

May 14, 1999

Tennessee Valley Authority  
ATTN: Mr. J. A. Scalice  
Chief Nuclear Officer and  
Executive Vice President  
6A Lookout Place  
1101 Market Street  
Chattanooga, TN 37402-2801

SUBJECT: NRC EXAMINATION REPORT NO. 50-390/99-301

Dear Mr. Scalice:

On April 12 - 16, 1999, the Nuclear Regulatory Commission (NRC) administered examinations to employees of your company who had applied for licenses to operate the Watts Bar Nuclear Plant. At the conclusion of the examination, the examiners discussed the examination questions and preliminary findings with those members of your staff identified in the enclosed report.

A Simulation Facility Report is included in this report as Enclosure 2. Enclosure 3 is the Facility Post-Examination Comments. Enclosure 4 is the NRC Resolution of post-examination comments. A copy of the written examination questions and answer key, as noted in Enclosure 5, was provided to the members of your training staff at the conclusion of the examination.

All twelve of the senior reactor operators (SRO) and reactor operator (RO) applicants passed the operating test but one SRO applicant failed the written examination. We recommend that your staff review the individual examination reports to determine if adjustments to the training program, as well as individual remediation, are needed.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room (PDR).

Should you have any questions concerning this letter, please contact me at (404) 562-4638.

Sincerely,

(Original signed by H. O. Christensen)

Harold O. Christensen, Chief  
Operator Licensing and  
Human Performance Branch  
Division of Reactor Safety

Docket No. 50-390  
License No. NPF-90

Enclosures: (See page 2)

DISTRIBUTION CODE  
IE42

- Enclosures: 1. Report Details  
2. Simulation Facility Report  
3. Facility Recommendations  
4. NRC Resolution of Recommendations  
5. Written Examinations and Answer Keys (SRO / RO)  
(Document Control Desk Only)

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TVA

3

cc w/encls cont'd:  
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Training Manager  
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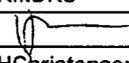
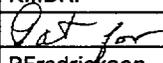
Distribution w/encls:

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- V. McCree, RII
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- R. E. Martin, NRR
- C. O. Thomas, NRR
- P. A. Taylor, RII
- C. F. Smith, RII
- D. W. Jones, RII
- D. H. Thompson, RII
- L. S. Mellen, RII
- PUBLIC

NRC Resident Inspector  
 U.S. Nuclear Regulatory Commission  
 1260 Nuclear Plant Road  
 Spring City, TN 37381

**\*For previous concurrence see attached page**

OFFICE	RII:DRS*	RII:DRS*	RII:DRP*	RII:DRS	RII:DRP		
SIGNATURE							
NAME	MErnstes	PSteiner	ELea	HChristensen	PFredrickson		
DATE	5/ 199	5/ 199	5/ 199	5/14/199	5/13/199	5/ 199	5/ 199
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OFFICE	RII:DRS	RII:DRS	RII:DRP	RII:DRP				
SIGNATURE	<i>ME</i>	<i>ME for</i>	<i>ME for</i>					
NAME	MErnstes	PSteiner	ELea	PFredrickson				
DATE	5/11/99	5/11/99	5/11/99	5/ /99	5/ /99	5/ /99	5/ /99	5/ /99
COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-390

License No.: NPF-90

Report No.: 50-390/99-301

Licensee: Tennessee Valley Authority

Facility: Watts Bar Nuclear Plant

Location: 1260 Nuclear Plant Road  
Spring City TN 37381

Dates: April 12 - 16, 1999

Examiners: Michael E. Ernstes, Chief License Examiner  
Edwin Lea, License Examiner  
Paul M. Steiner, License Examiner

Approved by: Harold O. Christensen, Chief  
Operator Licensing and Human  
Performance Branch  
Division of Reactor Safety

Enclosure 1

## EXECUTIVE SUMMARY

### Watts Bar Nuclear Plant NRC Examination Report Nos. 50-390/99-301

During the period April 12 - 16, 1999, NRC examiners conducted an announced operator licensing initial examination in accordance with the guidance of Examiner Standards, NUREG-1021, Interim Revision 8. This examination implemented the operator licensing requirements of 10 CFR §55.41, §55.43, and §55.45.

Seven senior reactor operator applicants and five reactor operator applicants received written examinations and operating tests. The NRC administered the operating tests during the week of April 12, 1999. Your staff administered the written examination on April 9, 1999.

#### Operations

- The as-submitted written examination and operating tests met the requirements of NUREG-1021. (Section O5.1)
- Eleven of twelve applicants passed the examination. One SRO applicant failed the written examination. (Section O5.1)
- A generic weakness was identified in the ability of applicants to locally reset Emergency Diesel Generator trips, and in their knowledge of Auxiliary Feedwater system operation. (Section O5.1)

#### • Applicant Pass/Fail

	SRO	RO	Total	Percent
Pass	7	5	12	92%
Fail	1	0	1	8%

## Report Details

### Summary of Plant Status

During the period of the examinations Unit 1 was shutdown for refueling.

### I. Operations

#### **O5 Operator Training and Qualifications**

##### **O5.1 Initial Licensing Examinations**

###### **a. Scope**

NRC examiners conducted regular, announced operator licensing initial examinations during the week of April 12, 1999. The examiners administered examinations developed by members of the Watts Bar training staff under the requirements of an NRC security agreement, in accordance with the guidelines of the Examiner Standards, NUREG-1021, Interim Revision 8. This examination represented your first effort at developing written examinations and operating tests for the NRC's operator licensing process. Seven Senior Reactor Operators (SRO) and five Reactor Operators (RO) license applicants received written examinations and operating tests.

###### **b. Observations and Findings**

###### **(1) Written Examination**

Your staff submitted 127 multiple choice written questions for NRC review. The RO and SRO written examinations shared 73 questions with 27 additional questions for each test that were license level specific. From these 127 questions; 8 had distractors which the examiners judged were not plausible and could be easily eliminated; 8 questions were judged to be of little discriminatory value. Your staff made the changes necessary for all questions to meet the guidelines of NUREG-1021.

The number and type of corrections needed for the examination were typical for a facility's initial effort at examination development. Your exam authors were in frequent contact with the NRC chief examiner for guidance on the examination development process.

One SRO applicant failed the written examination, the eleven other applicants passed.

Your staff submitted four post-examination comments on the written examination. Three of these were due to identifying the incorrect answer in the answer key. One other question was deleted from the SRO examination. The stem for this question did not contain sufficient information on plant conditions, resulting in all distractors being correct.

The examiners conducted a post-examination grading item analysis of the written examinations. A generic knowledge weakness was identified concerning

knowledge of the Auxiliary Feedwater (AFW) System. SRO question 56 (RO question 53) was missed by 75 percent of the applicants. SRO question 58 (RO question 55) was missed by 58 percent of the applicants. Both questions tested the knowledge of AFW system operation.

(2) Simulator Scenarios

Your staff submitted three simulator scenarios for NRC review. The simulator tests followed the guidelines of NUREG-1021. The malfunctions were logically sequenced to lead to the major plant transient and served as a valid measurement tool of applicant abilities. The examiners made minor changes to enhance the test items of each scenario.

(3) Walkthrough Examination

The walkthrough examination sets submitted by your staff contained job performance measures (JPMs) that met the guidelines of the NUREG-1021 and were of the appropriate level of difficulty. Minor JPM content additions were made to improve their usability by the examiners. Some of the JPM follow-up questions tested at the memory level but inappropriately permitted use of references. These questions were modified to either restrict the use of references or were enhanced to test at the analysis level.

The questions your staff submitted for Category A, "Administrative Topics", of the walkthrough examination did not test at a level which could discriminate adequate knowledge for the licensed position being sought. Additionally, there were only slight differences between the topics submitted for the RO and SRO examinations. Your staff in conjunction with the examiners developed additional questions to test at the appropriate level.

A generic weakness was identified during the walkthrough examination. Seven applicants were asked to demonstrate how to locally reset the EDG overspeed and high crankcase pressure trips. Each of the seven applicants were unable to correctly identify how to reset one or both of the trips.

c. Conclusions

In general, the examiners concluded that the quality and level of difficulty of the licensee's draft examination submittal was adequate. There were four post-examination comments on the written examination due to technical inaccuracies. Eleven of twelve applicants passed the examination. One SRO applicant failed the written examination. Detailed applicant performance comments were transmitted under separate cover for management review and to allow appropriate applicant remediation. A generic weakness was identified in the ability of applicants to locally reset Emergency Diesel Generator trips, and in knowledge of AFW system operation.

**V. Management Meetings****X1 Exit Meeting Summary**

An exit interview was conducted on April 16, 1999, to reiterate the purpose of the site visit and to discuss the findings. The licensee had no comments and the examiner received no dissenting comments. No proprietary information was received.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

- \*W. Lagengren, Watts Bar Nuclear Plant Manager
- \*K. Lovell, Simulator Services Manager
- \*R. Purcell, Site Vice President
- \*J. Roden, Operations Training Manager
- \*S. Spencer, Quality Assurance
- \*R. Stockton, Licensing Engineer
- \*T. Wallace, Operations Superintendent

NRC

- K. Van Doorn, Senior Resident Inspector
- \*D. Rich, Resident Inspector

\*Attended Exit Interview

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

Discussed

None

## SIMULATION FACILITY REPORT

Facility Licensee: Watts Bar Nuclear Plant

Facility Docket No.: 50-390

Operating Tests Administered on: April 12 - 16, 1999

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating tests, the following items were observed (if none, so state):

ITEM

DESCRIPTION

None

Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

Richard T. Purcell  
Site Vice President, Watts Bar Nuclear Plant

APR 22 1999

Mr. Michael E. Ernstes  
Operator Licensing and  
Human Performance Branch, NRC Region II  
Atlanta Federal Center  
61 Forsyth St., Suite 23T85  
Atlanta, Georgia 30303

In the Matter of the )  
Tennessee Valley Authority )

Docket No. 50-390

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - REACTOR AND SENIOR  
REACTOR OPERATOR INITIAL EXAMINATIONS - 50-390/99-301

Beginning on April 9, 1999, license examinations were administered to a group of reactor operator (RO) and senior reactor operator (SRO) candidates at WBN. Provided in the enclosure to this letter are post-examination comments related to four questions on the written examinations. These comments are provided in accordance with Examination Standard (ES) 501, "Initial Post-Examination Activities," of NUREG 1021, "Operator Licensing Examination Standards for Power Reactors."

Should you require additional information regarding this matter, please contact John Roden at (423) 365-8980.

Sincerely,

  
for R. T. Purcell

Enclosure  
cc: Page 2

ENCLOSURE 3

U.S. Nuclear Regulatory Commission

Page 2

APR 22 1999

Enclosure

cc (Enclosure):

NRC Resident Inspector  
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Rockville, Maryland 20852

Mr. Harold O. Christensen  
Chief, Operator Licensing and  
Human Performance Branch, NRC Region II  
Atlanta Federal Center  
61 Forsyth St., Suite 23T85  
Atlanta, Georgia 30303

Mr. Luis A. Reyes  
Regional Administrator, NRC Region II  
Atlanta Federal Center  
61 Forsyth St., Suite 23T85  
Atlanta, Georgia 30303

- Enclosure

**Comments Related to Examination Questions**

NRC WRITTEN EXAMINATION  
WBN April 9, 1999 Exam

Quest No.	Comment/Reference	Resolution
RO - 37 SRO - 44	<p>The answer key has the wrong answer identified as correct. The answer key indicates 'A' as the correct answer. The only correct answer is 'C'.</p> <p>The CRDM M/G sets A and B are powered from the Unit 1 480V Unit Boards 1A and 1B respectively. The power supply to the 1A 480V Unit Board is 6.9KV Unit Board 1A and 1B 480V Unit Board is from 6.9kV Unit Board 1D. Therefore, the tripping of 6.9kV Unit Board 1B would leave both 480V Unit Boards energized and both CRD MG sets running.</p> <p>References: 15E500-1, 1-47W747-2</p>	<p>Proposal: accept only 'C' as the correct answer.</p>
RO - 75 SRO - 75	<p>The answer key has the wrong answer identified as correct. The answer key indicates 'C' as the correct answer. The only correct answer is 'B'.</p> <p>While the battery is only rated for 30 minutes, the DG will continue to run even after the battery is depleted. There are no associated devices that will prevent the Diesel from running if it is already running and connected when the battery is depleted. Correct answer verified using prints and discussion with system engineer.</p> <p>References: 3- OT-SYS082A, Prints 47W760-82 series (DG schematics)</p>	<p>Proposal: accept only 'B' as the correct answer.</p>

NRC WRITTEN EXAMINATION  
WBN April 9, 1999 Exam

Quest No.	Comment/Reference	Resolution
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SRO ONLY

SRO - 33	<p>The answer key has the wrong answer identified as correct. The answer key indicates 'A' as the correct answer. The only correct answer is 'D'.</p> <p>'A' is not correct because the 2 inverters identified would remove both power supplies from the SSPS Train A logic cabinet which would prevent the P10 signal from 2 power range instruments from grounding the source range indications. Placing the Input Inhibit switch to inhibit will cause a backup P10 signal to be generated which blocks (grounds) the source range output.</p> <p>References: 1082H70 Sheet 28, 1082H70 Sheet 3, 1-45W600-57-17, 1-47W600-57-14, 1-45W600-92-1</p>	<p>Proposal: accept 'D' as the only correct answer.</p>
SRO - 36	<p>The question needed additional information in the stem. As written, all 4 answers would be correct. The simulator steam line radiation monitor indicates an increase due to N16 during large SG tube rupture events prior to the reactor trip and the Radiation Monitoring lesson plan referenced supports this indication. The question did not specify when the monitors were checked but prior to the trip all choices would be correct.</p> <p>Reference: 3-OT-SYS090A</p>	<p>Proposal: delete this question from the examination.</p>

## NRC RESOLUTION OF FACILITY RECOMMENDATIONS

RO 37 / SRO-44: Recommendation accepted. The given conditions in the question were intended to show that power was lost upstream of 480V Unit board 1B resulting in a loss of power to the 1B M/G set. However, the incorrect Unit board was identified in the initial conditions, therefore the 1B M/G set would remain energized. Change the answer key from A to C.

RO-75 / SRO-75: Recommendation accepted. The question was intended to test the effects of a loss of battery power on the EDG. Although, the battery will last only 30 minutes by design, the EDG would continue to run once started. Change the answer key from C to B.

SRO-33: Recommendation accepted. The conditions given in distractor A would also de-energize the SSPS Train A logic cabinet and prevent the P-10 signal from being generated. The conditions in distractor D cause a backup P-10 signal to be generated which de-energize the Source Range Monitors. Change the answer key from A to D.

SRO-36: Recommendation accepted. The question was intended to test available indications of a steam generator tube rupture following a reactor trip. The conditions given in the question stem did not indicate that the reactor had been tripped. All four distractors are correct. Delete the question from the exam.

WATTS Bar

99-301

Date: Wednesday, March 31, 1999

**WATTS BAR RO EXAMINATION**

**EXAM INTEGRITY REQUIRED**

**RO EXAMINATION  
WATTS BAR NUCLEAR PLANT  
APRIL 9, 1999**

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

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

**Applicant Information**

Name:	Region: I / II / III / IV
Date:	Facility/Unit: Watts Bar Unit 1
License Level: RO / SRO	Reactor Type: W / CE / BW / GE
Start Time:	Finish Time:

**Instructions**

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected four hours after the examination starts.

**Applicant Certification**

All work done on this examination is my own. I have neither given nor received aid.

\_\_\_\_\_

Applicant's Signature

**Results**

Examination Value	100 Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

1. When preparing to realign a misaligned control rod, which ONE of the following is performed prior to realigning the rod?
  - a. Disconnect lift coil for the misaligned RCCA only.
  - b. Disconnect all lift coils in the affected bank, except for misaligned RCCA.
  - c. Disconnect movable gripper coil for the misaligned RCCA only.
  - d. Disconnect all movable gripper coils in the affected bank, except for misaligned RCCA.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

2. Given the following plant conditions:

- The plant is operating at 75% RTP.
- "RCP SEAL LEAKOFF FLOW HI" annunciator ON.
- "RCP #1 SEAL OUTLET TEMP HI" annunciator ON.
- The RO referred to the appropriate ARIs, then determined that #1 seal leak off flow was off scale high and #1 seal outlet temperature was increasing.

Which ONE of the following actions is correct?

- a. Close the #1 seal return valve, reduce power to less than 48%, then stop affected RCP.
- b. Close the #1 seal return valve, trip the reactor , then stop the affected RCP.
- c. Reduce power to less than 48%, stop the affected RCP, then close the #1 seal return valve after RCP coastdown.
- d. Trip the reactor, stop the affected RCP, then close the #1 seal return valve after RCP coastdown.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

3. Given the following conditions:

- Unit was operating at 100% full power when a total loss of offsite power occurred.
- Operators implemented E-O "Reactor Trip Or Safety Injection" and have transitioned to ES-0.1 "Reactor Trip Response".
- MSIVs were closed due to operator action.
- Hottest incore thermocouple is 595 °F and stable.
- Reactor coolant system pressure is 2235 psig and stable.
- Steam Generator pressures are as follows:  
SG #1 1070 psig; SG #2 1080 psig; SG #3 980 psig; SG #4 965 psig
- RCS cold leg temperatures are as follows:  
Loop #1 555 °F; Loop #2 556 °F, Loop #3 534 °F, Loop #4 542 °F

Which ONE of the following describes the present status of natural circulation flow?

