

U.S. Nuclear Regulatory Commission

Site-Specific RO Written Examination

Applicant Information

Name:

Date:

Facility/Unit: MCGUIRE

Region: I  II  III  IV

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. To pass the examination, you must achieve a final grade of at least 80.00 percent. Examination papers will be collected 6 hours after the examination begins.

Applicant Certification

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

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

Results

Examination Value \_\_\_\_\_ Points

Applicant's Score \_\_\_\_\_ Points

Applicant's Grade \_\_\_\_\_ Percent

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 1  
(1 point)

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Regarding the NC pump motor stator coolers,

- 1) cooling water is supplied from the \_\_\_\_\_ system.
- 2) upon initiation of an \_\_\_\_\_ signal, the cooling water supply will be isolated.

Which ONE (1) of the following completes the statements above?

- A.
    1. RN
    2. Ss (Safety Injection)
  - B.
    1. RN
    2. Sp (Phase B)
  - C.
    1. KC
    2. Ss (Safety Injection)
  - D.
    1. KC
    2. Sp (Phase B)
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 2  
(1 point)

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Given the following initial conditions on Unit 1:

- NCS Tavg is 215°F
- NCS pressure is 250 PSIG
- VCT pressure is 28 PSIG
- The 1A NC pump is to be started for a unit heatup

Subsequently:

- The 1A2 Oil Lift pump is started
- Oil Lift pressure is 580 PSIG

In accordance with OP/1/A/6150/002A (REACTOR COOLANT PUMP OPERATION) Enclosure 4.1 (STARTUP AND OPERATION), the MINIMUM required #1 Seal differential pressure for starting the NC pump (1) met.

Based on the conditions above, if the 1A NC PUMP SAFETY BKR "**START**" pushbutton is depressed, the pump (2) start.

Which ONE (1) of the following completes the statements above?

- A. 1. is  
2. will
  - B. 1. is  
2. will NOT
  - C. 1. is NOT  
2. will
  - D. 1. is NOT  
2. will NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 3  
(1 point)

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Given the following conditions on Unit 2:

- The unit is in solid operations while cooling down
- Both trains of ND are in service
- 'A' NV pump is in service
- Letdown is through 2NV-121

Subsequently:

- 2A1 KC pump trips

Per OP/2/A/6100/SD-8 (WATER SOLID OPERATIONS) which ONE (1) of the following describes operator actions necessary to respond to the failure?

### **COMPONENT LEGEND:**

2NV-121 (ND LETDOWN CONTROL)  
2NV-241 (SEAL INJECTION FLOW CONTROL)

- A. Throttle CLOSED 2NV-241 OR Throttle OPEN 2NV-121
- B. Throttle OPEN 2NV-241 OR Throttle OPEN 2NV-121
- C. Throttle CLOSED 2NV-241 OR Throttle CLOSED 2NV-121
- D. Throttle OPEN 2NV-241 OR Throttle CLOSED 2NV-121
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 4  
(1 point)

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Given the following initial conditions on Unit 1:

- The unit is in MODE 5
- NC temperature is 112°F
- LTOP is in service
- 1B NV pump is running
- 1A NV pump is currently tagged out for maintenance
- Both NI pumps are tagged out

Subsequently:

- Maintenance on the 1A NV pump is complete
- A 30 minute run of the 1A NV pump must be performed for post-maintenance testing (PMT)

Per Technical Specification 3.4.12 (LTOP SYSTEM),

- 1) to meet the LCO requirements of the Tech Spec during 1A NV pump PMT, the crew must \_\_\_\_\_.
- 2) LCO relief valve requirements can be met by having two PORVs with a lift setting of less than or equal to \_\_\_\_\_ PSIG.

Which ONE (1) of the following completes the statements above?

- A. 1. stop the 1B NV pump ONLY  
2. 450
- B. 1. stop the 1B NV pump and rack out its breaker  
2. 450
- C. 1. stop the 1B NV pump ONLY  
2. 385
- D. 1. stop the 1B NV pump and rack out its breaker  
2. 385

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 5  
(1 point)

---

Given the following conditions on Unit 2:

- The unit is in Mode 4 with a cooldown in progress
- Both ND trains are in operation
- ND pump suction pressure is 30 PSIG
- ND pump suction header temperature is 226°F

Subsequently:

- NC system and ND system temperatures begin to increase due to a reduction of KC flow to the ND heat exchangers

Based on the indications above, ND pump cavitation will occur if ND pump suction temperature increases by a MINIMUM of     (1)     °F.

One indication that the ND pump is cavitating would be that motor amps are     (2)    .

Which ONE (1) of the following completes the statements above?

### **REFERENCE PROVIDED**

- A. 1. 25  
2. high
  - B. 1. 48  
2. high
  - C. 1. 25  
2. fluctuating
  - D. 1. 48  
2. fluctuating
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 6  
(1 point)

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Given the following:

- At time 08:10:00, an inadvertent Reactor Trip/Safety Injection occurs due to IAE testing

At time 08:10:30, SI   (1)   be reset.

When the Safety Injection RESET pushbutton is depressed after the required time delay, any subsequent AUTOMATIC actuation signals   (2)   start safeguards equipment.

Which ONE (1) of the following completes the statements above?

- A.     1. can NOT  
       2. will
  - B.     1. can NOT  
       2. will NOT
  - C.     1. can  
       2. will
  - D.     1. can  
       2. will NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 7  
(1 point)

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The purpose of the LTOP System is to prevent a \_\_\_\_ (1) \_\_\_\_ concern.

In accordance with Tech Spec 3.4.12 (LTOP System), the LCO is applicable in MODE 4 if NC system temperature is less than \_\_\_\_ (2) \_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.     1. Cold Overpressure  
       2. 300°F
  
  - B.     1. Pressurized Thermal Shock (PTS)  
       2. 300°F
  
  - C.     1. Cold Overpressure  
       2. 320°F
  
  - D.     1. Pressurized Thermal Shock (PTS)  
       2. 320°F
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 8  
(1 point)

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Given the following conditions on Unit 1:

- The unit is at 100% RTP
- 1NC-34A (U1 PZR PORV) has been identified as leaking
- Over the last 4 hours, PRT level has increased from 8% to 26%
- PRT pressure is 65 PSIG

Based on the conditions above, the Tech Spec 3.4.13 (RCS OPERATIONAL LEAKAGE) limit for IDENTIFIED leakage     (1)     been exceeded.

The PRT rupture disc will rupture if PRT pressure increases to a MINIMUM pressure of     (2)    .

Which ONE (1) of the following completes the statements above?

### **REFERENCE PROVIDED**

- A. 1. has  
2. 85 PSIG
  - B. 1. has  
2. 100 PSIG
  - C. 1. has NOT  
2. 85 PSIG
  - D. 1. has NOT  
2. 100 PSIG
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 9  
(1 point)

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Given the following conditions on Unit 1:

- The unit is in HOT SHUTDOWN on ND Cooling (Both Train A and B)
- B Train KC is aligned to supply Reactor and Aux Bldg Non-Essential Headers with both 1B1 and 1B2 pumps in operation
- A Train KC is aligned to supply the A ND HX Header with both 1A1 and 1A2 pumps in operation
- The 1A1 KC pump has just tripped

In accordance with the Limits and Precautions of OP/1/A/6400/005 (Component Cooling Water System), KC flow through the 1A ND Heat Exchanger shall be throttled to less than a MAXIMUM of \_\_\_\_\_.

Which ONE (1) of the following completes the statement above?

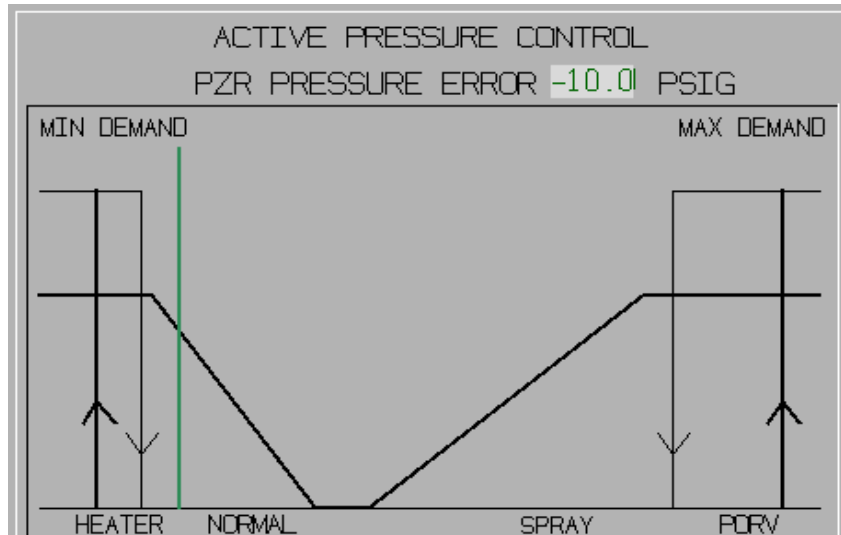
- A. 2000 GPM
  - B. 4000 GPM
  - C. 5000 GPM
  - D. 6000 GPM
-

# McGuire Nuclear Station

## ILT-31 MNS RO NRC Examination

Question: 10  
(1 point)

The Pressurizer Pressure Master Controller soft controls indicate as follows:



With the current ERROR signal, "C" Pzr heaters will be energized     (1)     of the time.

The Pzr Backup heaters energize at a PRESSURE ERROR of     (2)     PSIG.

Which ONE (1) of the following completes the statements above?

- A. 1. 17%  
2. (-) 25
- B. 1. 17%  
2. (-) 17
- C. 1. 83%  
2. (-) 25
- D. 1. 83%  
2. (-) 17

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 11  
(1 point)

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Given the following conditions on Unit 2:

- The unit is at 100% RTP
- The top row of SSPS bistable status lights simultaneously illuminate
- Power Range Channel N-41 indication is lost
- Intermediate Range Channel N-35 indication is lost

Which ONE (1) of the following describes the failure that has occurred, AND the response of the Reactor Protection System?

