

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

Applicant Information

Name:

Region: I

Date:

Facility/Unit: Salem Units 1 and 2

License Level: SRO

Reactor Type: Westinghouse PWR

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 four 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

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

1.	A	B	C	D	26.	A	B	C	D
2.	A	B	C	D	27.	A	B	C	D
3.	A	B	C	D	28.	A	B	C	D
4.	A	B	C	D	29.	A	B	C	D
5.	A	B	C	D	30.	A	B	C	D
6.	A	B	C	D	31.	A	B	C	D
7.	A	B	C	D	32.	A	B	C	D
8.	A	B	C	D	33.	A	B	C	D
9.	A	B	C	D	34.	A	B	C	D
10.	A	B	C	D	35.	A	B	C	D
11.	A	B	C	D	36.	A	B	C	D
12.	A	B	C	D	37.	A	B	C	D
13.	A	B	C	D	38.	A	B	C	D
14.	A	B	C	D	39.	A	B	C	D
15.	A	B	C	D	40.	A	B	C	D
16.	A	B	C	D	41.	A	B	C	D
17.	A	B	C	D	42.	A	B	C	D
18.	A	B	C	D	43.	A	B	C	D
19.	A	B	C	D	44.	A	B	C	D
20.	A	B	C	D	45.	A	B	C	D
21.	A	B	C	D	46.	A	B	C	D
22.	A	B	C	D	47.	A	B	C	D
23.	A	B	C	D	48.	A	B	C	D
24.	A	B	C	D	49.	A	B	C	D
25.	A	B	C	D	50.	A	B	C	D

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51.	A	B	C	D	76.	A	B	C	D
52.	A	B	C	D	77.	A	B	C	D
53.	A	B	C	D	78.	A	B	C	D
54.	A	B	C	D	79.	A	B	C	D
55.	A	B	C	D	80.	A	B	C	D
56.	A	B	C	D	81.	A	B	C	D
57.	A	B	C	D	82.	A	B	C	D
58.	A	B	C	D	83.	A	B	C	D
59.	A	B	C	D	84.	A	B	C	D
60.	A	B	C	D	85.	A	B	C	D
61.	A	B	C	D	86.	A	B	C	D
62.	A	B	C	D	87.	A	B	C	D
63.	A	B	C	D	88.	A	B	C	D
64.	A	B	C	D	89.	A	B	C	D
65.	A	B	C	D	90.	A	B	C	D
66.	A	B	C	D	91.	A	B	C	D
67.	A	B	C	D	92.	A	B	C	D
68.	A	B	C	D	93.	A	B	C	D
69.	A	B	C	D	94.	A	B	C	D
70.	A	B	C	D	95.	A	B	C	D
71.	A	B	C	D	96.	A	B	C	D
72.	A	B	C	D	97.	A	B	C	D
73.	A	B	C	D	98.	A	B	C	D
74.	A	B	C	D	99.	A	B	C	D
75.	A	B	C	D	100.	A	B	C	D

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Question 001

Unit 2 is at BOL and was manually tripped from 100% power when 21BF19, Feedwater Regulating Valve, failed closed.

An Estimated Critical Position (ECP) calculation was performed and boron concentration was adjusted for a critical rod height of Control Bank D at 115 steps.

However, when determining control bank worth, the personnel performing the ECP determined remaining rod worth using the MOL curve on Reactor Engineering Manual Figure 4 instead of the BOL curve.

Which one of the following describes how this error affects critical rod height?

- A. Criticality would occur within the ± 300 pcm administrative limit
- B. Criticality would occur above the rod insertion limit (RIL) but outside the ± 300 pcm administrative limit
- C. Criticality would occur below the Rod Insertion Limit (RIL) (C-58)
- D. Criticality cannot be achieved by pulling control rods

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Question 002

Given the following:

- Control bank control rod 1D2 dropped when a fuse failed
- Unit 2 remained at 50% power
- The fuse has been replaced and the circuit tested
- Reactor Engineering has granted permission to restore the rod to bank position at 8 steps per minute

During the control rod recovery, the following annunciator is received:

- OHA E-40, ROD BANK URGENT FAILURE

Which one of the following describes the cause of this alarm?

- A. Logic Cabinet Pulser failure
- B. Power Cabinet Regulation failure
- C. Bank Overlap Unit sequence error
- D. Logic Cabinet Slave Cycler output error

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Question 003

Which one of the following indications requires the trip of an operating Reactor Coolant Pump?

- A. Shaft vibration is 12 mils
- B. Flange vibration is 6 mils
- C. RCP standpipe high level alarm
- D. Seal Injection flow is 5.5 GPM

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Question 004

Unit 1 is at 25% power. The main turbine is rolling at 1200 rpm when an internal fault causes 11 Station Power Transformer (SPT) to de-energize.

Which one of the following describes the required operator action?

- A. Ensure 11 SPT is isolated electrically
- B. Start Condensate Pumps as necessary to maintain SGFP suction pressure
- C. Trip the main turbine and ensure the DC Oil Pumps started
- D. Trip the reactor and perform the required actions of EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION

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Question 005

Given the following conditions:

- Unit 2 is at 100% power.
- CVCS is aligned with 2CV55, Charging Header Flow Control Valve, in Manual
- 2CV71, Seal Injection Pressure control valve, was throttled to maintain Seal Injection pressure within limits
- Charging pump discharge pressure indicates 2410 psig
- Seal injection flow is 5.8 GPM to each RCP
- The RO is directed to raise Seal Injection flow to all RCPs

Which one of the following describes BOTH actions that will accomplish this task?

- A. Throttle open 2CV55, or throttle open 2CV71
- B. Throttle closed 2CV55, or throttle closed 2CV71
- C. Throttle open 2CV55, or throttle closed 2CV71
- D. Throttle closed 2CV55 or throttle open 2CV71

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Question 006

Given the following conditions:

- Unit 2 is at 100% power.
- VCT level indication on LT-112 has been erratic.
- As part of troubleshooting the problem 2SJ1&2SJ2, Charging Pump Suction from RWST, and 2CV40& 2CV41, Charging Pump Suction from VCT, have all been placed in MANUAL on the respective bezel.

Which one of the following describes the charging pump suction flowpath if an AUTO SI signal occurs and power is lost to the 230V bus (2B) that supplies 2SJ2 and 2CV41?

- A. Charging suction shifts immediately to the RWST (2SJ1). The VCT (2CV40) isolates
- B. Charging pumps will begin to cavitate when VCT level lowers below their NPSH
- C. Charging suction is via both the RWST and the VCT until LT-114 reaches the LO-LO setpoint, closing 2CV40
- D. SSPS shifts 2SJ1&2 and 2CV40&41 to AUTO, charging suction then shifts to the RWST (2SJ1) and the VCT (2CV40) isolates

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Question 007

Containment Pressure Channel II fails and is properly removed from service.

Which one of the following identifies the ESF actuation logic for the remaining Containment pressure channels?

- A. SI-1/2; CS-1/3
- B. SI-1/2; CS-2/3
- C. SI-1/3; CS-1/3
- D. SI-1/3; CS-2/3

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Question 008

An entry condition for S2.OP-AB.ROD-0004, ROD POSITION INDICATION FAILURE, is "One or more Group Demand Counters (GDC) indicating ± 2 steps from Slave Cyclor output".

Which one of the following describes how an operator can determine this condition exists?

- A. OHA E-24 ROD DEV OR SEQ alarm actuated
- B. Plant Computer point Rod Position Deviation is displayed
- C. Compare the P/A Converter indication to GDC indication
- D. Deviations may only be determined by voltmeter readings from the Rod Position Indication cabinets

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Question 009

Given the following conditions:

- Unit 2 is at 100% power.
- PRNIS Channel N-44 indication began oscillating and was removed from service IAW S2.OP-SO.RPS-0001, NUCLEAR INSTRUMENTATION CHANNEL TRIP/RESTORATION
- I&C installed the P-10 jumper per direction from the Operations Superintendent on duty.

Which one of the following describes plant response if PRNIS Channel N-43 fails high?

- A. The reactor remains at power. Rod Control is placed in MANUAL
- B. The reactor remains at power. The PR High Flux Trip on N-44 is bypassed
- C. The reactor will trip. SRNIS will be manually reinstated
- D. The reactor will trip. SRNIS will reinstate automatically

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Question 010

Unit 2 is at 100% power with all major control systems in AUTO.