- a. Exists in all loops.
- b. Exists in only loops 1 and 2.
- c. Exists in only loops 1, 2, and 3.
- d. Exists in only loops 1, 2, and 4.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

4. Given the following plant conditions:

- Plant trip occurred during startup.
- The crew is performing ES-0.1, "Reactor Trip Response".
- Two control rods failed to fully insert into the core.
- The OAC has been directed to borate 6500 gallons.

Which ONE of the following describes the correct method to accomplish the boration using the preferred flowpath?

- a. Set the boric acid flow controller at 10% for 650 minutes.
- b. Set the boric acid flow controller at 50% for 325 minutes.
- c. Align the CCP suction to the RWST and establish charging flow at 65 gpm for 100 minutes.
- d. Align the CCP suction to the RWST and establish charging flow at 100 gpm for 65 minutes.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

5. Given the following conditions:

- Plant operating at 100% RTP
- All systems in a normal alignment.
- C-S CCS pump trips due to a problem with it's supply breaker.

Which ONE of the following will meet the Tech Spec LCO requirements due to the CCS pump trip?

- a. Restore the C-S CCS pump to OPERABLE status within 7 days.
- b. Aligning the 1B-B CCS pump to supply Unit 1 Train B CCS within 72 hours.
- c. Place the 2B-B CCS pump in service to restore flows and pressure to normal.
- d. Align C-S pump to its alternate power supply through the manual transfer switch within 72 hours.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

6. Given the following plant conditions:

- Plant is operating at 100% power.
- Tavg at 588.2°F and RCS pressure at 2235 psig.
- Rod control is in MANUAL.
- Average core exit thermocouples indicates 620°F.

Which ONE of the following would INCREASE RCS subcooling?

- a. Loop 2 Pzr spray valve fails partially open.
- b. EHC circuit failure causes #4 governor valve to fail closed.
- c. Pzr pressure control failure causes all backup heaters to energize.
- d. VCT makeup control failure causes inadvertent dilution of the RCS.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

7. During the performance of ECA-2.1, "Uncontrolled Depressurization of All SGs", the crew is directed to MAINTAIN at least minimum detectable flow to each SG with NR level below 10%.

Which ONE of the following best describes the purpose for maintaining feed flow under those circumstances?

- a. Prevents thermal shock to the steam generator main feedwater nozzles.
- b. Ensures that dryout conditions and subsequent thermal stresses do not develop during SG blowdown.
- c. Ensures criteria for transition to FR-H.1, Loss of Secondary Heat Sink, not met during performance of ECA-2.1.
- d. Prevents stagnant loop formation so a PTS challenge does not occur due to the combined effects of RCS cooldown and ECCS injection.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

8. FR-P.1, "Pressurized Thermal Shock", directs the operator to perform a "soak" if certain cooldown criteria is exceeded.

Which ONE of the following describes which parameter the operator uses to determine if the cooldown criteria is exceeded and what component the soak is protecting?

- a.  $T_{avg}$ ; reactor vessel.
- b.  $T_{cold}$ ; reactor vessel.
- c.  $T_{avg}$ ; steam generator tube sheet.
- d.  $T_{cold}$ ; steam generator tube sheet.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

9. Given the following plant conditions:

- Plant was at 10% during a plant startup when a loss of condenser vacuum caused a turbine trip to occur.
- Steam Dump mode selector switch in STEAM PRESSURE mode.
- Condenser backpressure increased to 12 inches Hga.
- No component or instrumentation failures occurred.
- No operator action was taken.

Which ONE of the following describes the response of the Steam Dumps and SG PORVs during this event?

	<u>Steam Dumps</u>	<u>SG PORVs</u>
a.	Open	Open
b.	Open	Shut
c.	Shut	Open
d.	Shut	Shut

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

10. Which ONE of the following is a purpose of depressurizing all intact SGs to 300 psig during the performance of ECA-0.0, "Loss of Shutdown Power"?
- a. Reduces  $\Delta P$  across SG U-tubes to minimize possibility of tube rupture.
  - b. Reduces  $\Delta P$  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.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

11. Given the following plant conditions:

- Plant was operating at 100% power when station a blackout occurred.
- Emergency Diesel Generators failed to restore power to the Shutdown Boards.
- Operating Crew has implemented ECA-0.0, "Loss of Shutdown Power"

Which ONE of the following correctly describes an action directed by ECA-0.0 to prevent automatic loading of equipment that starts on a Safety Injection?

- a. Place Safety Injection Equipment handswitches to STOP then back to A-AUTO.
- b. Place all 43TL switches to TEST then back to NORMAL.
- c. Manually reset the BOX and BOY relays.
- d. Actuate, then reset Safety Injection.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

12. Given the following conditions:

- Plant is in Mode 3
- During performance of Control Building routine rounds the AUO discovers the 125V DC supply breaker to 120V AC Vital Inverter 1-II in the TRIPPED position.

Which ONE of the following describes the correct action which must be taken with regard to Tech Specs?

- a. Attempt to close the supply breaker one time, if the breaker can be closed, Tech Spec LCO action entry is NOT required.
- b. The Tech Spec LCO action for the inverter must be entered until the breaker can be closed.
- c. If the inverter is aligned to it's AC supply and the voltage is normal, Tech Spec LCO action entry is NOT required.
- d. If the inverter is aligned to it's AC supply and the voltage is normal, enter the appropriate Tech Spec LCO action for the inverter for tracking only until the breaker can be closed.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

13. Given the following plant conditions:

- Plant is operating at 100%.
- All systems aligned normal.
- Loss ERCW Supply header 2A occurs due to a rupture in the yard.

Which ONE of the following describes indications the operator would see in the main control room in this event? (Assume no operator actions)

- a. Ice condenser chillers trip.
- b. Containment temperature increasing.
- c. General ventilation chillers trip.
- d. CCS surge tank level increasing with auto makeup valve closed.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

14. Which ONE of the following choices describes the method used for verifying the position of a LOCKED and THROTTLED valve in a safety related flowpath?
- a. Independent verification must be conducted by two individuals at different times where the 1st must position the valve and the 2nd verifies locking mechanism installed.
  - b. Independent verification must be conducted by two individuals, one locally physically positions and locks the valve and the 2nd observes using remote indication in the control room.
  - c. Second party verification must be conducted by two individuals at the same time where one initially positions and locks the valve while the 2nd party observes.
  - d. Second party verification must be conducted by two individuals who will each position the valve to ensure correct positioning and then locked by the 2nd party.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

15. Which ONE of the following actuations would be the result if the operator placed one of the two Phase B manual actuation switches on panel 1-M-6 to the actuate position?
- a. 1 train Phase B Containment Isolation.  
1 train Containment Vent Isolation.
  - b. 1 train Phase B Containment Isolation.  
Neither train Containment Vent Isolation.
  - c. Both trains Phase B Containment Isolation.  
Both trains Containment Vent Isolation.
  - d. Neither train of Phase B Containment Isolation.  
Neither train Containment Vent Isolation.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

16. Given the following conditions:

- Crew has just transitioned to E-1 in response to a large break LOCA.
- RCS pressure is 325 psig.
- Highest core exit thermocouple is 1224°F.
- Containment pressure is 9 psig.
- All S/G levels offscale LOW.
- Total AFW flow is 225 gpm.

Which ONE of the following procedures should the crew implement to respond to this event?

- a. E-1, "Loss of Reactor or Secondary Coolant".
- b. FR-H.1, "Loss of Secondary Heat Sink".
- c. FR-Z.1, "High Containment Pressure".
- d. FR-C.1, "Inadequate Core Cooling".

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

17. Given the following plant conditions:

- The Unit is at 12% power.
- Control rods are in MANUAL.
- Turbine in "IMP IN" mode of control and load increase in progress.
- After rod withdrawal of several steps, the IN-HOLD-OUT lever is returned to the HOLD position.
- The OAC observes that the green RODS OUT light remains illuminated and outward rod motion continues.

Which ONE of the following actions is required, per AOI-2, "Rod Control System Malfunction?"

- a. Trip the Reactor and enter "E-0, Reactor Trip or Safety Injection."
- b. Place the Rod Bank Selector in AUTO and check for continued rod motion.
- c. Check for failed instruments and select or block appropriate instrument inputs.
- d. Place the IN-HOLD-OUT lever to the IN position and check for continued rod motion.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

18. Given the following plant information:

- Plant was operating at 100% power when a control rod partially dropped into the core causing Axial Flux Difference (AFD) to exceed Tech Spec (doghouse) limits specified in the COLR.
- In accordance with Tech Specs the crew initiates actions to reduce power to < 50% in 30 minutes.

Which ONE of the following describes why this action is required?

- a. Ensures QPTR Tech Spec limits are not exceeded.
- b. Ensures the that penalty points accumulated when above the COLR limits (doghouse) do not exceed limits that would require plant shutdown.
- c. To prevent shielding of the NIs which would make trip setpoints non-conservative.
- d. To prevent exceeding heat flux hot channel limits due to the Xenon redistribution following a power change.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

19. Given the following plant conditions:

- Startup is in progress with the reactor at 15% RTP.
- Intermediate Range Monitor, 1-NI-92-136A, fails HIGH resulting in a reactor trip.
- Crew is performing E-0, "Reactor Trip Response".

Which ONE of the following statements describe how the Source Range Monitors (SRM) will be reinstated?

- a. When the operable IRM indicates  $< 1.66 \times 10^{-4}\%$  power the operator will place both SR Trip RESET-BLOCK switches, 1-N33A and 1-N-33B, to RESET.
- b. When the operable IRM indicates  $< 1.66 \times 10^{-4}\%$  power, the SRMs will automatically reinstate.
- c. After P-6 permissive automatically resets, the operator will place both SR Trip RESET-BLOCK switches, 1-N33A and 1-N33B, to RESET.
- d. After P-6 permissive automatically resets, the SRMs will automatically reinstate.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

20. Which ONE of the following represents the conditions of the steam entering the PRT from a leaking PORV if pressurizer pressure is 1385 psig and PRT pressure is 5 psig? (assume an ideal thermodynamic process)
- a. Superheated steam 260°F - 270°F.
  - b. Superheated steam 250°F - 260°F.
  - c. Saturated steam 225°F - 235°F.
  - d. Saturated steam 275°F - 285°F.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

21. Given the following plant conditions:

- Small LOCA has occurred.
- Operators have implemented the appropriate EOPs.
- RCS pressure is 1600 psig
- Contmt Spray pumps auto started.

Which ONE of the following is the primary process that provides core cooling for the given conditions?

- a. Reflux boiling in the RCS due to cooling in the SGs.
- b. Natural circulation in the RCS and cooling via SG PORVs.
- c. Coolant flowing out of the break allowing ECCS to cool the core.
- d. Forced RCS circulation through SGs and cooling using SG PORVs.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

22. Given the following conditions:

- The plant was operating near the end of the fuel cycle when a small LOCA occurred.
- The crew implemented the EOPs and are performing E-1.
- E-1 directs the operators to maintain intact SG levels at 10% - 50% NR.

Which ONE of the following describes why maintaining SGs as an available heat sink is important to the mitigation of small LOCAs?

- a. Limits steam formation in the SG tubes.
- b. Prevents RCS pressure from decreasing to saturation pressure.
- c. Limits RCS pressure increase if break flow is not sufficient to remove heat.
- d. Prevents thermal shock to the SG tubes due to ECCS injection of cold water.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

23. Given the following plant conditions:

- Large LOCA occurred while the plant was operating at 100% power.
- All systems responded normally.
- It has been approximately 12 hours since operators aligned ECCS for cold leg recirculation.
- All ECCS pumps are in service.

Which ONE of the following correctly describes the current alignment for the RHR and SI pumps?

- a. One SI pump aligned to all hot legs, one RHR pump aligned to 1 & 3 hot legs.
- b. One SI pumps aligned to all hot legs, both RHR pumps aligned to 1 & 3 hot legs.
- c. Both SI pumps aligned to all hot legs, one RHR pump aligned to 1 & 3 hot legs
- d. Both SI pumps aligned to all hot legs, both RHR pumps aligned to 1 & 3 hot legs.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

24. Given the following conditions in the Component Cooling System :

- U1 SURGE LEVEL HI/LO annunciation in alarm.
  - Side A level, 1-LI-70-63A, increased to 87%.
  - Side B level, 1-LI-70-69A, increased to 87%.
  - U-1 Surge Tank makeup valve, 1-LCV-70-63A CLOSED.
- The CRO observes the following additional alarms associated with CCS.
  - RCP THRM BAR RET HDR TEMP HI.
  - RCP THRM BAR RET HDR FLOW LO.
  - RCP1 THRM BAR RET FLOW LO.

Which ONE of the following describes automatic actions that would have resulted from these conditions?

- a. Surge tank vent closed due to high return flowrate from the RCP's thermal barrier.
- b. Surge tank vent closed due to a high return temperature from RCP's thermal barrier.
- c. RCP thermal barrier heat exchanger inlet and discharge valves closed due to high return temperature.
- d. RCP thermal barrier heat exchanger inlet and discharge valves closed due to high differential flowrate.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

25. Given the following plant conditions:

- Small LOCA caused reactor trip and safety injection.
- All systems responded as designed.
- The operating crew has implemented E-1, "Loss of Reactor or Secondary Coolant".

Which ONE of the following best describes the conditions which would warrant transition to ES-1.2, "Post LOCA Cooldown and Depressurization".

- a. RCS pressure less than the shutoff head of the RHR pumps and SI termination criteria met.
- b. RCS pressure less than the shutoff head of the RHR pumps and SI termination criteria not met.
- c. RCS pressure greater than the shutoff head of the RHR pumps and SI termination criteria met.
- d. RCS pressure greater than the shutoff head of the RHR pumps and SI termination criteria not met.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

26. With the unit at 100% power, an inadvertent operation resulted in 1-HS-74-33A, RHR HX A OUTLET XTIE valve, being closed.

Which ONE of the following conditions is required?

- a. Both trains of ECCS must be declared inoperable because neither RHR pump can inject into all 4 cold legs.
- b. Both trains of ECCS must be declared inoperable because containment sump recirculation cannot be established with this valve closed.
- c. One train of ECCS must be declared inoperable because the A train RHR pump cannot inject into all 4 cold legs.
- d. One train of ECCS must be declared inoperable because the A train RHR pump cannot supply suction to 1A-A CCP and SIP during containment sump recirculation.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

27. 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 increasing.

When terminating safety injection which ONE of the following identifies actions that result in a decrease 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.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

28. Given the following plant conditions:

- Plant in Mode 5.
- RCS temperature 175°F.
- RCS pressure 325 psig.
- Train A RHR in service, Train B RHR tagged out for repairs.

Which ONE of the following is the preferred method of core cooling in the event a Loss of RHR Shutdown Cooling occurs?

- a. Actuate Safety Injection, spill through the PZR PORVs.
- b. Normal charging to RCS, spill through the PZR PORVs.
- c. Natural or forced RCS flow with Secondary Heat Sink established.
- d. Reflux cooling via any SG with level  $\geq$  10% NR level.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

29. Given the following plant conditions:

- ATWS occurred while plant was at 100% power
- Operators implemented FR-S.1, Anticipated Trip Without Scram, and currently performing step 4, "Initiate RCS Boration".

Which ONE of the following is the reason that this step must be performed manually by the operator instead of through manual initiation of SI?

- a. Initiation of SI will isolate the flow path from the BAT to the CCP.
- b. Manual operator action provides the most direct boration flowpath to the core.
- c. Initiation of SI will cause isolation of normal charging and reduce the ability to inject boron.
- d. Manual operator action ensures a more rapid swapover of the CCP suction from the VCT to RWST.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

30. When using a manual trip switch to trip the reactor in the event of an ATWS, which ONE of the following describes how the reactor trip breaker trip coils are affected?
- a. UV coils and shunt coils are de-energized.
  - b. UV coils are de-energized, the shunt coils are energized.
  - c. UV coils are de-energized, the shunt coils are unaffected.
  - d. UV coils are unaffected, the shunt coils are energized.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

31. Which ONE of the following describes how the detector assembly signal inputs to the Source (SRM) and Intermediate range (IRM) NIS and the overlap between the two instrument outputs?
- a. SRM uses both fission chambers in a detector assembly while the IRM uses only one; 3 decades of overlap.
  - b. SRM uses both fission chambers in a detector assembly while the IRM uses only one; Full range of overlap.
  - c. SRM uses only one of the fission chambers in a detector assembly while the IRM uses both; 3 decades of overlap.
  - d. SRM uses only one of the fission chambers in a detector assembly while the IRM uses both; Full range of overlap.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

32. Given the following:

- Plant is at 30% power.
- Startup is in progress.

Which ONE of the following would be required of the operating crew if 1-NI-92-136 failed high?

- a. Ensure reactor trip and implement E-0, "Reactor Trip Response".
- b. Stop any positive reactivity changes until the instrument is repaired
- c. Startup may continue, place the failed channel Level Trip Switch to BYPASS.
- d. Reduce power to  $< 10\%$  and place the failed channel Level Trip Switch to BYPASS.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

33. Given the following plant conditions:

- SG tube leak has occurred on loop 3 SG.
- Loop 3 SG pressure = 1035 psig.
- The operating crew implemented AOI-33, "Steam Generator Tube Leak" up to the point of initiating RCS cooldown.
- The plant has been placed in Hot Standby with Tavg stable at 557°F.

Using the Leaking SG Pressure vs. Target Incore Temperature table (attached) from AOI-33, determine the actual subcooling that will exist when the RCS cooldown and depressurization is terminated.

