

Final Submittal

(Blue Paper)

1. Reactor Operator Written Examination

WATTS BAR EXAM 2002-301

**50-390
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Name: _____
Exam

Watts Bar Initial License Reactor Operator

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1. 001A4.03 001

During a plant heatup, the control rods were withdrawn 5 steps in the BANK-SELECT position to prevent "thermal lock-up" of the rods during the heatup.

Which ONE of the following would result if the control rods were NOT fully inserted using BANK-SELECT prior to withdrawing rods using MANUAL?

- A. Rod upper limit stop malfunction.
- B. ☒ Rod bank overlap malfunction.
- C. Rod bottom lights malfunction.
- D. Rod Position Indication malfunction.

Ref: WB exam bank
Lesson Plan 3-OT-SYS85A

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2. 001AK3.01 001

Given the following plant conditions:

- Plant at 65% power.
- Impulse pressure transmitter, 1-PT-1-73, fails HIGH causing rods to step at 72 steps per minute.
- Rods were placed in MANUAL causing rod motion to stop 14 steps from their original position.

Which ONE of the following describes the appropriate course of action?

- A. Ensure turbine load remains constant and dilute to restore original rod position.
- B. Reduce turbine load to compensate for the rise in reactor power.
- C. Withdraw rods manually to restore Tavg to program.
- D. Insert rods manually to drop Tavg to program.

Reference: AO10400.06

Question Analysis:

- a. Incorrect - Diluting would further increase the difference between Tavg and Tref if turbine load were held constant.
- b. Incorrect - Turbine load would need to be increased to offset the increase in T-avg due to rods stepping out from the NI failure.
- c. Incorrect - withdrawing rods would further increase the difference between Tavg and Tref.
- d. Correct - Tavg would be elevated due to the rods stepping out on the PT failure. Inserting rods manually to decrease Tavg to program is appropriate.

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3. 001K1.05 001

Given the following:

- Unit power is 66%
- Control Rods are in Automatic
- No operator actions

Which ONE of the following would cause rods move in, then remain at the new position with a reduced T-avg.

- A. Loop A Th fails low
- B. PT 1- 73 fails high
- C. Loop A Tc fails low
- D. PRM channel N-41 fails high

REF: 3-OT-SYS85A

- a. incorrect - rod control circuit uses auct High Tave - failing low does not make this the auct hi
- b. incorrect - this channel of turbine pressure inputs the control rod logic and the Tref program is topped out at 588.2
- c. incorrect - rod control circuit uses auct High Tave - failing low does not make this the auct hi
- d. correct - Rods move in until the power mismatch rate signal decays, then remain at the new position with a reduced T-avg.

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4. 002K5.10 001

Given the following:

- Unit 1 is at 90% power and ramping up.
- Rods are in automatic with Bank D at 216 steps
- The operator has met all requirements to raise turbine load and has pressed the turbine control GO button
- Turbine control valves are opening and megawatts are rising
- Tav_g is on program

Which ONE of the following describes Tref/Tav_g behavior assuming no dilution by the operator as the turbine load is raised to bring the unit to 100%?

- A. Tav_g and Tref will rise and continue to be matched.
- B. Tref will rise, but Tav_g will remain constant.
- C. Tav_g and Tref will remain constant.

D. Tref will rise and Tav_g will drop.

Ref: WB lesson plant 3-OT-SYS085A, obj 7 & 21

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5. 003A2.02 001

Given the following:

- Unit 1 is at 39% power
- Annunciator 100D, RCP Seal Leak Off Flow Hi has alarmed, due to #1 RCP.
- #1 RCP Lower Bearing Temperature is at 220°F and increasing.
- #1 RCP has been tripped.
- #1 Seal Return valve has been closed following coastdown.

Per AOI-24, which ONE of the following describes the correct actions for the control room crew?

- A. Trip the Rx and go to E-0, Rx Trip or Safety Injection.
- B. Go to GO-5, UNIT SHUTDOWN FROM 30% REACTOR POWER TO HOT STANDBY.
- C. Go to AOI-5, Unscheduled Removal of One RCP Below P-8
- D. Go to AOI-39, Rapid Load Reduction to remove the Unit from service.

Ref: WB lesson plan 3-OT-AOI2400, obj. 10
WB AOI-24, section 3.2, step 2

Distractor analysis:

A is incorrect because AOI 24, section 3.2, step 2 says to trip Rx IF power >48%, otherwise, trip the RCP

B is incorrect (same as A) and because once Rx is tripped in AOI 24, then E-0 becomes controlling procedure.

C is correct based on AOI 24, section 3.2, step 2 RNO for rising bearing temp directs tripping pump, closing seal leakoff and going to AOI-5

D is incorrect because power is less than P-8, 48% and AOI 24 directs transition to AOI- 5, which after several other actions can direct to AOI-39 or other power reduction procedures.

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6. 004K4.04 001

Given the following:

- Unit 1 is recovering from a Main Control Room evacuation in accordance with AOI-27, Main Control Room Inaccessibility.
- Control has been formally transferred from the Auxiliary Control Room.
- When the UO attempted to perform a blended makeup to the VCT, annunciator 112-E, PW to Blender Flow Deviation alarmed.

Which ONE of the following describes the cause of the alarm?

- A. Transfer switch for Primary Water Pumps left in Aux position
- B. ✓ Transfer switch for 1-FCV-62-143, Blender Primary Water Flow Control Valve left in Aux position
- C. Transfer switch for 1-LCV-62-118, LETDOWN DIVERT LCV TO HUT left in Aux position
- D. Transfer switch for 1-FCV-62-144, Makeup to CCP Suction Flow Control Valve left in Aux position

Ref: WB procedure AOI-27

Distractor analysis:

A is incorrect, switch does not exist

B is correct, in Aux position at the Auxiliary Control Room, FCV-143 remains closed regardless of activities on the Main Control Board

C is incorrect because level is not an input when performing a manual makeup

D is incorrect because this switch does not exist

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7. 004K5.04 001

Which ONE of the following is the primary reason for maintaining a hydrogen cover gas in the VCT during normal at power operations?

- A. to assure N-16 concentrations are ALARA
- B. to maintain RCS pH within TRM limits
- C. to maintain conductivity below .017 micro Mhos
- D. to maintain oxygen concentration below the TRM upper limit

Ref: NA 2002 -

Lesson plan 3-OT-SYS062A, TRM 3.4.4 Chemistry

- a. incorrect N-16 is a bi-product of the nuclear reaction not influenced by hydrogen cover gases
- b. incorrect RCS pH is controlled by primary chemistry not with cover gases
- c. incorrect conductivity is controlled by water quality efforts not cover gases
- d. correct Hydrogen cover gases "scavenge" oxygen, thus lowering the oxygen concentration

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8. 005AK3.02 001

Given the following plant conditions:

- Reactor power is at 75% with a power rise in progress using control rods.
- The OAC determines that Control Bank D rod H-12 is immovable and is 14 steps below the other rods in Bank D.
- Crew is performing AOI-2, "Malfunction of Reactor Control System"

Which ONE of the following describes how control rod H-12 will be realigned to control bank D and how control bank insertion limit will change following the realignment?

- A. Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be higher.
- B. ✓ Control Bank D will be realigned to control rod H-12 and control bank D insertion limit will be lower
- C. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be lower.
- D. Control rod H-12 will be realigned to Control Bank D and control bank D insertion limit will be higher.

REF: AOI-2, section 3.4 p. 23.

Lesson plan 3-OT-SYS085A pp. 36-37.

- a. incorrect - the method of realignment is correct but the change in insertion limit is in the wrong direction since the bank will be inserted to match H-12 position.
- b. correct - control bank D will be inserted to match rod H-12 position and since the bank is being inserted the insertion limit for control bank D will be lower after the bank is aligned with rod H-12.
- c. incorrect - the method of realignment is incorrect and the change in insertion limit is wrong since the bank will not move the insertion limit will not change.
- d. incorrect - the method of realignment is incorrect and the change in insertion limit is wrong since the bank will not move the insertion limit will not change.

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9. 005K5.03 001

Given the following:

- Unit 1 is in Mode 4 with #1 Reactor Coolant Pump running.
- "A" train RHR has JUST been placed in service when the Reactor Operator notes source range counts suddenly rising.

Which ONE of the following describes the correct action?

- A. ✓ Commence a boration per AOI-34 Immediate Boration to add negative reactivity.
- B. Start the #2 Reactor Coolant Pump and secure the #1 Reactor Coolant Pump to ensure through mixing of the RCS volume.
- C. Start "B" Train RHR and secure "A" train RHR to reestablish pre-event conditions.
- D. Allow RCS to heat up to add negative reactivity.

Ref: TP Exam Bank

WB AOI-34

WB Lesson Plan 3-OT-AOI3400

Distractor Analysis:

A is correct because AOI provides guidance to immediately borate when uncontrolled +reactivity is inserted.

B is incorrect because swapping RCP's will not add negative reactivity to the core.

C is incorrect same as answer B.

D is incorrect because there is no guidance for a normal boration.

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10. 006A1.11 001

Given the following plant conditions:

- A SGTR has occurred on SG #1.
- ES-3.1, "Post SGTR Cooldown Using Backfill", is in progress.
- Ruptured SG level is 25%.
- RCS is at 390°F.
- RCS is at 400 psig.
- Cooling down using steam dumps to condenser.
- RCP #4 in service.

ES-3.1 step 13 requires a return to step 3 if RCS temperature is greater than 200°F.
Step 3 requires the operator to ensure adequate shutdown margin.

Why is it necessary to reverify adequate shutdown margin at this point in the procedure?

- A. The RCS temperature change during cooldown will cause significant boron concentration changes due to PZR outsurge.
- B. Charging to maintain PZR level during cooldown will cause significant boron concentration changes.
- C✓ The secondary fluid in the ruptured SG will cause significant boron concentration changes.
- D. The auxiliary spray will cause significant boron concentration changes.

REF: ES-3.1, Post-SGTR Cooldown using Backfill

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11. 006K1.07 001

Given the following conditions:

- The plant is operating at 100% power.
- Inadvertent Safety Injection occurred
- #1 SG level transmitter that controls MDAFW pump LCV failed low.
- #4 SG PORV opened momentarily after the reactor trip and developed a large packing leak.

Which ONE of the following would cause the initial main feedwater isolation during this transient?

- A. The #1 SG level reached 83%.
- B.✓ The safety injection actuation signal.
- C. Tavg dropping to 564°F following the reactor trip.
- D. When the south valve vault level had risen to 4 inches due to the PORV packing leak.

Reference: SYS003A.14

- a. Incorrect - level may reach 83% but FWI would already have been actuated by the SI.
- b. Correct - SI causes immediate FWI.
- c. Incorrect - would normally actuate FWI following a reactor trip however the SI initiated the FWI immediately.
- d. Incorrectly - PORV leak would cause increase in level in the vault room however FWI would have already been actuated by the SI.

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12. 008AK1.01 001

Given the following:

- Unit 1 is stable at 100% power
- A pressurizer safety valve opens and fails to reseal and the Unit trips

Which ONE of the following indications would the operator expect to see as a result of this event over the next 30 min?

- A. Safety tailpipe temperature would increase to greater than 600 F and then slowly decrease.
- B. Safety tailpipe temperature would increase to greater than 600 F and then slowly increase.
- C. Safety tailpipe temperature would increase to between 220 F and 330 F and then slowly decrease and stabilize.
- D. Safety tailpipe temperature would increase to between 220 F and 330 F and then slowly increase and stabilize.

Ref- Farley 2000

Reactor Coolant System N3-68-4001

ARI-88-94

Lesson Plan 3-OT-SYS068A

- a. incorrect - the temperature is correct for pressures of 2240
- b. incorrect - the temperature is correct for pressures of 2240
- c. correct - since it relieves to the PRT, the pressure will increase until the rupture disc relieves (85 psig) and then the pressure (and temperature) will decrease and eventually stabilize
- d. incorrect - will not continue to increase once the PRT rupture disc relieves.

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13. 008K1.02 001

Which ONE of the following correctly describes the uses of CCS in the Reactor Building?

- A. RCP oil coolers, Seal Water Htx. and RCP thermal barriers.
- B. RCP oil coolers, RCP thermal barriers and Regen Htx.
- C. RCP oil coolers, RCP thermal barriers and Non-Regen Htx.
- D. RCP oil coolers, RCP thermal barriers and Excess Letdown Htx.