Which one of the following describes an immediate consequence associated with loss of 2B 115VAC Vital Instrument Bus?

- A. AUTO and MANUAL rod withdrawal is blocked
- B. RCS low flow reactor trip logic changes from 2/4 to 1/4
- C. All PRNIS 2/4 logic is reduced to 2/3 until the required bistables are tripped
- D. Rods withdraw until the Nuclear/Turbine Mismatch signal decays out of the Rod Control System

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Question 011

Given the following conditions:

- A LOCA has occurred on Unit 1.
- The crew is in LOCA-1, Loss of Reactor Coolant.
- The RO notes that the Subcooling Margin Monitor (SCMM) is reading 16 °F less than his previous check but RCS pressure and temperature has remained constant

Which one of the following describes a reason for that change?

- A. The SCMM shifted to ADVERSE
- B. An in-core thermocouple failed high
- C. Rising containment pressure is lowering RCS pressure detector output
- D. Containment temperature is rising affecting the in-core thermocouple output from the reference junction box

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Question 012

Given the following conditions:

- A LOCA has occurred on Unit 2
- A PURPLE Path has developed on Containment Environment due to an abnormal rise in Containment Sump level

In accordance with FRCE-2, RESPONSE TO HIGH CONTAINMENT SUMP LEVEL, which one of the following tanks/systems are potential sources of in-leakage?

- A. Service Water and Primary Water Storage Tank
- B. Fire Protection and Auxiliary Feedwater
- C. Component Cooling Water and Main Feedwater
- D. Demineralized Water Storage Tank and Volume Control Tank

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Question 013

Which one of the following will prevent the RO from opening 22CS36, 22 RHR to CS Supply Valve, during the shift to cold leg recirculation?

- A. 21SJ44, Containment Sump Isolation Valve, is CLOSED
- B. RH2, RCS-RHR Loop Isolation Valve, is OPEN
- C. 22CS2, Containment Spray Pump Discharge Valve, is OPEN
- D. Either Containment Spray Pump breaker CLOSED

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Question 014

Unit 2 is at 100% power with all major control systems in AUTO. 22 Heater Drain Pump is OOS for breaker replacement.

Which one of the following specifies the power reduction required if 21 Condensate Pump trips? Assume SGFP suction pressure remains above the trip setpoint.

- A. 10%
- B. 15%
- C. 20%
- D. 25%

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Question 015

Unit 2 is at 100% power. 2B 4KV Vital Bus has just tripped on DIFF.

Which one of the following lists only equipment that is still OPERABLE?

- A. 21 AFW; 22 Charging; 24 CFCU
- B. 21 AFW; 21 SI; 22 CS
- C. 22 AFW; 21 CS; 2 ECAC
- D. 22 AFW; 21 RHR 22 SI

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Question 016

Given the following conditions:

- The crew is in FRHS-1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, and the criteria for initiating RCS bleed and feed has been met.
- Prior to the actual procedure steps there is a CAUTION statement that reads:
 - TO ESTABLISH RCS HEAT REMOVAL BY RCS BLEED AND FEED, STEPS 24 THRU 29 MUST BE PERFORMED QUICKLY AND WITHOUT INTERRUPTION

Which one of the following describes the basis for that statement?

- A. Stopping RCP's is the first step in the process. This terminates all RCS heat removal until bleed and feed is initiated
- B. Expeditious performance of the steps allows time for other compensatory actions if bleed and feed actions are unsuccessful
- C. Delay allows core cooling to degrade further. RCS pressure rises such that ECCS flow is lower when bleed and feed is initiated
- D. Establishing SI flow and then delaying opening the PZR PORV's may lead to damage to the PORV's and Code Safety Valves when they pass water

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Question 017

Which one of the following identifies the RMS channel(s) that is/are capable of closing 2WG41, Waste Gas Release Valve?

- A. 2R16, Plant Vent Effluent
- B. 2R41D, Plant Vent Release Rate
- C. Either 2R16 or 2R41D
- D. Either 2R41C, Plant Vent Noble Gas (High Range) or 2R41D

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Question 018

Given the following conditions:

- A LOCA has occurred on Unit 1.
- The RVLIS Summary Page is displaying DYNAMIC RANGE.
- During the subsequent cooldown and depressurization, void content indication remained constant at 80%.

Which one of the following describes actual void content response and reason for that response during the cooldown and depressurization?

- A. It was accurate at 80%. RVLIS is pressure and temperature compensated
- B. It was accurate at 80%. D/P is an accurate measure of void content, without compensation
- C. It was lower than 80%. Lowering pressure and rising density creates a RVLIS indication error
- D. It was higher than 80%. Lowering pressure and rising density creates a RVLIS indication error

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Question 019

Given the following conditions:

- A LOCA has occurred on Unit 2.
- The operating crew has transitioned to 2-EOP-LOCA-3, TRANSFER TO COLD LEG RECIRCULATION.

Which one of the following lists ALL of the interlocks that must be satisfied to open 21SJ45, RHR Discharge to SI Pumps Valve?

- A. 21 and 22SJ44, Containment Sump Suction Valve, OPEN
- B. 2SJ67 or 2SJ68, SI Pump Recirc Valve, CLOSED
- C. 21SJ44 OPEN; 2SJ67 or 2SJ68 CLOSED; RH1 or RH2, RHR-RCS Loop Suction Stop Valves, CLOSED
- D. 21 and 22 SJ44 OPEN; 2SJ67 or 2SJ68 CLOSED; RH1 or RH2 CLOSED

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Question 020

Unit 2 is at 50% power. There is a power ascension in progress at a rate of 10%/hr. Pressurizer (PZR) Pressure Channel III, PT-457 is selected for CONTROL.

Assuming no operator action, which one of the following describes RCS pressure response if the PZR Pressure Channel III fails low?

- A. Rises until the PZR Spray Valves open
- B. Rises until one PZR PORV opens
- C. Rises until both PZR PORV's open
- D. Rises until a PZR Code Safety Valve opens

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Question 021

Unit 2 is at 100% power. 21 Charging Pump is running and a 75 gpm letdown orifice is in service.

Assuming no operator action, which one of the following describes plant response if the PZR level channel selected to ALARM fails low?

- A. Charging flow remains constant. PZR level will be maintained at the 100% power setpoint
- B. Charging flow remains constant. PZR level will be maintained between the letdown isolation and zero power setpoints
- C. Charging flow will rise. PZR level will steadily rise to the reactor trip setpoint
- D. Charging flow will lower. PZR level will steadily rise to the reactor trip setpoint

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Question 022

Given the following conditions on Unit 2:

- The unit was at 100% power when an electronic failure and technician error resulted in an AUTO SI
- Train A Reactor Trip Brkr, RTB A, failed to open and is still closed
- I&C has NOT installed the P-4 jumpers on RTB A

Which one of the following describes a consequence of this situation?

- A. Condenser steam dumps will maintain Tav_g at 552°F
- B. SI CANNOT be reset and AUTO SI from another signal is NOT blocked
- C. The PO will have to manually close the Feedwater Isolation Valves on 21 and 22 SG
- D. The HI Steam Flow/LO-LO Tav_g SI setpoint remains at the 100% power value on Train A

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Question 023

Unit 1 is at 100% power with all major control systems in AUTO.

Which one of the following describes the response of steam generator (SG) level if PT-505, Turbine First Stage Pressure, fails to zero psig?

- A. All feedwater regulating valves shift to MANUAL. The PO must select PT-506 to restore automatic control
- B. All feedwater-regulating valves shift to MANUAL. The PO must maintain SG levels
- C. All SG levels are automatically maintained at 44% via a signal from PT-506
- D. All SG levels are automatically maintained at 44% via a signal from AVG STEAM FLOW

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Question 024

Given the following conditions on Unit 2:

- A large break LOCA has occurred
- Containment pressure peaked at 32 psig and is now 2.5 psig
- Pre-LOCA Containment temperature was 90°F
- Post-LOCA Containment temperature is 120°F
- The Technical Support Center has recommended that 22 Hydrogen Recombiner be placed in service

Which one of the following values is the proper setting for 22 Hydrogen Recombiner potentiometer?