- a. 58°F subcooling.
- b. 60°F subcooling.
- c. 68°F subcooling.
- d. 70°F subcooling.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

34. Given the following plant conditions:

- Unit is operating at 100% RTP.
- 1-XS-68-339E is selected to the LI-68-339 & 335 position.
- LT-68-339 failed to a constant output equivalent to 30% level.
- All other systems are operating normally.

Assuming NO operator action which ONE of the following describes the plant response to this failure?

- a. Low level deviation alarm would actuate but ACTUAL Pressurizer level would remain on setpoint.
- b. Charging would decrease causing Pressurizer level to decrease until Letdown isolates.
- c. Charging flow would increase resulting in a reactor trip on high Pressurizer level.
- d. Backup heaters would energize due to a level deviation of 5% from setpoint.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

35. During refueling and with core off load in progress, which ONE of the following describes a condition that would cause the containment evacuation alarm to actuate?
- a. Purge air exhaust radiation monitor, 1-RM-90-130 reaches alarm setpoint.
  - b. Upper cntmt area radiation monitor, 1-RM-90-59, reaches alarm setpoint.
  - c. Intermediate range monitor, N135, fails high.
  - d. Source range monitor, N131, fails high.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

36. Given the following plant conditions:

- Plant is operating at 100% power when a loss of offsite power occurs.
- Emergency diesel generators start and re-energize the 6.9KV shutdown boards.

Which ONE of the following describes how the Main Control Room chillers and associated air handling units respond during this event?

- a. The air handling units restart when power is restored and the MCR chillers automatically sequence back on after a time delay.
- b. The air handling units must be manually restarted, then the MCR chillers can automatically sequence back on.
- c. MCR chillers and air handling units must both be manually restarted after power is restored.
- d. MCR chillers must be manually restarted after the air handling units automatically sequence back on after a time delay.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

37. Given the following:

- Plant is at 25% power.
- The 480V Common Emergency Transformer is tagged out for maintenance.
- All other systems/components aligned normal.
- 1B 6.9 KV Unit board de-energizes due to a faulty relay operation.

Which ONE of the following describes the effect this event will have on the CRD M/G sets?

- a. Only 1A CRD M/G set running.
- b. Only 1B CRD M/G set running.
- c. Both CRD M/G sets running.
- d. No CRD M/G sets running.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

38. Which ONE of the following explains why rod insertion limits increase as reactor power increased from 0% to 100% power?
- a. As power increases moderator temperature coefficient decreases.
  - b. As power increases flux shifts more to the top of the core.
  - c. As power increases control rod worth decreases.
  - d. As power increases power defect increases.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

39. Given the following plant conditions:

- Unit was operating at 40% power when the #4 Reactor Coolant Pump (RCP) lower bearing temperature began to steadily increase.
- Power was reduced to 8% and the #4 RCP stopped.

Which ONE of the following statements identifies the operator response necessary to control level in #4 steam generator (SG) when the RCP was stopped?

- a. Feedwater flow to #4 SG will be controlled by the MFW reg valve and will be greater than the flow to the other 3 SGs.
- b. Feedwater flow to the #4 SG will be controlled by the MFW reg valve and will be less than the flow to the other 3 SGs.
- c. Feedwater flow to the #4 SG will be controlled by the MFW bypass reg valve and will be greater than the flow to the other 3 SGs.
- d. Feedwater flow to the #4 SG will be controlled by the MFW bypass reg valve and will be less than the flow to the other 3 SGs.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

40. During plant startup the operator inadvertently stopped RCP #4 when he attempted to stop the oil pump.

Which ONE of the following states the earliest that the RCP may be restarted?

- a. 1 hour after being stopped.
- b. 30 minutes after being stopped.
- c. 5 minutes after being stopped.
- d. May be restarted immediately.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

41. Which ONE of the following explains why 1-PCV-62-120, Volume Control Tank H<sub>2</sub> Supply Press Control, is adjusted to maintain Volume Control Tank (VCT) hydrogen pressure between 15 psig and 30 psig when the plant is at power?
- a. Ensures adequate NPSH for the CCPs if both start simultaneously.
  - b. Provides backpressure in CCP miniflow line to prevent excessive flow.
  - c. Provides backpressure to the #2 RCP seal to ensure adequate flow to #3 seal.
  - d. Ensures Hydrogen concentration in the RCS controlled at 35-50 cc/kg for oxygen scavenging.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

42. Given the following plant conditions:

- Plant at 100% power at EOL.
- Letdown and charging in service.
- VCT makeup in AUTO and BA flow controller set at 5%.
- Crew just completed Reactor Coolant Filter swap.
- 1-HS-62-118, Letdown divert to HUT, was inadvertently left in the DIVERT position.

Which ONE of the following describes the VCT response to the given conditions?  
(assume no operator actions)

- a. VCT level will remain as is.
- b. VCT level decreases to 7% then stabilizes.
- c. VCT level decreases to 20% then stabilizes.
- d. VCT level decreases until VCT drains completely.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

43. 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 and Safety Injection  
Pzr PORV, 1-PCV-68-340 opens.
- b. Reactor trip but NO Safety Injection  
Pzr PORV, 1-PCV-68-340 opens.
- c. Reactor trip and Safety Injection  
Pzr PORV, 1-PCV-68-340 remains closed.
- d. Reactor trip, but NO Safety Injection  
Pzr PORV, 1-PCV-68-340 remains closed

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

44. Given the following conditions:

- Unit 1 was at 100% RTP
- A loss of 120V Vital Instrument Power Board 1-II resulted in a Reactor trip.
- A subsequent loss of Reactor Coolant resulted in PZR pressure decreasing below the Safety Injection setpoint.

Which ONE of the following describes the status of ECCS pumps following the automatic Safety Injection initiation?

- a. Both trains of ECCS pumps start automatically.
- b. Only train A of ECCS pumps starts automatically.
- c. Only train B of ECCS pumps starts automatically.
- d. Neither train of ECCS pumps starts automatically.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

45. Given the following plant conditions:

- Plant operating at 100% power.
- Power range channel NI-43 failed LOW.
- Operators implemented AOI-4, "Nuclear Instrumentation Malfunction", to remove the failed channel from service and trip associated bistables.

After the failure, which ONE of the following represents the high power trip logic for the remaining channels both BEFORE and AFTER the failed instrument was removed from service and associated bistables tripped?

	<u>BEFORE</u>	<u>AFTER</u>
a.	1/3	1/3
b.	1/3	2/3
c.	2/3	1/3
d.	2/3	2/3

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

46. Which ONE of the following describes the conditions that will cause actuation of the power range monitor's CHANNEL DEVIATION alarm?
- a. Ratio between the highest reading lower detector to the average of the lower detectors  $> 1.04$ .
  - b. Difference between the highest reading lower detector and the lowest reading lower detector  $> 4\%$ .
  - c. Ratio between the highest reading channel to the average of all channels  $> 1.04$ .
  - d. Difference between the highest reading channel to the lowest reading channel  $> 4\%$ .

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

47. Which ONE of the following describes where individual incore thermocouple indications may be displayed?
- a. Plant computer and RVLIS display.
  - b. Plant computer and incore detector display panel.
  - c. RVLIS display and incore detector display panel.
  - d. RVLIS display and RVLIS recorders on M-4 and M-6.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

48. The operating crew is responding to inadequate core cooling with the following conditions:

- Crew is unable to reinitiate ECCS flow.
- S/G depressurization proves ineffective due to loss of secondary heat sink.
- All core exit thermocouples indicate  $>1200^{\circ}\text{F}$ .
- RVLIS indicates  $< 33\%$  and slowly decreasing.
- RCP seal injection startup criteria cannot be established.

Based on the above conditions, which ONE of the following operator actions is required?

- a. Do NOT start RCP's; continue attempts to reestablish ECCS flow.
- b. Do NOT start RCP's; continue attempts to reestablish a secondary heat sink.
- c. Open Pzr PORVs and block valves, then start RCPs, one at a time.
- d. Start RCPs, one at a time, until core exit thermocouples are  $< 1200^{\circ}\text{F}$ .

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

49. The upper containment cooling fans are in the following alignment:

- "A", "B", and "C" are running
- "D" is off with handswitch in A-P AUTO

Which ONE of the following describes a condition that will cause "D" Upper Containment Cooling fan to automatically start?

- a. Temperature in any of the running fan's discharge > 95°F.
- b. Any running fan trips due to a motor overload.
- c. ERCW TCV full open on any running fan.
- d. Phase B Containment Isolation.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

50. Given the following plant conditions:

- Blackout has occurred.
- All equipment has functioned as expected.
- Emergency Diesel Generators started and restored voltage to the Shutdown Boards.

Which ONE of the following describes the status of the containment coolers 5 minutes after voltage was restored?

- a. Upper containment coolers off, CRDM coolers selected for AP-AUTO running, lower containment coolers selected for AP-AUTO running.
- b. Upper containment coolers selected for AP-AUTO running, CRDM coolers selected for AP-AUTO running, lower containment coolers off.
- c. Upper containment coolers off, CRDM coolers off, lower containment coolers selected for AP-AUTO running.
- d. Upper containment coolers selected for AP-AUTO running, CRDM coolers off, lower containment coolers off.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

51. Which ONE of the following describes the function of the Containment Air Return Fans during a LOCA?
- a. Moves air from the upper containment to the suction of EGTS to enhance cleanup.
  - b. Ensures  $\Delta P$  between upper and lower containment is maintained to force air and steam through the Ice Condenser.
  - c. Recirculates air between upper Containment and the annulus to prevent flammable hydrogen concentration from collecting in either area.
  - d. Maintains positive closing pressure on Ice Condenser backdraft dampers to prevent reverse flow through ice condenser.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

52. Which ONE of the following lists 2 conditions that will directly cause a glycol circulating pump to trip?
- a. Low expansion tank level.  
Low glycol temperature.
  - b. Low expansion tank level.  
High discharge pressure.
  - c. Low suction pressure.  
High discharge pressure.
  - d. Low suction pressure.  
Low glycol temperature.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

53. Given the following plant conditions:

- Plant is operating at 30% power.
- An instrument air line leak caused #3 SG Main Feedwater reg valve to close.
- Level in #3 SG decreased to 16% NR.
- Operators stopped the air leak and restored SG level thereby preventing reactor trip.

Which ONE of the following indicates the status of the Auxiliary Feedwater (AFW) pumps?

- a. No AFW pumps running.
- b. All AFW pumps running.
- c. Only the TDAFW pump running
- d. Both MDAFW pumps running.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

54. Given the following conditions:

- Plant startup in progress.
- Tavg is being maintained at 557°F by Steam dumps.
- Operators are preparing to take the reactor critical.
- Standby Main Feedwater Pump in service supplying the SGs.

Which ONE of the following is the reason why a Condensate Booster Pump should NOT be operated at this time?

- a. To prevent overfeeding steam generators.
- b. To prevent lifting the high pressure feedwater heater relief valves.
- c. To prevent overpressurization and damage to the SG's feedwater preheat section.
- d. To prevent overpressurization and damage to the Standby Main Feedwater Pump suction piping.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

55. Given the following plant conditions:

- Plant is operating at 100% power.
- 1A-A AFW pump running for flow test with AUX FEEDWATER PMP 1A-A RECIRC, 1-FCV-3-355A, OPEN to the CST for a pump performance test.
- Reactor trip occurs.

Which ONE of the following describes the effect on the 1A-A AFW pump recirc valve?

- a. Recirc valve remains open providing miniflow protection.
- b. Recirc valve closes, however the operator could reopen it after 5 seconds.
- c. Recirc valve must automatically close within 5 seconds or the pump will trip.
- d. Recirc valve closes and cannot be reopened until after the accident start signal is reset.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

56. Which ONE of the following best describes the condition of the TDAFW Pump Governor Valve and Trip & Throttle Valve following an ELECTRICAL overspeed trip of the turbine? (Assume the overspeed occurred 2 minutes ago and NO operator actions have been taken)
- a. Governor Valve - open  
Trip & Throttle Valve - latched and closed
  - b. Governor Valve - open  
Trip & Throttle Valve - unlatched and closed
  - c. Governor Valve - closed  
Trip & Throttle Valve - latched and closed
  - d. Governor Valve - closed  
Trip & Throttle Valve - unlatched and closed

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

57. Given the following:

- Plant operating at 100% power.
- Reactor Coolant Drain Tank (RCDT) aligned to the Holdup Tank (HUT).
- Excess letdown in service to the RCDT to repair leak on the normal letdown piping.

Which ONE of the following occurs if RCDT radiation monitor, 1-RM-90-275, RCDT, reaches the alarm setpoint?

- a. Isolates PRT drain to the RCDT.
- b. Isolates the RCDT pumps discharge.
- c. Realigns excess letdown from RCDT to VCT.
- d. Realigns discharge of the RCDT pumps from the Holdup Tank to Tritiated Drain Collector Tank.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

58. Which ONE of the following correctly describes the dilution flowpath and release point during a normal Waste Gas Decay Tank release?
- a. Train A ABGTS through the Unit 1 Shield Building vent.
  - b. Train A EGTS through the Unit 1 Shield Building vent.
  - c. CNTMT Annulus Vacuum Fans through the Auxiliary Building vent.
  - d. Auxiliary Building General Supply Fans through the Auxiliary Building vent.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

59. Given the following plant conditions:

- Plant is in MODE 6 with refueling in progress.
- During movement of an irradiated fuel assembly from the core it is dropped and severely damaged.
- The containment airborne radioactivity increases.

Which ONE of the following describes the ESF actuation that would occur?

- a. Phase A Containment Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- b. Phase A Containment Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.
- c. Containment Vent Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- d. Containment Vent Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

60. Given the following;

- Plant is in mode 5, post refueling.
- Plant is preparing for a vacuum refill of the RCS following a drain down.

Which ONE of the following identifies the 2 parameters that are used to determine the maximum vacuum to be drawn on the RCS?

- a. Charging flowrate; PRT level.
- b. Charging flowrate; RCS temperature.
- c. RHR flowrate; PRT level.
- d. RHR flowrate; RCS temperature.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

61. Given the following conditions:

- The plant is operating at 100% power.
- Inadvertent Safety Injection occurred due to an Instrument Maintenance technician working in the instrument racks who accidentally shorted a circuit board.
- #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 decreasing to 564°F following the reactor trip.
- d. When the south valve vault level increased to 4 inches due to the PORV packing leak.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

62. Given the following:

- Plant is operating at 100% RTP.
- CLA #4 check valves have continuous seat leakage of approximately 0.6 gpm.
- Assume no operator actions taken.

Which ONE of the following identifies the effect of this check valve leakage on the Cold Leg Accumulator (CLA)?

- a. Decrease in the CLA level and nitrogen pressure.
- b. Decrease in the CLA boron concentration and increase in level.
- c. Decrease in the CLA boron concentration and decrease in level.
- d. Increase in the CLA boron concentration and increase in nitrogen pressure.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

63. Given the following:

- Plant tripped due to loss of Vital Inverter 1-IV which caused a loss of 120v AC Vital Instrument Power Board.
- Crew is responding to the event and is currently performing ES-0.1, Reactor Trip Response.
- Pzr pressure is 2280 psig and increasing.

Which ONE of the following identifies the availability of Pzr sprays?

- a. Manual operation of both Pzr spray valves is required because the master controller will be failed due to loss of power to controller.
- b. Auxiliary spray must be established because both spray valve controllers will fail due to loss of power.
- c. Loop 1 spray will be available but loop 2 will be failed due to loss of power to the controller.
- d. Loop 2 spray will be available but loop 1 will be failed due to loss of power to the controller.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

64. Which ONE of the following explains the reason for maintaining a small amount of flow through the PZR spray bypass line?
- a. Reduces the differential pressure across the PZR spray valve to ensure it can open upon demand.
  - b. Provides a small amount of flow from the PZR surge line through the PZR to keep the surge line cool.
  - c. Maintains small amount of spray to ensure control heaters are on to minimize  $\Delta T$  between liquid and vapor space.
  - d. Provides a small flow through the spray line to prevent thermal shock when the spray valve opens.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

65. Given the following plant conditions:

- The plant is operating at 100% power.
- All Control Systems are in automatic.
- PZR level control is selected to LT-68-339 and 335.

Which ONE of the following describes the plant response if LT-68-335 failed LOW with no operator action?

- a. Letdown isolation valve LCV-62-70 goes closed and all orifice isolation valves close.
- b. Letdown isolation valve LCV-62-69 goes closed and all orifice isolation valves close.
- c. Letdown isolation valve LCV-62-70 goes closed and orifice isolation valves remain open.
- d. Letdown isolation valve LCV-62-69 goes closed and orifice isolation valves remain open.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

66. Given the following plant conditions:

- Plant cooldown in progress with RCS temperature at 425°F.
- Pzr level at 70% and increasing.
- GO-6 directs the operator to bypass the pneumatic flow limiter for 1-FCV-62-93, Charging Flow Control.

Which ONE of the following describes why the flow limiter is bypassed at this time?

- a. Allows the operator to reduce charging flow to prevent overfilling the Pzr as plant cooldown is continued.
- b. Allows the operator to reduce charging flow in order to prevent excessive flow from potentially damaging RCP seals.
- c. Allows the operator to increase charging flow in order to cool letdown flow when all orifices are in service.
- d. Allows the operator to increase charging flow in order to fill the Pzr to solid conditions during the plant shutdown.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

67. Which ONE of the following describes how a reactor trip is ensured in the event one train of the Reactor Protection System failed?
- a. A trip signal from each train is sent to both trains of reactor trip breakers which are arranged in series.
  - b. A trip signal from each train is sent to both trains of reactor trip breakers which are arranged in parallel.
  - c. A trip signal from each train is sent to one of two redundant trains of reactor trip breakers which are arranged in series.
  - d. A trip signal from each train is sent to one of two redundant trains of reactor trip breakers which are arranged in parallel.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

68. Given the following plant conditions:

- Unit is operating at 100% RTP
- All control systems are in AUTOMATIC except rod control, which is in MANUAL.