Ref: WB Lesson Plan 3-OT-SYS070A, obj. 2&15
Dwg. 47W859-2

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14. 009EA2.39 001

Which ONE of the following explains why it is preferable to leave the RCP's running during a small break LOCA if the RCS pressure RCP trip criteria on the foldout page are met but there is no SI flow?

- A.✓ To provide heat removal through the break and the S/G's.
- B. To maintain two phase mixture level above the break longer.
- C. To limit single phase inventory loss out of the break.
- D. To prevent boron stratification in the core.

Ref: WB Lesson Plan 3-OT-0100, obj. 3
WB Lesson Plan 3-OT-0100, pp. 14
DC Cook exam bank

A is correct because the pumps will pump two phase (or steam) flow and cool by reflux in S/G's
B is incorrect because the two phase mixture will continue to exit the vessel.
C is incorrect same as B.
D is incorrect because there will be boron stratification in the core due to severe inventory depletion.

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15. 010K3.01 001

Given the following:

- Pressurizer pressure is 2230 psig and rising.
- The variable heaters are energized.
- The spray valves are closed.
- The Master Pressure Controller, 1-PIC-68-340A, fails to a constant output equivalent to 2230 psig.

Which ONE of the following describes the response of the pressure control system if the operator takes no further action?

- A. Pressure will rise until PORV's 1-PCV-68-334 and 1-PCV-68-340A open to control pressure.
- B. Pressure will rise until relief valve 1-PCV-68-334 opens to control pressure.
- C. Pressure will rise until the spray valves open to control pressure.
- D. Pressure will cycle on the variable heaters at a higher setpoint.

Ref: WB lesson plan 3-OT-SYS068C

Distractor analysis:

A is incorrect because PORV continues to receive a constant input and therefore remains closed.

B is correct because PORV 334 receives input from PT 323 which is seeing the actual pressure rise.

C is incorrect because the spray valves remain closed because their input is not changing from the master controller and is spray open setpoint.

D is incorrect because the input to the variable heaters is constant at a value less than their shutoff point.

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16. 011A3.03 001

Given the following:

- Unit is at 50% power.
- All automatic control systems are in their normal lineup.
- Pressurizer level program fails to an output corresponding to 50% load.
- Assume no operator action is taken.

Which ONE of the following describes the effect on charging flow and PZR level as the plant load is raised to 100%?

- A. Charging flow rises to maintain actual PZR level constant.
- B. Charging flow drops and actual PZR level drops.
- C. Charging flow drops to maintain actual PZR level constant.
- D. Charging flow remains constant and actual PZR level rises.

Reference: WB Lesson Plan 3-OT-SYS068C Obj. #14

Distractor analysis:

A is incorrect because T_{av} increases as power increases which will make PZR actual level increase.

B is incorrect, same reason as A

C is correct because as PZR level rises with coolant expansion due to T_{av} increase, with LT-339 output at 50%, an error is generated that PZR level is too high, causing charging flow to decrease.

D is incorrect, same as A for PZR level, charging flow increases, see C.

Note, WB exam bank had answer C as "Charging flow rises and actual PZR level rises." Need to check this with them.

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17. 011EA1.04 001

Given the following plant conditions:

- Unit 1 tripped due to a Large Break LOCA.
- Containment pressure = 12.5 psid.
- RWST level = 20%.
- Containment Emergency Sump level = 15%.
- RHR Swapover to the Containment Sump could not be performed.
- The operating crew has transitioned to ECA - 1.1, "Loss of RHR Sump Recirculation."
- The crew is performing step 3 of ECA - 1.1, "Loss of RHR Sump Recirculation", to determine the proper Containment Spray pump alignment and operation.

Which ONE of the following actions will result in the Containment Spray pumps being in the proper alignment under the existing plant conditions?

- A. Leave both Containment Spray pumps running until RWST level drops to 8%.
- B. Stop both Containment Spray pumps and place handswitches in "pull-to-lock."
- C. ✓ Stop one Containment Spray pump and allow the remaining pump to take suction from the RWST.
- D. Stop both Containment Spray pumps, until suction can be aligned to the Containment Sump, then restart one pump.

REF: ECA-1.1, Loss of RHR Sump Recirculation

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18. 011EK2.02 001

Given the following conditions:

- A large break LOCA occurred
- Operators have just completed swapover to Containment Sump
- A loss of offsite power occurs

Which ONE of the following describes the actions required for this condition?

- A. Pull to lock SI pumps and CCPs until the RHR pumps have been restarted after the shutdown boards are reenergized.
- B. ✓ Pull to lock the CCPs until the RHR pumps are restarted after the shutdown boards are reenergized.
- C. Ensure both RHR pumps are started by the blackout sequencer after the diesel generators reenergize the shutdown boards then restart the SI pumps.
- D. Ensure all ECCS pumps are started by the blackout sequencer when the diesel generators reenergize the shutdown boards.

REF: ES-1.3 step 18, Lesson plan 3-OT-EOP0100 p. 45

- a. incorrect - only the CCPs are required to be placed in pull to lock but examinee may select this distractor since the SI pumps suction is also being supplied by the RHR pumps.
- b. correct - Since SI is reset the RHR pumps will not automatically sequence on following a blackout signal. ES-1.3 requires the operator to place the CCPs in pull to lock, restart the RHR pumps and then restart the CCPs.
- c. incorrect - The RHR pumps will not sequence on following a blackout with SI reset, but examinee may select since he/she must associate resetting SI with the transfer sequence to containment sump and may assume the RHR pumps sequence on with SI reset since they are supplying CCP and SIP suction.
- d. incorrect - All ECCS pumps will not sequence on since SI has been reset. May assume the SI pumps are the only ECCS pumps that don't sequence on following SI reset and the RHR pumps start prior to the CCPs since they are supplying suction to the pumps.

Watts Bar Initial License Reactor Operator Exam

19. 012K6.10 001

Given the following:

- Unit 1 is at 100% power
- Permissive 70-D, P-7 LO POWER TRIPS BLOCKED illuminates

Which ONE of the following describes the effects on RPS?

- A. The reactor will not trip on Pressurizer High Pressure.
- B. The reactor will not trip on Pressurizer Low Water Level.
- C. The reactor will not trip on Pressurizer Low Pressure.
- D. The reactor will not trip on Loss of Flow in one loop.

Ref: WB Lesson Plan 3-OT-SYS099A, obj. 17

Distractor analysis:

- A is incorrect because P-7 is not an input to the trip.
- B is incorrect because PZR Lo Water Level is not a trip.
- C is correct, because P-7 blocks it when P-7 is off (light on).
- D is incorrect because P-8 is unaffected and trips Rx on 1/4 logic.

Watts Bar Initial License Reactor Operator Exam

20. 013K2.01 001

Given the following:

- 1A-A and 1B-B SI pump breakers are "racked in"
- A fuse blows in the NORMAL DC Trip Circuit for the 1A-A SI pump
- A safety injection (SI) acutation occurs

Which ONE of the following describes the response of the SI pumps to the SI signal?

- A. 1B-B SI pump will start, but 1A-A SI pump will not auto start until the control power supply is transferred.
- B. 1B-B SI pump will start, but 1A-A SI pump will not auto start and must be started from MCR handswitch.
- C. ✓ Both SI pumps will auto start, but the 1A-A SI pump can not be stopped from the MCR.
- D. Both SI pumps will auto start, but the 1A-A SI pump can not be stopped mechanically at the breaker.

REF: Watts Bar exam bank
3-OT-SYS57C

- a. Incorrect - examinee may believe that the pump will not start with fuse blown in the trip circuit. They may believe it is the same dc power is supplied to the pump start circuit.
- b. Incorrect - examinee may confuse the control power supplies to the pump and the start logic.
- c. Correct - both pumps will start automatically, however with fuses blown in the trip circuit the pump breaker cannot be opened from any electrical control handswitch.
- d. Incorrect - both pumps will start automatically. Examinee may believe that the with a blown fuse in the trip circuit that it cannot be stopped locally since the trip fuses are in the same compartment with the breaker and mechanical trip switch.

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21. 013K6.01 001

Given the following plant conditions:

- Reactor power is 100%
- Pressurizer pressure channel I, 1-PT-68-340, has been removed from service for surveillance testing with it's associated bistables tripped.
- Pressurizer pressure channel IV, 1-PT-68-322, fails LOW.

Which ONE of the following describes the result of these conditions?

- A.✓ Reactor trip, but NO Safety Injection
Pzr PORV, 1-PCV-68-340 remains closed
- B. Reactor trip and Safety Injection
Pzr PORV, 1-PCV-68-340 remains closed.
- C. Reactor trip but NO Safety Injection
Pzr PORV, 1-PCV-68-340 opens.
- D. Reactor trip and Safety Injection
Pzr PORV, 1-PCV-68-340 opens.

Ref: WB Lesson Plan 3-OT-SYS099A
Drawing 47W611-63-1

Watts Bar Initial License Reactor Operator Exam

22. 014A4.01 001

Given the following:

- Operators are preparing for a reactor startup
- All shutdown banks were withdrawn
- All control banks are fully inserted
- The rod control startup reset switch is manipulated in error

Which ONE of the following describes the required actions to proceed with the startup?

- A. Restore the P/A converter to 230 steps
- B.✓ Restore the shutdown group step counters to 230 steps
- C. Restore the bank overlap unit to 230 steps
- D. Reinsert all shutdown banks

REF: INPO bank

WB lesson plan 3-OT-SYS85A

- a. incorrect - P/A converter does not need to be reset because the control banks are fully inserted
- b. correct - all group step counters are reset to 0 by the reset switch
- c. incorrect - bank overlap counters are at 0 because the control rods are fully inserted
- d. the shutdown group counters can be manually reset - reinsertion is not required

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23. 015G2.2.12 001

Given the following:

- Unit 1 has been ramping up in power in accordance with GO-4, Normal Power Operation and has stabilized at 53% power to perform 1-SI-92-1, NIS daily comparison.

Results of the surveillance are as follows:

Calorimetric Power - 49%
N-41 indication - 54%
N-42 indication - 52%
N-43 indication - 52%
N-44 indication - 53%

Which ONE of the following describes the required action?

- A. ✓ Shall obtain concurrence from the System 92 System Engineer and adjust all NI's to 49%.
- B. Make no adjustments.
- C. Shall obtain concurrence from the System 92 System Engineer and adjust all NI's to 51%.
- D. Adjust N-41 to 51%.

Ref: WB procedure 1-SI-92-1

Distractor analysis:

- A is correct in that it is permissible to downward adjust NI's to equal calorimetric, but N-41 requires concurrence from the engineer because its adjustment will exceed 4%
- B is incorrect because T/S requires NI's to be + or - 2% or less
- C is incorrect because no NI will be adjusted more than 4%
- D is incorrect because the other NI's will still be out more than 2%.

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24. 015K4.06 001

While operating at 90% power, one power range channel of nuclear instrumentation Power Range has been removed from service which resulted in the OTDeltaT trip bistable placed in bypass.

What is the coincidence for a NIS OTDeltaT reactor trip?

- A. 2 out of 4
- B.✓ 2 out of 3
- C. 1 out of 4
- D. 1 out of 3

REF: INPO bank

Neutron Monitoring System N3-92-4003

- a. incorrect - coincidence changes to 1 out of three when in bypass
- b. correct - coincidence changes to 2 out of 3
- c. incorrect - wrong logic and bypass limited to 4 hours
- d. incorrect - bypass status limited to 4 hours

Watts Bar Initial License Reactor Operator Exam

25. 016K3.02 001

Given the following:

- With Pressurizer Level Control Channel Select switch 1-XS-68-339E selected to LI-68-339 & 335, the following SEQUENTIAL plant events occur due to a failure without operator action.
 - Charging flow rises to maximum
 - Pressurizer level begins to rise
 - Letdown isolates and heaters turn off
 - Pressurizer level eventually rises to the high level reactor trip

Which ONE of the following failures occurred?

- A. Level channel 1-LT-68-339 failed high.
- B. Level channel 1-LT-68-335 failed high.
- C.✓ Level channel 1-LT-68-339 failed low.
- D. Level channel 1-LT-68-335 failed low.

Ref: WB lesson plan 3-OT-SYS068C, Obj. 12

Distractor analysis:

A is incorrect because charging "see" the level as high, throttles to minimum. Actual level decreases and channel LT 335 shut letdown valve 62-69 and isolates heaters. With no letdown, even an minimum charging, actual level rises to the high level trip setpoint.