- A. <50 KW
- B. 50-51 KW
- C. 51-52 KW
- D. >52 KW

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Question 025

Given the following conditions:

- The reactor is at 50% power.
- 24MS167, Main Steam Isolation Valve, trips CLOSED

Assuming the reactor does NOT trip, which one of the following describes the initial response of RCS ΔT and SG pressure in the affected loop?

- A. RCS ΔT rises and SG steam pressure lowers
- B. RCS ΔT lowers and SG steam pressure rises
- C. RCS ΔT rises and SG steam pressure rises
- D. RCS ΔT lowers and SG steam pressure lowers

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Question 026

Unit 1 is at 100% power.

Which one of the following describes ALL of the Vital Instrument Inverter breaker(s) that will be in the closed position for normal operations?

- A. Normal AC Supply only
- B. Normal AC Supply and DC Supply only
- C. Normal AC Supply and Backup AC Supply
- D. Normal AC Supply, Backup AC Supply, and DC Supply

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Question 027

The Station Blackout Air Compressor is aligned to Which one of the following Control Air headers?

- A. 1A and 2A
- B. 1B and 2B
- C. 1A and 2B
- D. 1B and 2A

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Question 028

Given the following conditions:

- Unit 2 is in MODE 4
- RCS Cooldown is in progress
- 21RHR Pump and Heat Exchanger (HX) are in service to provide shutdown cooling
- The CRS directs that the RCS cooldown rate be REDUCED

Which one of the following describes the method for reducing the cooldown rate?

- A. Throttle open on 21RH18, RHR Heat Exchanger Flow Control valve, while throttling closed on 2RH20, RHR Heat Exchanger Bypass valve, to maintain total RHR flow constant
- B. Throttle closed on 21RH18, RHR Heat Exchanger Flow Control valve, while throttling closed on 2RH20, RHR Heat Exchanger Bypass valve, to reduce total RHR flow
- C. Throttle closed on 21RH18, RHR Heat Exchanger Flow Control valve, while throttling open on 2RH20, RHR Heat Exchanger Bypass valve, to maintain total RHR flow constant
- D. Throttle open on 21RH18, RHR Heat Exchanger Flow Control valve, while throttling open on 2RH20, RHR Heat Exchanger Bypass valve, to raise RHR heat exchanger bypass flow

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Question 029

Steam Dump Controller in MS PRESS CONT mode due to a previous failure of PT-506 Turbine First Stage Pressure.

Following a reactor trip, PT-507, Main Steam Header Pressure fails off-scale high.

Assuming no operator action, Which one of the following describes the effect of this failure?

- A. Steam Dumps remain closed. RCS temperature rises until MS10s open to control RCS temperature
- B. Steam Dumps open. RCS temperature rapidly lowers until steam dumps close at 543 deg F. Steam dumps will then cycle to maintain 543 deg F
- C. Steam Dumps remain closed. RCS temperature rises until Main Steam Safety Valves open to control RCS temperature
- D. Steam Dumps open. RCS temperature rapidly lowers until 543 deg F when Main Steam Line Isolation and Safety Injection actuate

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Question 030

Which one of the following describes a design feature intended to prevent water hammer in the Containment Fan Coil Units during a SEC Mode III actuation?

- A. All SW57's, CFCU Pressure Control Inlet Valves, fully close to maintain CFCU inlet piping full until SW pressure is restored
- B. All SW57's, CFCU Pressure Control Inlet Valves, open fully and the SW accumulators maintain full flow through the CFCU while the SW Pumps start and pressure is restored
- C. SW accumulators are capable of providing 2640 gpm to each CFCU during the brief delay when SW Pumps are starting and pressure is being restored
- D. SW accumulators automatically discharge into both nuclear headers to maintain the CFCU's full of water while the SW Pumps start and pressure is restored

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Question 031

Given the following conditions:

- A complete loss of off-site power has occurred.
- All vital buses (both units) are loaded in SEC Mode II.
- All SEC's have been reset in anticipation of starting some additional equipment.

Which one of the following describes how Control Air pressure will be maintained?

- A. #1 ECAC is running supplying "A" Header; #2 ECAC is running supplying "B" Header
- B. #1 ECAC is running supplying "B" Header; #2 ECAC is running supplying "A" Header
- C. At 85 psig #1 ECAC auto starts and supplies "A" Header and #2 ECAC auto starts and supplies "B" Header
- D. At 85 psig #1 ECAC auto starts and supplies "B" Header and #2 ECAC auto starts and supplies "A" Header

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Question 032

Which one of the following leak locations will cause pressurizer level indication to read HIGHER than actual level?

- A. Level detector Reference Leg
- B. Level detector Variable Leg
- C. Pressurizer Vapor Space
- D. Pressurizer Surge Line

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Question 033

Which one of the following describes the minimum set of conditions necessary to initiate an instantaneous Blackout (Mode II) operation of the SECs?

- A. 1/3 4KV vital busses <95% rated voltage
- B. 2/3 4KV vital busses <95% rated voltage
- C. 1/3 4KV vital busses <70% rated voltage
- D. 2/3 4KV vital busses <70% rated voltage

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Question 034

Unit 2 is at 100 % power.

A bus failure results in the loss of 21 RCP. The reactor does NOT automatically trip.

The crew manually turns the reactor trip switches and enters EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION.

While verifying the reactor trip, the RO reports the following indications:

- Plant computer IRPI is lost
- Dixon IRPI indication on CC2 is lost.
- Intermediate Range flux is DECREASING on all channels
- Power Range flux indication is 2%

Which one of the following describes the condition of the plant?

- A. The reactor is tripped, NO further action required to verify the trip.
- B. The reactor is tripped. Operate the reactor trip breaker bezels and open breakers 2E6D and 2G6D to confirm rod insertion.
- C. The reactor is NOT tripped. Trip the Turbine, initiate Manual Rod insertion, and go to EOP-FRSM-1, RESPONSE TO NUCLEAR POWER GENERATION
- D. The reactor is NOT tripped. Boration of 270 PPM over the Shutdown boron concentration is required until IRPI indication is available to verify no more than 1 stuck control rod.

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Question 035

A pressurizer code safety valve has indications of leakage.

The following indications exist:

- Pressurizer pressure is 2225 psig and stable.
- Safety Valve tailpipe temperature indicates 231°F and rising slowly
- PRT pressure is 6 psig and rising 1 psi every 10 minutes

Which one of the following is the reason for the temperature indication seen downstream of the safety valve?

- A. The leak is too small to overcome ambient heat loss to the containment
- B. The fluid velocity in the tailpipe results in a loss of energy and lower temperature
- C. The fluid temperature corresponds to the PRT saturation pressure because minimal energy is lost in a throttling process.
- D. The volume of water in the PRT quenches the superheated vapor downstream of the leaking safety valve

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 036

Given the following conditions:

- A Small Break LOCA has occurred
- The crew is performing the actions of EOP-LOCA-2, POST LOCA COOLDOWN AND DEPRESSURIZATION
- All SI pumps are running
- All RCPs are running
- RCS cooldown via Main Steam Dumps is ongoing
- RCS Tave is 510°F and lowering at a rate of 90°F/Hr
- RCS pressure is 1350 psig and stable
- Pressurizer level indicates 38% and rising

Which one of the following describes the next major action to be implemented in the EOP to mitigate the current conditions?

- A. Depressurize the RCS using normal spray to collapse voids and refill the PZR
- B. Transition to EOP-TRIP-3, SI TERMINATION, to immediately stop all SI pumps
- C. Stop all but one RCP and begin the SI flow reduction process by stopping ECCS pumps
- D. Stop the cooldown. Energize all pressurizer heaters to collapse voids and stabilize pressurizer level

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 037

Unit 2 is in MODE 5. Shutdown Cooling is lost. Neither RHR pump can be restarted.

- RCS temperature is 122°F
- RCS pressure is 110 psig
- Pressurizer cold calibrated level is 25%

Which one of the following methods of Decay Heat Removal will be initiated under these conditions?

- A. Hot Leg Injection
- B. Cold Leg Injection
- C. Steam Generator Reflux boiling
- D. Forced flow or Natural Circulation cooling

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 038

Unit 2 is at 100% power. All control systems are in automatic.