Which ONE of the following events will cause Loop 1 Overtemperature delta-T (OTΔT) trip setpoint to DECREASE?

- a. Loop 1 T-avg output unit failed HIGH.
- b. Pressurizer pressure increased by 20 psig.
- c. Loop 1 Reactor Coolant flow indication failed HIGH.
- d. Reactor power decreased to 50% while maintaining Tavg on program.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

69. Given the following plant conditions:

- Plant startup is in progress
- Shutdown banks fully withdrawn
- Control banks A and B fully withdrawn, control bank C at 153 steps and control bank D at 25 steps.

Which ONE of the following statements describes a condition that would result in actuation of the "RODS AT BOTTOM" annunciator?

- a. A rod in control bank D drops to 5 steps.
- b. A rod in control bank C drops to 15 steps.
- c. A rod in control bank B drops to 25 steps.
- d. A rod in control bank A drops to 35 steps.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

70. Which ONE of the following describes how Main Control Room instruments being supplied from an Eagle rack in the Aux Instrument room will indicate if a fuse blows in the power supply to the panel?
- a. Indicates last value prior to loss of power.
  - b. Indicates bottom of scale
  - c. Indicates top of scale.
  - d. Indicates mid scale.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

71. Given the following plant conditions and time line:

- 1200 - LOCA in progress.
- 1200 - RCS pressure is 1800 psig and decreasing.
- 1206 - Contmt pressure is 1.5 psig.
- 1206 - Loss of offsite power occurred just as the crew completed the immediate operator actions of E-0.
- 1207 - Contmt pressure is 3.1 psig.
- 1207 - RCS pressure is 1400 psig and decreasing.

Which ONE of the following describes the status of the Containment Spray (CS) system 2 minutes after the Emergency Diesel Generators restored power to their respective shutdown boards?

- a. CS pumps RUNNING; spray header isolation valves CLOSED.
- b. CS pumps RUNNING; spray header isolation valves OPEN.
- c. CS pumps OFF; spray header isolation valves CLOSED.
- d. CS pumps OFF; spray header isolation valves OPEN.

Question Modified

7:55 am on 4/9/99

Per teleconference

w/ T. Newman

& P. Steiner

RO    SRO  
71 / 55

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

72. Given the following plant conditions:

- Plant shutdown in progress.
- All shutdown and control rods are inserted.
- Source Range High Flux at Shutdown Alarm has been unblocked.

Which ONE of the following describes how the Source Range High Flux at Shutdown Alarm setpoint is adjusted during plant shutdown?

- a. Adjusted by the operator by depressing the reset button on the Shutdown monitor.
- b. Adjusted automatically as the background countrate decreases.
- c. Adjustment performed by Instrument Maintenance every 4 hours according to the background countrate.
- d. Adjustment of the setpoint is not required as long as background countrate is decreasing.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

73. Given the following plant conditions:

- Station Blackout has occurred.
- Emergency Diesel Generators have restored voltage to the shutdown boards.
- The Spent Fuel Pit (SFP) Pump/Thermal Barrier Booster Pump (TBBP) space coolers control switches are in AUTO.

Which ONE of the following statements describes the starting sequence of the SFP pumps and SFP Pump/TBBP Pump space coolers after power is restored to the shutdown boards?

- a. SFP pumps start automatically.  
Coolers restart automatically if area temperature > 95°F.
- b. SFP pumps must be manually started .  
Coolers restart automatically if area temperature > 95°F.
- c. SFP pumps start automatically.  
Coolers must be manually started.
- d. SFP pumps must be manually started.  
Coolers must be manually started.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

74. 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  $T_{avg}$  = initial  $T_{avg}$  and final power = initial power.
- b. Final  $T_{avg}$  = initial  $T_{avg}$  and final power > initial power.
- c. Final  $T_{avg}$  < initial  $T_{avg}$  and final power = initial power.
- d. Final  $T_{avg}$  < initial  $T_{avg}$  and final power > initial power.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

75. Given the following plant conditions:

- Plant is responding to a Station Blackout.
- A fault occurred on the DG 1A-A 125V battery charger causing it to be unavailable.

What effect will the loss of the battery charger have on DG 1A-A?

- a. The Diesel will NOT start.
- b. The Diesel will start and run normally.
- c. The Diesel will start and run for approximately 30 minutes.
- d. The Diesel will start but the generator breaker will NOT close.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

76. Which ONE of the following identifies the design capacity of the Emergency Diesel Generator (DG) air start receivers?
- a. Five successive start attempts on the DG without recharging the air start receiver(s).
  - b. Five successive start attempts on the DG provided the air compressors auto start to recharge the system during the start attempts.
  - c. Seven successive start attempts on the DG without recharging the air start receiver(s).
  - d. Seven successive start attempts on the DG provided the air compressors auto start to recharge the system during the start attempts.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

77. Given the following conditions:

- Radwaste AUO is in the process of making a liquid radwaste release from the monitor tank.
- 1-RM-90-122, WDS Liquid Effluent, radiation monitor has just been placed in service.
- The release flowrate has been adjusted with 1-ISV-77-660, Cooling Tower Blowdown Release Header Isol.
- Effluent radiation levels increased sharply and caused a high radiation alarm on 1-RM-90-122.

Which ONE of the following actions would occur?

- a. Automatic isolation of 0-RCV-77-43, Cooling Tower Blowdown Radiation Release Control, to terminate the release.
- b. Automatic isolation of the cooling tower blowdown diffuser valves, 1-FCV-27-100 and 101, which will route the effluent to the holding pond.
- c. 1-RM-90-122 alarms on the local radwaste panel, O-L-2, the release will continue until the AUO manually isolates 1-ISV-77-660, Cooling Tower Blowdown Release Header Isol.
- d. 1-RM-90-122 alarms in the Main Control Room and requires the operator to manually isolate cooling tower blowdown diffuser valves, 1-FCV-27-100 and 101, which route the radwaste release to the holding pond.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

78. Given that a tornado touched down at the intake pumping station and a loss of the 480V Intake Pumping Station Board resulted.

Which ONE of the following describes how the loss of equipment at the intake pumping station would affect the operation of the CCW system?

- a. Cooling tower basin level remains the same, but blowdown will automatically align from the diffusers to the Yard Holding Pond.
- b. Cooling tower basin level increases due to automatic isolation of cooling tower blowdown.
- c. Cooling tower basin level decreases until makeup from RCW system increases automatically to maintain basin level.
- d. Cooling tower basin level decreases due to loss of a source of makeup.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

79. A maintenance worker calls 3911 from a telephone in the turbine building to report a fire on Elevation 729. The call is answer by an operator in the MCR.

Which ONE of the following is correct concerning the Fire Alarm?

- a. The alarm will sound **AUTOMATICALLY** when the call is placed via the 3911 number and the operator can stop the alarm **MANUALLY** using a pushbutton on the MCR operator desk.
- b. The alarm will sound **AUTOMATICALLY** when the call is placed via the 3911 number and will stop **AUTOMATICALLY** after 3 minutes.
- c. The alarm must be **MANUALLY** initiated by using a pushbutton on the MCR operator desk and it will stop **AUTOMATICALLY** after 3 minutes.
- d. The alarm must be **MANUALLY** initiated and stopped by using a pushbutton on the MCR operator desk.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

80. Given the following plant conditions:

- Plant operating at 100% power.
- All plant systems aligned normal.

Which ONE of the following describes the power supply for 1A-A RHR pump in the event a Safety Injection occurred in conjunction with a loss of power to "C" Common Station Service Transformer?

- a. RHR pump powered from 6.9KV Shutdown Board 1A-A supplied from it's associated DG.
- b. RHR pump powered from 6.9KV Shutdown Board 1A-A supplied from it's alternate supply.
- c. RHR pump powered from 6.9KV Shutdown Board 2A-A via the maintenance supply.
- d. RHR pump would not have an available power supply since 6.9KV Shutdown Board 1A-A is de-energized.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

81. Which ONE of the following describes the minimum temperature that would require the operator to initiate cooling of the Pressurizer Relief Tank (PRT) and how cooling would be accomplished?
- a. 120°F; Open 1-FCV-68-301, PRT VENT TO WDS HDR.
  - b. 112°F; Open 1-FCV-68-301, PRT VENT TO WDS HDR.
  - c. 120°F; Open 1-FCV-68-303, PRI WATER TO PRT.
  - d. 112°F; Open 1-FCV-68-303, PRI WATER TO PRT.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

82. Why is it required to verify both power supply circuit breakers OPEN prior to operating the C-S CCS pump manual power supply manual throw-over switch?
- a. To maintain separation of the two trains.
  - b. To prevent possible damage to the pump motor.
  - c. The switch is not rated for operation under load.
  - d. The throw-over switch is interlocked to prevent operation with either breaker closed.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

83. Which ONE of the following explains the purpose of the charcoal adsorber beds in the Emergency Gas Treatment System (EGTS) filter banks?
- a. Reduces the levels of radioactive xenon gas.
  - b. Facilitates the removal of organic and inorganic iodine.
  - c. Neutralize the acidity caused by moisture drawn into the filter units
  - d. Ensures adsorption of particulates which may contain radioactive nuclides.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

84. Given the following plant conditions:

- The plant has suffered a LOCA.
- "A" Hydrogen Recombiner has been placed in service.
- "B" Hydrogen recombinder has faulty thermocouples and is tagged out.
- Subsequently the breaker for the "A" Hydrogen Recombiner trips on overcurrent due to a short in the recombinder heaters.

Which ONE of the following indicates how the concentration of hydrogen will be controlled inside containment?

- a. Containment Purge air cleanup units may be used to remove hydrogen and recirculate their discharge back to containment.
- b. Lower containment coolers condense steam from containment creating a recombination effect of the hydrogen and steam.
- c. Air Return Fans create a mixing effect and the hydrogen igniters will burn hydrogen to maintain it below an explosive concentration.
- d. Emergency Gas Treatment System will remove hydrogen which collects in the containment dome and discharges to the shield building vent.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

85. Given the following plant conditions:

- Reactor power is 40%.
- Rod Control is in MANUAL.
- Turbine trip occurs due to low EHC pressure.
- #3 SG PORV opens fully at the trip due to a controller problem and fails to reclose.

Which ONE of the following describes the final steady-state condition of the Steam Dumps and RCS Tavg? (assume no operator actions are taken)

- a. Steam dumps closed with Tavg decreasing.
- b. Steam dumps modulated open maintaining Tavg at 557°F.
- c. Steam dumps modulated open maintaining Tavg at 562°F.
- d. Steam dumps modulated open maintains Tavg at a value greater than 562°F.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

86. 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. Maintains governor valves at a set reference position but will respond to changes in system frequency.
- b. Maintains governor valves at a set reference position and will NOT respond to changes in system frequency.
- c. Governor valve position is adjusted to maintain generator load constant and will respond to changes in system frequency.
- d. Governor valve position is adjusted to maintain generator load constant and will NOT respond to changes in system frequency.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

87. Given the following plant conditions:

- The Unit is in Mode 1, at 100% load.
- All systems are aligned normal.
- A Safety Injection signal has just been initiated.

Which ONE of the following describes the operator actions required to align ERCW following a Safety Injection?

- a. Place control switch for 0-FCV-67-152, CCS HEAT EXCHANGER C ALT DISCH TO HDR B, to position "A" and ensure 0-FCV-67-144, CCS HEAT EXCHANGER "C" DISCH TO HDR A automatically opens.
- b. Place control switch for 0-FCV-67-152, CCS HEAT EXCHANGER C ALT DISCH TO HDR B, to CLOSE and ensure 0-FCV-67-144, CCS HEAT EXCHANGER C DISCH TO HDR A, automatically opens.
- c. CLOSE 0-FCV-67-144, CCS HEAT EXCHANGER C DISCH TO HDR A, and ensure 0-FCV-67-152, CCS HEAT EXCHANGER C ALT DISCH TO HDR B, automatically opens to Position "A".
- d. OPEN 0-FCV-67-144, CCS HEAT EXCHANGER C DISCH TO HDR A, and ensure 0-FCV-67-152, CCS HEAT EXCHANGER C ALT DISCH TO HDR B automatically opens to position "A".

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

88. Engineering has developed a graph of VCT Level versus VCT pressure that will be used as an Operator Aid.

Which ONE of the following positions represents the MINIMUM level of approval for posting this as an operator aid?

- a. Any individual holding a Senior Reactor Operator license.
- b. Shift Manager
- c. Operations Superintendent
- d. Plant Manager

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

89. Which ONE of the following represents the proper use of a Reference Use procedure?
- a. The procedure is readily available at the work site for reference.  
The procedure may be performed completely from memory but the user is responsible for results.
  - b. The procedure is readily available for reference but not necessarily at the work site.  
The procedure may be performed completely from memory but the user is responsible for results.
  - c. The procedure is readily available at the work site.  
Procedure shall be referenced to ensure each segment was performed.
  - d. The procedure is readily available but not necessarily at the work site.  
Procedures shall be referenced to ensure each segment was performed.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

90. Given the following:

- A REP Alert has been declared.
- The Evacuation alarm was initiated using the ASSEMBLY AND ACCOUNTABILITY MAN pushbutton and has been sounding for 30 seconds.
- First Aid and Medical Personnel are needed immediately in the MCR.

Which one of the following will allow the Codes, Alarms, and Paging (CAP) System 'Paging' function to override the "Evacuation Alarm" function?

- a. Push and release the ALL CLEAR AUTO pushbutton.
- b. Push the ASSEMBLY AND ACCOUNTABILITY AUTO pushbutton to the locked in position.
- c. Push the ALL CLEAR MAN pushbutton to the locked in position.
- d. Push the CANCEL pushbutton.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

91. Given the following:

- Plant startup in progress.
- MSIVs had inadvertently closed due to high negative rate when charging the steam header.
- MSIV bypass valves open.
- Steam header pressure equalized with Steam Generator pressures.
- The operating crew is ready to reopen the MSIVs.

Which one of the following is the proper sequence to open MSIVs?

- a. Place all 4 MSIV hand switches to the 'PULL-TO-RESET' position, then place all 4 MSIV hand switches to the CLOSE position. The MSIVs can then be opened from their respective hand switches.
- b. Place the #1 MSIV hand switch to the 'PULL-TO-RESET' position, then place all 4 MSIV hand switches to the CLOSE position. The MSIVs can then be opened from their respective hand switches.
- c. Place all 4 MSIV hand switches to the CLOSE position, then place all 4 MSIV hand switches to the 'PULL-TO-RESET' position to reset the circuit to allow the MSIVs to be opened from their respective hand switches.
- d. Place all 4 MSIV hand switches to the CLOSE position, then place only the #1 MSIV hand switch to the 'PULL-TO-RESET' to allow the MSIVs to be opened from their respective hand switches.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

92. Given the following:

- Unit is shutdown for refueling
- Containment Spray (CS) Pump 1B-B is out of service and tagged for maintenance.
- CS pump 1B-B discharge valve, 1-FCV-72-39, was discovered to be leaking through and had to be hand-tightened 1.5 turns using the handwheel.
- A cheater was NOT used on the discharge valve handwheel.

Which ONE of the following is required because the valve was manually tightened?

- a. The valve remains OPERABLE because a cheater was not required to manually seat the valve.
- b. The valve must be declared INOPERABLE until an engineering analysis of the torque applied to the valve is performed.
- c. The valve is to be declared and remain INOPERABLE until the handwheel can be rotated 1.5 turns in the open direction after maintenance is complete.
- d. The valve is to be declared and remain INOPERABLE until testing identified and completed by Technical Support or Shift Manager.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

93. Given the following conditions:

- Reactor is critical at 1% power.
- Fuel assemblies and inserts are being shuffled in the Spent Fuel Pit (SFP).
- The following alarms are received and validated in the MCR:
  - SFP 0-RM-90-102/103 RAD HI
  - 1-RR-90-1 AREA RAD HI
- The operator verified ABGTS in service and the area has been evacuated.

Which ONE of the following describes additional verification of Auxiliary Building ventilation equipment that the operator should perform?

- a. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans running.
- b. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans off.
- c. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans running.
- d. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans off.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

94. Given the following:

- Unit shutdown to repair SG #2 handhole leak and currently in mode 5.
- A small area that is accessible in containment has a general area dose rate of 1150 mrem/hr.
- The top of this area cannot be enclosed.

Other than the appropriate posting, which ONE of the following is the minimum additional protection measures that must be provided for this area?

- a. Barricaded and a warning device or visible flashing light activated.
- b. Roped off and a security person posted to prevent access.
- c. Roped off and a RADCON Tech monitoring either locally or via closed circuit TV.
- d. A visible flashing light activated, and entrance to containment locked or the area monitored by closed circuit T.V.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

95. Which ONE of the following identifies an acceptable combination of parallel operation of the Containment Purge Exhaust Fans with the ABGTS and EGTS?
- a. Operation of ONE Purge Air Exhaust Fan is allowed with the ABGTS Train A in service for release of a WGDT.
  - b. Operation of BOTH Purge Air Exhaust Fans is allowed with the ABGTS Train A in service provided a WGDT is NOT being released.
  - c. Operation of ONE Purge Air Exhaust Fan is allowed with the EGTS Train A in service for release of a WGDT.
  - d. Operation of BOTH Purge Air Exhaust Fans is allowed with the EGTS Train A in service provided a WGDT is NOT being released.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

96. Given the following conditions at a work site:

- Airborne activity - 3 DAC
- Radiation level - 40 mrem/hr.
- Radiation level with shielding - 10 mrem/hr.
- Time to place shielding - 15 minutes.
- Time to conduct task WITH respirator - 1 hour.
- Time to conduct task WITHOUT respirator - 30 minutes.

