
- c. Candidate may select thinking that due to the overcooling a SIAS will occur and then incorrectly concludes that a Containment Isolation signal occurs, which would close the MSIVs.
- d. Candidate may select, correctly concluding an overcooling will occur. However, Reactivity Control is addressed in a different Safety Function check, and the real concern is overcooling/depressurizing the PCS to the point of SIAS.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 56**Tier/Group:** SRO RO**K/A:** 000074 (W/E06&E07) Inad. Core Cooling / 4 K3.06

Knowledge of the reasons for the following responses as they apply to the Inadequate Core Cooling: Confirming that the PORV cycles open at the specified setpoint.

Importance Rating: SRO 4.2 RO 3.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given normally available Control Room references, describe the normal operation of the LTOP system including: (ASFE0K6.02)

- d. Actuation of the PORV

References: FSAR Section 7.4.2.1, item 2**Source of Question:** Palisades Bank 12144 Direct**DISTRACTOR ANALYSIS**

- a. Valve indicating lights is one viable verification of PORV position.
- b. **Correct** - Due to the fact that other systems discharge into the Quench Tank, certain parameters would NOT be a positive means of verifying PORV position.
- c. The acoustic monitor is listed in the FSAR as one of the more positive means of verifying PORV position. Candidate may select because for other valves, indicating lights (run from limit switches) are considered a positive method of verifying valve position.
- d. Tail pipe temperature is considered a viable means of verifying PORV position.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 57

Tier/Group: SRO RO

K/A: 2.1.11 Knowledge of Less than one hour Tech Spec actions for systems.

Importance Rating: SRO 3.8 RO 3.0

10CFR55 Content: SRO RO

Palisades Training Objective: ASFE0G8.01 - One hour T.S.

References: T.S. 3.4.11

Source of Question: Palisades Bank 99NRC-8 (significantly modified)

DISTRACTOR ANALYSIS

- a. Candidate incorrectly believes that cold shutdown conditions must be established to allow restoring the valve to operable.
- b. Candidate incorrectly believes that the plant must be cooled down due to the inoperable valve.
- c. **Correct** - Entry into Hot Standby conditions is not permitted per TS 3.0.4, but the plant is not to be cooled down to below 430°F since the PORV would be required for LTOP operations.
- d. Candidate incorrectly believes that entry into a higher operating condition is permitted, provided power operations are not entered.

Difficulty Rating: 3

Cognitive Level: High Low ✓

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

Question Number: 58**Tier/Group:** SRO RO**K/A:** 000065 Loss of Instrument Air / 8 A2.06

Ability to determine and interpret the following as they apply to the Loss of Instrument Air: When to trip reactor if instrument air pressure is decreasing.

Importance Rating: SRO 4.2 RO 3.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions, analyze the data to determine if a loss of SW, loss of CCW, or loss of Instrument Air has occurred. (TBAIG10.01)

References: ONP-6.1, 7.1 ARP-7, window 1, 2, 3**Source of Question:** Palisades Bank 419 (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate recalls that certain sprinkler systems may wet down electrical busses. However, this is not reactor trip criteria for the given plant conditions.
- b. Candidate is correct in noting a concern for Primary Coolant Pumps, but incorrectly applies a design feature of controlled bleedoff (relief valve) that ensures bleedoff flow when the normal control valve loses operating air.
- c. **Correct** - The Exciter Air Coolers for the Main Generator is of primary concern.
- d. Candidate is correct in noting a concern for the Cooling Tower Pumps (which use Service Air in a bubbler level indicating system), but fails to recall a design feature (an accumulator) which ensures operating air for a significant period of time.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 59**Tier/Group:** SRO RO

K/A: 078 K4.02 Instrument Air
Knowledge of Instrument Air System design features/interlocks which provide for cross connecting to other air systems.

Importance Rating: SRO 3.5**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given Plant conditions involving the symptoms of Loss of Instrument Air, respond IAW ONP-7.1.
(TBAIT00.03) (IOTFT.03)

References: ONP-7.1**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. **Correct** - C-903A/B were originally designed to provide large amounts of air for the Condensate Demin Polishing system, which is not used.
- b. Candidate incorrectly selects this as the basis for using these air compressors (since the fact is true), but it is not the basis for using them.
- c. It is true that these air compressors are not powered from the D/Gs, but this is NOT the basis for using them in this situation.
- d. Even one FWP air compressor is more than enough to supply plant air, even with leaks. BOTH of these large compressors would have no trouble supplying the headers, even with Service Air NOT isolated.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 60**Tier/Group:** SRO RO**K/A:** 061 Auxiliary/Emergency Feedwater K1.11

Knowledge of the physical connections and/or cause-effect relationships between the AFW and the following systems: AFW turbine exhaust drains.

Importance Rating: SRO 2.8 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Monitor the AFW system and its components under any plant condition IAW plant Administrative Procedures, AO Rounds Sheets, Watch Standing Practices and SOP-12. (ISIET00.04)

References: M-205, sh. 2 DBD-1.03 SOP-12, Att. 15, p. 5 QO-21, p. 13, 74
FSAR, 9.7**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate misapplies a concern for a release to the atmosphere, believing that a stuck steam trap would pass contaminated steam; but fails to recall a more significant design feature of the steam driven Aux Fd Pump (all exhaust steam exhausts to the atmosphere).
- b. Candidate reasons that the plant would become contaminated, incorrectly extending this to the secondary plant, and additionally believes that a stuck steam trap would pass contaminated steam.
- c. Candidate incorrectly makes a conclusion that Loss of Forced Circulation also means loss of all power, and therefore the need to use the steam driven Aux Fd Pp.
- d. **Correct** - ST-0523 stuck closed will likely mean that the steam driven Aux Fd Pp's turbine exhaust line will fill with water, and possibly overspeed and trip the turbine when started, per recent industry events.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** Drawing of M-205, sh. 2, lower left portion

WRITTEN QUESTION DATA SHEET

Question Number: 61**Tier/Group:** SRO RO**K/A:** 033 Spent Fuel Pool Cooling K1.05

Knowledge of the physical connections and/or cause-effect relationships between the Spent Fuel Pool Cooling System and the following systems: RWST.