- A. Loss of 120 VAC Bus 2EKVB;  
Train A SSPS General Warning Alarm is received.
  - B. Loss of 120 VAC Bus 2EKVA;  
Train A SSPS General Warning Alarm is received.
  - C. Loss of 120 VAC Bus 2EKVD;  
Train B SSPS General Warning Alarm is received.
  - D. Loss of 120 VAC Bus 2EKVC;  
Train B SSPS General Warning Alarm is received.
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 12  
(1 point)

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Given the following:

- Unit 1 is at 100% power
- A LBLOCA inside containment occurs
- Containment pressure is 3.7 PSIG and stable
- Safety Injection Train "B" fails to actuate

Based on the conditions above AND PRIOR TO any operator actions,

- 1) Phase A, Train "B" containment isolation valves \_\_\_\_\_ automatically CLOSE.
- 2) Phase B containment isolation valves on \_\_\_\_\_ will automatically CLOSE.

Which ONE (1) of the following completes the statements above?

- A.
    1. will
    2. Train A ONLY
  - B.
    1. will
    2. both Trains
  - C.
    1. will NOT
    2. Train A ONLY
  - D.
    1. will NOT
    2. both Trains
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 13  
(1 point)

---

Given the following conditions on Unit 1:

- A LOCA has occurred
- Containment pressure peaked at 2.9 PSIG and now is 2.6 PSIG and stable

Which ONE (1) of the following describes the operation of the Containment Cooling system based on these conditions?

- A. All VU units have started and RV containment isolation valves are open.
  - B. All VU units have shunt tripped off and RV containment isolation valves are open.
  - C. All VU units have started and RV containment isolation valves are closed.
  - D. All VU units have shunt tripped off and RV containment isolation valves are closed.
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 14  
(1 point)

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Given the following initial conditions on Unit 1:

- Unit 1 is at 100% RTP
- The Control Room has received Floor Cooling Glycol alarms on annunciator panel 1AD-9
- An operator has been dispatched per the annunciator response procedure
- Floor Cooling Glycol Temperature is 22°F
- Ice bed temperature is 27°F

Based on the conditions above,

- 1) the required actions per the annunciator response for Floor Cooling Glycol temperature, is to \_\_\_\_\_ .
- 2) increased ice bed sublimation \_\_\_\_\_ a concern.

- A.
    1. stop one Floor Cooling pump if both are running
    2. is
  - B.
    1. stop one Floor Cooling pump if both are running
    2. is NOT
  - C.
    1. start an additional Floor Cooling pump if available
    2. is
  - D.
    1. start an additional Floor Cooling pump if available
    2. is NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 15  
(1 point)

---

Given the following conditions on Unit 2:

- A Large Break LOCA has occurred
- "B" train of NS has been aligned per ES-1.3 (TRANSFER TO COLD LEG RECIRC)
- 2NI-185A (2A ND PUMP SUCTION FROM CONT SUMP ISOL) failed to OPEN from the control room
- The crew is aligning ND aux spray

Based on the conditions above,

- 1) 2NS-43A (2A ND HX OUTLET TO NS CONT OUTSIDE ISOL) \_\_\_\_\_ OPEN from the control room.
- 2) if 2NS-43A is OPEN, when containment pressure decreases to less than 0.35 PSIG, 2NS-43A \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. will
    2. will CLOSE automatically
  - B.
    1. will
    2. must be CLOSED manually
  - C.
    1. will NOT
    2. will CLOSE automatically
  - D.
    1. will NOT
    2. must be CLOSED manually
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 16  
(1 point)

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Given the following initial conditions on Unit 1:

- Unit is at 75% RTP

Subsequently,

- A small steam leak develops on 1A S/G
- NC system pressure is 2210 PSIG and STABLE

Based on the conditions above,

- 1) a Main Steam Isolation will occur if the 1A S/G pressure decreases to less than a MINIMUM of \_\_\_\_\_ PSIG.
- 2) if a Main Steam Isolation occurs, the SM PORVs \_\_\_\_\_ close.

Which ONE (1) of the following completes the statements above?

- A.     1. 775  
       2. will NOT
  - B.     1. 875  
       2. will NOT
  - C.     1. 775  
       2. will
  - D.     1. 875  
       2. will
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 17  
(1 point)

---

Given the following conditions on Unit 2:

- A loss of all feedwater has occurred
- 2A S/G is faulted inside Containment
- Containment pressure has peaked at 2.8 PSIG and is stable
- NO CA flow is available
- FR-H.1 (RESPONSE TO LOSS OF SECONDARY HEAT SINK) has been implemented

Given the following parameters:

	<u>TIME</u>	
<u>SG WR Level</u>	<u>1515</u>	<u>1530</u>
2A S/G	10%	10%
2B S/G	37%	25%
2C S/G	33%	21%
2D S/G	35%	23%

Per FR-H.1 foldout page, the EARLIEST time that the crew is required to implement NC System Feed and Bleed is     (1)    .

Per FR-H.1, a MINIMUM of     (2)     PZR PORV(s) must be opened to establish NC system Feed and Bleed.

Which ONE (1) of the following completes the statements above?

- A. 1. 1515  
2. ONE
- B. 1. 1515  
2. TWO
- C. 1. 1530  
2. ONE
- D. 1. 1530  
2. TWO

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 18  
(1 point)

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Given the following initial conditions on Unit 1:

- The unit is at 98% RTP
- In preparation for a Unit 1 TDCA pump performance test the following flow control valves are positioned as follows:

1CA-64AB (TD CA PUMP TO 1A S/G) -- CLOSED

1CA-52AB (TD CA PUMP TO 1B S/G) -- CLOSED

1CA-48AB (TD CA PUMP TO 1C S/G) -- OPEN

1CA-36AB (TD CA PUMP TO 1D S/G) -- OPEN

Subsequently,

- An IAE technician inadvertently generates a U1 TDCA pump auto-start signal

After the inadvertent auto-start signal is initiated,     (1)     of the U1 TDCA Flow Control valves will be OPEN.

In accordance with the Control Room Crew Expectations Manual, the crew will CLOSE any OPEN U1 TDCA Flow Control valves     (2)    .

Which ONE (1) of the following completes the statements above?

- A.
    1. all four
    2. as soon as practical
  - B.
    1. all four
    2. when directed by OP/1/A/6250/002 (AUXILIARY FEEDWATER SYSTEM)
  - C.
    1. only two
    2. as soon as practical
  - D.
    1. only two
    2. when directed by OP/1/A/6250/002 (AUXILIARY FEEDWATER SYSTEM)
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 19  
(1 point)

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Given the following on Unit 2:

- Unit 2 is at 100% RTP
- 2A D/G has been started per PT/2/A/4350/002 A (DIESEL GENERATOR 2A OPERABILITY TEST)
- 2A D/G has been running idle for 45 minutes

Based on the conditions above, the 2A D/G should be loaded to a MINIMUM of 3000 kW AND run for one hour to ensure (1).

The 2A D/G load limit for CONTINUOUS OPERATION is (2) kW.

Which ONE (1) of the following completes the statements above?

- A.
    1. injector tips are clean
    2. 4000
  - B.
    1. burnout of excess fuel in cylinders
    2. 4000
  - C.
    1. injector tips are clean
    2. 4400
  - D.
    1. burnout of excess fuel in cylinders
    2. 4400
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 20  
(1 point)

---

Given the following conditions on Unit 2:

- The unit is in MODE 3
- All NCPs are running and powered from their normal sources
- A Generator-Switchyard protective lockout occurs on 2A Bus Line
- AUTO / MAN mode selector switches are in AUTO

Based on the conditions above,

- 1) NCP 2A \_\_\_\_\_.
- 2) Bus 2TA automatically \_\_\_\_\_ transfers to its alternate power supply.

Which ONE (1) of the following completes the statements above?

- A.
    1. trips
    2. slow
  - B.
    1. trips
    2. fast
  - C.
    1. continues to run
    2. slow
  - D.
    1. continues to run
    2. fast
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 21  
(1 point)

---

Given the following conditions on Unit 2:

- A BLACKOUT has occurred on 2ETB
- D/G '2B' failed to start due to an 86N relay actuation
- 2AD-11 / F4 (BATT EVCD UNDERVOLTAGE) is in alarm
- EVDD bus voltage is 113 VDC and lowering slowly

In accordance with AP-07 (LOSS OF ELECTRICAL POWER), the action required to restore bus EVDD is to \_\_\_\_\_.

Which ONE (1) of the following completes the statement above?

- A. cross tie Bus EVDB to Bus EVDD
  - B. align Battery Charger EVCS to Bus EVDD
  - C. swap Battery Charger EVCD power supply to 1EMXB
  - D. swap Battery Charger EVCD power supply to 2EMXH
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 22  
(1 point)

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Given the following initial conditions on Unit 2:

- A loss of voltage has occurred on 2ETA
- Blackout loading is in progress

Subsequently:

- A Safety Injection signal is received before Blackout loading is completed on 2ETA

Based on the conditions above, the Blackout load sequence     (1)    , 2ETA is cleared of     (2)     loads, and the SI load sequence is actuated.

Which ONE (1) of the following completes the statement above?