The controlling pressure input to the pressurizer pressure master controller fails to 2225 psig.

Which one of the following describes the initial response of the pressurizer heaters?

- A. Variable heaters and backup heaters are energized.
- B. Variable heaters and backup heaters are deenergized.
- C. Variable heaters are energized. Backup heaters are deenergized.
- D. Variable heaters are deenergized. Backup heaters are energized.

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 039

Reactor startup is in progress.

IR power indicates 5×10^{-11} amps on both channels. Source Range High Flux trip has NOT been blocked.

For the two switch positions shown below, describe the Reactor Protection System response to a blown instrument power fuse on Source Range channel N-31.

SR Level Trip Bypass: NORMAL

SR Level Trip Bypass: BYPASS

- | | | |
|----|-----------------|-----------------|
| A. | No Reactor Trip | No Reactor Trip |
| B. | Reactor Trip | No Reactor Trip |
| C. | No Reactor Trip | Reactor Trip |
| D. | Reactor Trip | Reactor Trip |

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 040

During a Reactor Startup the following conditions exist:

- P-6 has just energized
- Source Range Channel N-31 indicates 4×10^3 CPS
- Source Range Channel N-32 indicates 5×10^3 CPS
- Intermediate Range Channel N35 indicates 2×10^{-11} amps
- Intermediate Range Channel N36 indicates 2×10^{-10} amps

Which one of the following is the cause of the above readings?

- A. Intermediate Range Channel N35 is undercompensated.
- B. Intermediate Range Channel N36 is undercompensated.
- C. Intermediate Range Channel N35 is overcompensated.
- D. Intermediate Range Channel N36 is overcompensated.

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 041

The crew is performing S2.OP-AB.SG-0001, STEAM GENERATOR TUBE LEAK, due to a rise in radiation as indicated on 2R15, Condenser Air Ejector process radiation monitor.

The CRS orders a unit shutdown due to the following conditions:

- 2R15 is in ALARM
- 2R19C, SG BLOWDOWN PROCESS is RISING
- 2R53C, N16 MS LINE RAD MONITOR is RISING

Which one of the following describes the reason that a Unit shutdown is required for these conditions?

- A. The 2R15 alarm setpoint is based upon the 140 GPD tube leakage criteria requiring unit shutdown
- B. The combination of conditions indicates that the leakage is rising faster than a rate of 60 GPD/HR
- C. RCS inventory cannot be maintained if 2R53C reaches an alarm condition
- D. The combination of conditions will exceed the capacity of the Condensate Polishing system to remove impurities

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 042

Unit 2 has sustained a Steam Generator Tube Rupture. The crew is preparing to cooldown to a target temperature of 497°F.

A loss of Off-Site Power occurs. All equipment functions as required.

Which one of the following describes how the cooldown to target temperature will be accomplished?

- A. Intact SG MS10s set to 25%
- B. Main Steam Dumps in Pressure Control mode set to 25%
- C. Intact SG MS10s set to maximum rate
- D. Main Steam Dumps in Pressure Control mode set to maximum rate

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 043

Given the following conditions:

- Unit 2 is at 100% power.
- A Feedwater line break occurs downstream of the Aux Feed line to 22 SG inside containment.
- All actuations occur as required.

Which one of the following procedure transitions will be made after EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION?

- A. EOP-TRIP-2, REACTOR TRIP RESPONSE
- B. EOP-TRIP-3, SAFETY INJECTION TERMINATION
- C. EOP-LOSC-1, LOSS OF SECONDARY COOLANT to EOP-LOCA-1, LOSS OF REACTOR COOLANT to EOP-TRIP 3
- D. EOP-LOSC-1 to EOP-LOSC-2, MULTIPLE STEAM GENERATOR DEPRESSURIZATION to EOP-LOCA-1 to EOP-TRIP-3

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 044

Unit 2 is at 100% power. All systems are in their normal alignments.

2A 125 volt DC bus is lost.

Which one of the following describes the effect, if any, on the 2A vital instrument inverter?

- A. Inverter output voltage will remain the same
- B. Inverter output voltage will drop, causing a transfer to the regulated supply
- C. Inverter output voltage will drop, requiring a manual transfer to the regulated supply.
- D. Inverter output voltage will remain the same, but the auctioneering circuit will cause static switch transfer to the alternate supply.

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 045

A Loss of Control Air has occurred on Unit 2. The crew is performing actions of S2.OP-AB.CA-0001, LOSS OF CONTROL AIR.

Which one of the following is the preferred method of secondary heat removal during this event and the basis for that method?

- A. 23 AFP is preferred because flow can still be controlled using 21AF11-24AF11, Aux Feedwater flow control valves,
- B. 23 AFP is preferred because AFW flow can more easily be controlled by manually controlling SG pressure via local operation of MS10s
- C. 21 and 22 AFPs are preferred because 23 AFP speed control is lost and 21AF11-24AF11 are failed closed
- D. 21 and 22 AFPs are preferred because SG level control will not require entry to the 23AFP room and the probability of a Main Steam Delta P SI is avoided

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 046

The crew is performing EOP-LOCA-2, POST LOCA COOLDOWN AND DEPRESSURIZATION. 22 Charging Pump has been stopped. Conditions are met for stopping one Safety Injection (SI) Pump.

Which one of the following identifies the pump to be stopped and the reason for the selection?

- A. Stop 21 SI Pump to equalize diesel generator loading
- B. Stop 21 SI Pump to increase the probability of continuing injection flow if one ECCS train is lost
- C. Stop 22 SI Pump to ensure one full train of injecting ECCS equipment is maintained in service
- D. Stop 22 SI Pump to ensure ECCS injection flow if any single vital bus failure occurs

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 047

Given the following conditions:

- A SBLOCA has occurred on Unit 2 outside containment
- Actions of EOP-LOCA-6, LOCA OUTSIDE CONTAINMENT, have failed to isolate the break
- RCS pressure is 1440 psig and continues to lower.

Which one of the following identifies the procedure that will be used upon transition from EOP-LOCA-6 and the basis for the transition?

- A. EOP-TRIP-7, REDIAGNOSIS, to identify the break location
- B. EOP-LOCA-1, LOSS OF REACTOR COOLANT, to continue actions to address the LOCA
- C. EOP-LOCA-2, POST LOCA COOLDOWN AND DEPRESSURIZATION, to terminate SI and conserve makeup inventory
- D. EOP-LOCA-5, LOSS OF EMERGENCY COOLANT RECIRCULATION, to address the loss of inventory available for core cooling

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 048

The plant is at 98 % power.

Rod Control is operating in MANUAL. Control Bank D is at 206 steps.

The Reactor Operator withdraws Control Bank D two steps to maintain Tave on program. When the Raise Rods pushbutton is released, Control Bank D rods continue to move in the OUT direction.

Based on these conditions, which of the following action is required?

- A. Immediately trip the reactor and enter EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION
- B. Enter AB.ROD-3, CONTINUOUS ROD MOTION. Attempt to stop rod motion by depressing the LOWER pushbutton or selecting AUTO on the Rod Bank Selector Switch
- C. Enter AB.ROD-3. Place the Rod Bank Selector Switch in the CBD position and re-insert Control Bank D to 206 steps
- D. Ensure rod motion stops at the withdrawal limit and borate as necessary to control Tavg. If RCS Tavg exceeds 581°F then trip the reactor and enter EOP-TRIP-1

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 049

Unit 2 has been at 100% power for 40 days.

Which one of the following plant conditions requires verification of minimum SHUTDOWN MARGIN within one hour?

- A. Control Bank D Group 2 demand counter is declared INOPERABLE
- B. All control Bank D rods are verified 6 steps lower than the group demand counters
- C. One Control Bank D rod IRPI is declared inoperable
- D. One Control Bank D rod is declared untrippable

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 050

Fourteen hours following a LOCA, Hot Leg Recirculation is placed in service. Which one of the following describes the analyzed event that determined the need for Hot Leg Recirculation?

- A. Large Hot Leg Break
- B. Large Cold Leg Break
- C. Small Hot Leg Break
- D. Small Cold Leg Break

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 051

Given the following conditions:

- Unit 2 is at 41% power.
- 21 RCP seal leakoff is 2.9 GPM and has been rising for the past 2 hours.
- The crew is preparing to shutdown the plant when the following annunciator is received in the control room:
 - Control Console CC1, Bezel 2-5, SEAL LEAKOFF FLOW HI-LO
 - 21 RCP seal leakoff flow is approximately 6.5 GPM and rising

Which one of the following describes all actions required?