B is incorrect because LT-68-335 can't be selected for level control

C is correct because failing low makes charging increase and level would initially go up rapidly due to letdown also isolating and cause a trip the Rx

D is incorrect same as B

Watts Bar Initial License Reactor Operator Exam

26. 017AK1.04 001

Given the following plant conditions:

- Unit is operating at 30% power.
- All control systems are in AUTO.
- Loop 3 Reactor Coolant Pump has just tripped.

Which ONE of the following is the overall plant response?

- A. Reactor trips on HIGH steam generator level when the #3 steam generator level "swells".
- B. ✓ Unit power remains the same with steam flow rising on the other steam generators.
- C. Unit power is reduced to approximately 22% power (3/4 of original power level).
- D. The reactor trips on a Low RCS Flow condition.

REF: WB bank Lesson plan 3-OT-TAA015, Student Handout, p. 8-9

- a. correct - Core flow will decrease and if reactor power remains constant then DT across the core will increase to a higher value.
- b. incorrect - Core flow will decrease and if reactor power remains constant then DT across the core will increase to a higher value. Examinee may misinterpret a decrease in flow correlating to a decrease in DT.
- c. incorrect - Core flow will decrease and if reactor power remains constant then DT across the core will increase and stabilize at a higher value. Examinee may misinterpret a constant reactor power with a constant DT.
- d. incorrect - Core flow will decrease and if reactor power remains constant then DT across the core will increase and stabilize at a higher value. Examinee may misinterpret a decrease in flow correlating to a decrease in DT and returning to the original value since reactor power remains constant.

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27. 017K3.01 001

If all core-exit thermocouples are inoperable during an event in which the RCPs were tripped, what indication(s) may be used to verify that natural circulation cooling is occurring?

- A. RCS hot leg temperatures only
- B. RCS cold leg temperatures only
- C. Both RCS cold leg and hot leg temperatures
- D. There are no direct indications to verify natural circulation for this condition.

REF: Bank (NA'02)

Watts Bar, ES-01, "Reactor Trip Response

- a. incorrect - insufficient information
- b. incorrect - insufficient information
- c. correct - the difference in temperatures will be adequate to determine if natural circulation has been established
- d. incorrect, using both hot and cold legs is adequate

Watts Bar Initial License Reactor Operator Exam

28. 022AG2.1.32 001

During water Solid operations with letdown from RHR, SOI-62.01 requires that 1-FCV-62-83, RHR LETDOWN FLOW CONTROL be full open.

Which ONE of the following describes the basis for this precaution?

- A. To ensure maximum letdown flow rate for purification.
- B. To ensure VCT level can be maintained under all charging flow conditions.
- C✓ To ensure 1-PCV-62-81, Letdown Pressure Control can control pressure transients.
- D. To ensure RCS to RHR Suction Relief Valve (1-RFV-74-505) isn't challenged.

REF: RHR, 3-OT-SYS074A

Distractor analysis:

Answer A is incorrect because charging flow controls letdown flow.

Answer B is incorrect because balancing charging and letdown controls VCT level.

Answer C is correct because with FCV-62-83 less than full open, it can in effect limit flow and prevent pressure reduction when PCV-62-81 fully opens in response to a high pressure transient.

Answer D is incorrect because the suction relief can be challenged by other factors (eg. pump starts) even with FCV-62-83 full open.

Watts Bar Initial License Reactor Operator Exam

29. 022G2.1.10 001

Which ONE of the following correctly identifies the minimum and maximum allowable temperatures per Tech Spec for the Containment upper compartment temperature in Mode 2.

- A. Between 85°F and 120°F.
- B. ✓ Between 60°F and 110°F.
- C. Between 60°F and 120°F.
- D. Between 85°F and 110°F.

Ref: WB lesson plan 3-OT-SYS030C, obj 3

WB TS 3.6.5

Modified from WB exam bank which asked MODE 1 limits.

Distractor analysis:

See attached TS

Watts Bar Initial License Reactor Operator Exam

30. 022K4.03 001

Given the following plant conditions:

- Reactor trip & Safety Injection occurred due to Large Break LOCA.
- Containment ØB isolation has occurred.
- All systems responded normally.

Which ONE of the following describes the response of the Lower Compartment Coolers when ØB is reset?

- A. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves remain closed.
- B. Fans in A-P-AUTO remain off.
Cooler ERCW isolation valves open.
- C. Fans in A-P-AUTO start.
Cooler ERCW isolation valves remain closed.
- D. Fans in A-P-AUTO start .
Cooler ERCW isolation valves open.

Ref: WB Lesson Plan 3-OT-SYS030C, obj. 5
WB Exam Bank

Watts Bar Initial License Reactor Operator Exam

31. 024AK2.01 001

A condition has occurred which warrants entry into AOI-34, "Immediate Boration". While attempting to borate, the aligned boric acid pump TRIPS.

Which ONE of the following Immediate Boration flowpaths should be used in this condition?

- A. To the suction of the CCPs through Emergency Borate valve 1-FCV-62-138 after re-aligning the boric acid pump on tank recirc.
- B. To the suction of the CCPs through Manual Boration valve 1-ISV-62-929 after re-aligning the boric acid pump on tank recirc.
- C. ☒ To the suction of the CCPs through 1-FCV-62-135 and 136 using the RWST as the boration source.
- D. From the discharge of the CCPs through 1-FCV-63-25 and 26 using the BIT as the boration source.

REF: AOI-34, Immediate Boration

Watts Bar Initial License Reactor Operator Exam

32. 025A3.02 001

Given the following:

- Large Break LOCA has occurred causing a Reactor Trip and Safety Injection
- OAC observes annunciator "Glycol Exp Tank Level HI/HI-Hi" is lit

Which ONE of the following describes the most likely reason the annunciator is illuminated?

- A. Phase A closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the auxiliary building side of the isolation valves relieve glycol into the glycol expansion tank.
- B. ✓ Phase A closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.
- C. Phase B closes the glycol containment isolation valves; glycol inside containment heats up and relief valves on the auxiliary building side of the isolation valves relieve glycol into the glycol expansion tank.
- D. Phase B closes the glycol containment isolation valves; glycol inside containment heats up and expands into the glycol expansion tank.

REF: Bank
lesson plan OT-SYS061A
drawing 1-47-814-2

In the event of a LOCA, the glycol heats up from approximately -5 F to the containment accident temperature and expands harmlessly into the expansion tank. The liquid trapped between a pair of isolation valves is relieved around the inner isolation valve through a bypass line via a small check valve. The bypass line also contains test connections for periodic leak testing of the isolation valves and check valve.

- a. incorrect - no relief valves feedback to the expansion tank
- b. correct
- c. incorrect - no relief valves feedback to the expansion tank
- d. incorrect - phase B does not close the these valves

Watts Bar Initial License Reactor Operator Exam

33. 025AA2.07 001

Given the following:

- RCS temperature is 118 F
- Reactor Vessel head is removed
- Reactor Upper Internals are installed in the reactor vessel
- Refueling Level is 718' 6"
- RCS draining is in process at 10 gpm
- RHR pump A is running with indicated flow of 2700 gpm
- RHR pump A begins to exhibit indications of cavitation

The cavitation and subsequent loss of RHR heat removal is occurring due to

- A. draining with the upper internals in place, which reduced the RHR suction pressure.
- B. steam binding of the RHR pump, caused by low recirculation flow.
- C. air entrapment at the RHR suction inlet, caused by the high flow conditions.
- D. draining with the upper internals in place, which reduced the RHR discharge pressure.

Ref. Bank

SOI-74.01

AOI-14

GO.10

- a. incorrect, upper internal installation will not effect RHR suction pressure.
- b. incorrect, recirculation flow valve shuts at 1400gpm
- c. correct, air entrapment occurs at higher flow rates, normal midloop flow rate is 2000
- d. incorrect, upper internals installed will not effect RHR discharge pressure to this extent

Watts Bar Initial License Reactor Operator Exam

34. 025G2.1.27 001

Which ONE of the following is a purpose of the Ice Condenser System?

- A. Helps limit peak clad temperature of the fuel by maintaining a minimum back pressure on the RCS during blowdown phase.
- B. Uses sodium tetraborate to remove elemental hydrogen from the containment atmosphere.
- C.✓ Absorbs (thermal) energy released during LOCA to control the peak pressure in containment.
- D. Uses sodium hydroxide to remove elemental iodine from the containment atmosphere.

Ref: WB lesson plan 3-OT-SYS061A, obj 2

Watts Bar Initial License Reactor Operator Exam

35. 026A1.01 001

Given the following:

- A Rx trip/Safety Injection has occurred due to a Large Break LOCA
- Containment Pressure is 1.6 psig and rising
- One High Containment Pressure bistable has illuminated

Which ONE of the following describes the correct operator response to prevent Containment Pressure from exceeding design limits?

- A. Continue to closely monitor Containment Pressure and the High Containment Pressure bistable status.
- B. Manually actuate HS-30-64A, Phase B Actuation Switch on M-6, and HS-30-68A, Phase B Actuation Switch on M-5, simultaneously.
- C. Manually start and align Train A and Train B Containment Spray Systems.
- D. Manually actuate HS-30-64A, Phase B Actuation Switch on M-6, and HS-30-64B, Phase B Actuation Switch on M-6, simultaneously.

REF: WB bank

3-OT-SYS072A, Containment Spray System Lesson Plan
N3-72-4001, Containment Heat Removal Spray System

Watts Bar Initial License Reactor Operator Exam

36. 026AK3.03 001

Given the following:

- Unit is at 100% power.
- "A" Train CCS Surge tank level is dropping due to a leak.
- US has entered AOI-15, Loss of Component Cooling Water.

Which ONE of the following describes required actions in the event "A" Train CCS surge tank level cannot be maintained.

- A. Transfer "A" Train CCS suction to the "B" Train side of the surge tank, isolate non ESF header.
- B. Shift Thermal Barrier Booster pump suction to "B" train, shutdown affected "A" Train components, start "B" Train components as necessary.
- C. Stop the thermal barrier booster pumps, trip the Reactor and stop all RCPs.
- D. Shutdown running "A" Train components and place in auto, start "B" Train components as necessary.

Reference: SYS072A.08
WB Bank

Watts Bar Initial License Reactor Operator Exam

37. 027AK3.03 001

Given the following:

- Unit 1 is at 100% power.
- Annunciator 89A, PZR PORV LINE TEMP HI, illuminates.
- Both PORV's indicate closed.
- Pressurizer pressure is normal.

In accordance with AOI-6, Small Reactor Coolant System Leak, which ONE of the following is the correct action and reason?

- A. Close the associated block valve because a vapor-space leak causes PZR level to increase.
- B. Close both block valves because a vapor-space leak causes PZR level to increase.
- C. Close the associated block valve because the PRT will rupture.
- D. Close both block valves and remove power because the PRT will rupture.

Ref: WB lesson plan 3-OT-AOI1800, obj. 1 & 5
AOI-18
AOI-6
ARI 89-A

Disaster analysis:

Answer A and B are incorrect because PZR level rise is only associated with large leaks that affect PZR pressure.

Answer C is correct because it follows the ARI guidance and small leaks can raise PRT pressure to the rupture disc setpoint.

Answer D is incorrect because power should not be removed.

Watts Bar Initial License Reactor Operator Exam

38. 029EA1.13 001

Which ONE of the following is the NEXT action the operator is required to take if the main turbine does NOT trip automatically and CANNOT be tripped from the MCR: per FR-S.1, "RESPONSE TO NUCLEAR POWER GENERATION/ATWS"?

- A. Place both EHC pumps control switches in P-T-L.
- B. Trip the turbine locally at the front standard.
- C. Manually RUNBACK the turbine.
- D. Shut the MSIV's.

REF: WB lesson plan 3-OT-FRS-0001, Obj. 3
WB exam bank

Distractor analysis:

- A is incorrect because it is a followup action later in the procedure, step 9 RNO.
- B is incorrect because it is a local action if MCR actions fail, step 9 RNO.
- C is correct per RNO step 2
- D is also in RNO step 2, but only occurs if runback doesn't work.

Watts Bar Initial License Reactor Operator Exam

39. 029K1.02 001

Which ONE of the following describes the sample path of RE-90-130, Cntmt Purge Exhaust, and effect of the alarm exceeding the alarm setpoint?