Importance Rating: SRO 2.8 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions, one or more annunciators alarmed: EK-1309 Spent Fuel Pool Lo Level

References: ARP-8, #9 SOP-27 DBD 2.07, p. 5, 60 ONP-23.3, 4.9.8**Source of Question:** Palisades Bank PRAC1-83 Direct**DISTRACTOR ANALYSIS**

- a. **Correct** - If losses are other than due to evaporative losses, the SIRWT should be used to maintain adequate boron concentration in the pool.
- b. This should only be used as a last resort in the event of a major loss of water with no other sources available.
- c. This would dilute the pool.
- d. This would dilute the pool.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 62**Tier/Group:** SRO RO**K/A:** 055 Condenser Air Removal G 2.1.28

Knowledge of the purpose and function of major system components and controls.

Importance Rating: SRO 3.3 RO 3.2**10CFR55 Content:** SRO RO**Palisades Training Objective:**

List five (5) indications of main condenser air/water in-leakage.

(ASLA0A1.01)

References: LP-IOTF, Parameter Trends LP-ASLA, p. 8**Source of Question:** Palisades Bank 95NRC (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly applies the effects of rising air in-leakage to the main condenser, when in actuality, more air in the main condenser would dilute the off-gas and make counts reduce, not rise.
- b. **Correct** - Candidate correctly understands that air in-leakage (and lowering condenser vacuum) would effect depression, and determines there would be more condensate depression.
- c. Since the main condenser uses a bubbler level indicating system, candidate may select this distractor, thinking incorrectly that a loss of vacuum would somehow effect the bubbler system.
- d. Candidate correctly understands that Gland Seal Steam pressure has an effect on condenser vacuum since a gland seal system provides sealing for the Main Turbine and therefore prevents air in-leakage, however candidate incorrectly applies that relationship for an air in-leakage condition.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 63**Tier/Group:** SRO RO**K/A:** 000068 (BW/A06) Control Room Evac. / 8 A2.04
Ability to determine and interpret the following as they apply to the Control Room Evacuation: S/G pressure**Importance Rating:** SRO 4.0 RO 3.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving an Alternate Safe Shutdown, determine the consequences of failing to perform any given step contained within ONP 25.2. (TBAM0K6.02)

References: ONP-25.2, Attachment 2, p. 1, 2 C-33 and C-150A graphic**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. **Correct** - ONP-25.2, 4.3.a requires the operators to place the AVG TEMP DISPLAY SELECT SWITCH to LOOP 2. The NOTE just prior to the step explains that LOOP 2 selected ensures a valid temperature input for the ADV controller. If LOOP 1 were selected the ADVs would not have a valid temperature input for proper operation. Steam Generator pressures remaining stable would be an indication that the ADVs are operating properly, since they have valid inputs.
- b. Steam Generator pressure indication is NOT available at panel C-33.
- c. Steam Generator pressure lowering is NOT a positive indication of a valid signal to the ADVs.
- d. Steam Generator pressure indication is NOT available at panel C-33.

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

SENIOR REACTOR OPERATOR

Palisades 2001 NRC Initial License Exam

WRITTEN QUESTION DATA SHEET

Question Number: 64

Tier/Group: SRO RO

K/A: BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4 K2.01

Knowledge of the interrelations between the (Natural Circulation Operations) and components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Importance Rating: SRO 3.4 RO 3.0

10CFR55 Content: SRO RO

Palisades Training Objective:

Given plant conditions involving a loss of forced circulation, respond IAW EOP 8.0. (TBACT00.01)

References: LP-TBAC EOP-4.0 Basis, p. 114 for Step 39

Source of Question: INPO Bank: DC Cook April 2000 (Direct)

DISTRACTOR ANALYSIS

- a. Subcooling would reduce natural circ. flow; however, the given conditions actually result in a rise in subcooling and natural circ flow actually rises.
- b. A reduction in decay heat rate means less thermal driving head, and less natural circ. flow.
- c. **Correct** - Higher rate of removing heat provides a higher thermal driving head.
- d. Higher density in the cold leg would actually raise natural circ flow.

Difficulty Rating: 3

Cognitive Level: High ✓ Low

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

Question Number: 65**Tier/Group:** SRO RO

K/A: 017 In-core Temperature Monitor A3.01
Ability to monitor automatic operation of the ITM system including: Indications of normal, natural, and interrupted circulation of RCS.

Importance Rating: SRO 3.8 RO 3.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given a set of accident data, evaluate parameters to determine if natural circulation is occurring IAW the in-use EOP. TBAC0A2.03

References: EOP-8.0**Source of Question:** Palisades Bank Pr1-73 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - To verify NC, Average of Qualified CETs minus TC must be less than 50 °F, average of Qualified CETs must be at least 25 degrees F subcooled, and difference between Loop TH and Average of Qualified CETs must be less than or equal to 15 degrees F.
- b. Difference between CETs and TH is too high.
- c. Difference between CETs and TC is too high.
- d. Difference between CETs and TH is too high.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 66**Tier/Group:** SRO RO**K/A:** 000015/17 K1.01 RCP Malfunctions / 4

Knowledge of the operational implications of natural circulation as it applies to PCP malfunctions.

Importance Rating: SRO 4.6**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given accident conditions, recognize the parameters used to determine the conditions of the core heat transfer capability. (TBAC0A2.02)

References: EOP-8.0, Basis, p. 54 LP-TBAC, p. 10-11 FSAR 14.7 Fig. 14.7-6 through 10
FSAR 14.7.2.1, 14.7.2.2.1, 14.7.2.4**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes that the reactor trip recovery procedure may be implemented, possibly because natural circulation is available.
- b. Candidate incorrectly believes that Station Blackout Recovery may be implemented, possibly because all offsite power has been lost.
- c. **Correct** - The conditions given require implementation of forced circulation recover; per conditions given in the stem, both safeguards busses are being powered by the D/Gs.
- d. Conditions given do not support use of the functional recovery procedure.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 67**Tier/Group:** SRO RO**K/A:** 002 K5.15 Reactor Coolant

Knowledge of the operations implications of the reasons for maintaining subcooling margin during natural circulation as it applies to the PCS.

Importance Rating: SRO 4.6**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given accident conditions, recognize the parameters used to determine the conditions of the core heat transfer capability. (TBAC0A2.02)

References: EOP-8.0 Basis, p.55, p. 123**Source of Question:** INPO Bank Salem 1 & 2 1991 (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate may select due to thinking that more subcooling means increased heat removal from the fuel. However desirable this may be, it is not the complete and true basis.
- b. **Correct** - Correct basis per EOP-8.0.
- c. Candidate may have misinterpreted the MTC effects on reactivity.
- d. Candidate may select due to a legitimate concern over thermal shocking of PCS components, however, candidate has misapplied the concept.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 68**Tier/Group:** SRO RO**K/A:** CE/E09 A1.01 Functional Recovery

Ability to operate/monitor components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features as they apply to the Functional Recovery.