Assumptions:

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

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

- a. Conduct task WITHOUT respirator or shielding.
- b. Conduct task WITH respirator and WITHOUT shielding.
- c. Place shielding while wearing respirator and conduct task WITH respirator.
- d. Place shielding while wearing respirator and conduct task WITHOUT respirator.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

97. Given the following plant conditions:

- Plant is in mode 5, taking the Pzr solid water operation.
- COMS is armed.
- Train "A" RHR is in service to provide shutdown cooling.
- Misoperation of 1-FCV-62-81 caused high pressure in the RCS
- Subsequently the OAC stopped the 1A RHR pump and closed 1-FCV-74-1 and 2, Loop 4 HL To RHR Suction.
- After pressure was returned to normal the OAC attempted to realign RHR and could not re-open 1-FCV-74-2.

Which ONE of the following actions may be taken to restore RHR cooling?

- a. Open RHR System Isol Bypass valves, 1-FCV-74-8 and 9, place both RHR pumps in service.
- b. Open 1-FCV-74-1, Loop 4 HL To RHR Suction, and 1-FCV-74-9, RHR System Isol Bypass valve; place both RHR pumps in service.
- c. Open RHR System Isol Bypass valves, 1-FCV-74-8 and 9; place 1 RHR pump in service.
- d. Open 1-FCV-74-1, Loop 4 HL To RHR Suction, and 1-FCV-74-9, RHR System Isol Bypass valve; place 1 RHR pumps in service.

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

98. Given the following conditions:

- Reactor Trip and Safety Injection occurred due to a LOCA.
- Crew currently performing E-1, Loss of Reactor or Secondary Coolant when the following conditions are identified:
- RWST level is 44% and slowly decreasing.
- Steam Generator #3 level increased to 84% due to a failed LCV that has now been isolated
- Containment sump level is 81% and slowly increasing.

Based on the information above, which ONE of the following actions should the crew take?

- a. Transition to FR-Z.2, Containment Flooding.
- b. Transition to ES-1.3, Transfer to RHR Containment Sump.
- c. Transition to FR-H.3, Steam Generator High Level
- d. Continue in E-1, Loss of Reactor or Secondary Coolant

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

99. Which ONE of the following describes the reason ECA-1.1, "Loss of RHR Sump Recirculation", is given priority over FR-Z.1, "High Containment Pressure", concerning Containment Spray System operation?
- a. FR-Z.1 would have the spray pump aligned to sump when level in RWST was below setpoint which would damage pump if RHR recirc was not available.
  - b. With sump recirculation unavailable, it is extremely important to conserve RWST water by minimizing operation of Containment Spray pumps.
  - c. ECA-1.1 has less restrictive criteria for Containment Spray operation since it assumes "Phase B" isolation occurs and FR-Z.1 assumes it does not occur.
  - d. FR-Z.1 is a YELLOW path Function Restoration Instruction and should not be given priority over an Emergency Contingency Action (ECA).

**WATTS BAR NUCLEAR**  
**RO EXAMINATION**

100. Given the following conditions:

- Unit at 7% power with startup in progress all bistables are in normal configuration.
- A failure of Pressurizer pressure transmitter 1-PT-68-340 resulted in the actual pressurizer pressure decreasing to 1945 psig before the operating crew manually stabilized the plant with Pressurizer Master Controller in MANUAL.
- Pressurizer pressure is currently 1960 psig and increasing.
- The following alarms are currently LIT due to the transient:
  - 90A - PZR Press Hi (1-M-5)
  - 124C - PZR Press Lo (1-M-6)
- The following status lights are LIT due to the transient:
  - PZR Press Hi Rx trip PS-68-340A
  - PZR Press Lo Rx trip PS-68-334E
  - PZR Press Lo Rx trip PS-68-323E
  - PZR Press Lo Rx trip PS-68-322E

Which ONE of the following is required for the above conditions?

- a. Trip the reactor and Initiate Safety Injection
- b. Trip the reactor but a Safety Injection is not required
- c. Transfer auto control of pressure to 1-PT-68-323 (Channel III) and restore pressure to normal.
- d. Restore pressure to normal using MANUAL control of the Master Controller and leave in manual until 1-PT-68-340 is repaired.

Watts Bar  
99-301

Date: Wednesday, March 31, 1999

**WATTS BAR SRO EXAMINATION**

**EXAM INTEGRITY REQUIRED**

Question 55 modified 4/9/99 @ 7:55am prior to administration @1

**SRO EXAMINATION  
WATTS BAR NUCLEAR PLANT  
APRIL 9, 1999**

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

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

**Applicant Information**

Name:	Region: I / II / III / IV
Date:	Facility/Unit: Watts Bar Unit 1
License Level: RO / <u>SRO</u>	Reactor Type: <u>W</u> / CE / BW / GE
Start Time:	Finish Time:

**Instructions**

Use the answer sheets provided to document your answers. Staple this cover sheet on top of the answer sheets. The passing grade requires a final grade of at least 80.00 percent. Examination papers will be collected four hours after the examination starts.

**Applicant Certification**

All work done on this examination is my own. I have neither given nor received aid.

\_\_\_\_\_  
Applicant's Signature

**Results**

Examination Value	_____ 100 _____ Points
Applicant's Score	_____ Points
Applicant's Grade	_____ Percent

**WATTS BAR**  
**SRO EXAMINATION**

1. Given the following plant conditions:

- The Unit is at 12% power.
- Control rods are in MANUAL.
- Turbine in "IMP IN" mode of control and load increase in progress.
- After rod withdrawal of several steps, the IN-HOLD-OUT lever is returned to the HOLD position.
- The OAC observes that the green RODS OUT light remains illuminated and outward rod motion continues.

Which ONE of the following actions is required, per AOI-2, "Rod Control System Malfunction?"

- a. Trip the Reactor and enter "E-0, Reactor Trip or Safety Injection."
- b. Place the Rod Bank Selector in AUTO and check for continued rod motion.
- c. Check for failed instruments and select or block appropriate instrument inputs.
- d. Place the IN-HOLD-OUT lever to the IN position and check for continued rod motion.

**WATTS BAR**  
**SRO EXAMINATION**

2. 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 increased reactor power.
- c. Withdraw rods manually to restore  $T_{avg}$  to program.
- d. Insert rods manually to decrease  $T_{avg}$  to program.

**WATTS BAR**  
**SRO EXAMINATION**

3. Given the following plant information:

- Plant was operating at 100% power when a control rod partially dropped into the core causing Axial Flux Difference (AFD) to exceed Tech Spec (doghouse) limits specified in the COLR.
- In accordance with Tech Specs the crew initiates actions to reduce power to < 50% in 30 minutes.

Which ONE of the following describes why this action is required?

- a. Ensures QPTR Tech Spec limits are not exceeded.
- b. Ensures the that penalty points accumulated when above the COLR limits (doghouse) do not exceed limits that would require plant shutdown.
- c. To prevent shielding of the NIs which would make trip setpoints non-conservative.
- d. To prevent exceeding heat flux hot channel limits due to the Xenon redistribution following a power change.

**WATTS BAR**  
**SRO EXAMINATION**

4. Which ONE of the following identifies the devices that must be set to ZERO prior to withdrawing a dropped rod in control bank "C"?
- a. Computer position indication for control bank C  
Step counters for control bank C  
P/A converter for control bank C
  - b. Step counters for control bank C  
P/A converter for control bank C  
Bank overlap counter
  - c. P/A converter for control bank C  
Bank overlap counter  
Computer position indication for control bank C
  - d. Bank overlap counter  
Computer position indication for control bank C  
Step counters for control bank C

**WATTS BAR**  
**SRO EXAMINATION**

5. When preparing to realign a misaligned control rod, which ONE of the following is performed prior to realigning the rod?
- a. Disconnect lift coil for the misaligned RCCA only.
  - b. Disconnect all lift coils in the affected bank, except for misaligned RCCA.
  - c. Disconnect movable gripper coil for the misaligned RCCA only.
  - d. Disconnect all movable gripper coils in the affected bank, except for misaligned RCCA.

**WATTS BAR**  
**SRO EXAMINATION**

6. Given the following plant conditions:

- Large LOCA occurred while the plant was operating at 100% power.
- All systems responded normally.
- It has been approximately 12 hours since operators aligned ECCS for cold leg recirculation.
- All ECCS pumps are in service.

Which ONE of the following correctly describes the current alignment for the RHR and SI pumps?

- a. One SI pump aligned to all hot legs, one RHR pump aligned to 1 & 3 hot legs.
- b. One SI pumps aligned to all hot legs, both RHR pumps aligned to 1 & 3 hot legs.
- c. Both SI pumps aligned to all hot legs, one RHR pump aligned to 1 & 3 hot legs
- d. Both SI pumps aligned to all hot legs, both RHR pumps aligned to 1 & 3 hot legs.

**WATTS BAR**  
**SRO EXAMINATION**

7. Which ONE of the following would cause the RHR/CVCS pipe break alarms to be LIT?
- a. Rupture of the Pressurizer Relief Tank.
  - b. Relief valve on RHR suction line open.
  - c. Letdown cntmt isolation valve, 1-FCV-62-77 leaking around valve stem.
  - d. Leak on the charging line on the outlet of the regenerative heat exchanger.

**WATTS BAR**  
**SRO EXAMINATION**

8. 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 increasing.

When terminating safety injection which ONE of the following identifies actions that result in a decrease 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.

**WATTS BAR**  
**SRO EXAMINATION**

9. Given the following:

- Reactor Coolant Pump #3 bearing temperature is approaching the alarm setpoint.
- RCS pressure is 850 psig
- #1 seal leakoff valve is open.
- #1 seal leakoff flowrate is 0.5 gpm.
- RCP seal injection flow is 7 gpm/pump.

Which ONE of the following conditions must exist before #1 seal leak-off bypass valve, 1-FCV-62-53, may be opened?

- a. Close #1 seal leak-off valves on all 4 RCPs.
- b. RCS pressure must be reduced to less than 500 psig.
- c. RCS pressure must be increased to greater than 1000 psig.
- d. Seal injection must be increased to greater than 8 gpm per pump.

**WATTS BAR**  
**SRO EXAMINATION**

10. Given the following conditions:

- Unit was operating at 100% full power when a total loss of offsite power occurred.
- Operators implemented E-O "Reactor Trip Or Safety Injection" and have transitioned to ES-0.1 "Reactor Trip Response".
- MSIVs were closed due to operator action.
- Hottest incore thermocouple is 595 °F and stable.
- Reactor coolant system pressure is 2235 psig and stable.
- Steam Generator pressures are as follows:  
SG #1 1070 psig; SG #2 1080 psig; SG #3 980 psig; SG #4 965 psig
- RCS cold leg temperatures are as follows:  
Loop #1 555 °F; Loop #2 556 °F, Loop #3 534 °F, Loop #4 542 °F

Which ONE of the following describes the present status of natural circulation flow?

- a. Exists in all loops.
- b. Exists in only loops 1 and 2.
- c. Exists in only loops 1, 2, and 3.
- d. Exists in only loops 1, 2, and 4.

**WATTS BAR**  
**SRO EXAMINATION**

11. Given the following plant conditions:

- Plant trip occurred during startup.
- The crew is performing ES-0.1, "Reactor Trip Response".
- Two control rods failed to fully insert into the core.
- The OAC has been directed to borate 6500 gallons.

Which ONE of the following describes the correct method to accomplish the boration using the preferred flowpath?

- a. Set the boric acid flow controller at 10% for 650 minutes.
- b. Set the boric acid flow controller at 50% for 325 minutes.
- c. Align the CCP suction to the RWST and establish charging flow at 65 gpm for 100 minutes.
- d. Align the CCP suction to the RWST and establish charging flow at 100 gpm for 65 minutes.

**WATTS BAR**  
**SRO EXAMINATION**

12. Given the following conditions:

- Plant operating at 100% RTP
- All systems in a normal alignment.
- C-S CCS pump trips due to a problem with it's supply breaker.

Which ONE of the following will meet the Tech Spec LCO requirements due to the CCS pump trip?

- a. Restore the C-S CCS pump to OPERABLE status within 7 days.
- b. Aligning the 1B-B CCS pump to supply Unit 1 Train B CCS within 72 hours.
- c. Place the 2B-B CCS pump in service to restore flows and pressure to normal.
- d. Align C-S pump to its alternate power supply through the manual transfer switch within 72 hours.

**WATTS BAR**  
**SRO EXAMINATION**

13. Given the following plant conditions:

- ATWS occurred while plant was at 100% power
- Operators implemented FR-S.1, Anticipated Trip Without Scram, and currently performing step 4, "Initiate RCS Boration".

Which ONE of the following is the reason that this step must be performed manually by the operator instead of through manual initiation of SI?

- a. Initiation of SI will isolate the flow path from the BAT to the CCP.
- b. Manual operator action provides the most direct boration flowpath to the core.
- c. Initiation of SI will cause isolation of normal charging and reduce the ability to inject boron.
- d. Manual operator action ensures a more rapid swapover of the CCP suction from the VCT to RWST.

**WATTS BAR**  
**SRO EXAMINATION**

14. When using a manual trip switch to trip the reactor in the event of an ATWS, which ONE of the following describes how the reactor trip breaker trip coils are affected?
- a. UV coils and shunt coils are de-energized.
  - b. UV coils are de-energized, the shunt coils are energized.
  - c. UV coils are de-energized, the shunt coils are unaffected.
  - d. UV coils are unaffected, the shunt coils are energized.

**WATTS BAR**  
**SRO EXAMINATION**

15. During the performance of ECA-2.1, "Uncontrolled Depressurization of All SGs", the crew is directed to MAINTAIN at least minimum detectable flow to each SG with NR level below 10%.

Which ONE of the following best describes the purpose for maintaining feed flow under those circumstances?

- a. Prevents thermal shock to the steam generator main feedwater nozzles.
- b. Ensures that dryout conditions and subsequent thermal stresses do not develop during SG blowdown.
- c. Ensures criteria for transition to FR-H.1, Loss of Secondary Heat Sink, not met during performance of ECA-2.1.
- d. Prevents stagnant loop formation so a PTS challenge does not occur due to the combined effects of RCS cooldown and ECCS injection.

**WATTS BAR**  
**SRO EXAMINATION**

16. FR-P.1, "Pressurized Thermal Shock", directs the operator to perform a "soak" if certain cooldown criteria is exceeded.

Which ONE of the following describes which parameter the operator uses to determine if the cooldown criteria is exceeded and what component the soak is protecting?

- a.  $T_{avg}$ ; reactor vessel.
- b.  $T_{cold}$ ; reactor vessel.
- c.  $T_{avg}$ ; steam generator tube sheet.
- d.  $T_{cold}$ ; steam generator tube sheet.

**WATTS BAR**  
**SRO EXAMINATION**

17. Given the following plant conditions:

- Plant was at 10% during a plant startup when a loss of condenser vacuum caused a turbine trip to occur.
- Steam Dump mode selector switch in STEAM PRESSURE mode.
- Condenser backpressure increased to 12 inches Hga.
- No component or instrumentation failures occurred.
- No operator action was taken.

Which ONE of the following describes the response of the Steam Dumps and SG PORVs during this event?

	<u>Steam Dumps</u>	<u>SG PORVs</u>
a.	Open	Open
b.	Open	Shut
c.	Shut	Open
d.	Shut	Shut

**WATTS BAR**  
**SRO EXAMINATION**

18. Which ONE of the following is a purpose of depressurizing all intact SGs to 300 psig during the performance of ECA-0.0, "Loss of Shutdown Power"?
- a. Reduces  $\Delta P$  across SG U-tubes to minimize possibility of tube rupture.
  - b. Reduces  $\Delta P$  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.

**WATTS BAR**  
**SRO EXAMINATION**

19. Given the following plant conditions:

- Plant was operating at 100% power when station a blackout occurred.
- Emergency Diesel Generators failed to restore power to the Shutdown Boards.
- Operating Crew has implemented ECA-0.0, "Loss of Shutdown Power"

Which ONE of the following correctly describes an action directed by ECA-0.0 to prevent automatic loading of equipment that starts on a Safety Injection?

- a. Place Safety Injection Equipment handswitches to STOP then back to A-AUTO.
- b. Place all 43TL switches to TEST then back to NORMAL.
- c. Manually reset the BOX and BOY relays.
- d. Actuate, then reset Safety Injection.

**WATTS BAR**  
**SRO EXAMINATION**

20. Given the following conditions:

- Plant is in Mode 3
- During performance of Control Building routine rounds the AUO discovers the 125V DC supply breaker to 120V AC Vital Inverter 1-II in the TRIPPED position.

Which ONE of the following describes the correct action which must be taken with regard to Tech Specs?

- a. Attempt to close the supply breaker one time, if the breaker can be closed, Tech Spec LCO action entry is NOT required.
- b. The Tech Spec LCO action for the inverter must be entered until the breaker can be closed.
- c. If the inverter is aligned to it's AC supply and the voltage is normal, Tech Spec LCO action entry is NOT required.
- d. If the inverter is aligned to it's AC supply and the voltage is normal, enter the appropriate Tech Spec LCO action for the inverter for tracking only until the breaker can be closed.