- A. Trip 21 RCP and close 21CV104, 21 RCP seal leakoff isolation valve, in 3-5 minutes
- B. Trip the reactor, trip 21 RCP, and close 21CV104 in 3-5 minutes
- C. Commence a controlled plant shutdown, trip 21 RCP when the reactor trip breakers are open
- D. Commence a controlled plant shutdown, raise 21 SG level to minimize effects of shrink, then trip 21 RCP

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 052

Unit 2 is operating at 100 % power when a Loss of Off-Site power causes a reactor trip. Ten minutes after the trip, the following conditions exist:

- 21SG Pressure 1010 psig and stable
- 22SG Pressure 1005 psig and stable
- 23SG Pressure 1015 psig and stable
- 24SG Pressure 1010 psig and stable

- All RCPs are Off
- RCS Pressure is 2230 psig and stable
- Thot is approximately 575°F in all 4 loops and lowering slowly
- Core Exit TCs indicate approximately 580°F
- Tcold is approximately 555°F in all 4 loops and stable

Based on the above indications, what is the condition of the RCS?

- A. Natural Circulation exists. The steam dumps are maintaining heat removal
- B. Natural Circulation does not exist. Heat removal may be established by opening the steam dumps
- C. Natural Circulation exists. MS10s are maintaining heat removal
- D. Natural Circulation does not exist. Heat removal may be established by opening the MS10s

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 053

Given the following conditions:

- Unit 2 is at 88% power.
- A Component Cooling Water leak results in entry into S2.OP-AB.CC-0001, COMPONENT COOLING ABNORMALITY.
- ATTACHMENT 4, LEAK ISOLATION METHOD, has determined that level lowers with either CC header in service, with makeup initiated.

Which one of the following describes the action(s) required IAW S2.OP-AB.CC-0001?

- A. Unit shutdown must be initiated within 1 hour due to entry to TS 3.0.3
- B. The reactor must be tripped to allow isolation of the non-safeguards header
- C. Initiate alternate makeup to the CC Surge Tank while isolating the non-safeguards header
- D. Return to step 1 of Attachment 4 to rediagnose the leak location

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 054

During an ATWT event from 100% power, Which one of the following will provide the most immediate negative reactivity insertion?

- A. RCS boration
- B. Manual rod insertion
- C. Manual Turbine Trip
- D. Isolating a Faulted Steam Generator

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 055

Which one of the following describes the reason for the sequence of diagnostic steps in EOP-TRIP-1 REACTOR TRIP OR SAFETY INJECTION?

- A. Main Steam Line break diagnosis takes priority because a high energy steam break could potentially mask other failures
- B. SGTR diagnosis takes priority because of the highest probability of radioactive release
- C. Main Steam Line break diagnosis takes priority because AFW must be isolated to remain within accident analysis assumptions for containment pressure
- D. SGTR diagnosis takes priority to minimize the potential for component failure due to water in the Main Steam lines

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 056

Following a SMALL BREAK LOCA coincident with loss of Off-Site power, the crew is performing action contained in EOP-FRTS-1, RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITIONS.

Which one of the following describes the difference in SI termination criteria for FRTS-1 as opposed to the criteria in EOP-TRIP-3, SAFETY INJECTION TERMINATION?

The criteria in FRTS-1 is...

- A. less restrictive to allow for a faster reduction in RCS pressure
- B. more restrictive to allow for a more controlled reduction in RCS pressure
- C. less restrictive because subsequent RCP restart is likely to cause propagation of any existing flaw in the reactor vessel walls
- D. more restrictive because subsequent RCP restart is likely to cause propagation of any existing flaw in the reactor vessel walls

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 057

Which one of the following describes why the Condensate pump suction temperature is monitored and limited to <140 deg F during a loss of Main Condenser vacuum?

- A. Minimize the possibility of condensate polishing resin damage and minimizes the possibility of last stage turbine blade overheating.
- B. Minimize the possibility of condensate polishing resin damage and steam flashing in the condensate suction pipe
- C. Minimize steam flashing in the condensate suction piping and ensures Main Condenser heat removal capability
- D. Minimize the possibility of last stage turbine blade overheating and ensures Main Condenser heat removal capability

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 058

A loss of all AC power has occurred on Unit 2.

The CRS directs performance of Blackout coping actions per S2.OP-AB.LOOP-0001, LOSS OF OFF-SITE POWER, Attachment 1, Part A.

Which one of the following actions will be taken as a result of performing this attachment?

- A. Reduction of Unit 3 Battery loads
- B. Isolation of RCP seals
- C. Manual start of 23 AFW pump
- D. De-energization of SECs

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 059

Unit 2 is at 100% power. All control systems in automatic.

- OHA B-3, "2B VTL INSTR BUS INVRT FAIL" is received
- All channel II indications are failed
- Aux Alarm Typewriter, 2B 115VAC VITAL INSTR BUS LOSS OF VOLT is in alarm

Which one of the following describes the effect on subsequent operation of the pressurizer backup heaters?

- A. Can be operated from the control room after placing pressurizer pressure master controller in manual
- B. Can be operated from the control room after installation of a jumper
- C. Can be turned ON and OFF using CMC switch and LOCAL/REMOTE selector on Elev. 78
- D. Can be operated in automatic after pressurizer level channel III is selected for ALARM

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 060

Which one of the following describes the fire protection actuation sequence if a fire is sensed in the Diesel Fuel Oil Storage Tank area?

- A. CO2 discharge begins immediately. If the thermal detector has NOT reset within five minutes then the deluge valve opens and remains open for five minutes
- B. If CO2 flow is NOT sensed within one minute then the deluge valve opens and remains open until the detector resets
- C. If CO2 flow is NOT sensed within one minute then OHA A-7, FIRE PROT FIRE actuates and the crew will be directed to manually open the deluge valve
- D. If CO2 flow is NOT sensed within one minute then the deluge valve opens and remains open for five minutes

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 061

Due to a chemical spill, the Unit 2 control room is being evacuated IAW S2.OP-AB.CR-0001, CONTROL ROOM EVACUATION.

The reactor is tripped. Three control rods indicate fully withdrawn.

Which one of the following describes the required actions to initiate a Rapid Boration?

- A. Align charging through CV175, Rapid Borate Stop Valve, IAW EOP-TRIP-2, REACTOR TRIP RESPONSE
- B. Ensure SI is actuated IAW EOP-FRSM-1, RESPONSE TO NUCLEAR POWER GENERATION
- C. Open CV175 from the Hot Shutdown Panel and isolate control air to CV55, Charging Flow Control valve, to allow maximum charging flow IAW S2.OP-AB.CR-0001
- D. Manually open CV175 and control charging flow through CV55 using the Manual hand air operator IAW S2.OP-AB.CR-0001

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 062

The crew is performing EOP-FRCC-1, RESPONSE TO INADEQUATE CORE COOLING.

Both channels of Reactor Vessel Level Indication System (RVLIS) are INOPERABLE. Preparations are being made to start RCPs.

Which one of the following indications provides the status of RCS inventory under these conditions?

- A. Pressurizer Level
- B. Safety Injection flow
- C. Core Exit Thermocouples
- D. Core Delta Temperature ($T_{hot} - T_{cold}$)

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 063

Following an alarm on R31, Letdown Line Failed Fuel Process Monitor, high RCS activity was confirmed IAW S2.OP-AB.RC-0002, HIGH ACTIVITY IN REACTOR COOLANT.

The CRS directs a plant shutdown be performed.

Which one of the following actions performed IAW AB.RC-0002 is designed to limit the release of radioactivity in the event of a subsequent SGTR?

- A. MSIVs are closed
- B. MS10 setpoints are raised
- C. RCS is cooled down below 500°F
- D. Maximum condensate polishers are placed in service

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 064

Which one of the following Unit 2 Radiation Monitoring System channels in alarm will require action IAW EOP-LOCA-6, LOCA OUTSIDE CONTAINMENT?