Importance Rating: SRO 4.0

10CFR55 Content: SRO 43(b).5
(Candidate must assess whether the procedure has been properly implemented.)

Palisades Training Objective:

Describe the once-through method of core cooling and the conditions for use. (TBAH0A2.02)

References: EOP-9.0, HR-3**Source of Question:** Palisades Bank PR3-16 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly selects a procedure for loss of feedwater; and selects the Immediate Actions section (possibly due to a sense of urgency); however, this ONP does not provide the required actions.
- b. Candidate incorrectly selects a procedure for loss feedwater, and selects the Subsequent Actions section (possibly allowing additional time for diagnosis and restoration); however, this ONP does not provide the required actions for given conditions.
- c. Candidate correctly recognizes EOP-9.0 entry conditions, but selects the wrong success path.
- d. **Correct** - EOP-9.0, HR-3 provides the listed actions.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 69

Tier/Group: SRO RO

K/A: 035 Steam Generator A2.06

Ability to:

- predict the impacts of the following malfunctions of operations on the S/Gs, and
- based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. Small Break LOCA

Importance Rating: SRO 4.6 RO 4.5

10CFR55 Content: SRO RO

Palisades Training Objective:

Determine the impact a loss of coolant accident will have on each of the safety functions.

(TBAG0K3.01)

References: EOP-1.0 Basis, p. 39, 43, 71, 87, 93

Source of Question: NEW

DISTRACTOR ANALYSIS

- Correct** - Prescribed S/G level for this condition; degraded containment conditions do cause instrument inaccuracies.
- Candidate incorrectly believes there is no effect on S/Gs.
- This condition might occur, however, procedure guidance exists to preclude it. Further, maintaining S/G pressures high would not affect the likelihood of this happening.
- The first part may occur, however, maintaining S/G pressures higher than PCS pressure would only exacerbate any voiding in the S/G U-tubes.

Difficulty Rating: 4

Cognitive Level: High ✓ Low

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

Question Number: 70**Tier/Group:** SRO RO**K/A:** 000011 Large Break LOCA / 3 K1.01

Knowledge of the operational implications of Natural circulation and cooling, including reflux boiling, as they apply to the Large Break LOCA.

Importance Rating: SRO 4.4 RO 4.1**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions involving various size LOCAs, describe the methods available for core decay heat removal. (TBAG0A2.01)

References: EOP-4.0 Basis**Source of Question:** GFES Jan 2000 Bank Question #114 in Thermal Hydraulics (significantly modified)**DISTRACTOR ANALYSIS**

- a. S/Gs are also required for adequate heat removal for a SBLOCA.
- b. S/Gs are also required for adequate heat removal for a SBLOCA.
- c. Reflux boiling is only a minor contributor to heat removal during a LBLOCA. Fluid flow out the break ALONE provides adequate heat removal.
- d. **Correct** - Fluid flow out the break ALONE provides adequate heat removal during a LBLOCA.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 71**Tier/Group:** SRO RO

K/A: 000008 A1.07 Pressurizer Vapor Space Accident / 3
Ability to operate/monitor the reseating of code safety and PORVs as they apply to the PZR Vapor Space Accident.

Importance Rating: SRO 4.2**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Determine the impact a loss of coolant accident will have on each of the safety functions. (TBAG0K3.01)

References: EOP-2.0, EOP-4.0, EOP-8.0, EOP-9.0**Source of Question:** INPO Bank San Onofre 2000 (significantly modified)**DISTRACTOR ANALYSIS**

- a. **Correct** - Once EOP-4.0 has been entered, all applicable actions must be completed before transitioning to the required GOP for shutdown.
- b. Conditions do NOT allow entry to EOP-2.0.
- c. EOP-9.0 would apply for multiple events, but no PCPs in this case does not qualify as an additional event.
- d. Once EOP-4.0 Safety Function Status Checks are complete, operators are required to go to GOP-9 for plant shutdown.

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 72**Tier/Group:** SRO RO**K/A:** CE/A16 A1.03 Excess PCS Leakage / 2

Ability to monitor for desired operating results during abnormal and emergency situations as they apply to Excess PCS Leakage.

(Reselected A2.01) - Ability to determine and interpret the following as they apply to the (Excess PCS Leakage): Facility conditions and selection of appropriate procedures during abnormal and emergency conditions.**Importance Rating:** SRO 3.5**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given an estimated primary leak rate, select the applicable procedures, administrative guidance, and/or Improved Technical Specifications. IOTF.K33

References: ONP-23.1 T.S. 3.4.13, including Basis**Source of Question:** Palisades Bank 12140 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - Unidentified exceeds the 1 gpm limit per Tech Specs.
- b. Identified leakage totals 9.1 gpm. Candidate fails to recall the actual limit of 10 gpm, and erroneously applies the limit of 1 gpm for unidentified leakage.
- c. Candidate may select by incorrectly believing that the 0.2 gpm leakage in to the 'A' Steam Generator exceeds the TS limit of NO pressure boundary leakage allowed. However, candidate is incorrect since Primary to Secondary leakage is considered a separate category and is NOT considered pressure boundary leakage, and has its own specified limit (432 gallons per day through any ONE SG). This amount of leakage totals 288 gallons per day.
- d. Candidate may select by incorrectly applying the primary to secondary allowable limit.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 73**Tier/Group:** SRO RO

K/A: 000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4 G 2.4.4
Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures

Importance Rating: SRO 4.3 RO 4.0**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given post reactor trip conditions, determine the proper follow-up EOP IAW the Diagnostic Flowchart.
(TBAB0A2.04)

References: EOP-1.0 EOP-6.0**Source of Question:** INPO BANK Direct May 2001 Comanche Peak**DISTRACTOR ANALYSIS**

- a. Candidate may select, reasoning incorrectly that Containment pressure is rising due to a PCS leak inside Containment.
- b. Containment pressure would not be rising with a Feedwater line break outside containment; further, steam generator levels are rising.
- c. **Correct** - Excessive cooldown from a steam line break inside containment is cooling down the PCS, resulting in a positive reactivity insertion, and resultant power rise; and a rise in containment pressure.
- d. Candidate notes a reducing steam pressure and Tave and incorrectly concludes the steam line break is outside containment.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 74**Tier/Group:** SRO RO**K/A:** CE/A11; W/E08 RCS Overcooling - PTS / 4 A2.02

Ability to determine and interpret the following as they apply to the (RCS Overcooling): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.