- A.     1. stops  
       2. all
  - B.     1. is completed  
       2. all
  - C.     1. stops  
       2. all non-SI
  - D.     1. is completed  
       2. all non-SI
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

**Question: 23**  
(1 point)

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Regarding Diesel Generator Auxiliaries:

- 1) Which ONE (1) of the following is a heat load that is cooled by the DG Cooling Water (KD) System?
  - 2) Which ONE (1) of the following is the MIMIMUM KD Surge Tank level required to perform a MANUAL MODE start?
- 
- A.
    1. VG After Coolers
    2. 11.5 inches
  - B.
    1. Air Intake System Intercooler
    2. 11.5 inches
  - C.
    1. VG After Coolers
    2. 25 inches
  - D.
    1. Air Intake System Intercooler
    2. 25 inches
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 24  
(1 point)

---

Given the following initial conditions on Unit 1:

- Unit is at 100% RTP
- A leak on the RC piping in the turbine building basement has occurred
- All TB Sump pumps are in "Manual" and "ON", maintaining sump level stable

Subsequently:

- A detector failure occurs due to a failed power supply on 1EMF-31 (TURBINE BUILDING SUMP MONITOR)

Based on the conditions above,

- 1) the Unit 1TB Sump pumps \_\_\_\_\_ trip automatically.
- 2) to continue with the leak mitigation, the crew will be required to \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. will NOT
    2. open 1WP-35 (WMT & VUCDT TO RC CONTROL)
  - B.
    1. will
    2. clear the EMF-31 Trip 2 signal and restart the TB sump pumps
  - C.
    1. will NOT
    2. open 1WP-6 (U1 TB SUMP PUMPS DISCH TO WC ISOL)
  - D.
    1. will
    2. place the HI RAD INH/BYP switch in BYP and restart the TB sump pumps
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 25  
(1 point)

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Given the following conditions on Unit 1:

- I&E has requested that the 1A Nuclear Service Water Pump breaker be racked out for lubrication

To which ONE (1) of the following locations should an Operator be dispatched to rack out the breaker?

- A. 1TA
  - B. 1TD
  - C. 1ETA
  - D. 1ETB
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 26  
(1 point)

---

Concerning the VI System,

1VI-1812 (VI AIR DRYER BYPASS FILTER ISOL) solenoid will vent the actuator when VI system pressure decreases to less than a MAXIMUM of    (1)    PSIG.

RESET must be depressed on the local VI    (2)    to CLOSE 1VI-1812.

Which ONE of the following completes the statements above?

- A.     1. 90  
       2. Sequencer Control Panel
  
  - B.     1. 90  
       2. Reflash Panel
  
  - C.     1. 85  
       2. Sequencer Control Panel
  
  - D.     1. 85  
       2. Reflash Panel
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 27  
(1 point)

---

Given the following initial conditions:

- Both Units are at 100% RTP
- VI (INSTRUMENT AIR) compressors are in a D, E, F alignment
- VS (STATION AIR) is in a normal alignment

Subsequently:

- A VI header rupture occurs
- Annunciators 1AD-12 / C1 (VI/VS LO PRESSURE) AND 1AD-12 / D1 (VI/VS LO LO PRESSURE) are in alarm

Based on the conditions above,

1VI-820 (VI TO VS CONTROL VALVE) will auto-close when VI system pressure decreases to less than a MAXIMUM of    (1)    PSIG AND

the VS compressor    (2)    auto-start.

- A.     1. 85  
       2. will
  
  - B.     1. 90  
       2. will
  
  - C.     1. 85  
       2. will NOT
  
  - D.     1. 90  
       2. will NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 28  
(1 point)

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Regarding Containment isolation signals,

- 1) the S/G CF Containment Isolation valves (CF-35, 30, 28, & 26) will close if Containment pressure increases to a MINIMUM of \_\_\_\_\_ PSIG.
- 2) a Containment Phase A isolation will occur if NC system pressure decreases to less than a MAXIMUM of \_\_\_\_\_ PSIG.

Which ONE (1) of the following completes the statements above?

- A.
    1. 1.0
    2. 1845
  - B.
    1. 1.0
    2. 1945
  - C.
    1. 3.0
    2. 1845
  - D.
    1. 3.0
    2. 1945
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 29  
(1 point)

---

Given the following conditions on Unit 2:

- The unit is at 100% RTP
- Annunciator 1AD-2 / A10 (ROD CONTROL URGENT FAILURE) is LIT
- I&E had determined that the alarm is the result of an urgent failure in the Logic Cabinet

Based on the conditions above,

- 1) one of the possible causes of the Logic Cabinet urgent failure is a \_\_\_\_\_.
- 2) the Logic Cabinet Urgent Failure blocks rod motion in \_\_\_\_\_.

- A.     1. Slave Cyclor failure  
       2. AUTO ONLY
- B.     1. Slave Cyclor failure  
       2. AUTO AND MANUAL
- C.     1. Phase failure  
       2. AUTO ONLY
- D.     1. Phase failure  
       2. AUTO AND MANUAL
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 30  
(1 point)

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Given the following initial conditions on Unit 1:

- Unit is at 25% RTP
- Power ascension to 50% RTP is in progress
- "A" Pzr heaters are ON

Subsequently,

- A DCS malfunction occurs in the Pzr Level Median Select for Selected Pzr Level 1
- Selected Pzr Level 1 fails at its current output
- No operator action is taken

Which ONE (1) of the following statements describes the plant response as the power ascension continues?

- A. Charging flow decreases  
Letdown isolates
  - B. Charging flow increases  
Pzr backup heaters energize
  - C. Charging flow decreases  
Letdown will NOT isolate
  - D. Charging flow increases  
Pzr backup heaters will NOT energize
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 31  
(1 point)

---

Given the following conditions on Unit 1:

- A Loss of Offsite Power has occurred
- 1ETA and 1ETB are energized from their respective DGs

Based on the conditions above, power can be restored to Pressurizer Heater Group(s)

\_\_\_\_\_.

Which ONE (1) of the following completes the statement above?

- A. D ONLY
  - B. C ONLY
  - C. A and B ONLY
  - D. C and D ONLY
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 32  
(1 point)

---

Given the following conditions on Unit 1:

- The unit is at 100% RTP
- A malfunction occurs which results in a DATA A Failure for Control Rod H-6 on DRPI
- At the time of the failure, the highest DRPI coil penetrated by Control Rod H-6 was a "B" Coil
- The actual position of all control rods has remained the same

After the failure, the DRPI indication for Control Rod H-6 \_\_\_\_\_.

In addition to the DATA A Failure alarm, a DRPI \_\_\_\_\_ alarm will also be received.

Which ONE (1) of the following completes the statements above?

- A.
    1. remains the same
    2. Non-Urgent Failure
  - B.
    1. decreases
    2. Non-Urgent Failure
  - C.
    1. remains the same
    2. Urgent Failure
  - D.
    1. decreases
    2. Urgent Failure
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 33  
(1 point)

---

Given the following conditions on Unit 1:

- A Large Break LOCA has occurred
- Subcooling based on the 5 HI T/C AVG indicates negative (-) 4°F on the Inadequate Core Cooling Monitor (ICCM)

Based on the conditions above, ICCM indication of Subcooling based on the 5 HI T/C AVG (1) be displayed in reverse video.

The Core Exit Thermocouples (CETs) will indicate a MAXIMUM temperature of (2).

Which ONE (1) of the following completes the statements above?

- A.     1. will  
       2. 1200°F
  
  - B.     1. will NOT  
       2. 1200°F
  
  - C.     1. will  
       2. 2300°F
  
  - D.     1. will NOT  
       2. 2300°F
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 34  
(1 point)

---

Given the following conditions on Unit 1:

- PT/1/A/4450/003 A (ANNULUS VENTILATION SYSTEM TRAIN A OPERABILITY TEST) is being performed
- During the test, a VE filter pre-heater malfunctions

When the 1A VE Filter temperature rises to a MINIMUM of \_\_\_\_ (1) \_\_\_\_ °F, annunciator 0AD-12 / F2 (1A VE FILTER HI TEMP) will alarm.

As a result of this alarm, the \_\_\_\_ (2) \_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.     1. 220  
       2. 1A VE pre-heaters trip ONLY
  
  - B.     1. 220  
       2. 1A VE pre-heaters and 1A VE Fan trip
  
  - C.     1. 325  
       2. 1A VE pre-heaters trip ONLY
  
  - D.     1. 325  
       2. 1A VE pre-heaters and 1A VE Fan trip
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 35  
(1 point)

---

Given the following initial conditions on Unit 2:

- Unit is in Mode 6
- VP (CONTAINMENT PURGE SYSTEM) is in service and refueling is in progress

Subsequently:

- A Trip 2 alarm on 2EMF-38(L) (CONTAINMENT PARTICULATE) is received

Based on the conditions above,

- 1) the VP Supply and Exhaust \_\_\_\_\_.
- 2) to regain control of VP components, 2EMF-38 must be reset and the Containment Ventilation (S<sub>H</sub>) Reset push button located on \_\_\_\_\_ must be depressed.

Which ONE (1) of the following completes the statements above?

- A.
    1. fans will be "OFF" ONLY
    2. 2MC-11
  - B.
    1. fans will be "OFF" ONLY
    2. Unit 2 HVAC panel
  - C.
    1. fans will be "OFF" AND dampers will be CLOSED
    2. 2MC-11
  - D.
    1. fans will be "OFF" AND dampers will be CLOSED
    2. Unit 2 HVAC panel
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 36  
(1 point)

---

Given the following on Unit 2:

- The unit is at 100% RTP
- The "SPENT FUEL POOL LEVEL LO" alarm is received on the Unit 2 OAC

- 1) Which ONE (1) of the following is the FIRST EMF that will alarm to confirm a leak on the Spent Fuel Pool Cooling system?
- 2) If a Trip 2 signal is received on 2EMF-42, what AUTOMATIC actions occur?

CONSIDER EACH QUESTION SEPARATELY.