**WATTS BAR**  
**SRO EXAMINATION**

21. Given the following plant conditions:

- Plant is operating at 100%.
- All systems aligned normal.
- Loss ERCW Supply header 2A occurs due to a rupture in the yard.

Which ONE of the following describes indications the operator would see in the main control room in this event? (Assume no operator actions)

- a. Ice condenser chillers trip.
- b. Containment temperature increasing.
- c. General ventilation chillers trip.
- d. CCS surge tank level increasing with auto makeup valve closed.

**WATTS BAR**  
**SRO EXAMINATION**

22. Which ONE of the following choices describes the method used for verifying the position of a LOCKED and THROTTLED valve in a safety related flowpath?
- a. Independent verification must be conducted by two individuals at different times where the 1st must position the valve and the 2nd verifies locking mechanism installed.
  - b. Independent verification must be conducted by two individuals, one locally physically positions and locks the valve and the 2nd observes using remote indication in the control room.
  - c. Second party verification must be conducted by two individuals at the same time where one initially positions and locks the valve while the 2nd party observes.
  - d. Second party verification must be conducted by two individuals who will each position the valve to ensure correct positioning and then locked by the 2nd party.

**WATTS BAR**  
**SRO EXAMINATION**

23. Given the following plant conditions;

- LOCA occurred at 0200.
- Operating crew implemented the EOPs and are currently performing FR-Z.1.
- Swapover to the Containment Sump was performed at 0225.
- 1A-A CCP and 1A-A SIP are running.

Which ONE of the following represents conditions that would require RHR spray to be aligned to containment?

	<u>Cntmt Pressure</u>	<u>Time</u>
a.	13.5 psig	0235
b.	11.5 psig	0255
c.	10.5 psig	0325
d.	8.5 psig	0355

**WATTS BAR**  
**SRO EXAMINATION**

24. Given the following conditions:

- Crew has just transitioned to E-1 in response to a large break LOCA.
- RCS pressure is 325 psig.
- Highest core exit thermocouple is 1224°F.
- Containment pressure is 9 psig.
- All S/G levels offscale LOW.
- Total AFW flow is 225 gpm.

Which ONE of the following procedures should the crew implement to respond to this event?

- a. E-1, "Loss of Reactor or Secondary Coolant".
- b. FR-H.1, "Loss of Secondary Heat Sink".
- c. FR-Z.1, "High Containment Pressure".
- d. FR-C.1, "Inadequate Core Cooling".

**WATTS BAR**  
**SRO EXAMINATION**

25. Given the following conditions:

- Reactor trip has just occurred.
- Reactor trip breakers failed to open.
- Crew implemented FR-S.1.
- Local actions to open the reactor trip breakers were unsuccessful.
- Local actions to open the M/G set output breakers were successful.

Which ONE of the following would be the control rod indication 30 seconds after the M/G set output breakers were opened?

- a. RPIs indicate on bottom; rod bottom lights lit.
- b. RPIs indicate on bottom; rod bottoms lights NOT lit.
- c. RPIs indicate position prior to trip; rod bottom lights lit.
- d. RPIs indicate position prior to trip; rod bottoms lights NOT lit.

**WATTS BAR**  
**SRO EXAMINATION**

26. A Pressurizer Vapor-Space LOCA has occurred with the following conditions:

- ES-1.2, Post LOCA Cooldown and Depressurization is in progress.
- CCP A-A and SIPs A-A and B-B are in the injection mode.
- CCP B-B has been removed from service as SI reduction sequence continues.
- RCS subcooling is 86°F.
- Pressurizer (PZR) level is offscale high.

Which ONE of the following describes actions used to mitigate the effects of this event?

- a. Starting additional ECCS pumps to increase RCS pressure.
- b. Cool RCS with S/G PORVs thereby decreasing subcooling margin so other ECCS pumps can be removed.
- c. Decrease RCS pressure thereby decreasing break flow and increasing ECCS flow.
- d. Increase RCS temperature thereby increasing RCS inventory through thermal expansion.

**WATTS BAR**  
**SRO EXAMINATION**

27. Given the following plant conditions:

- Small LOCA has occurred.
- Operators have implemented the appropriate EOPs.
- RCS pressure is 1600 psig
- Contmt Spray pumps auto started.

Which ONE of the following is the primary process that provides core cooling for the given conditions?

- a. Reflux boiling in the RCS due to cooling in the SGs.
- b. Natural circulation in the RCS and cooling via SG PORVs.
- c. Coolant flowing out of the break allowing ECCS to cool the core.
- d. Forced RCS circulation through SGs and cooling using SG PORVs.

**WATTS BAR**  
**SRO EXAMINATION**

28. Given the following:

- Reactor trip and SI occurred due to a small break LOCA.
- Crew progressed through the EOPs to the point of resetting SI and stopping the RHR pumps.
- RCS pressure is 1600 psig and stable.
- RCS saturated.
- Pzr level offscale low.

Which ONE of the following identifies when the RHR pumps would be required to be restarted during this event?

- a. Foldout page SI reinitiation criteria is met.
- b. RCS pressure decreases to 370 psig.
- c. RCS pressure decreases to 150 psig.
- d. Offsite power is lost and shutdown boards energized by DG.

**WATTS BAR**  
**SRO EXAMINATION**

29. Given the following plant conditions:

- Small LOCA caused reactor trip and safety injection.
- All systems responded as designed.
- The operating crew has implemented E-1, "Loss of Reactor or Secondary Coolant".

Which ONE of the following best describes the conditions which would warrant transition to ES-1.2, "Post LOCA Cooldown and Depressurization".

- a. RCS pressure less than the shutoff head of the RHR pumps and SI termination criteria met.
- b. RCS pressure less than the shutoff head of the RHR pumps and SI termination criteria not met.
- c. RCS pressure greater than the shutoff head of the RHR pumps and SI termination criteria met.
- d. RCS pressure greater than the shutoff head of the RHR pumps and SI termination criteria not met.

**WATTS BAR**  
**SRO EXAMINATION**

30. With the unit at 100% power, an inadvertent operation resulted in 1-HS-74-33A, RHR HX A OUTLET XTIE valve, being closed.

Which ONE of the following conditions is required?

- a. Both trains of ECCS must be declared inoperable because neither RHR pump can inject into all 4 cold legs.
- b. Both trains of ECCS must be declared inoperable because containment sump recirculation cannot be established with this valve closed.
- c. One train of ECCS must be declared inoperable because the A train RHR pump cannot inject into all 4 cold legs.
- d. One train of ECCS must be declared inoperable because the A train RHR pump cannot supply suction to 1A-A CCP and SIP during containment sump recirculation.

**WATTS BAR**  
**SRO EXAMINATION**

31. Given the following plant conditions:

- Plant in Mode 5.
- RCS temperature 175°F.
- RCS pressure 325 psig.
- Train A RHR in service, Train B RHR tagged out for repairs.

Which ONE of the following is the preferred method of core cooling in the event a Loss of RHR Shutdown Cooling occurs?

- a. Actuate Safety Injection, spill through the PZR PORVs.
- b. Normal charging to RCS, spill through the PZR PORVs.
- c. Natural or forced RCS flow with Secondary Heat Sink established.
- d. Reflux cooling via any SG with level  $\geq$  10% NR level.

**WATTS BAR**  
**SRO EXAMINATION**

32. Given the following plant conditions:

- Plant is operating at 100% power.
- Tavg at 588.2°F and RCS pressure at 2235 psig.
- Rod control is in MANUAL.
- Average core exit thermocouples indicates 620°F.

Which ONE of the following would INCREASE RCS subcooling?

- a. Loop 2 Pzr spray valve fails partially open.
- b. EHC circuit failure causes #4 governor valve to fail closed.
- c. Pzr pressure control failure causes all backup heaters to energize.
- d. VCT makeup control failure causes inadvertent dilution of the RCS.

**WATTS BAR**  
**SRO EXAMINATION**

33. With the plant in Mode 5, which ONE of the following would result in a loss of BOTH Source Range Monitors (SRM)?
- a. Loss of 120V Vital Inverters 1-I and 1-III.
  - b. Operator places both SRM Block Switches to BLOCK.
  - c. Instrument Maintenance Tech Removes control power fuses for BOTH IRMs.
  - d. Instrument Maintenance Tech places BOTH SSPS trains Input Error Inhibit Test switches to INHIBIT.

**WATTS BAR**  
**SRO EXAMINATION**

34. Given the following:

- Plant is at 30% power.
- Startup is in progress.

Which ONE of the following would be required of the operating crew if 1-NI-92-136 failed high?

- a. Ensure reactor trip and implement E-0, "Reactor Trip Response".
- b. Stop any positive reactivity changes until the instrument is repaired
- c. Startup may continue, place the failed channel Level Trip Switch to BYPASS.
- d. Reduce power to  $< 10\%$  and place the failed channel Level Trip Switch to BYPASS.

**WATTS BAR**  
**SRO EXAMINATION**

35. Given the following plant conditions:

- SG tube leak has occurred on loop 3 SG.
- Loop 3 SG pressure = 1035 psig.
- The operating crew implemented AOI-33, "Steam Generator Tube Leak" up to the point of initiating RCS cooldown.
- The plant has been placed in Hot Standby with Tavg stable at 557°F.

Using the Leaking SG Pressure vs. Target Incore Temperature table (attached) from AOI-33, determine the actual subcooling that will exist when the RCS cooldown and depressurization is terminated.

- a. 58°F subcooling.
- b. 60°F subcooling.
- c. 68°F subcooling.
- d. 70°F subcooling.

**WATTS BAR**  
**SRO EXAMINATION**

36. Given the following plant conditions:

- Unit operating at 100% power with transient in progress
- Pressurizer level is decreasing with maximum charging established
- No indication of failed fuel

Which ONE of the following would provide indication that a Steam Generator Tube Rupture is in progress?

- a. Vacuum Pump Exhaust Rad Monitor  
SG Discharge Rad Monitor  
Feed flow/steam flow mismatch
- b. Vacuum Pump Exhaust Rad Monitor  
SG Blowdown Rad Monitor  
Feed flow/steam flow mismatch
- c. SG Discharge Rad Monitor  
Vacuum Pump Exhaust Rad Monitor  
SG Blowdown Rad Monitor
- d. SG Discharge Rad Monitor  
Feed flow/steam flow mismatch  
SG Blowdown Rad Monitor

**WATTS BAR**  
**SRO EXAMINATION**

37. Given the following plant conditions:

- Plant is operating at 90% power.
- MFP speed controller, 1-PC-3-20, is in MANUAL due to a problem on feedwater header pressure transmitter 1-PT-3-1.
- BOTH MFP speed controllers, 1-SIC-3-20A and 1-SIC-3-20B, are in AUTO.
- The MFP  $\Delta P$  is on program.
- The Standby MFP is out of service for maintenance.

If MFP 1B tripped and turbine load was reduced in accordance with the AOI, which ONE of the following identifies the correct plant responses and operator actions?

- a. MFP 1A speed would automatically increase.  
MFP 1B recirculation valve would automatically close.  
MFP 1B condenser inlet and outlet MOVs must be manually closed.
- b. MFP 1A speed would automatically increase.  
MFP 1B recirculation valve must be manually closed.  
MFP 1B condenser inlet and outlet MOVs would automatically close.
- c. MFP 1A speed must be manually increased.  
MFP 1B recirculation valve would automatically close.  
MFP 1B condenser inlet and outlet MOVs must be manually closed.
- d. MFP 1A speed must be manually increased.  
MFP 1B recirculation valve must be manually closed.  
MFP 1B condenser inlet and outlet MOVs would automatically close.

**WATTS BAR**  
**SRO EXAMINATION**

38. 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 feed and bleed.
- Manual Safety Injection was initiated and when the operator attempted to open the pressurizer PORVs, PCV-68-334 failed to open.

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

- a. Verify PORV, 1-PCV-68-340, 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.
- b. Open the reactor head vents to reduce RCS pressure since one pressurizer PORV may not provide sufficient heat removal capacity.
- c. Close any open Pzr PORV to conserve RCS inventory and return to the steps to re-establish Main Feedwater.
- d. Stop one Centrifugal Charging Pump to reduce loss of inventory through PORVs.

**WATTS BAR**  
**SRO EXAMINATION**

39. If the normal supply breaker on the 250V Battery Board 1 feeding the 250V Turbine Bldg Dist Bd 1 were to be inadvertently opened, which ONE of the following conditions would occur or be required? (Assume Mode 3 and all systems in normal alignment)
- a. 250V Turb Bldg Dist Bd 1 would have to be manually transferred to it's Alternate Feed and control power to the 6.9KV Boards supplied from Dist Bd 1 would have to be manually restored.
  - b. 250V Turb Bldg Dist Bd 1 would automatically transfer to its Alternate Feed and control power to the 6.9KV Boards supplied from Dist Bd 1 would remain energized.
  - c. 250V Turb Bldg Dist Bd 1 would have to be manually transferred to it's Alternate Feed but control power for the 6.9KV Boards supplied from Dist Bd 1 would have automatically transferred to it's alternate supply.
  - d. 250V Turb Bldg Dist Bd 1 would automatically transfer to it's Alternate Feed but the control power to the 6.9KV Boards supplied from Dist Bd 1 would be deenergized.

**WATTS BAR**  
**SRO EXAMINATION**

40. Chem lab reported to the Shift Manager that due to an error in release time and isotopic analysis, the Appendix B limits of 10 CFR 20 had been exceeded by 25 times the limiting concentration during a gas decay tank release.

Which ONE of the following identifies the correct NRC reporting requirement?

- a. 1 hour notification.
- b. 4 hour notification.
- c. 24 hour notification.
- d. 2 day notification.

**WATTS BAR**  
**SRO EXAMINATION**

41. Given the following plant conditions:

- Unit is operating at 100% RTP.
- 1-XS-68-339E is selected to the LI-68-339 & 335 position.
- LT-68-339 failed to a constant output equivalent to 30% level.
- All other systems are operating normally.

Assuming NO operator action which ONE of the following describes the plant response to this failure?

- a. Low level deviation alarm would actuate but ACTUAL Pressurizer level would remain on setpoint.
- b. Charging would decrease causing Pressurizer level to decrease until Letdown isolates.
- c. Charging flow would increase resulting in a reactor trip on high Pressurizer level.
- d. Backup heaters would energize due to a level deviation of 5% from setpoint.

**WATTS BAR**  
**SRO EXAMINATION**

42. Which ONE of the following describes a safety feature of the Refueling Machine designed to prevent the accidental release of a fuel assembly?
- a. Gripper is mechanically engaged and disengaged by remote operating handle on bridge and requires no power or air to operate.
  - b. Gripper requires air to disengage and mechanical backup prevents gripper release under load even if air was applied.
  - c. Gripper disengages upon loss of air however a mechanical latch on the gripper prevents release.
  - d. When gripper is engaged, operators mechanically lock gripper in place with tube extension shaft which must be unlocked before gripper can release.

**WATTS BAR**  
**SRO EXAMINATION**

43. Given the following plant conditions:

- Plant is operating at 100% power when a loss of offsite power occurs.
- Emergency diesel generators start and re-energize the 6.9KV shutdown boards.

Which ONE of the following describes how the Main Control Room chillers and associated air handling units respond during this event?

- a. The air handling units restart when power is restored and the MCR chillers automatically sequence back on after a time delay.
- b. The air handling units must be manually restarted, then the MCR chillers can automatically sequence back on.
- c. MCR chillers and air handling units must both be manually restarted after power is restored.
- d. MCR chillers must be manually restarted after the air handling units automatically sequence back on after a time delay.

**WATTS BAR**  
**SRO EXAMINATION**

44. Given the following:

- Plant is at 25% power.
- The 480V Common Emergency Transformer is tagged out for maintenance.
- All other systems/components aligned normal.
- 1B 6.9 KV Unit board de-energizes due to a faulty relay operation.

Which ONE of the following describes the effect this event will have on the CRD M/G sets?

- a. Only 1A CRD M/G set running.
- b. Only 1B CRD M/G set running.
- c. Both CRD M/G sets running.
- d. No CRD M/G sets running.

**WATTS BAR**  
**SRO EXAMINATION**

45. Given the following plant conditions:

- Plant is operating at 95% power steady state at EOL.
- Engineering requested rods to be placed in Bank Select and inserted 15 steps to obtain data on B Bank rod worth.

Which ONE of the following should be the Unit Supervisor's response to this request?

- a. Test performance should not be allowed, the test places the plant in a Tech Spec LCO.
- b. Test performance should not be allowed until the reactor power can be reduced to < 50%.
- c. Test performance should not be allowed until a MACR (Manager Assigned Continuous Responsibility) is present.
- d. Test performance should not be allowed until the bank overlap and P/A converter counter settings are recorded to ensure the counters can be returned to normal following the test.

**WATTS BAR**  
**SRO EXAMINATION**

46. Given the following plant conditions:

- Unit was operating at 40% power when the #4 Reactor Coolant Pump (RCP) lower bearing temperature began to steadily increase.
- Power was reduced to 8% and the #4 RCP stopped.

Which ONE of the following statements identifies the operator response necessary to control level in #4 steam generator (SG) when the RCP was stopped?

- a. Feedwater flow to #4 SG will be controlled by the MFW reg valve and will be greater than the flow to the other 3 SGs.
- b. Feedwater flow to the #4 SG will be controlled by the MFW reg valve and will be less than the flow to the other 3 SGs.
- c. Feedwater flow to the #4 SG will be controlled by the MFW bypass reg valve and will be greater than the flow to the other 3 SGs.
- d. Feedwater flow to the #4 SG will be controlled by the MFW bypass reg valve and will be less than the flow to the other 3 SGs.