Importance Rating: SRO 3.4 RO 3.0**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the major mitigating actions taken to respond to an Excess Steam Demand Event (TBAD0A2.05)

References: EOP-6.0**Source of Question:** Palisades Bank 99NRC39 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes that the most affected SG must be steamed until the most affected SG reaches dryout to maintain coupling.
- b. **Correct** Maintaining the least affected SG within 50 psid of the most affected SG ensures the least affected SG remains closely coupled to the PCS. This DP must be maintained only until the heat removal capability of the most affected SG is lost to minimize the overcooling effects on the PCS. Steaming of the least affected SG must commence prior to dryout of the most affected SG to minimize PTS concerns.
- c. Candidate incorrectly believes that steaming the least affected SG while the most affected SG blows down will limit the PCS cooldown, but it is required to prevent reaching PTS conditions.
- d. Candidate incorrectly believes that steaming the least affected SG while the most affected SG steams until it no longer has heat removal capability will limit the PCS cooldown, but it is required to prevent reaching PTS conditions.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 75**Tier/Group:** SRO RO

K/A: 000025 Loss of RHR System / 4 A1.02
Ability to operate and/or monitor the following as they apply to the Loss of Residual Heat Removal System: RCS Inventory.

Importance Rating: SRO 3.9 RO 3.8**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions and ONP-17, determine the time to 200°. (TBA00A2.01) (IOTFK.29)

References: ONP-17, Attachment 1 (pp 1-12)**Source of Question:** Palisades Bank 2000 Requal (significantly modified)**DISTRACTOR ANALYSIS**

- a. Candidate selects the wrong curve (incorrect PCS level) to arrive at 40 minutes.
- b. Candidate selects the correct curve, but interpolates PCS initial temperature incorrectly.
- c. **Correct** - Correct calculated time.
- d. Candidate interpolates PCS initial temperature correctly, but selects the incorrect time after shutdown line.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** ONP-17, Attachment 1 (pp 1-12)

WRITTEN QUESTION DATA SHEET

Question Number: 76**Tier/Group:** SRO RO**K/A:** 2.4.46

Ability to verify that alarms are consistent with plant conditions

Importance Rating: SRO 3.6**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

IOTFK.27 - Given any of the symptoms in ONP-17, "Loss of Shutdown Cooling": a. List at least two possible causes for that symptom, b. Describe how that symptom can be verified.

References: ONP-17, 4.15.2.c (CAUTION prior to) SOER 85-04**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate may select since reactivity is always a concern. However, in this case NO procedural precautions exist since the entire SDC system is boron equalized when placing SDC in service.
- b. This concern is listed in SOP-3, 7.3.8 when placing the alternate LPSI pump in service when on SDC. However, this is not what the question is asking - it is asking for the basis of subsequent step vs. immediate action.
- c. **Correct** - Per the above references, and numerous other industry events, air binding of the alternate LPSI pump is a serious concern when in a reduced inventory condition.
- d. Reactor Vessel plenum overpressurization is a concern listed in ONP-17; however, it does not apply for the given plant conditions, since the PCS level is less than that specified in the specified CAUTION (ONP-17, 4.15.1.d)

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 77

Tier/Group: SRO RO

K/A: 000037 Steam Generator Tube Leak / 3 A2.10
Ability to determine and interpret the following as they apply to the Steam Generator Tube Leak:
Tech-Spec limits for RCS leakage.

Importance Rating: SRO 4.1 RO 3.2

10CFR55 Content: SRO RO

Palisades Training Objective:

Given plant conditions, select those conditions requiring a reactor trip. (IOTFK.04)

References: ONP-23.2 excerpt (pp. 2-5, Att. 1, Att.2)

Source of Question: Palisades Bank Week 3 Q18 on Annual Requal (Direct)

DISTRACTOR ANALYSIS

- a. Candidate incorrectly estimates leak rate and/or misinterprets procedural guidance.
- b. **Correct** - Per ONP-23.2 the required action for the calculated leakrate is to shutdown at a rate of less than 30% per hour.
- c. Candidate incorrectly estimates leak rate and/or misinterprets procedural guidance.
- d. Candidate incorrectly estimates leak rate and/or misinterprets procedural guidance.

Difficulty Rating: 3

Cognitive Level: High ✓ Low

References Supplied to Candidate: ONP-23.2 excerpt (pp. 1-6, Att. 1, Att.2)

WRITTEN QUESTION DATA SHEET

Question Number: 78

Tier/Group: SRO RO

K/A: 000038 Steam Generator Tube Rupture / 3 K1.02
Knowledge of the operational implications of the following concepts as they apply to the SGTR:
Leak rate vs. pressure drop

Importance Rating: SRO 3.5 RO 3.2

10CFR55 Content: SRO RO

Palisades Training Objective:

Given plant conditions involving a SGTR with the affected S/G isolated, discuss options available for cooling, depressurizing, and providing inventory control of the affected S/G including potential reactivity effects. (TBAF0A2.12)

References: EOP-5.0 Basis, pp. 150, 102 EOP Supplement 38**Source of Question:** Palisades Bank Week1 Q9 Annual Requal Bank (Direct)**DISTRACTOR ANALYSIS**

- a. Calculated if candidate mistakenly uses 90% level in the formula.
- b. Calculated if candidate mistakenly uses 50% level in the formula.
- c. **Correct** calculation by using delta level of 40%.
- d. Plausible since candidate may believe that the current PCS boron concentration is adequate.

Difficulty Rating: 3

Cognitive Level: High ✓ Low

References Supplied to Candidate: EOP Supplement 38

WRITTEN QUESTION DATA SHEET

Question Number: 79**Tier/Group:** SRO RO**K/A:** 000040 A1.04(BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer
Ability to operate/monitor isolation of all steam lines from header.**Importance Rating:** SRO 4.3**10CFR55 Content:** SRO 43(b).5
(Determination of which Safety Functions are of concern is a function of which procedure sections to refer to.)**Palisades Training Objective:**

Given plant conditions, determine the impact of an Excess Steam Demand Event on each safety function.