### COMPONENT LEGEND:

2EMF-4 (SPENT FUEL BLDG REFUEL BRDG)  
2EMF-42 (UNIT 2 FUEL BUILDING VENTILATION)

- A.
    1. 2EMF-4
    2. The VF Supply and Exhaust Fans will stop
  - B.
    1. 2EMF-42
    2. The VF Supply and Exhaust Fans will stop
  - C.
    1. 2EMF-4
    2. The Exhaust Filter Bypass Damper (D-5) will close
  - D.
    1. 2EMF-42
    2. The Exhaust Filter Bypass Damper (D-5) will close
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 37  
(1 point)

---

Given the following conditions on Unit 1:

- The unit is at 47% RTP for repairs to the 1B CF Pump
- The 1A CF Pump is in AUTOMATIC

S/G	NR Level (%)
1A	45
1B	51
1C	50
1D	47

Based on current conditions, a S/G LEVEL DEVIATION annunciator is LIT for S/G(s)  
(1).

In accordance with the Annunciator Response Procedure for S/G LEVEL DEVIATION,  
the crew will take manual control of the (2) to restore S/G levels to program.

Which ONE (1) of the following completes the statements above?

- A. 1. 1A ONLY  
2. CF Control or Bypass Valves
- B. 1. 1A AND 1D  
2. CF Control or Bypass Valves
- C. 1. 1A ONLY  
2. 1A CF Pump
- D. 1. 1A AND 1D  
2. 1A CF Pump
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

**Question: 38**  
(1 point)

---

Regarding the CF&E (CONTAINMENT FLOOR AND EQUIPMENT) Sumps,

- 1) one input into the CF&E sumps is \_\_\_\_\_.
- 2) the CF&E sumps discharge is aligned to the \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. VU AHU drains
    2. FDT (Floor Drain Tank)
  - B.
    1. VU AHU drains
    2. WMT (Waste Monitoring Tank)
  - C.
    1. Ice Condenser Drains
    2. FDT (Floor Drain Tank)
  - D.
    1. Ice Condenser Drains
    2. WMT (Waste Monitoring Tank)
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 39  
(1 point)

---

Given the following on Unit 1:

- A Loss of Offsite power has occurred
- 1A and 1B D/Gs are supplying the 4160V busses
- The crew has completed E-0 (REACTOR TRIP OR SAFETY INJECTION) and entered ES-0.1 (REACTOR TRIP RESPONSE)
- NCS  $T_{avg}$  is 552°F and slowly lowering

Based on the conditions above,

- 1) all Feedwater Isolation status lights on 1SI-4 \_\_\_\_\_ be lit.
- 2) ES-0.1 will check NC system \_\_\_\_\_ stable or trending to 557°F.

Which ONE (1) of the following completes the statements above?

- A. 1. will  
2.  $T_{avg}$
  - B. 1. will NOT  
2.  $T_{avg}$
  - C. 1. will  
2.  $T_{colds}$
  - D. 1. will NOT  
2.  $T_{colds}$
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 40  
(1 point)

---

Given the following conditions on Unit 2:

- The unit is operating at 100% RTP
- One PZR PORV is leaking past its seat
- Pressurizer pressure is 2235 PSIG
- Pressurizer Steam Space temperature is 653°F
- PRT pressure is 15 PSIG

Which ONE (1) of the following is the approximate expected temperature downstream of the leaking PZR PORV?

### **REFERENCE PROVIDED**

- A. 220°F
  - B. 240°F
  - C. 250°F
  - D. 300°F
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 41  
(1 point)

---

Given the following conditions on Unit 2:

- Unit is at 100% RTP
- 2B KC surge tank level is slowly trending up
- 2EMF-46B (COMPONENT COOLING TRAIN B) is in a Trip 2 condition

The indications above can be caused by a leak on the \_\_\_\_ (1) \_\_\_\_ heat exchanger.

When 2EMF-46B Trip 2 clears, 2KC-122 (KC SURGE TANK VENT VALVE) \_\_\_\_ (2) \_\_\_\_ automatically re-OPEN.

Which ONE (1) of the following completes the statements above?

- A. 1. Letdown  
2. will NOT
  - B. 1. Letdown  
2. will
  - C. 1. Seal Water Return  
2. will NOT
  - D. 1. Seal Water Return  
2. will
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 42  
(1 point)

---

Given the following conditions on Unit 1:

- Unit was operating at 90% RTP
- 1NV-7B (L/D CONT OUTSIDE ISOL) failed CLOSED
- The operators entered AP-12 (LOSS OF LETDOWN, CHARGING OR SEAL INJECTION)
- Excess L/D has been placed in service

1NV-24B (C NC LOOP TO EXS L/D HX ISOL) and 1NV-25B (C NC LOOP TO EXS L/D HX ISOL) can be controlled from the C/R AND the     (1)    .

Per AP-12, when placing Excess L/D in service, 1NV-26B (U1 EXCESS L/D HX OUTLET CNTRL) is cycled OPEN for two minutes and then CLOSED to     (2)    .

Which ONE (1) of the following completes the statements above?

- A.
    1. SSF
    2. minimize possible reactivity excursions
  - B.
    1. ASP
    2. minimize possible reactivity excursions
  - C.
    1. SSF
    2. reduce the possibility of water hammers
  - D.
    1. ASP
    2. reduce the possibility of water hammers
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 43  
(1 point)

---

Given the following initial conditions on Unit 2 :

- Both trains of Residual Heat Removal (ND) are in service
- ND heat exchanger outlet valves (2ND-14 & 2ND-29) are throttled to 2000 GPM each
- The ND heat exchanger bypass valve (2ND-34) is throttled to 50% OPEN

Subsequently:

- A loss of Instrument Air (VI) occurs

Based on the conditions above,

- 1) 2ND-14 and 2ND-29 fail \_\_\_\_\_.
- 2) 2ND-34 fails \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A. 1. open  
2. closed
  - B. 1. open  
2. open
  - C. 1. closed  
2. closed
  - D. 1. closed  
2. open
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

**Question: 44**  
(1 point)

---

Given the following conditions on Unit 1:

- The Pressurizer Pressure Calculated Error observed on the Ovation Soft Panel has failed to +100 PSIG
- 1AD-2 / E8 (DCS TROUBLE) is in alarm
- Actual Pressurizer Pressure is 2200 PSIG and decreasing

Based on the conditions above, which ONE (1) of the following indicates the status of the Pressurizer Pressure Control system?

- A. PORV 1NC-34A is OPEN  
PZR Spray Valves are OPEN
  - B. PORV 1NC-34A is OPEN  
PZR Spray Valves are CLOSED
  - C. PORV 1NC-34A is CLOSED  
PZR Spray Valves are OPEN
  - D. PORV 1NC-34A is CLOSED  
PZR Spray Valves are CLOSED
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 45  
(1 point)

---

Given the following conditions on Unit 2:

- A valid First Out annunciator is LIT on Annunciator Panel 2FO-1
- Both Reactor Trip breakers indicate OPEN
- IR SUR meters indicate +0.5 DPM
- All WR Neutron flux indications are stable
- The STA is manually evaluating the Critical Safety Function Status Trees (CSFSTs) because SPDS is not working

Based on the conditions above, the CSFSTs require implementation of FR-S.1 (RESPONSE TO NUCLEAR GENERATION / ATWS) if indicated power is greater than a MINIMUM of     (1)     OR if WR Neutron Flux indicates greater than a MINIMUM of     (2)    .

Which ONE (1) of the following completes the statement above?

- A. 1. 5 %  
2.  $10^{-3}$  %
  - B. 1. 5 %  
2.  $10^{-5}$  %
  - C. 1. 10 %  
2.  $10^{-3}$  %
  - D. 1. 10 %  
2.  $10^{-5}$  %
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 46  
(1 point)

---

Given the following conditions on Unit 1:

- The 1D S/G is ruptured
- E-3 (STEAM GENERATOR TUBE RUPTURE) has been implemented
- The first NC system depressurization was stopped with the following indications:

NC system pressure	1250 PSIG
1D S/G pressure	1050 PSIG

- SI has been terminated and the crew is preparing for a second NC system depressurization

In accordance with the SGTR mitigating strategy,

- 1) the second NC system depressurization is performed to \_\_\_\_\_.
- 2) the reason for initially establishing a minimum level in the ruptured S/G is to prevent \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. prevent S/G over-fill
    2. ruptured S/G depressurization
  - B.
    1. establish indicated level in the PZR
    2. ruptured S/G depressurization
  - C.
    1. prevent S/G over-fill
    2. additional damage of ruptured S/G tubes
  - D.
    1. establish indicated level in the PZR
    2. additional damage of ruptured S/G tubes
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 47  
(1 point)

---

Given the following conditions on Unit 1:

- A Steam line break has occurred
- NC pressure is 1700 PSIG and slowly lowering
- Tavg is 518°F and slowly lowering
- Containment pressure is 2.9 PSIG and stable on channels 1, 2 and 4 and 3.1 PSIG and stable on channel 3
- S/G 1A pressure is 755 PSIG on channels 1 and 2 and 765 PSIG on channel 4 and slowly lowering on all channels
- NO operator actions have been taken

Based on the conditions above,

- 1) MSIV and MSIV Bypass valves are \_\_\_\_\_.
- 2) The purpose of CLOSING MSIVs and MSIV Bypass valves in E-2 (FAULTED STEAM GENERATOR ISOLATION) is to \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. OPEN
    2. terminate an uncontrolled cooldown
  - B.
    1. OPEN
    2. isolate a faulted S/G from the non-faulted S/Gs
  - C.
    1. CLOSED
    2. terminate an uncontrolled cooldown
  - D.
    1. CLOSED
    2. isolate a faulted S/G from the non-faulted S/Gs
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 48  
(1 point)

---

Given the following conditions on Unit 1:

- A unit shutdown is in progress
- 0200 both Main Feedwater pumps trip

Subsequently, the following conditions are observed:

<u>CONDITION</u>	<u>TIME</u>			
	<u>0200</u>	<u>0205</u>	<u>0210</u>	<u>0215</u>
NCS Temp (°F)	557	558	558	559
NCS Press (PSIG)	1965	1960	1976	1991
NR SG A (%)	19	18	19	19
NR SG B (%)	20	18	17	16
NR SG C (%)	20	19	18	16
NR SG D (%)	18	16	18	19

Based on the conditions above,

- 1) the EARLIEST time that the MD CA pumps will be running is \_\_\_\_\_.
- 2) the EARLIEST time that the TD CA pump will be running is \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A. 1. 0200  
2. 0205
- B. 1. 0205  
2. 0205
- C. 1. 0200  
2. 0215
- D. 1. 0205  
2. 0215

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 49  
(1 point)

---

Given the following conditions:

- MNS has experienced a Station Blackout
- The 1A D/G fails to start
- The 1B D/G started and tripped on low lube oil pressure

Based on the conditions above,

- 1) the vital DC batteries that should be monitored for decaying voltage are \_\_\_\_\_.
- 2) the battery discharge rate will \_\_\_\_\_ on the vital DC batteries with decaying voltage, until the design battery capacity is exhausted.