- A. 2R5, Fuel Handling Building Spent Fuel Pit area
- B. 2R13A, 21 CFCU Service Water process monitor
- C. 2R15, Condenser Air Ejector
- D. 2R16, Plant Vent Effluent

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 065

The crew is performing actions of EOP-TRIP-3, SAFETY INJECTION TERMINATION.

- SI is reset
- SECs are reset
- All safeguards equipment has been stopped with the exception of 21 Charging pump

Subsequently, a Loss of Off-Site power occurs and the following conditions are present:

- RCS pressure is 1660 psig and lowering slowly
- Pressurizer level is 11% and lowering slowly

Which one of the following actions are required?

- A. Allow blackout loading sequence to complete, then continue aligning charging and letdown to maintain RCS inventory control
- B. Allow blackout loading sequence to complete, then manually reinitiate Safety Injection
- C. Allow blackout with SI loading sequence to complete, then check that safeguards equipment is operating properly
- D. Allow blackout loading to complete, reset SECs, and start ECCS pumps as necessary to maintain RCS inventory

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 066

The crew is preparing to commence Steam Generator depressurization IAW EOP-LOPA-1, LOSS OF ALL AC POWER.

Which one of the following describes the method and reason for the depressurization?

- A. Depressurize at the maximum rate to minimize RCS inventory loss
- B. Depressurize at the maximum rate to enhance AFW flow
- C. Depressurize at a maximum rate not to exceed a cooldown rate of 100 deg F/Hr to minimize a challenge to the Thermal Shock Safety Function
- D. Depressurize at a maximum rate not to exceed a cooldown rate of 100 deg F/Hr to maintain the ability to continue reflux boiling heat removal

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 067

Given the following conditions:

- The crew is performing EOP-LOSC-2, MULTIPLE SG DEPRESSURIZATION
- Action has been taken to limit the RCS cooldown rate.

While resetting Safety Injection during the SI termination sequence, the STA reports the following:

- RED path on Heat Sink CSF status tree
- 21MS167 has been closed and 21SG pressure is 550 psig and rising

Which one of the following describes the actions required and the basis for those actions under these conditions?

- A. Transition to EOP-LOSC-1, LOSS OF SECONDARY COOLANT, due to rising SG pressure. Raise feedwater flow to prevent unnecessary entry to EOP-FRHS-1, LOSS OF HEAT SINK
- B. Perform actions of EOP-FRHS-1 to establish minimum feedwater flow to avoid a challenge to the Core Cooling CSF
- C. Perform actions of EOP-LOSC-2 until Safety Injection is terminated, to minimize the possibility of pressurizer overfill
- D. Wait for verification that 21 SG is isolated, the transition to EOP-LOSC-1 to establish minimum heat sink and complete SI termination

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 068

Given the following conditions:

- The crew is performing EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION.
- The Plant Operator (PO) has been directed to perform EOP-APPX-1, COMPONENT COOLING RESTORATION.
- While performing APPX-1, the CRS determines that a transition to EOP-LOCA-1, LOSS OF REACTOR COOLANT, is necessary.

Which one of the following actions are required?

- A. Discontinue action in APPX-1 until directed by EOP-LOCA-1
- B. Continue action in APPX-1 but do not block or reset SECs until directed by EOP-LOCA-1
- C. Complete the action required by APPX-1 prior to transition to LOCA-1
- D. Transition to LOCA-1 and continue action as necessary in APPX-1

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 069

Which one of the following describes the PSEG initial administrative dose control level for a 23-year-old new employee with a lifetime exposure of 6.8 Rem?

- A. 2000 mrem/yr TEDE
- B. 3000 mrem/yr TEDE
- C. 4000 mrem/yr TEDE
- D. 4750 mrem/yr TEDE

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 070

Which one of the following parameter limits is designed to ensure that radiation releases will remain within the limits of 10CFR20?

- A. Liquid Waste discharge activity
- B. Primary system activity
- C. Secondary system activity
- D. Primary to secondary leakage

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 071

Unit 1 is operating at 100% power.

- 11 SI pump is INOPERABLE due to repairs estimated to take 48 hours
- An audit of completed surveillance procedures has determined the quarterly surveillance performed on 12 SI pump 37 days ago was improperly completed.

Which one of the following describes the appropriate action per Technical Specifications?

- A. Commence a plant shutdown within 1 hour
- B. Demonstrate the operability of 12 SI pump within 1 hour or commence a plant shutdown
- C. Demonstrate the operability of 12 SI pump within 24 hours or commence a plant shutdown
- D. Demonstrate the operability of 12 SI pump within 72 hours or commence a plant shutdown

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 072

An Independent Verification (IV) of valve position is required in an area with a 150 mrem/hr dose rate.

Which one of the following identifies the maximum time allowed for the IV before "hands-on" verification may be waived?

- A. 4 minutes
- B. 6 minutes
- C. 8 minutes
- D. 10 minutes

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 073

Unit 2 is operating at 100% power. All control systems are in automatic. All required plant equipment is in service.

Which one of the following equipment failures requires the EARLIEST action per Technical Specifications?

- A. Failure of 21 EDG
- B. Failure of battery charger 2A1
- C. Failure of 2A vital instrument inverter
- D. Failure of 28 volt DC bus 2A

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 074

Unit 2 is at 100% power. All control systems are in automatic. No evolutions are in progress.

You are assigned to relieve the on-shift CRS for approximately 30 – 45 minutes.

Which one of the following describes the shift turnover requirement for this activity?

- A. Turn over the operating status of the watchstation, sign the short-term relief log, attach it to the watchstation narrative log at the end of the shift.
- B. Turn over the operating status of the watchstation, document the short-term relief in the watchstation narrative log.
- C. Perform a board walkdown, sign the applicable portion of the watchstation turnover checklist, and document the relief in the watchstation narrative log.
- D. Perform a full turnover, complete the watchstation turnover checklist, and attach the checklist to the narrative log at the end of the shift.

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 075

Given the following:

- Unit 2 is in MODE 3
- Both Reactor Trip Breakers (RTB) are closed
- All Rod Drive MG (RDMG) Set breakers are open
- 21 and 23 RCP are operating
- Electrical Maintenance is scheduled to test 21 RDMG

Which one of the following describes actions required by S2.OP-SO.RCS-0001, ROD CONTROL SYSTEM OPERATION, and Technical Specifications prior to starting 21 RDMG?

- A. 22 and 24 RCP must be started before closing 21 RDMG set breakers
- B. 21 RDMG set breakers can be closed. Both 21 and 23RCP must remain in operation while 21 RDMG set breakers are closed
- C. Either 22 or 24 RCP must be started prior to closing 21 RDMG set breakers
- D. 21 RDMG set breakers can be closed. 21 or 23 RCP must remain in operation while 21 RDMG set breakers are closed

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 076

Given the following conditions:

- Unit 2 is in MODE 1, 100% power.
- A common-mode deficiency results in BOTH Safety Injection pumps being declared INOPERABLE. Attempts to restore the pumps are underway.
- At 1315, the CRS orders commencement of a plant shutdown per T.S. 3.0.3. During the shutdown, BOTH RHR pumps are also declared INOPERABLE.

Subsequently,

- 21 Safety Injection pump is restored OPERABLE at 1420
- 22 Safety Injection pump is restored OPERABLE at 1510
- 21 RHR pump is restored OPERABLE at 1535
- 22 RHR pump is restored OPERABLE at 1550

In accordance with Technical Specifications, when is the earliest time the power reduction may be stopped?

- A. 1420
- B. 1510
- C. 1535
- D. 1550

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 77

You are the WCC SRO. Maintenance has just completed work on 21 Service Water pump motor. The pump and motor are still uncoupled and it is cleared and tagged.

The leads have been reconnected to the motor. The Maintenance supervisor wishes to check the direction of motor rotation before the motor and pump are coupled.

Which one of the following describe the action necessary to allow the check for rotation?

- A. A full release of the Work Clearance Document must be completed
- B. A partial release of the Work Clearance Document must be completed
- C. Perform a partial release, replacing the breaker blocking tags with worker's blocking tags
- D. Perform a temporary deactivation of the motor breaker tags

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 078

Which one of the following Reactor Protection system trips provides the primary protection for rod ejection events?