TBAD0A2.01

References: FSAR 14.14.1 FSAR 14.10.2.2 EOP-6.0 Basis, p. 3**Source of Question:** Palisades Bank PR1-15 (direct)**DISTRACTOR ANALYSIS**

- a. The break is outside containment so containment pressure should not be of concern.
- b. PCS mass is not being lost although the volume the mass occupies is less due to the higher density of the water.
- c. **Correct** - An excessive cooldown due to an unisolated steam break is of concern because of the positive reactivity added; the affected SG blowing down may result in a loss of heat sink
- d. The break is outside containment so containment pressure should not be of concern.

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 80**Tier/Group:** SRO RO**K/A:** 015 K4.05 Nuclear Instrumentation

Knowledge of the NIS design features/interlocks that provide for the reactor trip.

(Reselected 015 A2.03) - Ability to (a) predict the impacts of the following malfunctions or operations on the NIS: and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.**Importance Rating:** SRO 3.5**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

RTB00G8.05 - Given plant conditions involving a xenon oscillation and Control Room references, determine the appropriate operator actions.

References: EM-04-17, Att. 1, Att. 5**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- Candidate may select since "Rod Position" is one of the parameters listed on the table. However, the primary action for a Dropped Rod is to match Turbine load and Tref with Reactor power and Tave.
- Candidate may select since "Rod Position" is one of the parameters listed on the table. However, the actions for a Continuous Rod Withdrawal are not on this table (use of EM-OFF or trip reactor).
- Correct** - The provided table is from the Engineering Manual section used for controlling Xenon oscillations.
- Candidate may select since "Power Escalation" is listed on the table; however even though an inadvertent dilution would affect reactor power, candidate incorrectly applies it here.

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE (except the table provided with the question)

WRITTEN QUESTION DATA SHEET

Question Number: 81**Tier/Group:** SRO RO**K/A:** 2.3.2

Knowledge of facility ALARA program

Importance Rating: SRO 2.9**10CFR55 Content:** SRO 43(b).4**Palisades Training Objective:**

Describe the following IAW Administrative Procedure 7.13.

(ADAAG15.04)

- a. Definitions (all), given Administrative Procedure 7.13
- b. Prerequisites (all), given Administrative Procedure 7.13
- c. Very High Radiation Area Access, without references
- d. Access when the reactor is critical, without references
- e. Unplanned/Abnormal/Emergency Entry, without references
- f. Individual responsibilities for proper radiation safety, without references

References: HP-11.1, rev 13, pp. 7, 15, 16, 19 AP 7.13, rev 9, p. 3**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. May select due to correct recognition that the work is in a High Radiation Area and requires a High Rad Area briefing, but fails to properly calculate, or fails to recognize the need to note stay time and project dose, and then determine that since the estimated total dose is >1R a Formal ALARA brief is required.
- b. **Correct** - A Formal ALARA brief required if estimated total dose > 1 R. A High Radiation Area Brief is required if general area > or = 1R/hr
- c. May select due to correct recognition that the work will result in greater than 1R dose and therefore requires a Formal ALARA brief, but fails to recognize this is a High Radiation Area, and therefore also requires a High Rad Area briefing.
- d. May select due to correct recognition that the work is in a High Radiation Area and requires a High Rad Area briefing, but fails to recognize the need to note stay time and project dose, and then determine that since the estimated total dose is >1R, which requires a Formal ALARA brief.

Difficulty Rating: 4**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 82**Tier/Group:** SRO RO**K/A:** 001 Control Rod Drive A4.06

Ability to manually operate and/or monitor in the control room: Control rod drive disconnect/connect.

Importance Rating: SRO 3.2 RO 2.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given Plant conditions, determine if the CRDM motors have power.

(ASEE0K2.01)

References: SOP-6, Att. 2, Section 5.0 Tech Spec Surveillance RO-19**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. **Correct** - This is the method used for this condition.
- b. Candidate incorrectly believes that movement of any rod is not specific enough to verify a particular rod.
- c. Candidate believes this method is not rigorous enough, since no sensing equipment or ammeter is used.
- d. Candidate fails to recall the relationship between PIP and SPI systems for rod indication.

Difficulty Rating: 4**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 83**Tier/Group:** SRO RO**K/A:** 2.1.14

Knowledge of system status criteria which requires notification of plant personnel.

Importance Rating: SRO 3.3**10CFR55 Content:** SRO 43(b).3**Palisades Training Objective:**

Given a plant condition and using plant procedures, formulate required reports and identify proper notifications.

ADAD0G3.01

References: AP 4.00, 5.5.3, rev 23**Source of Question:** Palisades Bank 2000CERT 27 (direct)**DISTRACTOR ANALYSIS**

- a. NRC reportable events are typically associated with ESF systems and actuations. If this were determined to be reportable, it would be no less than a 4-hour report. Select since many events are NRC reportable.
- b. May report certain events associated with the tertiary system to Rad Services, however, for this condition, the Radiological Services Supervisor is not required to be notified.
- c. **Correct** - Required per AP-4.00 for unscheduled derates of greater than 10%.
- d. Public affairs is notified in the event of trips, startups, shutdowns or events onsite which the public may become aware of through sensory perception. Select since public affairs is notified of most events which are reported to outside agencies.

Difficulty Rating: 4**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 84**Tier/Group:** SRO RO

K/A: 000027 K2.02 Pressurizer Pressure Control System Malfunction / 3
Knowledge of the interrelations between the PPCS malfunction and sensors and detectors.
(Reselected K2.03): Controllers and positioners

Importance Rating: SRO 2.8**10CFR55 Content:** SRO 43(b). 5**Palisades Training Objective:**

Given symptoms associated with a specific Off Normal event, describe the mitigating strategy and the basis for the mitigating strategy IAW the Off Normal Procedure. (IOTFK.05)

References: ONP-18**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. Candidate may select, incorrectly believing that the problem is caused by a condition which will be alleviated by tripping PCPs (also believing this will stop Pressurizer spray - P-50B and P-50C PCPs do provide PZR spray - though it would not be necessary to trip all PCPs).
- b. **Correct** - For a stuck open PZR spray, these are the required actions.
- c. Candidate may select, incorrectly believing that the problem is caused by a condition which will be alleviated by tripping PCPs (also believing this will stop Pressurizer spray - P-50B and P-50C PCPs do provide PZR spray.)
- d. Candidate fails to understand the operation of the PZR pressure controller - raising output would actually cause even more spray flow.)