Which ONE (1) of the following completes the statements above?

- A.
    1. EVCA and EVCB
    2. remain constant
  - B.
    1. EVCA and EVCB
    2. increase steadily
  - C.
    1. EVCC and EVCD
    2. remain constant
  - D.
    1. EVCC and EVCD
    2. increase steadily
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 50  
(1 point)

---

Given the following initial conditions on Unit 1:

- A Loss of Offsite Power has occurred
- The crew is verifying natural circulation flow per EP/1A/5000/ G-1 (Generic Enclosures) Enclosure 33 (NATURAL CIRCULATION PARAMETERS)

Given the following parameters:

1. NC system Subcooling > 0°F
2. NC system hot leg temperatures at saturation temperature for S/G pressure
3. NC system cold leg temperatures going up slowly
4. NC system hot leg temperatures going down
5. S/G pressure stable
6. NC system cold leg temperatures at saturation temperature for S/G pressure
7. NC system pressure stable
8. Core Exit T/C's stable

Which ONE (1) of the following sets of conditions confirm that Natural Circulation exists and is effective in cooling the core in accordance with G-1, Enclosure 33?

- A. 1, 3, 4, 5, 7
  - B. 2, 3, 5, 7, 8
  - C. 1, 4, 5, 6, 8
  - D. 1, 2, 5, 7, 8
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 51  
(1 point)

---

Given the following initial conditions on Unit 2:

- Both CFPT's tripped causing a Rx Trip 15 minutes ago
- The crew has completed E-0 (REACTOR TRIP OR SAFETY INJECTION) and transitioned to ES-0.1 (REACTOR TRIP RESPONSE)

Subsequently:

- EVDA output breaker to 2EVIA inverter trips OPEN

Based on the conditions above,

- 1) which ONE (1) of the following indicates the impact on the CA system flow instrumentation?
- 2) what alternate indication can be used to determine the status of CA flow to the affected S/G?

- A.
    1. 2A S/G CA flow fails low
    2. 2A CA Pump amps and breaker indicating lights
  - B.
    1. 2B S/G CA flow fails low
    2. 2B CA Pump amps and breaker indicating lights
  - C.
    1. 2C S/G CA flow fails low
    2. 2A CA Pump amps and breaker indicating lights
  - D.
    1. 2D S/G CA flow fails low
    2. 2B CA Pump amps and breaker indicating lights
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 52  
(1 point)

---

Given the following on Unit 1:

- Unit is at 100% RTP
- 125VDC Battery CXB is aligned for an "equalizing charge"

Subsequently:

- A fault on bus DCB causes the CXB Battery charger output breaker and the DCA -DCB cross tie breakers to OPEN

Based on the conditions above and per AP-15 (LOSS OF VITAL OR AUX CONTROL POWER),

- 1) switch indication on any component powered from 6.9 kV switchgear \_\_\_\_\_ will be DARK.
- 2) breakers powered from the affected 6.9 kV switchgear \_\_\_\_\_ be remotely operated.

Which ONE (1) of the following completes the statements above?

- A. 1. 1TB ONLY  
2. can
  - B. 1. 1TB AND 1TD  
2. can
  - C. 1. 1TB ONLY  
2. can NOT
  - D. 1. 1TB AND 1TD  
2. can NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 53  
(1 point)

---

Given the following initial conditions on Unit 1:

- Unit power ascension is in progress
- Unit is at 660 MW

Subsequently:

- MVARs are (-) 500 and slowly decreasing
- The operating crew enters AP-05 (GENERATOR VOLTAGE AND ELECTRICAL GRID DISTURBANCES)

- 1) If the voltage regulator is placed in MANUAL, the voltage regulator under excitation limiter \_\_\_\_\_ function to reduce leading MVARs.
- 2) Based on the conditions above and per AP-05, if unable to maintain MVARs within limits of the generator capability curve, then the crew will \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

**PROCEDURE LEGEND:**

AP-02 (TURBINE TRIP)

E-0 (REACTOR TRIP OR SAFETY INJECTION)

- A.
    1. will
    2. trip Unit 1 Turbine AND GO TO AP-02
  - B.
    1. will
    2. trip Unit 1 Reactor AND GO TO E-0
  - C.
    1. will NOT
    2. trip Unit 1 Turbine AND GO TO AP-02
  - D.
    1. will NOT
    2. trip Unit 1 Reactor AND GO TO E-0
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 54  
(1 point)

---

Given the following conditions on Unit 1:

- ECA-1.2 (LOCA OUTSIDE CONTAINMENT) has been implemented
- NC System pressure is 1700 psig and stable

In accordance with ECA-1.2,

- 1) the crew will FIRST stop and isolate the \_\_\_\_\_ pumps from the FWST.
- 2) the overall mitigating strategy includes cooldown and depressurization of the NCS to allow the \_\_\_\_\_.

Which ONE (1) of the following completes the statement above?

- A.
    1. ND
    2. Cold Leg Accumulators to inject
  - B.
    1. NI
    2. Cold Leg Accumulators to inject
  - C.
    1. ND
    2. ND isolation valves (1NI-173A and 1NI-178B) to close
  - D.
    1. NI
    2. ND isolation valves (1NI-173A and 1NI-178B) to close
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 55  
(1 point)

---

Given the following condition on Unit 1:

- S/G's 1C & 1D are indicating 30% Narrow Range Level
- S/G's 1A & 1B are faulted and indicating <5% Wide Range Level
- All CA is unavailable
- Containment Pressure is 3.5 PSIG
- E-0 (REACTOR TRIP OR SAFETY INJECTION) has been completed

Based on the conditions above, which ONE (1) of the following indicates the NEXT procedure to be implemented AND the action(s) required?

**PROCEDURE LEGEND:**

E-2 (FAULTED S/G ISOLATION)

FR-H.1 (RESPONSE TO LOSS OF SECONDARY HEAT SINK)

- A. Go to E-2;  
Isolate C & D S/G's
  - B. Go to FR-H.1;  
Commence NCS feed and bleed
  - C. Go to E-2;  
Close all MSIVs and MSIV bypasses
  - D. Go to FR-H.1;  
Restore feed water flow to C & D S/G's
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 56  
(1 point)

---

Given the following conditions on Unit 1:

- A Large Break LOCA has occurred inside Containment
- A and B ND pumps are not available
- The Control room crew has implemented ECA-1.1 (LOSS OF EMERGENCY COOLANT RECIRC)
- Containment pressure is 8 PSIG and slowly rising
- FWST level is 105 inches and lowering

When the FWST Level LO setpoint is reached, 1NI-184B (1B ND PUMP SUCTION FROM CONT SUMP ISOL) AND 1NI-185A (1A ND PUMP SUCTION FROM CONT SUMP ISOL) (1) automatically OPEN.

Per ECA-1.1 Foldout Page, when FWST level decreases to less than a MAXIMUM of (2) inches ALL ECCS pumps must be secured.

Which ONE (1) of the following completes the statements above?

- A. 1. will  
2. 95
  - B. 1. will NOT  
2. 95
  - C. 1. will  
2. 20
  - D. 1. will NOT  
2. 20
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 57  
(1 point)

---

Given the following initial conditions on Unit 1:

- A Unit runback has occurred
- Rods are inserting in AUTO
- Rod M-12 in Control Bank D is NOT inserting with its bank

Subsequently:

- A Rod Control Urgent Failure alarm is received
- Unit1 Control Rod Bank Select is taken to MANUAL
- I&E determines source of alarm is Power Cabinet 1BD

Due to the Power Cabinet Rod Control Urgent Failure alarm, Group 1 rods in Control Banks B and D will NOT move in \_\_\_\_ (1) \_\_\_\_.

When Unit 1 OATC attempts to continue control rod insertion, rods in all groups of the other banks \_\_\_\_ (2) \_\_\_\_ insert.

Which ONE (1) of the following completes the statements above?

- A.     1. AUTO ONLY  
       2. will
  
  - B.     1. AUTO OR MANUAL  
       2. will
  
  - C.     1. AUTO ONLY  
       2. will NOT
  
  - D.     1. AUTO OR MANUAL  
       2. will NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 58  
(1 point)

---

Given the following initial conditions on Unit 2:

- A loss of offsite power has occurred
- The crew has commenced a cooldown and depressurization in accordance with ES-0.2 (NATURAL CIRCULATION COOLDOWN)
- The following conditions are observed:

	<b>0220</b>	<b>0230</b>
NC Pressure (PSIG)	1685	1635
T-Colds (°F)	602	598
CETs (°F)	612	610

- At time 0230 Pressurizer level begins increasing rapidly

In accordance with ES-0.2, the MAXIMUM allowable cooldown rate is     (1)    .

The cause of the Pressurizer level increase is     (2)    .

Which ONE (1) of the following completes the statements above?