- A. RE-90-130 samples the Cntmt Purge Exhaust discharge and initiates a Containment Phase A Isolation upon alarm.
- B. ✓ RE-90-130 samples the Cntmt Purge Exhaust suction and initiates a Containment Vent Isolation upon alarm.
- C. RE-90-130 samples the Cntmt Purge Exhaust discharge and initiates a Containment Vent Isolation upon alarm.
- D. RE-90-130 samples the Cntmt Purge Exhaust suction and initiates a Containment Phase A Isolation upon alarm.

Ref: WB Lesson Plan 3-OT-SYS030C, obj. 10
WB Lesson Plan 3-OT-SYS090A, pp. 63
SOI 88.1, Checklist #3
Dwg. 1-47W866-1

Watts Bar Initial License Reactor Operator Exam

40. 032AK1.01 001

Given the following conditions:

- Reactor Startup in progress
- Shutdown Banks withdrawn
- Control Bank withdrawal is imminent
- SRM N132 indicates approximately 1000 cps
- SRM N131 is in bypass

Which ONE of the following will occur if the control power fuse for SRM N131 blows?

- A. Lose indication for SRM N131 on Main Control Board and NIS cabinets
- B. Both SRM drawers deenergizes and "non-operate" alarm acuates
- C.✓ Reactor Trips
- D. Rod withdrawal is blocked

REF: WB bank

Lesson Plan SYS092A

- a. incorrect-not all indicatipon lost since instrument power is available
- b. incorrect-SRM N132 unaffected by loss of control power to SRM N131
- c. correct- loss of control power deenergizes bistables and initiates trip signal (1/2 logic)
- d. incorrect - Source range low does not initiate rod stop

Watts Bar Initial License Reactor Operator Exam

41. 034K4.01 001

Which ONE of the following describes a feature of the Refueling Machine designed to prevent the accidental release of a fuel assembly?

- A. The Gripper is mechanically engaged and disengaged by a remote operating handle on the bridge and requires no power or air to operate.
- B.✓ The gripper requires air to disengage, however, a mechanical latch prevents gripper release under load even if air is supplied.
- C. The gripper disengages upon loss of air, however, a mechanical latch prevents gripper release under load even if air is removed.
- D. When the gripper is engaged, operators mechanically lock gripper in place with extension shaft which must be unlocked before the gripper can release.

Ref: lesson 3-OT-SYS079 (LO 11)

- a. incorrect - air required to disengage
- b. correct - mechanical latch on gripper works under load
- c. incorrect - engages on loss of air
- d. incorrect - no operator action required for gripper mechanical latch to operate

Watts Bar Initial License Reactor Operator Exam

42. 035K1.09 001

Given the following plant conditions:

- The reactor is operating at 50% power.
- Rod control is in MANUAL.
- Turbine control is in IMP-IN.
- #3 S/G PORV fails OPEN.

Which ONE of the following describes the resulting steady-state conditions?
(Assume no reactor trip or operator action and turbine power remains constant)

- A. Final Tavg < initial Tavg and final power > initial power.
- B. Final Tavg < initial Tavg and final power = initial power.
- C. Final Tavg = initial Tavg and final power > initial power.
- D. Final Tavg = initial Tavg and final power = initial power.

Ref: TAA011, General theory section

Distractor analysis:

A is correct steam loss through PORV causes Tavg decrease which adds positive reactivity which causes power to rise. Tavg will remain less than initial Tavg because some of the reactivity is used to overcome power defect associated with power rise.

B, C, and D are incorrect because they conflict with the above correct answer.

Note: Since IMP-IN is given, do we need to tell them that turbine power remains constant?

Watts Bar Initial License Reactor Operator Exam

43. 037AK3.07 001

Given the following:

- A SG tube leak of approximately 30 gpm has been identified on SG #3.
- The operating crew has entered AOI-33, Steam Generator Tube Leak.
- Operators have completed Step 21 of the AOI and have isolated feed flow to SG #3 after verifying level greater than 10%.

Which ONE of the following is a basis for ensuring the affected SG level greater than 10%?

- A. To ensure that the pressure and temperature limits of the SG shell are maintained.
- B. To prevent the RCS cooldown from causing depressurization of the affected SG.
- C. To prevent SG overfill.
- D. To prevent thermal shock to the tubes during RCS cooldown.

Ref: WB Lesson Plan 3-OT-AOI3300, obj. 8

A is incorrect in that these limits apply to CSD conditions

B is correct because the insulating layer of water above the tubesheet helps trap pressure in the S/G and minimize tube d/p during cooldown.

C is incorrect because level control is not an issue.

D is incorrect because there is no sudden introduction of cold water after the level is attained.

Watts Bar Initial License Reactor Operator Exam

44. 039A1.03 001

Given the following plant conditions:

- Startup in progress.
- Operators are warming the main steam lines using the MSIV bypasses.
- The OAC observes that the RCS has cooled down 108°F in the past hour.
- The CRO observes that the main steam lines have heated up 102°F in the past hour.

Which ONE of the following indicates the actions that should be taken by the operators and why?

- A. ✓ Close the MSIV bypass valves; RCS cooldown limit was exceeded.
- B. Close the MSIV bypass valves; main steam line heat-up limit was exceeded.
- C. Close the MSIV bypass valves; both RCS and main steam line limits were exceeded.
- D. Leave MSIV bypass valves open; NO RCS or main steam line limits were exceeded.

Ref: WB Exam Bank
WB Lesson Plan 3-OT-SYS001A , obj 24

- a. Correct - RCS cooldown limit of 100°F/hr was exceeded; main steam line limit of 200°F/hr was NOT exceeded. Closing the bypass valves would terminate the cooldown
- b. Incorrect - main steam line limit was not exceeded. Examinee could confuse the RCS and main steam line limits.
- c. Incorrect - only the RCS cooldown limit was exceeded. Examinee may believe the limits were the same. Closing the bypass valve would terminate the cooldown.
- d. Incorrect - examinee could confuse the limits and believe that neither limit was exceeded, however the RCS cooldown limit was exceeded and closing the bypass valve would terminate the cooldown.

Watts Bar Initial License Reactor Operator Exam

45. 040AG2.4.6 001

Given the following plant conditions:

- Unit was at 100% power.
- A main steam line break occurred in the Turbine Building.
- Operators were unable to close the MSIVs and transitioned to ECA-2.1, Uncontrolled Depressurization of All Steam Generators.
- SI termination steps are in progress.
- Loop 3 MSIV is closed locally.
- The CRO observes the #3 SG pressure rising slowly.

Which ONE of the following actions should be performed?

- A. Transition to E-2, "Faulted SG Isolation".
- B. Transition to ES-1.1, "SI Termination".
- C. Remain in ECA-2.1 until RHR is in service.
- D. ✓ Remain in ECA-2.1 until SI is terminated.

REF: ECA-2.1 Caution prior to step 17; Lesson plan 3-OT-EOP0201 p. 10
WBN Exam Bank

- a. incorrect - With SI termination in progress the crew should remain in ECA-2.1, but examinee may select since this would be the correct transition if SI termination was not in progress.
- b. incorrect - With SI termination in progress the crew should remain in ECA-2.1, but examinee may misinterpret step action and select the normal SI termination procedure vs. ECA-2.1.
- c. incorrect - With SI termination in progress the crew should remain in ECA-2.1, but examinee may select to stay in ECA-2.1 until complete which is after RHR is placed in service.
- d. correct - A caution prior to the SI termination steps of ECA-2.1 states that with if any intact S/G is restored during SI termination steps that transition to E-2 should be delayed until SI is terminated.

Watts Bar Initial License Reactor Operator Exam

46. 041K3.04 001

Given the following conditions:

- Unit at 100% power, EOL conditions.
- Turbine operating in IMP OUT.
- A steam dump valve inadvertently comes full open.
- All other control systems normal.

Which ONE of the following correctly describes the plant conditions, when plant stabilizes, and assuming NO operator action?

- A. Megawatts electrical same as initial; reactor power rises.
- B. Megawatts electrical same as initial; reactor power drops.
- C.✓ Megawatts electrical drops; reactor power rises.
- D. Megawatts electrical drops; reactor power drops.

Ref: WB Exam Bank

WB Lesson Plan 3-OT-SYS001B, obj 27

WB Lesson Plan 3-OT-SYS001B, pp. 24

Watts Bar Initial License Reactor Operator Exam

47. 045A3.05 001

Given the following plant conditions:

- Plant operating at 100% power.
- All systems aligned normal.
- Turbine EHC control is in IMP OUT.

Which ONE of the following describes turbine governor valve operation while in IMP OUT mode?

- A. Governor valve position is adjusted to maintain generator load constant and will NOT respond to changes in system frequency.
- B. Governor valve position is adjusted to maintain generator load constant and will respond to changes in system frequency.
- C. Maintains governor valves at a set reference position and will NOT respond to changes in system frequency.
- D. Maintains governor valves at a set reference position but will respond to changes in system frequency.

Ref: WB Exam Bank

WB Lesson Plan OT-3- SYS047A Obj. 2

Lesson plan pp. 12 and 18

Info on pp. 12 and 18 seem to conflict, need to follow up w/ site.

- a. Incorrect - in the IMP OUT mode governor valves adjust to maintain load and system frequency.
- b. Incorrect - in the IMP OUT mode governor valves adjust to maintain load and system frequency.
- c. Incorrect - governor valves are set at a reference set in by the operator, but WILL change in response to system frequency changes
- d. Correct - governor valves are set at a reference set in by the operator and WILL change in response to system frequency changes.

Watts Bar Initial License Reactor Operator Exam

48. 051AA2.02 001

Which ONE of the following combinations requires ONLY the turbine (NOT the reactor) to be tripped per AOI-11, " Loss of Condenser Vacuum"?

- A. Generator load 700 MWe; condenser pressure 5.3" Hga.
- B. Generator load 400 MWe; condenser pressure 5.0" Hga.
- C. ✓ Generator load 300 MWe; condenser pressure 4.0" Hga.
- D. Generator load 200 MWe; condenser pressure 3.0" Hga.

REF WB bank
AOI-11

- A. incorrect - per back pressure limit table in AOI-11
- B. incorrect - per back pressure limit table in AOI-11
- c. correct
- d. incorrect - per back pressure limit table in AOI-11

Watts Bar Initial License Reactor Operator Exam

49. 054AG2.4.48 001

Given the following:

- Unit 1 is at 100% power.
- Annunciator 63-F, SG LEVEL DEVIATION, alarms and the operator notices S/G #1 level rising along with MFP speed and the remaining S/G levels constant.

Which ONE of the following describes the (1) cause, (2) required action and (3) consequence of no operator action?

- A. (1) #1 S/G FRV is opening, (2) return #1 S/G level to program, (3) Auto Turbine Runback initiated
- B. (1) #1 S/G FRV is opening, (2) return #1 S/G level to program, (3) Feedwater Isolation initiated
- C. (1) MFP master controller failing high, (2) control MFP speed using manual, (3) Auto Turbine Trip initiated
- D. (1) MFP master controller failing high, (2) manually trip turbine, (3) Feedwater Isolation initiated

Ref: WB 3-AOI-1600

Distractor analysis:

- A is incorrect because the consequence is a P-14, Hi-Hi SG level which initiates a FW isolation.
- B is correct because only one SG is rising, hence a FRV is the cause, action is from AOI-16 for FRV failure and FW isolation occurs with no operator action at P-14.
- C is incorrect because a problem with the MFP controller would affect all SG's the same.
- D is incorrect same as C.

Watts Bar Initial License Reactor Operator Exam

50. 055EK3.02 001

Which ONE of the following is a purpose for depressurizing all intact SGs to 300 psig during the performance of ECA-0.0, "Loss of Shutdown Power"?

- A. Reduces DP across SG U-tubes to minimize possibility of tube rupture.
- B.✓ Reduces DP across RCP seals to minimize leakage and loss of RCS inventory.
- C. Maximizes Natural Circulation flow before Reflux cooling begins as the RCS becomes saturated.
- D. Maximizes Natural Circulation flow to allow reactor vessel head to cool since CRDM are unavailable.

References: ECA-0.0; ECA0000.03
WB bank, ECA-0.0

Watts Bar Initial License Reactor Operator Exam

51.055K3.01 001

Given the following conditions:

- Reactor power is steady-state at 100%.
- Rod control is in automatic.
- Condenser Vacuum Pumps 1A and 1B are running with 1C pump out of service for maintenance.