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 85**Tier/Group:** SRO RO**K/A:** 014 K3.01 Rod Position Indication

Knowledge of the effect that a loss or malfunction of the RPIS will have on the CRDS.

Importance Rating: SRO 2.8**10CFR55 Content:** SRO 43(b).6**Palisades Training Objective:**

Given various Plant conditions, one or more of the following annunciators in the alarmed condition:

(ASEE0G9.01)

- a. Identify any alternate system indications that can be used to verify a given alarm.
 - b. Describe the effect of a valid alarm condition on the operation of the CRD System.
 - c. Use applicable control room references to determine the actions required.
- EK-0924 (30, 36, 42) Group 1 (2, 3, 4) Power Dependent Insertion Limit

References: ARP-5, #24**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. May select since the SOP-34 contains extensive guidance on inputs to the CRDS for position monitoring, etc.; but contains no guidance on actually operating the CRDS.
- b. May select since the ONP does address a similar condition, but does not provide the detailed instructions on how to operate the CRDS; in fact, it refers the operator to SOP-6.
- c. **Correct** - the ARP refers the operator to SOP-6 for operating the CRDS to correct this condition
- d. There are Tech Spec implications to this alarm condition, and candidate incorrectly selects a document similar to Tech Specs, the ORM.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 86**Tier/Group:** SRO RO**K/A:** 000011 2.4.1 Large Break LOCA / 3

Knowledge of EOP entry conditions and immediate actions steps.

Importance Rating: SRO 4.6**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**

Given Plant conditions involving a loss of coolant, respond IAW EOP 4.0.

(TBAGT00.04)

References: EOP-1.0, Attachment 1, p. 3 Admin Proc. 4.06, Attachment 15, p. 7
EOP-1.0 Basis, p. 71**Source of Question:** Palisades Bank12216 (significantly modified)**DISTRACTOR ANALYSIS**

- a. **Correct** - For multiple events, EOP-9.0 Functional Recovery Procedure entry is required.
- b. Candidate may select since these two procedures do separately address the transient; however, candidate fails to recognize Functional Recovery procedure transitioning.
- c. Candidate may select since these two procedures do separately address the transient; however, candidate fails to recognize Functional Recovery procedure transitioning.
- d. Candidate may select since the Steam Generator Tube Rupture may involve a radiological release, and is therefore more important; but also realizes that a transition to the Functional Recovery Procedure is appropriate at some point.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 87**Tier/Group:** SRO RO**K/A:** 2.2.24

Ability to analyze the effect of maintenance activities on LCO status.

Importance Rating: SRO 3.8**10CFR55 Content:** SRO 43(b).2**Palisades Training Objective:**

Given conditions in which failure to meet an LCO (or ORM Specification) is discovered, SELECT the required actions IAW the following (determination of applicable Completion Time Extensions is for SROs ONLY): (ADAT0A1.12)

References: Tech Spec 3.5.2 Tech Spec 1.3, Completion Times**Source of Question:** Palisades Bank itsbank12 (significantly modified)**DISTRACTOR ANALYSIS**

- a. May select due to the incorrect assumption that P-66B and P-67A are same train equipment and as a result of this incorrect assumption, candidate misapplies LCO 3.5.2.B and concludes the completion time (i.e., restoring all equipment on that train) is 72 hours.
- b. May select due to an incorrect assumption that P-66B and P-67A are same train equipment and further misapplies the completion time extension rule and incorrectly determines that the LCO completion time must be calculated based on from the time the first piece of equipment in the train (P-66B) became inoperable PLUS a 4 hour extension.
- c. May select due to an incorrect assumption that P-66B and P-67A are same train equipment and further misapplies the completion time extension rule and incorrectly determines that the LCO completion time must be calculated based on from the time the first piece of equipment in the train (P-66B) became inoperable.
- d. **Correct** - P-67A is a different ESS train from P-66B and the specified LCO completion is 7 days from the time P-67A became inoperable.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** TS 1.3, Completion Times, LCO 3.5.2

WRITTEN QUESTION DATA SHEET

Question Number: 88**Tier/Group:** SRO RO**K/A:** 2.1.33

Ability to recognize indications for system operating parameters which are entry level conditions for Tech Specs.

Importance Rating: SRO 4.0**10CFR55 Content:** SRO 43(b). 2**Palisades Training Objective:**

Given available Control Room references and conditions involving Nuclear Instrumentation (includes Quadrant Power Tilt), SELECT the required action(s) and surveillance(s) IAW the following (ASGA0G8.01)

- | | | | |
|--------------|-------------------------------------|-------------------------------------|--------------|
| a. LCO 3.2.3 | b. LCO 3.3.7 | c. LCO 3.3.8 | d. LCO 3.3.9 |
| e. LCO 3.9.2 | f. ORM Table 3.17.6 items 12 and 15 | g. ORM Table 4.17.6 items 12 and 15 | |

References: Tech. Spec. 3.3.7 Tech Spec Table 3.3.7-1 DBD 7.6.1.4**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. May select due to an incorrect belief that only one CET is required per quadrant.
- b. **Correct** - Per DBD 7.6.1.4 and Tech Specs 4 per quadrant are required per the stated basis.
- c. May select due to an incorrect understanding that only one CET is required per quadrant. LTOP actually uses Tcolds as the indication monitored for entry condition.
- d. Selects correct number per quadrant, but misunderstands or fails to recall the indication used for LTOP entry conditions.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 89**Tier/Group:** SRO RO**K/A:** 059 K3.03 Main Feedwater

Knowledge of the effect that a loss or malfunctions of MFW will have on the S/Gs.