- A. Power Range Neutron Flux High setpoint and Overpower Delta T
- B. Power Range Neutron Flux Low setpoint and Power Range Neutron Flux High setpoint
- C. Overtemperature Delta T and Overpower Delta T
- D. Overpower Delta T and Power Range Neutron Flux High Rate

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 079

Given the following conditions:

- Both units are operating at 100% power.
- Reactor Engineering has determined that a single fuel assembly in the Spent Fuel Pool must be moved to a new storage location. An Action Request has been submitted.
- The assembly has been in the SFP for 100 months.
- The Operations Superintendent has given permission, and Radiation Protection has been notified of the movement.

Which one of the following describes the Operations Department requirements for this evolution IAW S2.OP-IO.ZZ-0010, SPENT FUEL POOL MANIPULATIONS?

A Senior Reactor Operator...

- A. shall direct the fuel movement from the crane trolley
- B. shall be present in the Fuel Handling Building during the fuel movement
- C. is only required if SFP boron concentration is verified <2000 ppm
- D. is not required to observe the fuel movement if a Reactor Engineer is present

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 080

A General Emergency has been declared at Salem Station. All Emergency Response Facilities have been activated.

A qualified volunteer has been selected to perform a life-saving task in the Aux Building.

Which one of the following describes the maximum allowable dose and approval level required for this task?

- A. 25 REM TEDE; Operations Superintendent approval
- B. 25 REM TEDE; Emergency Duty Officer approval
- C. 75 REM TEDE; Operations Superintendent approval
- D. 75 REM TEDE; Emergency Duty Officer approval

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 081

Unit 2 reactor has tripped. Safety Injection and Main Steam Line Isolation have actuated.

The crew is performing action of EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION. After evaluating RCP trip criteria, the following conditions exist:

- RCS pressure 1650 psig and trending up
- SG Pressures approximately 770 psig and stable
- Tave 520 deg F and trending up
- AFW flow approximately $6E^4$ lbm/hr to each SG
- SG NR levels off scale low
- Pressurizer level 15% and trending up
- Containment temperature is 105 deg F and stable
- Containment pressure is 0.1 psig and stable

Which one of the following procedure transitions will be made upon exit from EOP-TRIP-1?

- A. EOP-LOSC-1, LOSS OF SECONDARY COOLANT
- B. EOP-TRIP-3, SAFETY INJECTION TERMINATION
- C. EOP-LOCA-1, LOSS OF REACTOR COOLANT
- D. EOP-LOCA-6, LOCA OUTSIDE CONTAINMENT

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 082

During performance of Emergency Operating Procedures (EOPs) some notes or cautions apply to multiple subsequent procedure steps.

Which one of the following describes how these are identified?

- A. Circled box prior to step 1 of the procedure
- B. Shaded box prior to step 1 of the procedure
- C. Double-bordered box prior to the steps affected
- D. Shaded box prior to the steps affected

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 083

During performance of EOPs the CRS determines that a deviation in accordance with 10CFR50.54(x) is necessary.

Which one of the following describes the required notifications per SC.OP-AP.ZZ-0102, USE OF PROCEDURES?

- A. Operations Manager and the NRC must be notified prior to the intended deviation
- B. Operations Manager must be notified prior to the deviation. The NRC must be notified within 1 hour
- C. Operations Manager must be notified as soon as possible. The NRC must be notified within 1 hour
- D. Operations Manager must be notified within 1 hour. The NRC must be notified within 4 hours

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 084

Unit 2 is at 100% power. OHA A-9 has actuated. The crew has entered S2.OP-AB.ANN-0001, OVERHEAD ANNUNCIATOR MALFUNCTION. The crew has determined that the LEDs for SER A and SER B are extinguished.

Which one of the following is the required action?

- A. Take compensatory actions for loss of the OHA A and OHA B Windows
- B. Verify the OHA system remains operable by actuating an alarm every 10 minutes
- C. Maintain stable plant conditions. Initiate continuous control board walkdowns and implement the Event Classification Guide (ECG)
- D. Trip the reactor. Initiate continuous control board walkdowns and commence cooldown to Mode 5

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 085

Unit 1 is at 100% power when the following annunciators are received in the control room:

- OHA E-24, ROD DEV OR SEQ
- OHA E-48, ROD BOTTOM
- OHA E-39, PR CH DEV
- OHA E-31, PR OVRPWR ROD STOP

The following conditions exist:

- PR-N43, N44 indicate 101% power
- PR N41 indicates 103% power
- PR-N42 indicates 97% power

All Shutdown Bank and Control Bank group demand counters are at or above 222 steps. IRPI indicates all rods fully withdrawn with the exception of one Shutdown Bank C rod indicating 0 steps.

Which one of the following procedures is appropriate for these conditions?

- A. AB-NIS-0001, NI SYSTEM MALFUNCTIONS
- B. AB-ROD-0001, MISPOSITIONED OR STUCK CONTROL ROD
- C. AB-ROD-0002, DROPPED ROD
- D. AB-ROD-0004 , ROD POSITION INDICATION FAILURE

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 086

Unit 2 is in MODE 3 during a plant startup. RCS heatup and pressurization is in progress.

- Tave is 511 deg F
- RCS pressure is 1850 psig

One safety valve on 22 SG fails partially open. When it is reseated, the following conditions exist:

- Tave is 492 deg F
- RCS pressure is 1700 psig
- 21, 23, 24 SGs are 640 psig
- 22 SG is 520 psig
- All parameters are STABLE

Which one of the following describes all of the actions required?

- A. Stabilize plant parameters. Restore OPERABILITY of the affected safety valve and allow SG pressures to equalize prior to raising RCS pressure above the P-11 setpoint
- B. Stabilize plant parameters. Commence RCS cooldown and depressurization to place the plant in an operational MODE where the safety valve is not required
- C. Initiate Main Steam Line Isolation. Commence RCS cooldown and depressurization to place the plant in an operational MODE where the safety valve is not required
- D. Initiate Safety Injection and Main Steam Line Isolation. Go to EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 087

The Liquid Radwaste Disposal and SG Blowdown systems have automatic actuations that ensure compliance with:

- A. ODCM limit on Liquid Radwaste Effluent radioactivity
- B. EPA limits on plant effluent discharge temperatures
- C. minimum dilution flow requirements for Liquid Radwaste batch releases
- D. maximum flow limits for batch releases as well as continuous liquid radwaste discharge

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 088

The crew is attempting to locate a Service Water System leak per S2.OP-AB.SW-0001, LOSS OF SERVICE WATER HEADER PRESSURE.

The cause of the Service Water leak is suspected to be inside containment.

The CRS directs isolation of CFCUs.

How will the CRS direct the performance of the leak isolation per AB.SW-0001?

- A. ONLY if the CC1 Bezel alarm, IN-OUT WTR FLOW DEV is lit, shut down the affected CFCU and close the associated SW58, INLET WATER VALVE
- B. ONLY if the CC1 Bezel alarm, IN-OUT WTR FLOW DEV is lit, shut down the affected CFCU and close the associated SW72, OUTLET WATER VALVE
- C. For each CFCU one at a time, the SW72, OUTLET WATER VALVE, must be closed first during isolation, and the SW58, INLET WATER VALVE, must be opened first on restoration
- D. For each CFCU one at a time, the SW58, INLET WATER VALVE, must be closed first during isolation, and the SW72, OUTLET WATER VALVE, must be opened first on restoration

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 089

Unit 2 is at 100% power. VCT level transmitter LT-112 fails high.

Assuming no operator action, Which one of the following describes the effect on the plant?

- A. The VCT will overfill because automatic makeup will be continuous
- B. VCT level will drop until automatic makeup initiates
- C. VCT level will drop until charging pump suction swaps to the RWST
- D. VCT level will drop until the VCT is empty and charging pump suction is lost

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 090

Given the following conditions:

- A Loss of Feedwater has occurred. The crew is performing actions of EOP-FRHS-1, LOSS OF HEAT SINK.
- Following trip of the RCPs, RCS pressure is slowly rising. The pressure rise is terminated by PORV operation.
- Steam Generator Wide Range levels are all currently 37% and lowering at approximately 1% every 5 minutes. Attempts to restore feed have been unsuccessful.

Which one of the following parameters would indicate the need to immediately establish Bleed and Feed cooling?