Which ONE of the following conditions could result if NO operator action is taken in response to a COND VACUUM PUMP 1B SEAL WTR PRESS LOW alarm?

- A. Rising megawatt output and rising steam seal header pressure.
- B. Rising megawatt output and rising condenser hotwell level.
- C. Dropping megawatt output and dropping condensate temperature.
- D. Dropping megawatt output and rising condensate temperature.

REF: WB Lesson plan 3-OT-SYS1100, obj 4

Distractor analysis:

Degraded vacuum causes megawatt output to decrease due to reduce delta H. Therefore, A and B are incorrect.

Condenser is a saturated system, so higher Psat means higher Tsat. Therefore D is correct and C is incorrect.

Watts Bar Initial License Reactor Operator Exam

52. 056AK1.01 001

Given the following:

- Unit 1 has experienced a Loss of Offsite Power
- The operating crew is currently performing a cooldown, in accordance with ES-0.2, Natural Circulation Cooldown
- Prior to initiating the cooldown, two CRDM fans trip

Which ONE of the following describes the maximum allowable cooldown rate?

- A. <100°F in any one hour
- B. <50°F in any one hour
- C. <25°F in any one hour
- D. <10°F in any one hour

Ref: Watts Bar Lesson Plan 3-OT-EOP0000, obj. 15
Watts Bar Lesson Plan 3-OT-EOP0000, pp. 44 of 95

Distractor analysis:

Answer A is incorrect, but is normal max cooldown with forced RCS flow

Answer B is incorrect, but is correct for 3 or more CRDM fans operating (total of 4)

Answer C is correct per ES-0.2, step 7 RNO

Answer D just rounds out the 4

Watts Bar Initial License Reactor Operator Exam

53. 056K1.03 001

Given the following:

- Unit 1 is at 72% power.
- Both MFPT's in service
- A control problem causes 1-FCV-2-210, Condensate Inlet to 1A MFPT Condenser, to close.

Which ONE of the following describes the effect on continued plant operation?

- A. The Standby MFP starts and Rx power must be reduced.
- B. The Standby MFP starts and Rx power can remain 72%.
- C. The Standby MFP does not start and Rx power must be reduced.
- D. The Standby MFP does not start and Rx power can remain at 72%.

Ref: 3-OT-SYS002A, obj. 15
3-OT-SYS003A, obj. 5 & 7

Distractor analysis:

A and D are incorrect, because the 1A MFP trips on low condenser vacuum

C is incorrect because the standby feed pump auto starts

B is correct, because the standby feed pump starts and is able to carry ~15% turbine power and the 1B MFP can carry 67%, the sum of which is above 72%.

Watts Bar Initial License Reactor Operator Exam

54. 057AA2.18 001

Given the following:

- Unit 1 at 100% power
- Alarms received indicate a failed electrical board
- Other indications are:
 - Rx Trip - SI status panel 1-XX-55-5 is dark
 - Low seal flow to RCP's due to FCV-62-89 failing open
 - High charging flow due to FCV-62-93 failing open

Which ONE of the following identifies which electrical board that was lost?

- A. 125 V DC Vital Battery Board I
- B. 120 VAC Vital Instrument Power Board 1-I.
- C. 125 V DC Vital Battery Board II
- D. 120 VAC Vital Instrument Power Board 1-II.

Ref: WB Lesson Plan 3-OT-AOI2500, obj. 1
WB procedures AOI-25.1,.2 and 21.1,.2
WB exam bank

Distractor analysis:

See attached procedures which show loads from each of the above boards.

Watts Bar Initial License Reactor Operator Exam

55. 059AA1.01 001

Given the following:

- Unit 1 is operating at 50% power
- Annunciator 178-A, SG BLDN 1-RM-120/121 LIQ RAD HI alarms

Which ONE of the following correctly describes plant response and the actions of the control room operators?

- A. No automatic action and operators verify alarm validity.
- B.✓ Operators verify SG Blowdown is isolated to Cooling Tower Blowdown and aligned to Condensate Demin.
- C. Operators verify Auxiliary Bldg Rad Waste discharge header is isolated from the blowdown line.
- D. Operators verify Cooling Tower blowdown flow is bypassed to the 35 acre pond.

Ref: WB Lesson Plan 3-OT-AOI31000, obj. 2 & 3
ARI 178-A

Distractor analysis:

A is incorrect because RM 120/121 have auto actions

B is correct base on ARI 178-A

C is incorrect the Aux Bldg in not involved in SGBD stream

D is incorrect because this action would not prevent an offsite release.

Watts Bar Initial License Reactor Operator Exam

56. 059K4.11 001

After which ONE of the following events can the feedwater isolation be reset by operating only the two feedwater isolation reset pushbuttons without performing any other actions?

- A. A spray valve fails open causing pressurizer pressure to drop to 1725 psig. The spray valve is closed and pressure returns to 2235.
- B. From 10% Rx power, the operator overfeeds a single steam generator to the High-High Level setpoint and subsequently clears the High-High Level by reducing level.
- C. A turbine trip from 65% Rx power, causing a reactor trip. Steam dumps open to control Tavg at 557°F.
- D. A high steam line flow causes a low Tavg and an SI. Main Steam isolation terminates high flow condition and allows Tavg to return to 557°F.

Ref: WB Lesson Plan 3-OT-SYS003A, obj. 13
WB dwg. 1-47W611-3-2

Distractor analysis:

Answers A and D are incorrect because the SI input must also be reset.

Answer C is incorrect because both the FWI switches AND pushbuttons must reset.

Answer B is correct because when only a Hi-Hi S/G level input is present, when it clears, only the pushbutton needs depressing to break the seal-in. See attached logic drawing.

Watts Bar Initial License Reactor Operator Exam

57. 059K6.09 001

Given the following:

- Unit 1 is at 60% power with both 1A and 1B MFP's operating in AUTO.
- 1-PT-1-33, Steam Header Pressure, output begins to slowly drift LOW.
- Assume no operator action

Which ONE of the following describes the effect on the Main Feed Water System?

- A. Feed Water Reg valves begin to close and then both MFP's discharge pressure begins to rise.
- B. Both MFP's discharge pressure begins to rise and all Feed Water Reg valves begin to open.
- C. Both MFP's discharge pressure begins to drop and all Feed Water Reg valves begin to open.
- D. Feed Water Reg valves begin to close and then both MFP's discharge pressure begins to drop.

Ref: WB Lesson Plan 3-OT-SYS0003A, obj. 6
WB Dwg. 47W611-03-02

Distractor analysis:

C is correct because input from d/p program remains constant because steam flow remains constant. However, PT-1-33 failing low, causes the d/p actual (as sensed) to increase above program. This in turn causes the speed summer to decrease its output to the speed control station which will reduce feedpump speed and its discharge pressure. Flow rate will decrease and the FRV's will open to increase flow to the S/G's.

All other answer's are incorrect because they are variations of the answer with one parameter going in the wrong direction.

Watts Bar Initial License Reactor Operator Exam

58. 061A1.04 001

Which ONE of the following describes the base assumptions for minimum CST volume for a Loss of Offsite Power?

- A. 2 hours in Mode 3 followed by 50 °F/hr cooldown rate to Mode 5.
- B. Immediately cooldown at 50 °F/hr cooldown rate to Mode 4 .
- C. 2 hours in Mode 3 followed by a 50 °F/hr cooldown rate to Mode 4.
- D. Immediately cooldown at 50 °F/hr cooldown rate to Mode 5.

REF: Byron

WB AFW System description N3-3B-4002

- a. incorrect - capacity is for a 2 hour hold then cool to mode 4
- b. incorrect - capacity for 2 hours and then cool to mode 4
- c. correct - stand pipe in CST ensures 2 hours hold and then 50 F/hr cooldown to mode 4
- d. incorrect - capacity to hold for 2 hours with 50 F/hr cooldown to mode 4

Watts Bar Initial License Reactor Operator Exam

59. 061AA1.01 001

Which ONE of the following area radiation monitors initiate a Containment Ventilation Isolation?

- A. Waste Disposal System Gas Effluent Monitor, 0-RM-90-118
- B.✓ Containment Purge Rad Monitor, 1-RM-90-130
- C. Fuel Pool Area Monitor, 0-RM-90-102
- D. Personnel Access Area Monitor, 1-RM-90-2

REF: Lesson plan SYS90A

- a. incorrect - hi rad closes the vent header isol
- b. correct
- c. incorrect - isolates the aux building, does not generate an ABI
- d. incorrect - no auto actions

Watts Bar Initial License Reactor Operator Exam

60. 061K5.01R 001

Given the following:

- The Unit 1 reactor tripped from 100% pwr due to a loss of cooling to the Main Generator.
- The plant has stabilized in Mode 3.

Which ONE of the following describes the effect on the heat transfer rate between the RCS and the steam generators?

The heat transfer rate between the RCS and the Steam Generators will ...

- A. rise if AFW flow rises.
- B. rise if AFW temperature rises.
- C. drop if AFW temperature drops.
- D. drop if AFW flow rises.

REF: Modified from INPO bank

Watts Bar Initial License Reactor Operator Exam

61. 062A3.05 001

Given that the following occurred in sequence:

- A small break LOCA occurred which resulted in a reactor trip and SI.
- The SI signal was reset during the performance of E-1, "Loss of Reactor or Secondary Coolant."
- A loss of offsite power (LOOP) occurred and the diesel generators loaded as designed.

Assuming no operator actions, which ONE of the following would be the status of the loads on the 6.9kV SD boards?

- A. All equipment powered from the SD boards with the control board switch in automatic will be restarted.
- B. No 6.9kV SD board loads are automatically restarted.
- C. Equipment normally started during a LOOP will be automatically restarted; SI and RHR pumps remain OFF.
- D. All equipment that was operating prior to the LOOP will be automatically restarted; All running ESF equipment will be reenergized

Reference: WB Exam Bank

Watts Bar Initial License Reactor Operator Exam

62. 062AG2.4.24 001

Which ONE of the following correctly identifies the emergency cooling water supply to the control and station service air compressors, per AOI-13, "Loss of ERCW", if normal ERCW supply is lost?

- A. Raw Cooling Water header
- B.✓ Raw Service Water header
- C. Unit 1 Primary Water header
- D. Demin Water header

Ref: AOI-13

DWG 47w850-1
47w845-5

- a. incorrect - RCW does not support the compressors
- b. correct - RSW / Fire header connection in emergency
- c. incorrect - no ERCW connection to support compressors
- d. incorrect -

Watts Bar Initial License Reactor Operator Exam

63. 063K3.02 001

Given the following:

- Unit 1 was at 100% power when a reactor trip occurred due to Lo-Lo S/G level
- 1A-A DG was running paralleled to the 6.9kV Shutdown Board for surveillance.
- In addition to the expected post trip annunciators, the operator notes annunciators:
 - 17-A 125 DC VITAL CHGR/BATT I ABNORMAL
 - 17-B 125 DC VITAL BATT BD I ABNORMAL CKTS ISOLATED

Which ONE of the following describes the response to this event by 1A-A DG?

- A. 1A-A DG trips and its output breaker opens
- B. 1A-A DG continues to run and it's output breaker opens
- C. 1A-A DG trips and its output breaker remains closed
- D. 1A-A DG continues to run and its output breaker remains closed

Ref: WB lesson plan 3-OT-AOI2100, obj. 1 & 2

3-OT-SYS057P, obj. 8

WB Dwg's 1-45W724-1

1-45W727

1-45W760-82-2

1-45W760-211-4

Distractor analysis:

A is incorrect because the DG can run using its own DC control power, but the output breaker has not control power to trip.

B is incorrect because the output breaker has no control power to trip.

C is incorrect because the DG does not trip

D is correct because the DG has its own control power and the output breaker remains closed due to no control power.

Watts Bar Initial License Reactor Operator Exam

64. 064K2.03 001

Given the following:

- Unit 1 is at 100% power
- All Diesel Generators are in standby
- Annunciator 281-A, DG CONTROL POWER FAILURE for 1A-A DG

Which ONE of the following describes the status of the Diesel Generator(s) AFTER the annunciator alarms?

- A. 1A-A DG starts and is operable.
- B. 1A-A DG does not start and is inoperable.
- C. All four diesel generators start and are operable.
- D. All four diesel generators do not start and are inoperable.