Importance Rating: SRO 3.7**10CFR55 Content:** SRO 43(b).5**Palisades Training Objective:**Given plant conditions involving symptoms of an Excessive Feedwater Increase, respond IAW ONP-10.
(TBAET00.01) (IOTFT.39)**References:** ONP-3, 4.2.a, b**Source of Question:** Palisades Bank 12330 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes the reactor should have tripped, possibly due to misapplying a setpoint of 55% low level in the S/Gs (which only causes a low level alarm and NOT a reactor trip).
- b. Candidate misapplies a concern for adding positive reactivity due to raising S/G levels. Raising S/G levels in accordance with the procedure, would NOT adversely affect reactivity.
- c. **Correct** - Power reduction is to be stopped when feed flow is slightly higher than steam flow and to avoid excessive cooldown (and positive reactivity).
- d. Candidate incorrectly believes continuing to reduce power would cause S/G levels to restore to programmed levels. Incorrect because the raising of S/G levels during a power reduction is not a controlled method, nor is it per procedure.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 90**Tier/Group:** SRO RO**K/A:** 000036 K3.01 (BW/A08) Fuel Handling Incident / 8

Knowledge of the reasons for different inputs that will cause a reactor building evacuation as they apply to a Fuel Handling Incident.

Importance Rating: SRO 3.7**10CFR55 Content:** SRO 43(b).4, 5, 7**Palisades Training Objective:**

For any Off Normal Procedure requiring immediate actions, state the Immediate Actions of the applicable Off Normal Procedure. (IOTFK.03)

References: ONP-11.2**Source of Question:** Palisades Bank 4981 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate may select, since the title of this ONP implies some alternate means of maintaining the plant in a safe shutdown condition (which would be a concern for the given conditions), and because the procedure does specify evacuation of one area of the plant, but not of the refueling area.
- b. Candidate may select, since this ONP does address a type of refueling accident; however, it does not apply for evacuation of any area in the plant.
- c. **Correct** - The Immediate Action of the given ONP is to evacuate affected areas in the refueling area.
- d. Candidate may select, since this ONP does address a type of accident associated with fuel; however, it does not apply to this situation, and further, does not require evacuation of any plant areas.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 91

Tier/Group: SRO RO

K/A: 2.1.23 Perform system and integrated procedures

Importance Rating: SRO 4.0 RO 3.9

10CFR55 Content: SRO RO

Palisades Training Objective: IOTAG12.01 9189 (probably)

Given plant conditions involving plant startup and appropriate Control Room references determine what action must be taken to begin or continue plant startup.

References: SOP-1, 4.4.4, rev 49**Source of Question:** Palisades Bank PR1-27 (direct)**DISTRACTOR ANALYSIS**

- a. **Correct** - Above 185 °F, PCS and pressurizer DeltaT should be maintained above 50 oF.
- b. Delta T shall never allowed to drop below 25 oF.
- c. PCS heatup limit is 40 oF/hr, so no violation has occurred.
- d. PCS and pressurizer DeltaT should be maintained above 50 oF.

Difficulty Rating: 3**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 92**Tier/Group:** SRO RO**K/A:** 2.1.10 Knowledge of Conditions/limitations in the facility license**Importance Rating:** SRO 3.9 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

State the two functions of the Pressurizer Pressure Control System per FSAR 7.5.1.2 and 7.4.2.1.

(ASFE0G4.01)

References: Tech. Spec. 2.1.2**Source of Question:** NEW**DISTRACTOR ANALYSIS**

- a. May select since this is the setpoint for RPS Hi PZR Pressure trip.
- b. May select since this is the setpoint for ATWS trip on high PZR pressure.
- c. May select since 2650 is an important number in plant design (design MWt for Steam Generators), but is NOT correct for pressure Safety Limit.
- d. **Correct** - Per Tech Specs.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 93**Tier/Group:** SRO RO**K/A:** 2.4.12 Knowledge of general operating Crew responsibilities during emergency operations**Importance Rating:** SRO 3.9 RO 3.4**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the EOP performance standard requirements IAW AP 4.06.

References: AP 4.06 EOP 9.0, Placekeeper, p. 9, 10**Source of Question:** Palisades Bank 99NRC 38 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes that Heat Removal is the highest priority Safety Function.
- b. Candidate incorrectly believes that CA is a higher priority than IC.
- c. Candidate incorrectly believes that PC is a higher priority than IC (possibly due to concerns for subcooling).
- d. **Correct** - Candidate correctly believes that since IC is a higher priority Safety Function than PC, it should be addressed first.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 94**Tier/Group:** SRO RO**K/A:** 2.4.35 Knowledge of local auxiliary operator tasks during emergency operations, including system geography and system implications.**Importance Rating:** SRO 3.5 RO 3.3**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given plant conditions involving an Excess Steam Demand Event, describe the impact on plant operation of isolating the wrong S/G. (ISKFG12.01)

References: EOP-6.0 Basis, p. 41**Source of Question:** Palisades Bank 7227 Direct**DISTRACTOR ANALYSIS**

- a. Candidate correctly understands there is a crosstie between the main steam lines, but incorrectly applies this, since the crosstie is DOWNstream of the MSIVs. The break is UPstream of the MSIVs.
- b. Candidate recalls that the Turbine Bypass Valve is designed to remove PCS heat, however candidate incorrectly determines that the Turbine Bypass Valve is available for the given conditions. The TBV is DOWNstream of the MSIVs and the MSIVs are closed.
- c. **Correct** - There is no further heat removal available from "A" S/G (since it has blown dry) and now "B" has been incorrectly isolated.
- d. Candidate jumps to the conclusion that PCS pressure control is lost, since the ADVs are now not available; however, the Control Room CAN control PCS pressure using PZR heaters and sprays.

Difficulty Rating: 3**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 95**Tier/Group:** SRO RO**K/A:** 2.3.10 Ability to perform procedures to Reduce excessive levels of radiation and guard against personnel exposure**Importance Rating:** SRO 3.3 RO 2.9**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given a radiation exposure scenario, determine the ALARA solution using the radiation exposure theory inverse square law. (ADAAG15.02)

References: GP Course, Health Physics Fundamentals, p.5-17, 19**Source of Question:** INPO Bank San Onofre Sept 2000 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly calculates exposure.
- b. **Correct** - Per calculation
- c. Candidate correctly calculates exposure PER PERSON, but incorrectly applies ALARA principle, since overall exposure (two people) is greater.
- d. Candidate incorrectly calculates exposure per person.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 96**Tier/Group:** SRO RO**K/A:** 017 In-core Temperature Monitor A2.02

Ability to:

- a. predict the impacts of the following malfunctions or operations on the ITM system, and
- b. based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. Core damage

Importance Rating: SRO 4.1 RO 3.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Describe the once-through method of core cooling and the conditions for use.