- A. A low core Delta T
- B. A high core Delta T
- C. A rapid drop in RCS pressure
- D. A rapid drop in 22 SG pressure

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 091

Given the following:

- Unit 2 is in MODE 6. Fuel moves are in progress.
- A fuel assembly is in the mast tube of the manipulator crane, near the containment upender.
- Refueling cavity level begins to drop rapidly, approximately 2 inches per minute.
- Radiation Protection reports flooding in the lower elevations of containment.

Which one of the following describes the required location to place the fuel assembly IAW S2.OP-AB.FUEL-0002, LOSS OF REFUELING CAVITY OR SPENT FUEL POOL LEVEL?

- A. Place the assembly on the upender, move it to the Spent Fuel Pool, and close the fuel transfer tube gate valve
- B. Place the fuel assembly back to its original position in the core
- C. Place the fuel assembly in the upender, and lower the upender to the horizontal position, and close the fuel transfer tube gate valve
- D. Place the fuel assembly back to any open position in the core and lower the mast to the bottom of the slow zone

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 092

The following conditions exist on Unit 2:

- The operating crew initiated a MANUAL SI IAW S2.OP-AB.RC-0001, RCS LEAK
- The leak continued to escalate after SI
- 2A SEC was de-energized prior to the event
- 2B SEC and 2C SEC were Reset to start equipment that failed to start automatically
- Containment pressure now exceeds 15 psig on all channels
- The crew is still in EOP-TRIP-1, REACTOR TRIP OR SAFETY INJECTION

Which one of the following describes how the operator initiates MANUAL Containment Spray (CS)?

- A. Turn one PHASE B/SPRAY ACTUATION/CONT VENT ISOLATION Key in either Safeguards Train and turn one key for each CS Pump
- B. Turn two PHASE B/SPRAY ACTUATION/CONT VENT ISOLATION Keys in either Safeguards Train
- C. Turn two PHASE B/SPRAY ACTUATION/CONT VENT ISOLATION Keys in either Safeguards Train and turn one key for each CS Pump
- D. Turn two PHASE B/SPRAY ACTUATION/CONT VENT ISOLATION Keys in either Safeguards Train, turn one key for each CS Pump and depress each START pushbutton

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 093

Given the following:

- A reactor trip occurred on Unit 2.
- At the time of the trip 23BF19, Feedwater Regulating Valve, failed open.
- Before the line could be isolated, 23 SG NR level reached 95% but is now stable at 88%.
- The other SG's are being controlled at approximately 33%.
- The operating crew is transitioning to S2.OP-IO.ZZ-0008, MAINTAINING HSB, from TRIP-2, REACTOR TRIP RESPONSE. The crew also completed FRHS-3, RESPONSE TO SG HIGH LEVEL.

Which one of the following describes how the SG's may be used for maintaining Hot Standby conditions?

- A. Do NOT feed 23 SG until level has steamed down to <67%
- B. Do NOT steam 23 SG until the Technical Support Center (TSC) provides guidance
- C. Close the main steam isolation valves on 21, 22 and 24 SG's. Steam 23 SG until NR level is between 33-44%
- D. Close the main steam isolation valves on all SG's. Use the atmospheric relief valves for heat removal until the TSC provides guidance

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 094

Given the following:

- A small break LOCA has occurred. The operating crew is in 2-EOP-LOCA-2, POST LOCA COOLDOWN AND DEPRESSURIZATION.
- RCS subcooling is 45°F. The crew has determined that one Centrifugal Charging Pump (CCP) can be stopped.

Which one of the following explains what will happen to the value of subcooling when the selected CCP is stopped?

- A. Lowers because break flow remains constant while ECCS flow is reduced. RCS temperature rises and stabilizes at a higher value
- B. Lowers as RCS pressure lowers in response to reduced ECCS flow. Stabilizes at a lower value when break flow equals ECCS flow
- C. Remains the same. Flow from the running CCP rises, reaching a balance with break flow
- D. Remains the same. RCS temperature rises in response to the reduced ECCS flow but RCS pressure also rises

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 095

From the list below, which one of the choices contains only signals that are capable of directly generating a Containment Vent Isolation Signal?

- I. MANUAL CS
 - II. AUTO CS
 - III. Phase A Isolation
 - IV. HI RAD alarm on R11A or R12A or R12B
 - V. ALARM on R41A or R41B or R41C
 - VI. ALARM on R41D
-
- A. I, III, IV
 - B. I, V, VI
 - C. II, III, VI
 - D. I, IV, VI

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 096

Which one of the following sets of conditions will result in the MOST SEVERE reactivity excursion during a Main Steam Line Break?

- A. 10% power, RCS Boron = 200 ppm
- B. 10% power, RCS Boron = 1200 ppm
- C. 100% power, RCS Boron = 200 ppm
- D. 100% power, RCS Boron = 1200 ppm

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 097

Unit 2 is at 25% power. The crew was raising power but a SW leak developed on the MTLO Cooler.

The following conditions exist:

- 23B Circulator is OOS
- The crew just tripped the Main Turbine due to the MTLO problem
- A DIFF Relay on 2CW Section 23 actuated when the main generator breakers opened

Which one of the following describes the required action IAW S2.OP-AB.TRB-0001, TURBINE TRIP BELOW P-9?

- A. NO action is required. 2CW Bus will swap to the other source
- B. Reduce power as necessary to maintain condenser vacuum above steam dump vacuum interlock
- C. Reduce power to <5% to ensure power generation is within AFW heat removal capability
- D. Immediately trip the reactor due to complete loss of steam dump capability

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 098

Which one of the following describes the result of going to RAISE on the Voltage Control Switch of an EDG that is synchronized to the grid?

- A. Reactive load rises; EDG speed droops as a function of load
- B. Reactive load rises; EDG speed remains the same
- C. Voltage rises; EDG speed droops as load rises
- D. Voltage rises; EDG speed remains the same

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 099

Given the following:

- Unit 2 is at 100% power. 2A EDG was started for a surveillance run at 1315 today.
- Problems with 2A 4KV Vital Bus voltage indication at the local control panel have delayed synchronization.

Which one of the following describes both the clock time limit for running 2A EDG unloaded and the required action if that time is exceeded?

- A. 1330; Stop 2A EDG for at least one hour prior to the next start
- B. 1345; Load 2A EDG for at least one hour prior to stopping it
- C. 1415; Stop 2A EDG for at least one hour prior to the next start
- D. 1515; Load 2A EDG for at least one hour prior to stopping it

U.S.N.R.C. Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator

Question 100

Which one of the choices describes a difference between Unit 1 and Unit 2 SG Blowdown RMS channel response?

- A. On Unit 1, a WARNING on an R-19 closes the respective GB4, Blowdown Isolation Valve. On Unit 2, it does not
- B. On Unit 2, a WARNING on an R-19 closes the respective GB4, Blowdown Isolation Valve. On Unit 1, it does not
- C. On Unit 1, an ALARM on an R-19 closes just the respective GB4. On Unit 2, the same signal closes all interlocked blowdown valves
- D. On Unit 2, an ALARM on an R-19 closes just the respective GB4. On Unit 1, the same signal closes all interlocked blowdown valves

Site-Specific Written Examination
Salem Units 1 and 2
Senior Reactor Operator
Answer Key

1. B	26. D	51. B	76. C
2. B	27. A	52. D	77. D
3. B	28. C	53. B	78. B
4. D	29. D	54. C	79. D
5. C	30. D	55. A	80. D
6. A	31. B	56. A	81. B
7. B	32. A	57. B	82. C
8. C	33. D	58. A	83. C
9. D	34. A	59. B	84. C
10. A	35. C	60. D	85. C
11. A	36. C	61. D	86. D
12. A	37. B	62. C	87. A
13. B	38. C	63. C	88. C
14. C	39. B	64. D	89. D
15. B	40. B	65. D	90. A
16. C	41. A	66. A	91. C
17. B	42. C	67. C	92. C
18. A	43. C	68. D	93. B
19. C	44. A	69. A	94. B
20. B	45. D	70. A	95. D
21. D	46. B	71. C	96. A
22. B	47. D	72. A	97. C
23. C	48. A	73. A	98. B
24. C	49. D	74. A	99. D
25. B	50. B	75. A	100. D