**WATTS BAR**  
**SRO EXAMINATION**

47. During plant startup the operator inadvertently stopped RCP #4 when he attempted to stop the oil pump.

Which ONE of the following states the earliest that the RCP may be restarted?

- a. 1 hour after being stopped.
- b. 30 minutes after being stopped.
- c. 5 minutes after being stopped.
- d. May be restarted immediately.

**WATTS BAR**  
**SRO EXAMINATION**

48. Which ONE of the following explains why 1-PCV-62-120, Volume Control Tank H<sub>2</sub> Supply Press Control, is adjusted to maintain Volume Control Tank (VCT) hydrogen pressure between 15 psig and 30 psig when the plant is at power?
- a. Ensures adequate NPSH for the CCPs if both start simultaneously.
  - b. Provides backpressure in CCP miniflow line to prevent excessive flow.
  - c. Provides backpressure to the #2 RCP seal to ensure adequate flow to #3 seal.
  - d. Ensures Hydrogen concentration in the RCS controlled at 35-50 cc/kg for oxygen scavenging.

**WATTS BAR**  
**SRO EXAMINATION**

49. 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 its 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 and Safety Injection  
Pzr PORV, 1-PCV-68-340 opens.
- b. Reactor trip but NO Safety Injection  
Pzr PORV, 1-PCV-68-340 opens.
- c. Reactor trip and Safety Injection  
Pzr PORV, 1-PCV-68-340 remains closed.
- d. Reactor trip, but NO Safety Injection  
Pzr PORV, 1-PCV-68-340 remains closed

**WATTS BAR**  
**SRO EXAMINATION**

50. Given the following plant conditions:

- Plant operating at 100% power.
- Power range channel NI-43 failed LOW.
- Operators implemented AOI-4, "Nuclear Instrumentation Malfunction", to remove the failed channel from service and trip associated bistables.

After the failure, which ONE of the following represents the high power trip logic for the remaining channels both BEFORE and AFTER the failed instrument was removed from service and associated bistables tripped?

	<u>BEFORE</u>	<u>AFTER</u>
a.	1/3	1/3
b.	1/3	2/3
c.	2/3	1/3
d.	2/3	2/3

**WATTS BAR**  
**SRO EXAMINATION**

51. Which ONE of the following describes where individual incore thermocouple indications may be displayed?
- a. Plant computer and RVLIS display.
  - b. Plant computer and incore detector display panel.
  - c. RVLIS display and incore detector display panel.
  - d. RVLIS display and RVLIS recorders on M-4 and M-6.

**WATTS BAR**  
**SRO EXAMINATION**

52. Given the following plant conditions:

- Unit at 100% RTP.
- 1 A-A, B-B, and C-A Lower Compartment Coolers running in A-AUTO.
- 1 D-B Lower Compartment Cooler off in A-P AUTO.

Which One of the following would occur if the TCV for Lower Compartment Cooler 1A-A fails to the closed position?

- a. Containment temperature would increase causing TCVs for the running coolers to open more.
- b. Lower Compartment Cooler 1 D-B would start due to the increase in lower containment temperature.
- c. Lower Compartment Cooler 1 D-B would start due to the low ERCW flow through Lower Compartment Cooler 1 A-A.
- d. Lower Compartment Cooler 1A-A trips due to low ERCW flow and auto starts Lower Compartment Cooler 1 D-B.

**WATTS BAR**  
**SRO EXAMINATION**

53. Which ONE of the following describes the function of the Containment Air Return Fans during a LOCA?
- a. Moves air from the upper containment to the suction of EGTS to enhance cleanup.
  - b. Ensures  $\Delta P$  between upper and lower containment is maintained to force air and steam through the Ice Condenser.
  - c. Recirculates air between upper Containment and the annulus to prevent flammable hydrogen concentration from collecting in either area.
  - d. Maintains positive closing pressure on Ice Condenser backdraft dampers to prevent reverse flow through ice condenser.

**WATTS BAR**  
**SRO EXAMINATION**

54. Which ONE of the following lists 2 conditions that will directly cause a glycol circulating pump to trip?
- a. Low expansion tank level.  
Low glycol temperature.
  - b. Low expansion tank level.  
High discharge pressure.
  - c. Low suction pressure.  
High discharge pressure.
  - d. Low suction pressure.  
Low glycol temperature.

**WATTS BAR NUCLEAR**  
**SRO EXAMINATION**

55

71. Given the following plant conditions and time line:

- 1200 - LOCA in progress.
- 1200 - RCS pressure is 1800 psig and decreasing.
- 1206 - Contmt pressure is 1.5 psig.
- 1206 - Loss of offsite power occurred just as the crew completed the immediate operator actions of E-0.
- 1207 - Contmt pressure is 3.1 psig.
- 1207 - RCS pressure is 1400 psig and decreasing.

Which ONE of the following describes the status of the Containment Spray (CS) system 2 minutes after the Emergency Diesel Generators restored power to their respective shutdown boards?

- CS pumps RUNNING; spray header isolation valves CLOSED.
- CS pumps RUNNING; spray header isolation valves OPEN.
- CS pumps OFF; spray header isolation valves CLOSED.
- CS pumps OFF; spray header isolation valves OPEN.

Question Modified

7:55 am on 4/9/99

Per teleconference

w/ T. Newman

& P. Steiner

RO SRO  
71/55

**WATTS BAR**  
**SRO EXAMINATION**

56. Given the following plant conditions:

- Plant is operating at 30% power.
- An instrument air line leak caused #3 SG Main Feedwater reg valve to close.
- Level in #3 SG decreased to 16% NR.
- Operators stopped the air leak and restored SG level thereby preventing reactor trip.

Which ONE of the following indicates the status of the Auxiliary Feedwater (AFW) pumps?

- a. No AFW pumps running.
- b. All AFW pumps running.
- c. Only the TDAFW pump running
- d. Both MDAFW pumps running.

**WATTS BAR**  
**SRO EXAMINATION**

57. Given the following conditions:

- Plant startup in progress.
- Tavg is being maintained at 557°F by Steam dumps.
- Operators are preparing to take the reactor critical.
- Standby Main Feedwater Pump in service supplying the SGs.

Which ONE of the following is the reason why a Condensate Booster Pump should NOT be operated at this time?

- a. To prevent overfeeding steam generators.
- b. To prevent lifting the high pressure feedwater heater relief valves.
- c. To prevent overpressurization and damage to the SG's feedwater preheat section.
- d. To prevent overpressurization and damage to the Standby Main Feedwater Pump suction piping.

**WATTS BAR**  
**SRO EXAMINATION**

58. Given the following plant conditions:

- Plant is operating at 100% power.
- 1A-A AFW pump running for flow test with AUX FEEDWATER PMP 1A-A RECIRC, 1-FCV-3-355A, OPEN to the CST for a pump performance test.
- Reactor trip occurs.

Which ONE of the following describes the effect on the 1A-A AFW pump recirc valve?

- a. Recirc valve remains open providing miniflow protection.
- b. Recirc valve closes, however the operator could reopen it after 5 seconds.
- c. Recirc valve must automatically close within 5 seconds or the pump will trip.
- d. Recirc valve closes and cannot be reopened until after the accident start signal is reset.

**WATTS BAR**  
**SRO EXAMINATION**

59. Given the following conditions:

- Unit at 100% RTP.
- 1A-A AFW Pump running on recirculation for a surveillance instruction.
- A power spike causes the loss of annunciators for panel 1-M-2 which prevents the CST A HI/LO and LO/LO level alarms from functioning.
- The crew is conducting additional board surveillance.
- The remaining annunciator panels are functioning properly.

Which ONE of the following would indicate to the operators if an swapover of the AFW Pump suction to ERCW occurred automatically?

- a. ERCW valve position indication on 1-M-3.
- b. High flow indication on ERCW supply header on 0-M-27.
- c. High AFW pump discharge pressure indicated on 1-M-4.
- d. CST level indication decreasing on 1-M-2.

**WATTS BAR**  
**SRO EXAMINATION**

60. Given the following:

- Plant operating at 100% power.
- Reactor Coolant Drain Tank (RCDT) aligned to the Holdup Tank (HUT).
- Excess letdown in service to the RCDT to repair leak on the normal letdown piping.

Which ONE of the following occurs if RCDT radiation monitor, 1-RM-90-275, RCDT, reaches the alarm setpoint?

- a. Isolates PRT drain to the RCDT.
- b. Isolates the RCDT pumps discharge.
- c. Realigns excess letdown from RCDT to VCT.
- d. Realigns discharge of the RCDT pumps from the Holdup Tank to Tritiated Drain Collector Tank.

**WATTS BAR**  
**SRO EXAMINATION**

61. Which ONE of the following correctly describes the dilution flowpath and release point during a normal Waste Gas Decay Tank release?
- a. Train A ABGTS through the Unit 1 Shield Building vent.
  - b. Train A EGTS through the Unit 1 Shield Building vent.
  - c. CNTMT Annulus Vacuum Fans through the Auxiliary Building vent.
  - d. Auxiliary Building General Supply Fans through the Auxiliary Building vent.

**WATTS BAR**  
**SRO EXAMINATION**

62. Given the following plant conditions:

- Plant is in MODE 6 with refueling in progress.
- During movement of an irradiated fuel assembly from the core it is dropped and severely damaged.
- The containment airborne radioactivity increases.

Which ONE of the following describes the ESF actuation that would occur?

- a. Phase A Containment Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- b. Phase A Containment Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.
- c. Containment Vent Isolation from high radiation detected by upper containment radiation monitor, 1-RM-90-112.
- d. Containment Vent Isolation from high radiation detected by Containment Purge Exhaust radiation monitor, 1-RM-90-130.

**WATTS BAR**  
**SRO EXAMINATION**

63. Given the following;

- Plant is in mode 5, post refueling.
- Plant is preparing for a vacuum refill of the RCS following a drain down.

Which ONE of the following identifies the 2 parameters that are used to determine the maximum vacuum to be drawn on the RCS?

- a. Charging flowrate; PRT level.
- b. Charging flowrate; RCS temperature.
- c. RHR flowrate; PRT level.
- d. RHR flowrate; RCS temperature.

**WATTS BAR**  
**SRO EXAMINATION**

64. Given the following plant conditions:

- Rx trip/SI due to a large break LOCA.
- Phase B actuated.
- RCS pressure is 25 psig and decreasing.
- Incore temperature is 265°F.
- 1B-B RHR tripped from OC relay actuation when SI Actuated.
- RWST level is 33%.
- RVLIS levels indicate 43%.
- Containment sump level is 60%.
- Crew is currently in E-1, Loss of Reactor or Secondary Coolant.

Which ONE of the following actions would be required of the crew to perform?

- a. Transition to FRC-2, Degraded Core Cooling.
- b. Remain in E-1, Loss of Reactor or Secondary Coolant.
- c. Transition to ECA-1.1, Loss of RHR Sump Recirculation.
- d. Transition to ES-1.3, Transfer to RHR Containment Sump.

**WATTS BAR**  
**SRO EXAMINATION**

65. Given the following:

- Plant is operating at 100% RTP.
- CLA #4 check valves have continuous seat leakage of approximately 0.6 gpm.
- Assume no operator actions taken.

Which ONE of the following identifies the effect of this check valve leakage on the Cold Leg Accumulator (CLA)?

- a. Decrease in the CLA level and nitrogen pressure.
- b. Decrease in the CLA boron concentration and increase in level.
- c. Decrease in the CLA boron concentration and decrease in level.
- d. Increase in the CLA boron concentration and increase in nitrogen pressure.

**WATTS BAR**  
**SRO EXAMINATION**

66. Which ONE of the following explains the reason for maintaining a small amount of flow through the PZR spray bypass line?
- a. Reduces the differential pressure across the PZR spray valve to ensure it can open upon demand.
  - b. Provides a small amount of flow from the PZR surge line through the PZR to keep the surge line cool.
  - c. Maintains small amount of spray to ensure control heaters are on to minimize  $\Delta T$  between liquid and vapor space.
  - d. Provides a small flow through the spray line to prevent thermal shock when the spray valve opens.

**WATTS BAR**  
**SRO EXAMINATION**

67. Given the following plant conditions:

- Plant cooldown in progress with RCS temperature at 425°F.
- Pzr level at 70% and increasing.
- GO-6 directs the operator to bypass the pneumatic flow limiter for 1-FCV-62-93, Charging Flow Control.

Which ONE of the following describes why the flow limiter is bypassed at this time?

- a. Allows the operator to reduce charging flow to prevent overfilling the Pzr as plant cooldown is continued.
- b. Allows the operator to reduce charging flow in order to prevent excessive flow from potentially damaging RCP seals.
- c. Allows the operator to increase charging flow in order to cool letdown flow when all orifices are in service.
- d. Allows the operator to increase charging flow in order to fill the Pzr to solid conditions during the plant shutdown.

**WATTS BAR**  
**SRO EXAMINATION**

68. Given the following plant conditions:

- Unit is operating at 100% RTP
- All control systems are in AUTOMATIC except rod control, which is in MANUAL.

Which ONE of the following events will cause Loop 1 Overtemperature delta-T (OTΔT) trip setpoint to DECREASE?

- a. Loop 1 T-avg output unit failed HIGH.
- b. Pressurizer pressure increased by 20 psig.
- c. Loop 1 Reactor Coolant flow indication failed HIGH.
- d. Reactor power decreased to 50% while maintaining Tavg on program.

**WATTS BAR**  
**SRO EXAMINATION**

69. Which ONE of the following describes how Main Control Room instruments being supplied from an Eagle rack in the Aux Instrument room will indicate if a fuse blows in the power supply to the panel?
- a. Indicates last value prior to loss of power.
  - b. Indicates bottom of scale
  - c. Indicates top of scale.
  - d. Indicates mid scale.

**WATTS BAR**  
**SRO EXAMINATION**

70. Which ONE of the following explains the purpose of the charcoal adsorber beds in the Emergency Gas Treatment System (EGTS) filter banks?
- a. Reduces the levels of radioactive xenon gas.
  - b. Facilitates the removal of organic and inorganic iodine.
  - c. Neutralize the acidity caused by moisture drawn into the filter units
  - d. Ensures adsorption of particulates which may contain radioactive nuclides.

**WATTS BAR**  
**SRO EXAMINATION**

71. Given the following plant conditions:

- The plant has suffered a LOCA.
- "A" Hydrogen Recombiner has been placed in service.
- "B" Hydrogen recombiner has faulty thermocouples and is tagged out.
- Subsequently the breaker for the "A" Hydrogen Recombiner trips on overcurrent due to a short in the recombiner heaters.

Which ONE of the following indicates how the concentration of hydrogen will be controlled inside containment?

- a. Containment Purge air cleanup units may be used to remove hydrogen and recirculate their discharge back to containment.
- b. Lower containment coolers condense steam from containment creating a recombination effect of the hydrogen and steam.
- c. Air Return Fans create a mixing effect and the hydrogen igniters will burn hydrogen to maintain it below an explosive concentration.
- d. Emergency Gas Treatment System will remove hydrogen which collects in the containment dome and discharges to the shield building vent.

**WATTS BAR**  
**SRO EXAMINATION**

72. Given the following plant conditions:

- Plant shutdown in progress.
- All shutdown and control rods are inserted.
- Source Range High Flux at Shutdown Alarm has been unblocked.

Which ONE of the following describes how the Source Range High Flux at Shutdown Alarm setpoint is adjusted during plant shutdown?

- a. Adjusted by the operator by depressing the reset button on the Shutdown monitor.
- b. Adjusted automatically as the background countrate decreases.
- c. Adjustment performed by Instrument Maintenance every 4 hours according to the background countrate.
- d. Adjustment of the setpoint is not required as long as background countrate is decreasing.

**WATTS BAR**  
**SRO EXAMINATION**

73. Given the following plant conditions:

- Station Blackout has occurred.
- Emergency Diesel Generators have restored voltage to the shutdown boards.
- The Spent Fuel Pit (SFP) Pump/Thermal Barrier Booster Pump (TBBP) space coolers control switches are in AUTO.

Which ONE of the following statements describes the starting sequence of the SFP pumps and SFP Pump/TBBP Pump space coolers after power is restored to the shutdown boards?

- a. SFP pumps start automatically.  
Coolers restart automatically if area temperature > 95°F.
- b. SFP pumps must be manually started .  
Coolers restart automatically if area temperature > 95°F.
- c. SFP pumps start automatically.  
Coolers must be manually started.
- d. SFP pumps must be manually started.  
Coolers must be manually started.

**WATTS BAR**  
**SRO EXAMINATION**

74. 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  $T_{avg}$  = initial  $T_{avg}$  and final power = initial power.
- b. Final  $T_{avg}$  = initial  $T_{avg}$  and final power > initial power.
- c. Final  $T_{avg}$  < initial  $T_{avg}$  and final power = initial power.
- d. Final  $T_{avg}$  < initial  $T_{avg}$  and final power > initial power.

**WATTS BAR**  
**SRO EXAMINATION**

75. Given the following plant conditions:

- Plant is responding to a Station Blackout.
- A fault occurred on the DG 1A-A 125V battery charger causing it to be unavailable.

What effect will the loss of the battery charger have on DG 1A-A?

- a. The Diesel will NOT start.
- b. The Diesel will start and run normally.
- c. The Diesel will start and run for approximately 30 minutes.
- d. The Diesel will start but the generator breaker will NOT close.