- A.     1. 50°F / Hr  
       2. voiding in the Reactor Vessel head
  - B.     1. 50°F / Hr  
       2. an increase in flow from the NI pumps
  - C.     1. 100°F / Hr  
       2. voiding in the Reactor Vessel head
  - D.     1. 100°F / Hr  
       2. an increase in flow from the NI pumps
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 59  
(1 point)

---

Given the following conditions on Unit 2:

- Shutdown Bank Rods are withdrawn in preparation for a Reactor startup
- The startup is on hold while I&E completes an inspection of the Channel 1 Nuclear Instrument cabinet

### **PROCEDURE LEGEND:**

Tech Spec 3.3.1 (RTS INSTRUMENTATION)

In accordance with Tech Spec 3.3.1,

- 1) based on the conditions above, \_\_\_\_\_ channel(s) of Source Range Nuclear Instrumentation is/are currently required to be OPERABLE.
- 2) if the I&E technician caused a a loss of power to Source Range Channel N31, the crew \_\_\_\_\_ required to IMMEDIATELY open the Reactor Trip Breakers (RTBs).

Which ONE (1) of the following completes the statements above?

### **REFERENCE PROVIDED**

- A. 1. ONE  
2. is
  - B. 1. ONE  
2. is NOT
  - C. 1. BOTH  
2. is
  - D. 1. BOTH  
2. is NOT
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 60  
(1 point)

---

Given the following initial conditions on Unit 2:

- A reactor startup is being performed per OP/2/A/6100/003 (CONTROLLING PROCEDURE FOR UNIT OPERATION)
- Reactor power increase to allow taking critical rod height data is in progress
- Reactor power is  $7 \times 10^{-6}$  % (IR)

Subsequently:

- The IR Signal Processor for detector channel N36 fails

Based on the conditions above,

- 1) per Tech Spec 3.3.1 (RTS INSTRUMENTATION), the power increase \_\_\_\_\_.
- 2) Reactor power indication on \_\_\_\_\_ has been lost.

Which ONE (1) of the following completes the statements above?

- A. 1. can continue  
2. N36 ONLY
  - B. 1. must be suspended  
2. N36 ONLY
  - C. 1. can continue  
2. N32 AND N36
  - D. 1. must be suspended  
2. N32 AND N36
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 61  
(1 point)

---

Given the following conditions on Unit 2:

- 2EMF-59 (EQUIPMENT STAGING BUILDING VENTILATION MONITOR) is in Trip 2 alarm due to a release in the building
- The VK (EQUIPMENT STAGING BUILDING VENT) system selector switch is in the "ON" position

Which ONE (1) of the following describes the actions, if any, that will occur as a result of the Trip 2 alarm on 2EMF-59?

- A. The VK Supply fans ONLY will trip
  - B. The VK Exhaust AND Supply fans will trip
  - C. The VK exhaust filter bypass damper will CLOSE
  - D. NO automatic actions will occur
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 62  
(1 point)

---

Given the following conditions on Unit 1:

- Unit 1 is at 100% RTP
- 1AD-13 / E3 (FIRE DET SYS ALERT) is in alarm
- An electrical fire inside the auxiliary building cable spreading room has been reported
- AP-45 (PLANT FIRE) has been implemented

Fire suppression for the affected area will be accomplished by \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A. automatic halon actuation
  - B. automatic sprinkler actuation
  - C. an AO dispatched to open a MANUAL deluge valve
  - D. an AO dispatched to actuate a manual Cardox system
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 63  
(1 point)

---

Given the following conditions on Unit 2:

- The unit is at 100% RTP
- 2EMF-6 (REACTOR COOLANT FILTER 2B) is in Trip 2 alarm
- 2EMF-48 (REACTOR COOLANT HI RAD) is also in Trip 2 alarm
- The crew has implemented AP-18 (HIGH ACTIVITY IN REACTOR COOLANT)
- Chemistry has reported that the cause of the high activity is due to FAILED FUEL

In accordance with the mitigating strategy for AP-18, the crew will     (1)    .

The reason for performing this action is because it     (2)    .

Which ONE (1) of the following completes the statements above?

- A.
    1. ensure that a mixed bed demineralizer is in service
    2. causes a pH change that prevents further fuel degradation
  - B.
    1. ensure that a mixed bed demineralizer is in service
    2. facilitates the removal of fission products resulting from the failed fuel
  - C.
    1. increase letdown to 120 GPM
    2. increases the effectiveness of the fission product gas removal by the VCT
  - D.
    1. increase letdown to 120 GPM
    2. increases the removal rate of fission products by the demineralizer
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 64  
(1 point)

---

Given the following conditions on Unit 1:

- The operating crew initiated a manual SI due to a small break LOCA
- Equipment failures resulted in a RED condition on the Integrity CSF Status Tree
- NC Cooldown rate was approximately 220°F/hr
- NC System temperature is currently 240°F
- The crew is performing a soak in accordance with FR-P.1 (RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION)

Based on the conditions given, which ONE (1) of the following actions is permitted by FR-P.1 during the soak?

- A. Energize PZR heaters
  - B. Start an additional NV Pump
  - C. Place Auxiliary Spray in service
  - D. Increase CA flow to recover S/G NR level
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 65  
(1 point)

---

Given the following conditions on Unit 2:

- Unit tripped from 100% RTP
- A Loss of Off-Site Power has occurred
- ES-0.2 (NATURAL CIRCULATION COOLDOWN) has been implemented

Blocking automatic Safety Injection     (1)     required to be performed in ES-0.2 prior to implementing ES-0.3 (NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL).

The FIRST Major Action associated with ES-0.3 is     (2)    .

Which ONE (1) of the following completes the statements above?

- A.     1. is  
       2. initiate an NCS Cooldown
  
  - B.     1. is  
       2. try to start an NC pump
  
  - C.     1. is NOT  
       2. initiate an NCS Cooldown
  
  - D.     1. is NOT  
       2. try to start an NC pump
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 66  
(1 point)

---

Concerning AD-OP-ALL-0203 (REACTIVITY MANAGEMENT) during abnormal operating conditions,

- 1) a reactor trip should be initiated if the cause of a power change is not understood and reactor power level exceeds the pre-transient power level by greater than a MINIMUM of \_\_\_\_\_ , or is not controllable.
- 2) the ROs shall inform the CRS of \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. 5%
    2. all MANUAL control rod withdrawals
  - B.
    1. 5%
    2. the first MANUAL control rod withdrawal ONLY
  - C.
    1. 10%
    2. all MANUAL control rod withdrawals
  - D.
    1. 10%
    2. the first MANUAL control rod withdrawal ONLY
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 67  
(1 point)

---

When performing a normal fuel reload from the spent fuel pool to a core location, PT/0/A/4150/033 (TOTAL CORE RELOADING) requires the Reactor Building Crane operator to obtain permission from the \_\_\_\_\_ to PLACE a fuel assembly into a core location.

Which ONE (1) of the following completes the statement above?

- A. Fuel Handling SRO
  - B. Site Refueling Supervisor
  - C. Fuel Handling Reactor Engineer
  - D. Refueling Booth Support Reactor Operator
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 68  
(1 point)

---

Given the following initial conditions on Unit 2:

- Unit is at 4% RTP conducting a plant startup

Subsequently:

- One control bank "A" rod drops fully into the core
- NCS temperature decreases to 550°F

Based on the conditions above, the MOST limiting Tech Spec required action is to  
\_\_\_\_(1)\_\_\_\_ within \_\_\_\_ (2) \_\_\_\_.

Which ONE (1) of the following completes the statement above?

- A.     1. restore rod to within alignment limits  
       2. 30 minutes
  
  - B.     1. be in MODE 2 with  $K_{\text{eff}}$  less than 1.0  
       2. 30 minutes
  
  - C.     1. restore rod to within alignment limits  
       2. 1 hour
  
  - D.     1. be in MODE 2 with  $K_{\text{eff}}$  less than 1.0  
       2. 1 hour
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 69  
(1 point)

---

Given the following initial plant conditions:

- Both units are operating at 100% RTP
- The following alarms are lit on each unit:
  - 1AD-11 C-5 (XFMR A URGENT ALARM)
  - 2AD-11 C-5 (XFMR A URGENT ALARM)

Subsequently:

- An AO reports a loss of BOTH Cooling Groups has occurred on each transformer

To prevent a turbine runback to <56% RTP, cooling to the \_\_\_\_ (1) \_\_\_\_ Main Transformer must be restored within a MAXIMUM of \_\_\_\_ (2) \_\_\_\_ .

Which ONE (1) of the following completes the statement above?

- A.
    - 1. 1A
    - 2. 8 minutes, 45 seconds
  - B.
    - 1. 2A
    - 2. 8 minutes, 45 seconds
  - C.
    - 1. 1A
    - 2. 28 minutes, 45 seconds
  - D.
    - 1. 2A
    - 2. 28 minutes, 45 seconds
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 70  
(1 point)

---

Given the following conditions on Unit 1:

- You are to perform a valve lineup in the Letdown Heat Exchanger Room
- The dose rate in the room is 3000 mREM/HR
- Your total exposure for the year is 1000 mREM

In accordance with PD-RP-ALL-0001 (RADIATION PROTECTION):

The Letdown Heat Exchanger Room must be posted as a \_\_\_\_ (1) \_\_\_\_ Area.

The MAXIMUM amount of time you can spend in the room before reaching your EXCLUDE exposure limit is \_\_\_\_ (2) \_\_\_\_ minutes.

Which ONE (1) of the following completes the statements above?