Ref: WB lesson plan 3-OT-SYS082B, obj. 10

ARI 281-A

Dwg 1-45W727

1-45W760-82-2

1-45W760-82-4

1-45W760-82-6

Distractor analysis:

A is incorrect because the starting air solenoids need power from the Diesel 125V DC Distribution Panel 1-DPL-82-A-A which is deenergized as evidenced by the annunciator 281-A.
B is correct because the starting air solenoids have no power and cannot respond to an auto start signal
C and D are incorrect because they continue to have control power and all 125V vital battery boards are still energized.

Watts Bar Initial License Reactor Operator Exam

65. 065AA1.01 001

Given the following:

- Unit 1 is at 100% power
- Annunciator 42E, C&SS AIR COMPR SEQUENCER UNDERVOLTAGE
- Control Air pressure is slowly decreasing

Which ONE of the following describes actions for locally controlling air pressure?

- A. Take manual control of the Foxboro 43AP pneumatic controller
- B. Shift AC control power
- C. Start and stop Control Air Compressors
- D. Take manual control at the local control station using the solenoid manual valve

REF: Watts Bar ARI 42-E
lesson plan 3-OT-SYS032A, obj 11

Distractor analysis:

- A incorrect because controller has no power
- B incorrect because control power is DC, but shifting control power takes precedence over taking manual control of unloader
- C is incorrect due to no procedural guidance and undesirable from equipment standpoint
- D is correct IAW ARI

Watts Bar Initial License Reactor Operator Exam

66. 067AK1.02 001

Which ONE of the following is the most effective method of fire fighting in the Security Backup Diesel Room?

- A. Auto actuation of sprinkler system
- B. Auto actuation of fog system
- C. ✓ Auto actuation of foam system
- D. Auto actuation of CO2 system

REF: Watts Bar Exam Bank
SYS026A.21

Watts Bar Initial License Reactor Operator Exam

67. 068AK3.18 001

Evacuation of the Control Room is required due to a control room fire. The actions of AOI-30.2, "Fire Safe Shutdown", prior to evacuating the control room include which ONE of the following?

- A. Manual trip of all feedwater pumps
- B. ✓ Deenergizing the RCP start busses at the Electrical Control Board
- C. Initiating manual Safety Injection
- D. Manual trip of all unloaded diesel generators

Ref: AOI-30.2 Fire Safe Shutdown, appendix C steps 1 - 8,

Watts Bar Initial License Reactor Operator Exam

68. 068K1.07 001

Which ONE of the following describe how Incore Instrumentation Seal Table leakage enters the Liquid Radwaste System?

- A. Drains to the Reactor Coolant Drain Tank then pumped to the Tritiated Drain Collector Tank.
- B.✓ Drains to the Reactor Building Floor and Equipment Drain Pocket Sump then pumped to the Reactor Building Floor and Equipment Drain sump and then pumped to the Tritiated Drain Collector Tank.
- C. Drains to the Containment Pit Sump then pumped to the Reactor Building Floor and Equipment Drain Sump and then pumped to the Floor Drain Collector Tank.
- D. Drains to the Reactor Building Floor and Equipment Drain Sump then pumped to the Floor Drain Collector Tank.

Ref: WB lesson plan 3-OT-SYS077A, obj.
Dwg. 1-47W851-1

Watts Bar Initial License Reactor Operator Exam

69. 069AK2.03 001

Given the following:

- Unit 1 is at 100% power.
- Personnel report that they are working in upper containment and can not get the inner personnel access door closed due to damage.

Which ONE of the following describes the correct actions for Technical Specifications and access to repair the door?

- A. Declare the Upper Airlock Inoperable, preferred access to repair the inner door is via the Upper Airlock outer door.
- B. ✓ Declare the Upper Airlock Inoperable, preferred access to repair the inner door is via the Lower Airlock and Containment Divider Barrier Hatch.
- C. Upper Airlock remains operable, preferred access to repair the inner door is via the Upper Airlock outer door.
- D. Upper Airlock remains operable, preferred access to repair the inner door is via the Lower Airlock and Containment Divider Barrier Hatch.

Ref: WB 3-OT-AOI1200 , obj. 4
WB 3-OT-AOI1200, pp. 5
WB Tech Specs

Distractor analysis:

A is incorrect because the air lock is not inoperable because the outer door is operable. These actions are for an inoperable air lock.

B is incorrect because there is no requirement to repair the inner door within one hour.

C is correct per Tech Specs 6.2 condition A.

D is incorrect because there is no requirement per AOI 12 to commence shutdown within 1 hour.

Watts Bar Initial License Reactor Operator Exam

70. 071K3.05 001

Given the following plant conditions:

- A Gas Decay Tank is being released to the atmosphere using the normal release path.
- The tank being released has HIGH gaseous activity.
- 0-PCV-77-117, Plant Vent Pressure Control Valve fails toward the open position.

Which ONE of the following radiation monitor pairs will alarm to alert the operators and secure the release, respectively?

- A. Shield Building Ventilation Monitor [1-RE-90-400] and Aux Building Vent Monitor [0-RE-90-101].
- B. Auxiliary Building Ventilation Monitor [0-RE-90-101A] and Shield Building Ventilation Monitor [1-RE-90-400].
- C. Shield Building Ventilation Monitor [1-RE-90-400] and WDS Gas Effluent Monitor [0-RE-90-118].
- D. Auxiliary Building Ventilation Monitor [0-RE-90-101A] and WDS Gas Effluent Monitor [0-RE-90-118].

Ref: WB lesson plan 3-OT-SYS077B, obj. 9
3-OT-SYS090A, obj. 7

Distractor analysis

A is incorrect because the AB monitor is unrelated to WDS release

B is incorrect same as A

C is correct because the Shield Bldg monitor will upscale and the WDS effluent monitor will trip FCV-77-119 shut and secure release.

D is incorrect same as B

Watts Bar Initial License Reactor Operator Exam

71. 072A1.01 001

Given the following:

- Unit 1 is defueled
- Fuel movement activites in progress in the Fuel Pool
- Radiation readings on 0-RM-90-102 and 103, Spent Fuel Pit Area Monitors have been steadily rising.

If the radiation levels continue to rise, which ONE of the following should occur?

- A. ✓ Aux Building General Supply and Exhaust Fans STOP
Fuel Handling Area Exhaust Fans STOP
ABGTS Fans START
- B. Aux Building General Supply and Exhaust Fans START
Fuel Handling Area Exhaust Fans START
ABGTS Fans STOP
- C. Aux Building General Supply Fans and ABGTS Fans START
Fuel Handling Area Exhaust Fans START
ABGTS Fans START
- D. Aux Building General Supply Fans STOP
Fuel Handling Area Exhaust Fans STOP
ABGTS Fans STOP

Ref: WB Lesson Plan 3-OT-SYS030B, Obj.13
3-OT-SYS090A, Obj.7

ARI 184-B

Watts Bar Initial License Reactor Operator Exam

72. 072G2.4.31 001

Given the following:

- Unit 1 is in Mode 6
- Fuel Movement is in progress
- Annunciator 186-B MCR AREA 0-RM-90-135 RAD HI alarms

Which ONE of the following correctly describes the actions of the control room operators?

- A. Verify Control Building Isolation occurs.
- B. Notify fuel handling crew to stop all fuel movement.
- C. Notify RADCON to investigate the alarm.
- D. Verify emergency control building air cleanup and pressurizing fans RUNNING.

Ref: WB Lesson Plan 3-OT-090A, obj. 9
ARI 186-B

Distractor analysis:

A and D are incorrect because these are auto actions which occur if the MCR Intake rad monitors 125 or 126 alarm

B is incorrect because there would be no relation between Control Room area rad monitor and refueling operations (and no other rad monitor alarms are in)

C is correct per ARI guidance

Watts Bar Initial License Reactor Operator Exam

73. 073A2.01 001

Given the following:

- Unit 1 is at 100% power
- A liquid waste release is in progress
- Annunciator 181-A, WDS RELEASE LINE 0-RM-122 LIQ RAD HI alarms.
- The reading on 0-RM-90-122 has decreased to less than background

Which ONE of the following describes the INITIAL required actions by the control room operators?

- A. Have the detector assembly cleaned.
- B. Notify RADCON to take radiation readings in the detector area.
- C. ✓ Verify liquid rad waste release valve 0-RCV - 77 - 43 shut.
- D. Initiate a Maintenance Work Order to repair 0-RM-90-122.

Ref: WB lesson plan 3-OT-SYS090A, obj. 7
ARI 181-A

Distractor analysis:

A is incorrect because there is no guidance to clean the detector although low readings could be the result of fouling.

B is incorrect due to no guidance to confirm that areas readings are suddenly less than typical background

D is correct based on the guidance in the ARI and the philosophy to secure releases to the environment when process monitors fail.

D is incorrect as an initial action although ultimately the detector will need repair at a later time.

Watts Bar Initial License Reactor Operator Exam

74. 074EA2.01 001

Given the following:

- The Unit has tripped from 100% power with a LOCA in progress
- Pzr pressure is 900 psig
- RCPs are tripped
- Core Exit thermocouples indicate 720 degrees F
- RVLIS indicates 36%
- T_{hot} for all loops range between 512 degrees F and 525 degrees F

Which ONE of the following describes the conditions existing in the core as applicable to the EOPs?

- A. Subcooled conditions, which present no challenge to the fuel matrix and fuel cladding as long as the hot leg temperatures remain below saturated conditions.
- B. Saturated conditions, which does not present a challenge to the fuel matrix and fuel cladding as long as the cold leg temperatures remain at saturated conditions.
- C. Saturated conditions, which present a potential challenge to the fuel matrix and fuel cladding.
- D. Super heated conditions, which present a imminent challenge to the fuel matrix and fuel cladding.

REF: WB bank
steam tables

- a. incorrect - not saturated conditions
- b. incorrect - is super heated but does challenge the fuel matrix and fuel cladding
- c. incorrect - not saturated conditions
- d. correct - superheated conditions that present a challenge to fuel matrix and cladding

Watts Bar Initial License Reactor Operator Exam

75. 075A4.01 001

Given the following:

- Reactor trip and Safety Injection occurred while the plant was operating at 100% power
- Four ERCW pumps were running in their normal alignment before the SI occurred.

Which ONE of the following identifies ERCW pump status after the SI and the effect it has on the Condenser Circulating Water (CCW) system make-up?

- A. Four ERCW pumps running; CCW make-up is provided only from ERCW since RCW bypass strainer is isolated by the SI signal.
- B. Four ERCW pumps running; CCW make-up is provided only from ERCW since RCW bypass strainer is routed through the overflow structure.
- C. Four ERCW pumps running; CCW make-up is provided from both ERCW and RCW.
- D. Four ERCW pumps running; CCW make-up is not required since the Unit is tripped.

REF: lesson plans 3-OT-SYS027A (LO 2) and 067A (LO 13)

- a. incorrect - RCW has a bypass that ensures continuous make-up to CCW
- b. incorrect - RCW has a bypass that ensures continuous make-up to CCW
- c. correct - 2 pumps per train start on SI and RCW has a bypass that ensures continuous make-up to CCW
- d. incorrect - ERCW provides make-up during SI

Watts Bar Initial License Reactor Operator Exam

76. 076K2.08 001

Which ONE of the following describes the power supply for 1-FCV-67-91, Lower Containment 1C Cooler Supply?

- A. 480 V Reactor MOV Board 1B2-B
- B. 480 V Shutdown Board 1B2-B
- C. 480 V Reactor MOV Board 2B1-B
- D. 480 V Shutdown Board 1B1-B

Ref: WB Lesson Plan 3-OT-SYS067A, no specific learning objective

Dwgs: 1-45W760-67-5

1-45W751-11

1-45W749-4

1-45-W724-2

Distractor Analysis:

A is correct based on attached dwg's.

B and D are incorrect because the 480 V shutdown board does not directly feed any MOV's

C is incorrect because they have unit 2 designators.

Watts Bar Initial License Reactor Operator Exam

77. 078G2.4.11 001

Given the following conditions:

- Plant in Mode 5.
- Total Loss of Control Air has occurred.
- Train "A" RHR in Shutdown Cooling mode.
- The OAC reports that Pressurizer level is 92% and slowly rising.
- CCS is inservice with flow to the RCP thermal barriers.

Which ONE of the following actions should be taken to control Pressurizer level per AOI-10, "Loss of Control Air"?