**WATTS BAR**  
**SRO EXAMINATION**

76. Which ONE of the following identifies the design capacity of the Emergency Diesel Generator (DG) air start receivers?
- a. Five successive start attempts on the DG without recharging the air start receiver(s).
  - b. Five successive start attempts on the DG provided the air compressors auto start to recharge the system during the start attempts.
  - c. Seven successive start attempts on the DG without recharging the air start receiver(s).
  - d. Seven successive start attempts on the DG provided the air compressors auto start to recharge the system during the start attempts.

**WATTS BAR**  
**SRO EXAMINATION**

77. Given the following conditions:

- Radwaste AUO is in the process of making a liquid radwaste release from the monitor tank.
- 1-RM-90-122, WDS Liquid Effluent, radiation monitor has just been placed in service.
- The release flowrate has been adjusted with 1-ISV-77-660, Cooling Tower Blowdown Release Header Isol.
- Effluent radiation levels increased sharply and caused a high radiation alarm on 1-RM-90-122.

Which ONE of the following actions would occur?

- a. Automatic isolation of 0-RCV-77-43, Cooling Tower Blowdown Radiation Release Control, to terminate the release.
- b. Automatic isolation of the cooling tower blowdown diffuser valves, 1-FCV-27-100 and 101, which will route the effluent to the holding pond.
- c. 1-RM-90-122 alarms on the local radwaste panel, O-L-2, the release will continue until the AUO manually isolates 1-ISV-77-660, Cooling Tower Blowdown Release Header Isol.
- d. 1-RM-90-122 alarms in the Main Control Room and requires the operator to manually isolate cooling tower blowdown diffuser valves, 1-FCV-27-100 and 101, which route the radwaste release to the holding pond.

**WATTS BAR**  
**SRO EXAMINATION**

78. Given the following plant conditions:

- Unit at 100% RTP
- 1A CCW Pump trips on overcurrent

Which ONE of the following would result from the pump trip?

- a. Increasing condensate depression.
- b. Increasing condenser hotwell level.
- c. Decreasing condenser back pressure.
- d. Decreasing generator megawatt load.

**WATTS BAR**  
**SRO EXAMINATION**

79. A maintenance worker calls 3911 from a telephone in the turbine building to report a fire on Elevation 729. The call is answer by an operator in the MCR.

Which ONE of the following is correct concerning the Fire Alarm?

- a. The alarm will sound AUTOMATICALLY when the call is placed via the 3911 number and the operator can stop the alarm MANUALLY using a pushbutton on the MCR operator desk.
- b. The alarm will sound AUTOMATICALLY when the call is placed via the 3911 number and will stop AUTOMATICALLY after 3 minutes.
- c. The alarm must be MANUALLY initiated by using a pushbutton on the MCR operator desk and it will stop AUTOMATICALLY after 3 minutes.
- d. The alarm must be MANUALLY initiated and stopped by using a pushbutton on the MCR operator desk.

**WATTS BAR**  
**SRO EXAMINATION**

80. Given the following plant conditions;

- LOCA in progress.
- Crew has implemented the EOPs and is currently performing ES-1.3, "Transfer to Containment Sump".
- Automatic switchover to the Containment Sump is being verified in accordance with the procedure.
- The STA reports the following regarding status trees:
  - FRC - Orange
  - FRH - Green
  - FRI - Green
  - FRP - Green
  - FRS - Green
  - FRZ - Orange

Which ONE of the following describes the correct crew response?

- a. Stop performance of ES-1.3; Transition to FR-C.1.
- b. Stop performance of ES-1.3; Transition to FR-Z.1.
- c. Continue performance of ES-1.3; When transfer sequence is complete, implement FR-C.1.
- d. Continue performance of ES-1.3; When transfer sequence is complete, implement FR-Z.1.

**WATTS BAR**  
**SRO EXAMINATION**

81. Which ONE of the following describes the minimum temperature that would require the operator to initiate cooling of the Pressurizer Relief Tank (PRT) and how cooling would be accomplished?
- a. 120°F; Open 1-FCV-68-301, PRT VENT TO WDS HDR.
  - b. 112°F; Open 1-FCV-68-301, PRT VENT TO WDS HDR.
  - c. 120°F; Open 1-FCV-68-303, PRI WATER TO PRT.
  - d. 112°F; Open 1-FCV-68-303, PRI WATER TO PRT.

**WATTS BAR**  
**SRO EXAMINATION**

82. Why is it required to verify both power supply circuit breakers OPEN prior to operating the C-S CCS pump manual power supply manual throw-over switch?
- a. To maintain separation of the two trains.
  - b. To prevent possible damage to the pump motor.
  - c. The switch is not rated for operation under load.
  - d. The throw-over switch is interlocked to prevent operation with either breaker closed.

**WATTS BAR**  
**SRO EXAMINATION**

83. Given the following plant conditions:

- Reactor power is 40%.
- Rod Control is in MANUAL.
- Turbine trip occurs due to low EHC pressure.
- #3 SG PORV opens fully at the trip due to a controller problem and fails to reclose.

Which ONE of the following describes the final steady-state condition of the Steam Dumps and RCS Tavg? (assume no operator actions are taken)

- a. Steam dumps closed with Tavg decreasing.
- b. Steam dumps modulated open maintaining Tavg at 557°F.
- c. Steam dumps modulated open maintaining Tavg at 562°F.
- d. Steam dumps modulated open maintains Tavg at a value greater than 562°F.

**WATTS BAR**  
**SRO EXAMINATION**

84. Engineering has developed a graph of VCT Level versus VCT pressure that will be used as an Operator Aid.

Which ONE of the following positions represents the MINIMUM level of approval for posting this as an operator aid?

- a. Any individual holding a Senior Reactor Operator license.
- b. Shift Manager
- c. Operations Superintendent
- d. Plant Manager

**WATTS BAR**  
**SRO EXAMINATION**

85. Which ONE of the following represents the proper use of a Reference Use procedure?
- a. The procedure is readily available at the work site for reference.  
The procedure may be performed completely from memory but the user is responsible for results.
  - b. The procedure is readily available for reference but not necessarily at the work site.  
The procedure may be performed completely from memory but the user is responsible for results.
  - c. The procedure is readily available at the work site.  
Procedure shall be referenced to ensure each segment was performed.
  - d. The procedure is readily available but not necessarily at the work site.  
Procedures shall be referenced to ensure each segment was performed.

**WATTS BAR**  
**SRO EXAMINATION**

86. Given the following:

- A REP Alert has been declared.
- The Evacuation alarm was initiated using the ASSEMBLY AND ACCOUNTABILITY MAN pushbutton and has been sounding for 30 seconds.
- First Aid and Medical Personnel are needed immediately in the MCR.

Which one of the following will allow the Codes, Alarms, and Paging (CAP) System 'Paging' function to override the "Evacuation Alarm" function?

- a. Push and release the ALL CLEAR AUTO pushbutton.
- b. Push the ASSEMBLY AND ACCOUNTABILITY AUTO pushbutton to the locked in position.
- c. Push the ALL CLEAR MAN pushbutton to the locked in position.
- d. Push the CANCEL pushbutton.

**WATTS BAR**  
**SRO EXAMINATION**

87. Given the following plant condition:

- Unit in Mode 2 at 1% power and startup in progress.
- It was discovered that the trip busses for both MFW pumps were de-energized.

Which one of the following is the required action?

- a. Startup may continue as long as power is restored to one of the trip busses within 1 hour after entering Mode 1.
- b. Startup may continue as long as power is restored to both of the trip busses within 1 hour after entering Mode 1.
- c. A shutdown must be initiated within 1 hour unless power is restored to one of the trip busses.
- d. A shutdown must be initiated within 1 hour unless power is restored to both trip busses.

**WATTS BAR**  
**SRO EXAMINATION**

88. Given the following:

- Plant startup in progress.
- MSIVs had inadvertently closed due to high negative rate when charging the steam header.
- MSIV bypass valves open.
- Steam header pressure equalized with Steam Generator pressures.
- The operating crew is ready to reopen the MSIVs.

Which one of the following is the proper sequence to open MSIVs?

- a. Place all 4 MSIV hand switches to the 'PULL-TO-RESET' position, then place all 4 MSIV hand switches to the CLOSE position. The MSIVs can then be opened from their respective hand switches.
- b. Place the #1 MSIV hand switch to the 'PULL-TO-RESET' position, then place all 4 MSIV hand switches to the CLOSE position. The MSIVs can then be opened from their respective hand switches.
- c. Place all 4 MSIV hand switches to the CLOSE position, then place all 4 MSIV hand switches to the 'PULL-TO-RESET' position to reset the circuit to allow the MSIVs to be opened from their respective hand switches.
- d. Place all 4 MSIV hand switches to the CLOSE position, then place only the #1 MSIV hand switch to the 'PULL-TO-RESET' to allow the MSIVs to be opened from their respective hand switches.

**WATTS BAR**  
**SRO EXAMINATION**

89. Given the following conditions:

- Unit is in Mode 5 with normal plant alignment.
- 1A-A CCP in service supplying RCP seals.
- 1B-B CCP tagged per GO requirements but otherwise operable.
- 1A-A RHRP in service for shutdown cooling.
- 1B-B DG inoperable for outage modification.
- Maintenance has requested placing 1B-B CCP in service and tagging 1A-A CCP in preparation for a Post Maintenance Test.

Which ONE of the following would be the correct response to this request?

- a. Allow the work since Tech Specs allows 15 minutes to swap CCPs.
- b. Allow the work since only one train of DGs is required to be operable in Mode 5.
- c. Do NOT allow the work since, during the realignment, both CCPs will be in service which is NOT allowed by Tech Specs in Mode 5.
- d. Do NOT allow the work since 1B-B CCP is required to be have an operable emergency power source.

**WATTS BAR**  
**SRO EXAMINATION**

90. Given the following conditions:

- Reactor is critical at 1% power.
- Fuel assemblies and inserts are being shuffled in the Spent Fuel Pit (SFP).
- The following alarms are received and validated in the MCR:
  - SFP 0-RM-90-102/103 RAD HI
  - 1-RR-90-1 AREA RAD HI
- The operator verified ABGTS in service and the area has been evacuated.

Which ONE of the following describes additional verification of Auxiliary Building ventilation equipment that the operator should perform?

- a. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans running.
- b. Aux. Bldg. General Supply and Exhaust Fans running, Fuel Handling Exhaust Fans off.
- c. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans running.
- d. Aux. Bldg. General Supply and Exhaust Fans off, Fuel Handling Exhaust Fans off.

**WATTS BAR**  
**SRO EXAMINATION**

91. Changes to which ONE of the following will require a 10CFR50.59 review?
- a. Changes to the Nuclear Quality Assurance Plan.
  - b. System modification that adds a full flow recirculation test line to the discharge of the Safety Injection pumps.
  - c. Revision to the Radiological Emergency Plan that changes the designated assembly areas for accountability.
  - d. Change to the Physical Security Plan that requires moving a section of the perimeter fence.

**WATTS BAR**  
**SRO EXAMINATION**

92. Given the following:

- Unit shutdown to repair SG #2 handhole leak and currently in mode 5.
- A small area that is accessible in containment has a general area dose rate of 1150 mrem/hr.
- The top of this area cannot be enclosed.

Other than the appropriate posting, which ONE of the following is the minimum additional protection measures that must be provided for this area?

- a. Barricaded and a warning device or visible flashing light activated.
- b. Roped off and a security person posted to prevent access.
- c. Roped off and a RADCON Tech monitoring either locally or via closed circuit TV.
- d. A visible flashing light activated, and entrance to containment locked or the area monitored by closed circuit T.V.

**WATTS BAR**  
**SRO EXAMINATION**

93. Which ONE of the following identifies an acceptable combination of parallel operation of the Containment Purge Exhaust Fans with the ABGTS and EGTS?
- a. Operation of ONE Purge Air Exhaust Fan is allowed with the ABGTS Train A in service for release of a WGDT.
  - b. Operation of BOTH Purge Air Exhaust Fans is allowed with the ABGTS Train A in service provided a WGDT is NOT being released.
  - c. Operation of ONE Purge Air Exhaust Fan is allowed with the EGTS Train A in service for release of a WGDT.
  - d. Operation of BOTH Purge Air Exhaust Fans is allowed with the EGTS Train A in service provided a WGDT is NOT being released.

**WATTS BAR**  
**SRO EXAMINATION**

94. An operator is performing a manual frisk of a wrench for Alpha contamination. The background radiation count rate in the area is 40 cpm.

Which ONE of the following is the MINIMUM count rate at which the tool would be considered contaminated?

- a. 60 cpm.
- b. 70 cpm.
- c. 140 cpm.
- d. 340 cpm.

**WATTS BAR**  
**SRO EXAMINATION**

95. Given the following conditions at a work site:

- Airborne activity - 3 DAC
- Radiation level - 40 mrem/hr.
- Radiation level with shielding - 10 mrem/hr.
- Time to place shielding - 15 minutes.
- Time to conduct task WITH respirator - 1 hour.
- Time to conduct task WITHOUT respirator - 30 minutes.

Assumptions:

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

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

- a. Conduct task WITHOUT respirator or shielding.
- b. Conduct task WITH respirator and WITHOUT shielding.
- c. Place shielding while wearing respirator and conduct task WITH respirator.
- d. Place shielding while wearing respirator and conduct task WITHOUT respirator.

**WATTS BAR**  
**SRO EXAMINATION**

96. Given the following plant conditions:

- LOCA has occurred.
- ECCS aligned for cold leg recirc mode.
- RHR pump 1A-A tripped on instantaneous overcurrent.
- Room cooler for 1B-B RHR pump will NOT run and RHR pump and motor temperatures are increasing.
- A maintenance worker needs to enter the room to set up temporary cooling. This task is planned to take no longer than 20 minutes.
- Radiation level in the room is 30 Rem/hr.

Which ONE of the following describes the approval required prior to performing this task?

- a. Would not require prior approval since dose would be within TVA administrative limits.
- b. Would not require prior approval since dose would be within NRC limits, but 10CFR50.72 report would be required.
- c. Requires Radiological and Chemistry Control Manager approval.
- d. Requires Site Emergency Director approval.

**WATTS BAR**  
**SRO EXAMINATION**

97. Given the following conditions:

- Reactor Trip and Safety Injection occurred due to a LOCA.
- Crew currently performing E-1, Loss of Reactor or Secondary Coolant when the following conditions are identified:
- RWST level is 44% and slowly decreasing.
- Steam Generator #3 level increased to 84% due to a failed LCV that has now been isolated
- Containment sump level is 81% and slowly increasing.

Based on the information above, which ONE of the following actions should the crew take?

- a. Transition to FR-Z.2, Containment Flooding.
- b. Transition to ES-1.3, Transfer to RHR Containment Sump.
- c. Transition to FR-H.3, Steam Generator High Level
- d. Continue in E-1, Loss of Reactor or Secondary Coolant

**WATTS BAR**  
**SRO EXAMINATION**

98. Which ONE of the following describes the reason ECA-1.1, "Loss of RHR Sump Recirculation", is given priority over FR-Z.1, "High Containment Pressure", concerning Containment Spray System operation?
- a. FR-Z.1 would have the spray pump aligned to sump when level in RWST was below setpoint which would damage pump if RHR recirc was not available.
  - b. With sump recirculation unavailable, it is extremely important to conserve RWST water by minimizing operation of Containment Spray pumps.
  - c. ECA-1.1 has less restrictive criteria for Containment Spray operation since it assumes "Phase B" isolation occurs and FR-Z.1 assumes it does not occur.
  - d. FR-Z.1 is a YELLOW path Function Restoration Instruction and should not be given priority over an Emergency Contingency Action (ECA).

**WATTS BAR**  
**SRO EXAMINATION**

99. Given the following conditions:

- Unit at 7% power with startup in progress all bistables are in normal configuration.
- A failure of Pressurizer pressure transmitter 1-PT-68-340 resulted in the actual pressurizer pressure decreasing to 1945 psig before the operating crew manually stabilized the plant with Pressurizer Master Controller in MANUAL.
- Pressurizer pressure is currently 1960 psig and increasing.
- The following alarms are currently LIT due to the transient:
  - 90A - PZR Press Hi (1-M-5)
  - 124C - PZR Press Lo (1-M-6)
- The following status lights are LIT due to the transient:
  - PZR Press Hi Rx trip PS-68-340A
  - PZR Press Lo Rx trip PS-68-334E
  - PZR Press Lo Rx trip PS-68-323E
  - PZR Press Lo Rx trip PS-68-322E

Which ONE of the following is required for the above conditions?

- a. Trip the reactor and Initiate Safety Injection
- b. Trip the reactor but a Safety Injection is not required
- c. Transfer auto control of pressure to 1-PT-68-323 (Channel III) and restore pressure to normal.
- d. Restore pressure to normal using MANUAL control of the Master Controller and leave in manual until 1-PT-68-340 is repaired.

**WATTS BAR**  
**SRO EXAMINATION**

100. Given the following plant conditions:

- Plant at 80% power and startup in progress.
- Loss of power to all control room annunciators has occurred.
- 30 minutes have passed and power has not yet been restored.
- ICS computer and SPDS are available.

Which ONE of the following describes the correct control room operators' response to this event?

- a. Commence a reactor shutdown, dispatch personnel for local monitoring of equipment.
- b. Trip the reactor manually, dispatch personnel to monitor and manipulate plant equipment in response to the trip.
- c. Avoid any evolutions that would make the plant less stable and station personnel for increased surveillance.
- d. Expedite maintenance activities to restore power while slowly continuing the ascension to full power, monitor equipment with plant computer.