TBAH0A2.02

References: EOP-4.0 EOP-9.0**Source of Question:** Palisades Bank 2000 NRC Q1 Direct**DISTRACTOR ANALYSIS**

- a. Plausible since saturated conditions will exist until core is uncovered. Conditions reach superheat.
- b. **Correct** - As the core uncovers, heat is added to the steam flowing past the uncovered portion of the fuel. This results in superheated conditions.
- c. Plausible since voiding affects incore NI indication. Indication goes up instead of lowering.
- d. Plausible since leakage changes as core is uncovered. Indication rises instead of lowers.

Difficulty Rating: 2**Cognitive Level:** High ✓ Low**References Supplied to Candidate:** NONE

WRITTEN QUESTION DATA SHEET

Question Number: 97**Tier/Group:** SRO RO**K/A:** 086 Fire Protection A1.03

Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Fire Protection System operating the controls including: Fire Doors.

Importance Rating: SRO 3.2 RO 2.7**10CFR55 Content:** SRO RO**Palisades Training Objective:**

State the purpose of a fusible link on fire doors.

(ISDB0G4.05)

References: LP-ISDB DBD-1.10, 4.13**Source of Question:** Palisades Bank 1595 (direct)**DISTRACTOR ANALYSIS**

- a. Candidate incorrectly believes an interlock exists which uses the fusible link as an operating mechanism.
- b. Candidate correctly understands the fusible link is for a fire situation, but incorrectly believes it allows opening of a door for personnel escape.
- c. **Correct** - The link melts during a fire and lets the door shut.
- d. The fusible link does hold the door open, however, candidate fails to understand the door will close for a fire situation.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

SENIOR REACTOR OPERATOR

Palisades 2001 NRC Initial License Exam

WRITTEN QUESTION DATA SHEET**Question Number:** 98**Tier/Group:** SRO RO**K/A:** 2.2.27 Knowledge of the Refueling process**Importance Rating:** SRO 3.5 RO 2.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

State the definition of the following terms IAW the following:

(ADAT0A1.04)

- a. Improved Technical Specification 1.1/Operating Requirements Manual:
- Core Alteration

References: T.S. 1.0 GOP-11**Source of Question:** Palisades Bank PRAC2-98 (significantly modified)**DISTRACTOR ANALYSIS**

- a. Core alteration applies only to fuel, sources, or control rods
b. Exception to definition.
c. No movement of core components.
d. **Correct** - definition per Tech Specs.

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

SENIOR REACTOR OPERATOR*Palisades 2001 NRC Initial License Exam***WRITTEN QUESTION DATA SHEET**

Question Number: 99**Tier/Group:** SRO RO**K/A:** 2.2.13 Knowledge of Tagging and clearance procedures**Importance Rating:** SRO 3.8 RO 3.6**10CFR55 Content:** SRO RO**Palisades Training Objective:**

Given any plant conditions, determine the applicable Tagging Rules IAW AP 4.10

PSTOT00.02

References: AP-4.10, 6.8.2**Source of Question Number::** Palisades Bank PR2-24 (direct)**DISTRACTOR ANALYSIS**

- a. Not in keeping with ALARA practices.
- b. Not in minimizing the potential spread of contamination.
- c. **Correct** - Acceptable method per AP 4.10
- d. Not in keeping with ALARA practice

Difficulty Rating: 2**Cognitive Level:** High Low ✓**References Supplied to Candidate:** NONE

SENIOR REACTOR OPERATOR

Palisades 2001 NRC Initial License Exam

WRITTEN QUESTION DATA SHEET

Question Number: 100

Tier/Group: SRO RO

K/A: 2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements

Importance Rating: SRO 3.0 RO 2.6

10CFR55 Content: SRO RO

Palisades Training Objective:

Without the use of references, describe the following IAW Administrative Procedure 7.04.(ADAAG15.01)
e. Monitoring requirements

References: AP 7.15, Attachment 3

Source of Question: Palisades Bank PR2-100 (direct)

DISTRACTOR ANALYSIS

- a. **Correct** - Hand and foot frisk required, PCM-1B use required at Access Control.
- b. Hand and foot frisk required, PCM-1B use required at Access Control.
- c. Hand and foot frisk required, PCM-1B use required at Access Control.
- d. Hand and foot frisk required, PCM-1B use required at Access Control.

Difficulty Rating: 2

Cognitive Level: High Low ✓

References Supplied to Candidate: NONE

WRITTEN QUESTION DATA SHEET

**Palisades NRC Written Exam - 2001
Index of References Provided for
Senior Reactor Operator (SRO)**

Quest #	Required Reference
11	SOP-30, Att. 1 (Y-50 drawing)
14	OA-136 (SWS)
15	M-208, sh. 1A, 1B (FS-0885)
36	SOP-38, Att. 4 (RGEM Panel)
37	T.S. 3.9.2-1, "Refueling Operations - Nuclear Instrumentation"
46	Technical Data Book Figure 1.9, "Power Dependent Insertion Limits"
60	M-205, sh. 2, lower left
75	ONP-17, Att. 1 (pp 1-12), "Loss of Shutdown Cooling - Approximate Time to 200°F Curves"
77	ONP-23.2 excerpt (p. 2-5; Att.1; Att. 2), "Steam Generator Tube Leak"
78	EOP Supplement 38, "Determination of Final PCS Boron from S/G Backflow"
87	T.S. 1.3, "Completion Times"; LCO 3.5.2, "Emergency Core Cooling Systems"

WRITTEN QUESTION DATA SHEET

SRO KEY

1. c	26. b	51. b	76. c
2. c	27. a	52. b	77. b
3. d	28. a	53. a	78. c
4. d	29. a	54. d	79. c
5. b	30. b	55. b	80. c
6. d	31. c	56. b	81. b
7. a	32. d	57. c	82. a
8. b	33. b	58. c	83. c
9. b	34. a	59. a	84. b
10. c	35. d	60. d	85. c
11. d	36. c	61. a	86. a
12. c	37. b	62. b	87. d
13. a	38. d	63. a	88. b
14. a	39. d	64. c	89. c
15. d	40. b	65. a	90. c
16. d	41. a	66. c	91. a
17. c	42. c	67. b	92. d
18. d	43. c	68. d	93. d
19. a	44. b	69. a	94. c
20. a	45. a	70. d	95. b
21. b	46. b	71. a	96. b
22. d	47. d	72. a	97. c
23. c	48. b	73. c	98. d
24. b	49. d	74. b	99. c
25. b	50. b	75. c	100. a