- A. Locally isolate charging and letdown and place excess letdown in service.
- B. Stop CCPs until PZR level is less than 70% then cycle a CCP on and off to maintain PZR level between 65 and 70%.
- C. Locally Isolate charging until PZR level is less than 70% then adjust then locally operate 1-FCV-62-93 to control charging flow.
- D. Stop CCPs until PZR level is less than 70% then start a CCP to establish seal injection flow.

Ref: WB lesson Plan 3-OT-AOI1000, obj 7
AOI-10

Distractor Analysis:

- A is incorrect, the procedure does not direct isolation of charging, but stopping.
- B is incorrect, no procedural guidance to cycle charging between 65% and 70 %
- C is incorrect, no procedural guidance to locally operate FCV
- D is correct per AOI 10, section 3,4

Watts Bar Initial License Reactor Operator Exam

78. 079K4.01 001

If Station Control and Service Air System air pressure is dropping, the Service Air System automatically isolates from the Control Air System when pressure drops below which ONE of the following?

- A. 80 psig.
- B. 79.5 psig.
- C. 78 psig.
- D. 70 psig.

Ref: WB Exam Bank
WB Lesson Plan 3-OT-SYS032A, obj. 16

Distractor analysis:

A is correct, see lesson plan pp. 33 (attached)

B is incorrect, corresponds to isolation setpoint of Aux Air

C is incorrect, doesn't correspond to any auto event

D is incorrect, corresponds to essential and non-essential air to the Rx Bldg isolation

Watts Bar Initial License Reactor Operator Exam

79. 086G2.4.25 001

Given the following:

- The Unit is at 100% RTP and at steady state conditions.
- A fire is detected in the Auxiliary Building.
- The SM has determined the fire has the potential to affect equipment necessary to achieve/maintain safe shutdown.
- The US has transitioned to AOI-30.2, Fire Safe Shutdown.
- A Spurious Safety Injection occurs.

Which ONE of the following identifies the required procedure transition for the given conditions?

- A. Perform AOI-30.1, Plant Fires, concurrently with AOI-30.2, Fire Safe Shutdown.
- B. Perform AOI-30.2, Fire Safe Shutdown, while referring to ES-1.1 for SI termination actions.
- C. Perform E-O, Reactor Trip or Safety Injection, then AOI-30.2, Fire Safe Shutdown, when SI termination criteria is met.
- D. Perform AOI-30.2, Fire Safe Shutdown, while referring to other instructions as directed by AOI-30.2

Ref. WB lesson plan 3-OT-AOI3000
AOI 30.2

Distractor analysis:

A is incorrect because AOI-30.1 is a non-Appendix R fire procedure and the SM has determined it to be an Appendix R fire.

B is incorrect because AOI 30.2 takes precedence over EOP's.

C is incorrect same as B

D is correct because it is permissible to run AOI-30.2 concurrently with normal plant instructions.

Watts Bar Initial License Reactor Operator Exam

80. 103A2.03 001

Given the following:

- Unit 1 has Safety Injected
- Phase A isolation has occurred
- The crew is performing step 11 of E-0, Rx Trip or Safety Injection when the UO notes that Containment Pressure is 3.2 psig and Phase B has not actuated.
- MSIV's are open

Which ONE of the following describes the action(s) required?

- A. Manually actuate either Phase B handswitch, the MSIV's will close automatically on manual Phase B.
- B. Manually actuate either Phase B handswitch, manually close the MSIV's.
- C. Manually actuate both Phase B handswitches, the MSIV's will close automatically on manual Phase B.
- D. Manually actuate both Phase B handswitches, manually close the MSIV's.

Ref: WB lesson plan 3-OT-SYS088A, obj. 9
WB dwg. 1-47W-611-88-1

Distractor analysis:

A and C are incorrect because Phase B manual actuation required BOTH switches actuated simultaneously.

B is incorrect because spray pumps start as a result of manual actuation (see logic dwg)

D is correct because both switches are actuated and MSIV's only isolate as a result of input from Containment Pressure instruments.

Watts Bar Initial License Reactor Operator Exam

81. G2.1.2 001

Operators may take reasonable action that departs from a license condition or Technical Specifications in the event of a national security emergency and no action consistent with the license condition or TS that can meet the national security objectives is immediately apparent and the action is immediately needed to implement national security objectives....

- A. ✓ as designated by the national command authority through the NRC.
- B. as designated by the national command authority through TVA Management.
- C. as designated by the Technical Support Center during REP activation.
- D. as designated by the Technical Support Center with approval by Senior Executive Management.

Ref: WB procedure OPDP-1, sec. 3.4.3, TS compliance

A is correct

B is incorrect, lacks SRO approval statement

C is incorrect, lacks national command authority requirement

D is incorrect, refers to risk significant equipment

Watts Bar Initial License Reactor Operator Exam

82. G2.1.3 001

A Unit 1 UO is preparing to relieve the on-shift UO for a lunch break during a normal shift.

Which ONE of the following describes their required minimum actions when this occurs?

- A. A review of the Operating Log since last held shift or 3 days, whichever is less, Standing Orders, LCO(s) in actions
- B. A review of the Rounds sheets/Abnormal readings , Standing Orders, any SI/Test in progress/planned
- C. Abnormal or unusual plant conditions existing, any evolutions in progress, actions anticipated
- D. Radiological changes in plant during shift, a walkdown of the MCR control boards, SI/Test in progress/planned

Ref: Surry exam 2002
OPDP-1, pp. 24
Shift Turnover Checklist

A, B, and D are items from the Shift Turnover Checklist which is NOT required for a temporary relief per page 24 of OPDP-1, pp.24 and are therefore incorrect.
C are the items listed on pp. 24 as required for temporary turnover.

Watts Bar Initial License Reactor Operator Exam

83. G2.1.32 001

Flowrates in the Component Cooling Water System is limited to 12000 gpm shell side flow.

Which ONE of the following explains the basis for this precaution?

- A. It limits tube d/p and Heat Exchanger loading.
- B. It limits pump runout and tube vibration.
- C. It limits tube vibration and Heat Exchanger loading.
- D. It limits pump runout and tube erosion.

Ref: WB lesson plan 3-OT-SYS070A, obj. 1
SOI-70.01, section 3, P&L's

Distractor analysis:

C is correct, see P&L

A,B, and D are incorrect due to either erosion or pump runout which are not mentioned but is plausible at high flowrates.

Watts Bar Initial License Reactor Operator Exam

84. G2.2.12 001

Given the following:

- Unit 1 is at 100%
- 1-SI-68-32, Reactor Coolant System Water Inventory Balance is in progress
- 1 hour has elapsed since commencing data collection
- Final readings from the RCSWIB indicate that the total RCS leakage rate is -0.08 gpm

Which ONE of the following describes the correct action to be taken?

- A. Sign the surveillance as satisfactory
- B. ✓ Continue data collection for an additional hour
- C. Void the surveillance and perform at a later time
- D. Investigate to determine the source of inleakage to the RCS

Ref: WB procedure SI-68-32, pp. 16 & 17

A is incorrect because data must be collected for at least an additional hour before the surveillance can be termed complete

B is correct, see SI-68-32, pp. 16 & 17

C is incorrect because it is contrary to procedure guidance

D is incorrect unless the leakage continues to be negative by more than -0.10 gpm after the second data collection

Watts Bar Initial License Reactor Operator Exam

85. G2.2.13 001

Which ONE of the following is NOT a reason to tag a device, component, or piece of equipment per SSP-10.2, Clearance Program?

- A. Design deficiency
- B. DCN
- C. Test activity
- D. Open Work Orders

REF: WB procedure SPP-10.2, pp. 9

Watts Bar Initial License Reactor Operator Exam

86. G2.2.22 001

Which ONE of the following sets of conditions represents a violation of a technical specification safety limit and required action?

Reference Provided

- A. Power = 10%, Pressure = 2400 psig, Tavg = 655°F, be in Mode 3 within 1 hour
- B. Power = 80%, Pressure = 2250 psig, Tavg = 640°F, be in Mode 3 within 1 hour
- C. Power = 10%, Pressure = 2400 psig, Tavg = 655°F, restore to within limits in 2 hours
- D. Power = 80%, Pressure = 2250 psig, Tavg = 640°F, restore to within limits in 2 hours

Ref: TP 2000

WB TS Section 2, Safety limits

Distractor analysis:

A and C are incorrect because they are within limits and no action required

D is incorrect, because even though it is out of limits, it must be restore within 1 hour, 2 hours is the DNB parameter spec.

B is correct because it is both out of limits and has the correct required action per TS

Watts Bar Initial License Reactor Operator Exam

87. G2.3.1 001

Which ONE of the following dose components are included in a Radiation Worker's Occupational Dose?

- A. Total Effective Dose Equivalent and Planned Special Exposures.
- B. Planned Special Exposures and Committed Effective Dose Equivalent.
- C. Deep Dose Equivalent and Planned Special Exposure
- D. Deep Dose Equivalent and Committed Effective Dose Equivalent.

Ref: Surry exam 2002

WB Rad con procedure SPP-5.1, section 5, pp. 32

WB lesson plan 3-OT-RAD0003, pp.10

Watts Bar Initial License Reactor Operator Exam

88. G2.3.4 001

Given the following plant conditions:

- A LOCA has occurred and a SAE has been declared.
- The TSC and OSC have been activated.
- To prevent core damage it is recommended that entry be made into Safety Injection Pump Room 1A.
- Projected dose rate in the pump room is 1.16×10^5 mr/hr.
- Duration of the exposure is expected to be 3 minutes.

Which ONE of the following must authorize this exposure?

- A. Site Vice President
- B. Plant Manager
- C. Site Emergency Director
- D. Radcon Manager

REFERENCES: EPIP-15 p.3, SPP-5.1 p.10
WBN Exam Bank

- d. incorrect - per EPIP-15 of the Radiological Emergency plan the Site Emergency Director must authorize emergency dose limits in excess of TVA admin limits and 10 CFR 20. Examinee may select since the Radcon Manager is responsible for completing the paperwork and he must authorize exceeding the limit during non-emergency conditions.
- c. correct - With a projected dose of 1.16×10^5 mr/hr, the total dose to respond to this emergency condition is 5.8 Rem. (1.16×10^5 mR/hr / 60 minutes x 3 minutes). Per EPIP-15 of the Radiological Emergency plan the Site Emergency Director must authorize emergency dose limits in excess of TVA admin limits and 10 CFR 20.
- b. incorrect - per EPIP-15 of the Radiological Emergency plan the Site Emergency Director must authorize emergency dose limits in excess of TVA admin limits and 10 CFR 20. Examinee may select since Plant Manager must authorize exceeding 5 R during non-emergency conditions.
- a. incorrect - per EPIP-15 of the Radiological Emergency plan the Site Emergency Director must authorize emergency dose limits in excess of TVA admin limits and 10 CFR 20. Examinee may select since Plant Manager must authorize exceeding 5 R during non-emergency conditions.

Watts Bar Initial License Reactor Operator Exam

89. G2.3.9 001

Given the following:

- Unit 1 is in Mode 3 following a refueling outage
- Both Containment Purge Systems are in operation
- The Shift Manager has directed that the Containment Purge System be secured in accordance with SOI-30.02, CONTAINMENT PURGE SYSTEM.

Which ONE of the following should be considered prior to securing Containment Purge?

Reference Provided

- A. Outside air temperature
- B. Outside atmospheric pressure
- C.✓ Radiological implications
- D. Containment Purge HEPA and Charcoal filter DP

Ref: WB lesson plan 3-OT-SYS30C, obj. 12
WB procedure SOI-30.02

Distractor analysis:

A and D are incorrect because they only apply while the system is in service

B is incorrect, because it only applies when placing the system in service

C is correct because changes in ventilation, particularly reduction in ventilation can have adverse effects on radiation levels. This is also a precaution in the procedure related to securing CTMT purge. (see below)

CAUTION Radiological implications (e.g.: causing an area to become airborne or raising the humidity in contaminated areas) should be considered any time Containment Purge is secured.

Watts Bar Initial License Reactor Operator Exam

90. G2.4.1 001

Given the following:

- The Unit is at 100% power.
- A total Loss of Shutdown Power occurs

Which ONE of the following describes the correct procedure and immediate operator action.

- A. E-0, Rx Trip or Safety Injection, ensure Rx is tripped by Rod all bottom lights lit
- B. ECA-0.0, Loss of Shutdown Power, ensure Rx tripped by neutron flux dropping
- C. FR-S.1, Nuclear Power Generation/ATWS, ensure Rx is tripped by neutron flux dropping
- D. ECA-0.0, Loss of Shutdown Power, ensure Rx tripped by rod bottom lights lit

Ref: WB lesson plan 3-OT-PAI1204, obj 1
PAI-1204, E-0, ECA-0.0

Distractor analysis:

- A is incorrect because rod bottom lits will not have power
- B is correct because emergency procedures can be entered directly from a Loss of Shutdown power and NI's will still be powered from battery via inverter.
- C is incorrect because FR-S.1 is not an allowable procedure to enter EOP's
- D is incorrect because rod bottom lits will not have power

Watts Bar Initial License Reactor Operator Exam

91. G2.4.11 001

Given the following:

- Unit 1 is at 100% power with known leakage in SG 2 of 0.05 gpm
- The Chem Lab reports that today's leakage is 0.06, up from yesterday's reading of 0.05 gpm

Which ONE of the following should be performed?

Reference provided

- A. Be in Mode 3 within 24 hours
- B. Reduce load to hot standby in accordance with AOI-39, then cooldown and depressurize the RCS.
- C. Trip the reactor; enter E-0, then transition to E-3.
- D. Convene PORC to evaluate continued operation.

WB lesson plan 3-OT-AOI300, obj. 8
Procedure AOI-33, appendix B and C

Distractor analysis:

A is correct per table in App. B

B is incorrect because it the action for greater than 600 per day thru all or 150 per day thru one

C is incorrect because 0.6 is well within charging capability which is the decision point for E-0

D is incorrect because it is the action for leaks less than 0.05 per day

Watts Bar Initial License Reactor Operator Exam

92. G2.4.16 001

While in the Emergency Response procedures the team is directed to "Go To" another procedure, which ONE of the following is the correct implementation of this action?

- A. The "GO TO" implies the procedure in use is no longer applicable, and any tasks in progress need not be completed.
- B. Tasks still in progress must be completed prior to the transition directed by the "GO TO" step.
- C. The "GO TO" implies the procedure in use is no longer applicable, but any tasks in progress should be completed.
- D. Tasks still in progress need not be completed prior to the transition directed by the "GO TO" step, unless preceded by a double asterisk.

REF: WB lesson plan 3-OT-PAI-1204, obj. 13 & 19
WB procedure PAI-1204
Bank: From Surry 2002

Distractor analysis:

Answer C is correct, see below paragraph from PAI-1204

Answer A and B are incorrect due to timing or required completion

Answer D is incorrect because double astericks relates to high and low level steps vice transitions.

From PAI-1204:

Transition to another step or instruction may be completed before completion of the task in progress, provided that completion of the task is verified at a later time.

Transitions which are not high level action steps are identified with a double asterisk preceding the words GO TO and are in bold face type.

Watts Bar Initial License Reactor Operator Exam

93. G2.4.8 001

Given the following condition:

- The crew has entered ECA-0.0 due to a loss of both SD Bds.
- The Load Dispatcher has recovered one 161KV line from Watts Bar Hydro.
- The crew has implemented AOI-35.

Which ONE of the following actions should the crew take?

- A. Immediately transition to ECA-0.1, Recovery from Loss of Shutdown Power without SI required.
- B. Immediately transition to ECA-0.2, Recovery from Loss of Shutdown Power with SI required.
- C. Manually actuate SI and return to E-0, Rx Trip or Safety Injection.
- D. Continue with ECA-0.0, Loss of Shutdown Power while concurrently performing AOI-35, Loss of Offsite Power.

Ref: WB procedure ECA-0.0 and AOI-35
WB bank question

Watts Bar Initial License Reactor Operator Exam

94. WE02EA1.2 001

Given the following conditions:

- Plant is recovering from a reactor trip and safety injection due to a faulted SG.
- Faulted SG has completely blown down and as been isolated in accordance with the appropriate EOP.
- RCS pressure is 1900 psig and rising.

When terminating safety injection which ONE of the following identifies actions that result in a drop in the ECCS flow to the RCS?

- 1) Stopping the 1st charging pump.
- 2) Stopping both safety injection pumps.
- 3) Establishing normal charging and isolating BIT.
- 4) Stopping RHR pumps.

A. 1 and 3.

B. 3 and 4.

C. 1 and 2.

D. 2 and 4.

Reference: SYS063A
EOP0000.18

- a. Correct - both these actions would result in reducing flow to the core since at this pressure only CCPs would inject.
- b. Incorrect - 3 would reduce flow, however RHR pumps are not injecting at this pressure.
- c. Incorrect - 1 would reduce flow, however the SI pumps are not injecting at this pressure.
- d. Incorrect - neither would reduce flow at this pressure.

Watts Bar Initial License Reactor Operator Exam

95. WE03EK2.2 001

Given the following plant conditions:

- A small break LOCA has occurred.
- RCPs have been tripped.
- Appropriate actions in accordance with E-0 and E-1 have been completed.
- RCS pressure is stable at 1475 psig.
- ECCS is operating in cold leg injection mode.

Which ONE of the following statements describes the primary method of decay heat removal at this time?

- A. ✓ Heat transfer between the RCS and the S/Gs due to natural circulation flow.
- B. Heat transfer between the RCS and CCS via the RHR Heat Exchangers.
- C. Heat transfer from the injection of water from the RWST and the removal of steam/water out of the break.
- D. Heat transfer from Reflux boiling in the S/Gs.

REF: WB lesson plan 3-OT-EOP0100
WB lesson plan 3-OT-SYS063A
WB exam bank

Distractor Analysis:

- A is correct because due to the thermodynamic ΔT between the primary and secondary and resultant heat transfer rate will exceed the heat transfer into the injection flow water.
- B is incorrect because CCS flow is isolated from the RHR Hx's at this point in the accident.
- C is incorrect same as A
- D is incorrect because at this point in the accident the S/G U-tubes are still filled with water.

Watts Bar Initial License Reactor Operator Exam

96. WE05EA1.3 001

Given the following plant conditions:

- Unit is operating at 100% power at EOL.
- Total loss of feedwater occurs and operators implement FR-H.1, "Loss of Secondary Heat Sink".
- No means of feedwater addition is available and the operators have initiated bleed and feed.
- Manual Safety Injection was initiated and when the operator attempted to open the pressurizer PORVs, PCV-68-340 failed to open.

Which ONE of the following describes the correct operator mitigation strategy to respond to this problem?

- A. Stop one Centrifugal Charging Pump to reduce loss of inventory through PORVs.
- B. Close any open Pzr PORV to conserve RCS inventory and return to the steps to re-establish Main Feedwater.
- C. Open the reactor head vents to reduce RCS pressure since one pressurizer PORV may not provide sufficient heat removal capacity.
- D. Verify PORV, 1-PCV-68-334, and it's block valve open to reduce RCS pressure since 1 Pzr PORV provides adequate heat removal capacity for a loss of heat sink.

Ref: WB lesson plan 3-OT-FRH0001, obj. 9 & 10

Distractor analysis:

- a. Incorrect - one PORV is not sufficient to provide adequate heat removal.
- b. Correct - increases the bleed path capability and reduce pressure to ensure the core remains cooled.
- c. Incorrect - procedure directs bleed and feed not depressurizing a SG which would be a less effective cooling method.
- d. Incorrect - more bleed path capacity is needed to ensure pressure reduction and cooling capability, not less injection.

Watts Bar Initial License Reactor Operator Exam

97. WE08G2.4.18 001

Step 1 of FR-P.1, "Pressurized Thermal Shock", has the operator check that RCS pressure is greater than 150 psig.

This step is based on which ONE of the following?

- A. Preventing implementation of actions in FR-P.1 if a large break LOCA has occurred.
- B. Ensuring adequate low head safety injection cooling prior to isolating CLAs.
- C. Preventing core exit temperatures from exceeding the required temperature to place RHR inservice.
- D. Ensuring RHR system is in service to provide adequate mixing in the cold leg downcomer region.

Ref: WB Lesson Plan 3-OT-FRP0001, obj. 9
WB exam bank

Watts Bar Initial License Reactor Operator Exam

98. WE10EA2.2 001

Given the following plant conditions:

- Reactor trip occurred with subsequent loss of RCPs.
- Operators have implemented ES-0.2, "Natural Circulation Cooldown".
- A cooldown rate of 25°F/hour has been established.
- RCS depressurization has been initiated while maintaining subcooling > 165°F.
- Operators are monitoring PZR level and RVLIS for void formation.
- The OAC observes that loss of inventory in the Condensate Storage Tank is imminent.

Which ONE of the following describes the appropriate procedural actions?

- A. Stop the cooldown and remain in ES-0.2.
- B. Raise the cooldown rate and remain in ES-0.2.
- C. Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and lower the cooldown rate.
- D. ✓ Transition to ES-0.3, "Natural Circulation Cooldown With Steam Voids in Vessel (With RVLIS) and raise the cooldown rate.

REF: ES-0.2; ES-0.3; Modified INPO exam bank question

- a. Incorrect - loss of CST inventory should cue the examinee that transition to ES-0.3 is appropriate. Examinee may believe stopping cooldown is appropriate to conserve inventory.
- b. Incorrect - loss of CST inventory should cue the examinee that transition to ES-0.3 is appropriate. Examinee may believe raising cooldown rate would be appropriate in order to reach RHR conditions sooner however ES-0.2 does not provide instruction to do this.
- c. Incorrect - loss of CST inventory is an appropriate condition to require transition to ES-0.3 since more rapid cooldown rate is allowed while addressing voids in the RCS. Examinee may believe it is necessary to lower cooldown rate to conserve inventory.
- d. Correct - loss of CST inventory is an appropriate condition to require transition to ES-0.3 since more rapid cooldown rate is allowed while addressing voids in the RCS.

Watts Bar Initial License Reactor Operator Exam

99. WE11EA1.3 001

Given the following plant conditions:

- Reactor trip and SI occurred on Unit 1 due to a small break LOCA.
- Crew has transitioned from ES-1.3, "Transfer to RHR Containment Sump", to ECA-1.1, "Loss of RHR Sump Recirculation", due to the failure of both RHR sump suction valves to open.
- Crew has reduced ECCS flow to 1 CCP, closed BIT outlet valves and established charging flow
- Crew is performing Step 23 of ECA-1.1 to check makeup flow adequate and observes the following indications:
 - Loop 2 RCP running
 - RVLIS = 60% and slowly dropping

Which ONE of the following lists the correct operator action for this condition?

- A. Ensure additional makeup source to RWST has been aligned.
- B. ☒ Control charging to raise makeup flow.
- C. Place RHR shutdown cooling in service.
- D. Slowly depressurize RCS to inject CLAs.

Ref: WB lesson plan 3-OT-ECA0101, obj. 1
WB procedure ECA-1.1

Distractor analysis:

- A is incorrect because this is a continuing action from earlier in the procedure, not a hold point.
- B is correct per step 23 RNO because RVLIS < 63% w/ RCP running.
- C is incorrect because stem does not indicate that pressure-temp conditions would allow.
- D is incorrect because the depressurization step is later in the procedure assuming adequate subcooling and PZR level which are not indicated in the stem.

In original bank question the following was a distractor:

"Place at least one train of ECCS pumps inservice until RVLIS > 65%.". It has been replaced because step 23 RNO also has "OR restart ECCS pumps as necessary".

Watts Bar Initial License Reactor Operator Exam

100. WE13EK3.2 001

During the performance of FR-H.2, "Steam Generator Overpressure", operators are directed to verify T-hot less than 545 °F if initial attempts to depressurize the SG(s) is unsuccessful.

Which ONE of the following is bases for this verification?

- A. Ensures that the SG level instruments (WR) will be within the required accuracy during the depressurization.
- B. Determines whether SG blowdown can be used as a method to depressurize the affected SG(s).
- C. Ensures RCS saturation pressure is below shutoff head of SIPs in the event SGs become a heat SOURCE instead of a heat SINK.
- D. Ensures excessive heat transfer from the RCS is NOT the cause for the SG overpressure.

Ref: WB Lesson Plan 3-OT-FRH0001 obj 13
WB Lesson Plan 3-OT-FRH0001 pp 44 of 56
WB exam bank

Distractor analysis:

Answer D is correct based on lesson plan page 44