- A.     1. Locked High Radiation  
       2. 12
  
  - B.     1. Locked High Radiation  
       2. 16
  
  - C.     1. Very High Radiation  
       2. 12
  
  - D.     1. Very High Radiation  
       2. 16
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 71  
(1 point)

---

Given the following conditions:

- An RO is performing a valve lineup in the Unit 1 Auxiliary Building pipe chase
- The RO receives a Dose Rate alarm on his Electronic Dosimeter (ED)
- The possibility of Dose Rate alarms was discussed during the RP brief

In accordance with PD-RP-ALL-0001 (RADIATION WORKER RESPONSIBILITIES),

- 1) the Dose Rate alarm will \_\_\_\_\_.
- 2) based on the conditions above, the RO \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A.
    1. NOT clear until the ED is reset
    2. must stop work and exit the area
  - B.
    1. NOT clear until the ED is reset
    2. will reset the dose rate alarm and continue to work until two additional dose rate alarms are received
  - C.
    1. automatically clear when dose rate drops below 80% of alarm setpoint
    2. must stop work and exit the area
  - D.
    1. automatically clear when dose rate drops below 80% of alarm setpoint
    2. may continue to work until two additional dose rate alarms are received
-



# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 72  
(1 point)

---

Given the following conditions on Unit 1:

- Mode 4 valve checklist PT is being performed
- The PT calls for independent verification of a single valve located in a room with a general dose rate of 110 mREM/hr
- Estimated time to independently verify the valve's position is 5 minutes

In accordance with NSD-700 (VERIFICATION TECHNIQUES), independent verification of the valve above     (1)     be waived because     (2)    .

Which ONE (1) of the following completes the statement above?

- A.
    1. can
    2. the general area dose rate is greater than 100 mREM/hr
  - B.
    1. can NOT
    2. the general area dose rate is less than 500 mREM/hr
  - C.
    1. can
    2. the radiation exposure for a single verification exceeds the allowable limit
  - D.
    1. can NOT
    2. the radiation exposure for a single verification is within the allowable limit
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 73  
(1 point)

---

Related to Emergency Operating Procedures (EOPs) rules of usage,

1) the step below is a (an) \_\_\_\_\_ action step.

**3.**

**Check**

2) steps which may be performed in any order are designated by \_\_\_\_\_.

Which ONE (1) of the following completes the statements above?

- A. 1. immediate  
2. asterisks
  - B. 1. immediate  
2. bullets
  - C. 1. continuous  
2. asterisks
  - D. 1. continuous  
2. bullets
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

**Question: 74**  
(1 point)

---

Given the following plant conditions:

- A fire has been reported on a small oil cooled transformer
- The transformer may be energized

Which ONE (1) of the following indicates the fire class ratings of the portable fire extinguishers that must be used in this situation?

- A. A and B
  - B. B and C
  - C. C and D
  - D. A and D
-

# McGuire Nuclear Station

## *ILT-31 MNS RO NRC Examination*

Question: 75  
(1 point)

---

Given the following conditions on Unit 1:

- A Site Area Emergency has been declared
- A Site Assembly is being conducted in accordance with RP/0/A/5700/011 (CONDUCTING A SITE ASSEMBLY, SITE EVACUATION, OR CONTAINMENT EVACUATION)

Per Enclosure 4.3 (OSM ACTIONS FOR SITE ASSEMBLY),

- 1) the announcement for the Site Assembly shall be repeated every \_\_\_\_\_ minutes until notification that the Site Assembly has been completed.
- 2) the Site Assembly shall be completed within a MAXIMUM of \_\_\_\_\_ minutes.

Which ONE (1) of the following completes the statements above?

- A. 1. 10  
2. 30
  - B. 1. 20  
2. 30
  - C. 1. 10  
2. 60
  - D. 1. 20  
2. 60
-

## ***Reference List for: ILT-31 MNS RO NRC Examination***

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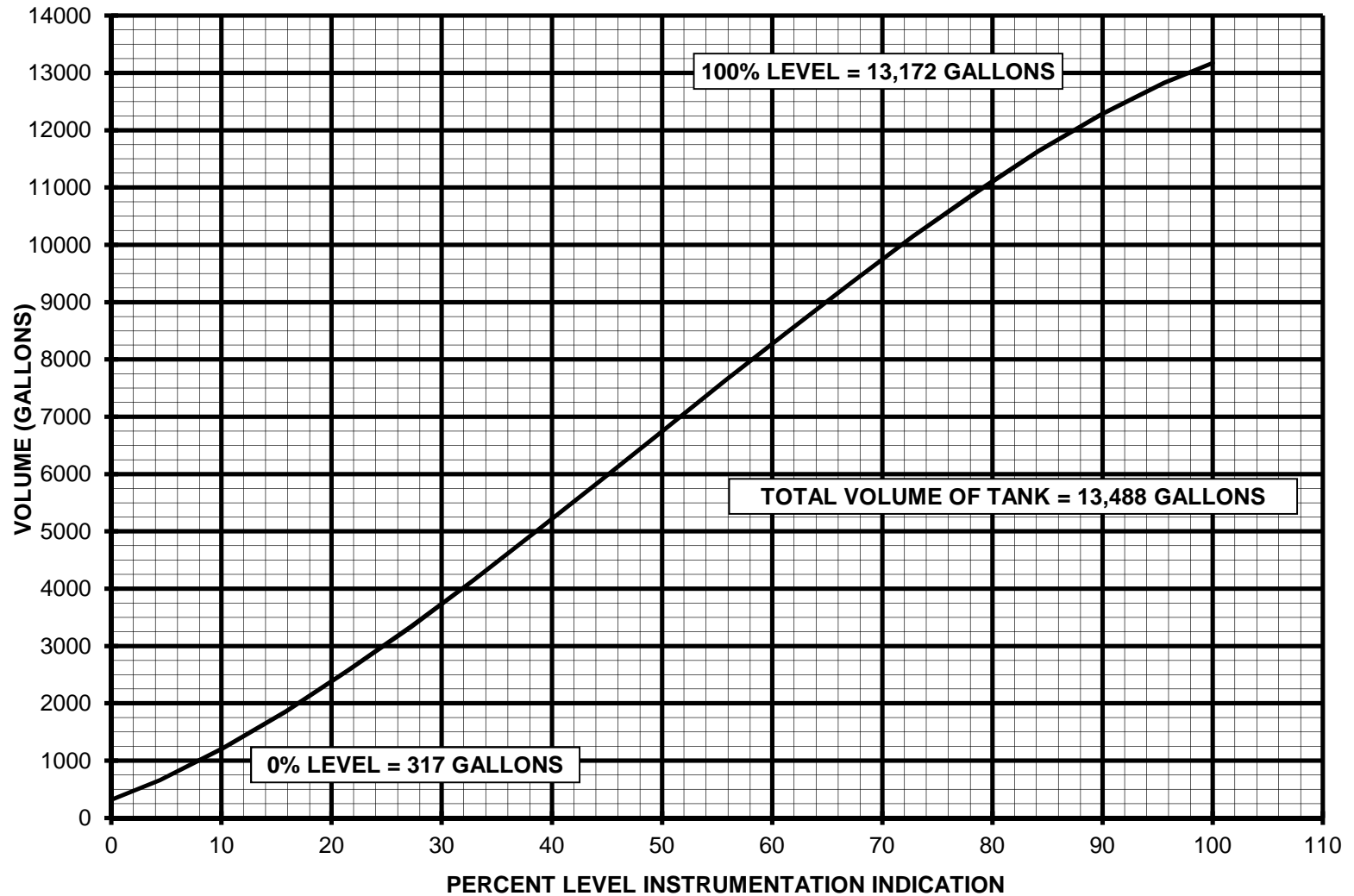
Steam Tables

Unit 1 Plant Data Book, Curve 7.2

Tech Spec 3.3.1 (RTS Instrumentation) Pages 1-15

# UNIT 1

OP/1/A/6100/22  
ENCLOSURE 4.3  
CURVE 7.2  
PRESSURIZER RELIEF TANK  
(VOLUME vs. LEVEL)



This data is also available on the OAC.

# UNIT 1

3.3 INSTRUMENTATION

3.3.1 Reactor Trip System (RTS) Instrumentation

LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1-1.

ACTIONS

-----NOTE-----  
Separate Condition entry is allowed for each Function.  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s).	Immediately
B. One Manual Reactor Trip channel inoperable.	B.1 Restore channel to OPERABLE status.	48 hours
	<u>OR</u> B.2 Be in MODE 3.	54 hours
C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u> C.2 Open reactor trip breakers (RTBs).	49 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>D. One channel inoperable.</p>	<p>-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing and setpoint adjustment. -----</p> <p>D.1.1 -----NOTE----- Only required to be performed when the Power Range Neutron Flux input to QPTR is inoperable -----</p> <p>Perform SR 3.2.4.2</p> <p><u>AND</u></p> <p>D.1.2 Place channel in trip.</p> <p><u>OR</u></p> <p>D.2 Be in MODE 3.</p>	<p>12 hours from discovery of THERMAL POWER &gt; 75% RTP</p> <p><u>AND</u></p> <p>Once per 12 hours thereafter</p> <p>72 hours</p> <p>78 hours</p>

(continued)



ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. One channel inoperable.</p>	<p>-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing. -----</p> <p>E.1 Place channel in trip.</p> <p><u>OR</u></p> <p>E.2 Be in MODE 3.</p>	<p>72 hours</p> <p>78 hours</p>
<p>F. THERMAL POWER &gt; P-6 and &lt; P-10, one Intermediate Range Neutron Flux channel inoperable.</p>	<p>F.1 Reduce THERMAL POWER to &lt; P-6.</p> <p><u>OR</u></p> <p>F.2 Increase THERMAL POWER to &gt; P-10.</p>	<p>24 hours</p> <p>24 hours</p>
<p>G. THERMAL POWER &gt; P-6 and &lt; P-10, two Intermediate Range Neutron Flux channels inoperable.</p>	<p>-----NOTE----- Limited boron concentration changes associated with RCS inventory control or limited plant temperature changes are allowed. -----</p> <p>G.1 Suspend operations involving positive reactivity additions.</p> <p><u>AND</u></p> <p>G.2 Reduce THERMAL POWER to &lt; P-6.</p>	<p>Immediately</p> <p>2 hours</p>
<p>H. THERMAL POWER &lt; P-6, one or two Intermediate Range Neutron Flux channels inoperable.</p>	<p>H.1 Restore channel(s) to OPERABLE status.</p>	<p>Prior to increasing THERMAL POWER to &gt; P-6</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME	
<p>I. One Source Range Neutron Flux channel inoperable.</p>	<p>-----NOTE----- Limited boron concentration changes associated with RCS inventory control or limited plant temperature changes are allowed.</p>	<p>Immediately</p>	
	<p>I.1 Suspend operations involving positive reactivity additions.</p>		
<p>J. Two Source Range Neutron Flux channels inoperable.</p>	<p>J.1 Open RTBs.</p>	<p>Immediately</p>	
<p>K. One Source Range Neutron Flux channel inoperable.</p>	<p>K.1 Restore channel to OPERABLE status.</p>	<p>48 hours</p>	
	<p><u>OR</u> K.2 Open RTBs.</p>	<p>49 hours</p>	
<p>L. Required Source Range Neutron Flux channel inoperable.</p>	<p>-----NOTE----- Plant temperature changes are allowed provided that SDM is maintained and Keff remains &lt; 0.99.</p>	<p>Immediately</p>	
	<p>L.1 Suspend operations involving positive reactivity additions.</p>		
	<p><u>AND</u> L.2 Close unborated water source isolation valves.</p>		<p>1 hour</p>
	<p><u>AND</u> L.3 Perform SR 3.1.1.1.</p>		<p>1 hour <u>AND</u> Once per 12 hours thereafter</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>M. One channel inoperable.</p>	<p>-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing. -----</p> <p>M.1 Place channel in trip.</p> <p><u>OR</u></p> <p>M.2 Reduce THERMAL POWER to &lt; P-7.</p>	<p>72 hours</p> <p>78 hours</p>
<p>N. One Reactor Coolant Flow - Low (Single Loop) channel inoperable.</p>	<p>-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing. -----</p> <p>N.1 Place channel in trip.</p> <p><u>OR</u></p> <p>N.2 Reduce THERMAL POWER to &lt; P-8.</p>	<p>72 hours</p> <p>76 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>O. One Turbine Trip - Low Fluid Oil Pressure channel inoperable.</p>	<p>-----NOTE----- One channel may be bypassed for up to 12 hours for surveillance testing. -----</p> <p>O.1 Place channel in trip.</p> <p><u>OR</u></p> <p>O.2 Reduce THERMAL POWER to &lt; P-8.</p>	<p>72 hours</p> <p>76 hours</p>
<p>P. One or more Turbine Trip - Turbine Stop Valve Closure channels inoperable.</p>	<p>P.1 Place channel(s) in trip.</p> <p><u>OR</u></p> <p>P.2 Reduce THERMAL POWER to &lt; P-8.</p>	<p>72 hours</p> <p>76 hours</p>
<p>Q. One train inoperable.</p>	<p>-----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing provided the other train is OPERABLE. -----</p> <p>Q.1 Restore train to OPERABLE status.</p> <p><u>OR</u></p> <p>Q.2 Be in MODE 3.</p>	<p>24 hours</p> <p>30 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>R. One RTB train inoperable.</p>	<p>-----NOTE----- One train may be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE.</p> <p>-----</p> <p>R.1 Restore train to OPERABLE status.</p> <p><u>OR</u></p> <p>R.2 Be in MODE 3.</p>	<p>24 hours</p> <p>30 hours</p>
<p>S. One or more channel(s) inoperable.</p>	<p>S.1 Verify interlock is in required state for existing unit conditions.</p> <p><u>OR</u></p> <p>S.2 Be in MODE 3.</p>	<p>1 hour</p> <p>7 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>T. One or more channel(s) inoperable.</p>	<p>T.1 Verify interlock is in required state for existing unit conditions.</p> <p><u>OR</u></p> <p>T.2 Be in MODE 2.</p>	<p>1 hour</p> <p>7 hours</p>
<p>U. One trip mechanism inoperable for one RTB.</p>	<p>U.1 Restore inoperable trip mechanism to OPERABLE status.</p> <p><u>OR</u></p> <p>U.2 Be in MODE 3.</p>	<p>48 hours</p> <p>54 hours</p>
<p>V. Two RTS trains inoperable.</p>	<p>V.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

-----NOTE-----  
Refer to Table 3.3.1-1 to determine which SRs apply for each RTS Function.  
-----

SURVEILLANCE	FREQUENCY
SR 3.3.1.1 Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2 -----NOTES----- 1. Adjust NIS channel if absolute difference is > 2% RTP.  2. Not required to be performed until 12 hours after THERMAL POWER is $\geq$ 15% RTP.  -----  Compare results of calorimetric heat balance calculation to Nuclear Instrumentation System (NIS) channel output.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.3 -----NOTES----- 1. Adjust NIS channel if absolute difference is $\geq$ 3% AFD.  2. Not required to be performed until 24 hours after THERMAL POWER is $\geq$ 15% RTP.  -----  Compare results of the incore detector measurements to NIS AFD.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.4 -----NOTES-----  This Surveillance must be performed on the reactor trip bypass breaker prior to placing the bypass breaker in service.  -----  Perform TADOT.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.3.1.5 Perform ACTUATION LOGIC TEST.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.3.1.6 -----NOTES-----  Not required to be performed until 24 hours after THERMAL POWER is <math>\geq</math> 75% RTP.  -----  Calibrate excore channels to agree with incore detector measurements.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.3.1.7 -----NOTES-----  Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3.  -----  Perform COT.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)



SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.8 -----NOTES-----            This Surveillance shall include verification that interlocks P-6 (for the Intermediate Range channels) and P-10 (for the Power Range channels) are in their required state for existing unit conditions.            -----            Perform COT.</p>	<p>-----NOTE-----            Only required when not performed within the Frequency specified in the Surveillance Frequency Control Program or previous 184 days            -----            Prior to reactor startup  <u>AND</u>            Four hours after reducing power below P-10 for power and intermediate range instrumentation  <u>AND</u>            Four hours after reducing power below P-6 for source range instrumentation  <u>AND</u>            In accordance with the Surveillance Frequency Control Program</p>

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.3.1.9 -----NOTES----- Verification of setpoint is not required. -----  Perform TADOT.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.3.1.10 -----NOTES----- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. -----  Perform CHANNEL CALIBRATION.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.3.1.11 -----NOTES----- 1. Neutron detectors are excluded from CHANNEL CALIBRATION.  2. Power Range Neutron Flux high voltage detector saturation curve verification is not required to be performed prior to entry into MODE 1 or 2.  3. Intermediate Range Neutron Flux detector plateau voltage verification is not required to be performed prior to entry into MODE 1 or 2.* -----  Perform CHANNEL CALIBRATION.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>
<p>SR 3.3.1.12 Perform CHANNEL CALIBRATION.</p>	<p>In accordance with the Surveillance Frequency Control Program</p>

(continued)

\* This note applies to the Westinghouse-supplied compensated ion chamber neutron detectors. The compensated ion chamber neutron detectors are being replaced with Thermo Scientific-supplied fission chamber neutron detectors which do not require detector plateau voltage verification. Therefore, this note does not apply to the fission chamber neutron detectors.

SURVEILLANCE	FREQUENCY
SR 3.3.1.13 Perform COT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.14 -----NOTES----- Verification of setpoint is not required. -----  Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.15 -----NOTES----- Verification of setpoint is not required. -----  Perform TADOT.	-----NOTE----- Only required when not performed within previous 31 days -----  Prior to reactor startup
SR 3.3.1.16 -----NOTES----- Neutron detectors are excluded from response time testing. -----  Verify RTS RESPONSE TIME is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.17 Verify RTS RESPONSE TIME for RTDs is within limits.	In accordance with the Surveillance Frequency Control Program

Table 3.3.1-1 (page 1 of 7)  
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
1. Manual Reactor Trip	1,2	2	B	SR 3.3.1.14	NA	NA
	3(a), 4(a), 5(a)	2	C	SR 3.3.1.14	NA	NA
2. Power Range Neutron Flux						
a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 110% RTP	109% RTP
b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 26% RTP	25% RTP
3. Power Range Neutron Flux Rate						
High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.11	≤ 5.5% RTP with time constant ≥ 2 sec	5% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8(j)(k) SR 3.3.1.11(j)(k)	≤ 30% RTP* ≤ 38% RTP	25% RTP
	2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8(j)(k) SR 3.3.1.11(j)(k)	≤ 30% RTP* ≤ 38% RTP	25% RTP

(continued)

\* The ≤ 30% RTP Allowable Value applies to the Westinghouse-supplied compensated ion chamber Intermediate Range neutron detectors. The compensated ion chamber neutron detectors are being replaced with Thermo Scientific-supplied fission chamber neutron detectors. The ≤ 38% Allowable Value applies to the replacement fission chamber Intermediate Range neutron detectors.

- (a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.
- (b) Below the P-10 (Power Range Neutron Flux) interlocks.
- (c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.
- (d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
- (j) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
- (k) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The methodologies used to determine the as-found and the as-left tolerances are specified in the UFSAR.

Table 3.3.1-1 (page 2 of 7)  
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	NOMINAL TRIP SETPOINT
5. Source Range Neutron Flux	2(d)	2	I,J	SR 3.3.1.1 SR 3.3.1.8(j)(k) SR 3.3.1.11(j)(k)	$\leq 1.3 \text{ E5 cps}^{**}$ $\leq 1.44 \text{ E5 cps}$	1.0 E5 cps
	3(a), 4(a), 5(a)	2	J,K	SR 3.3.1.1 SR 3.3.1.7(j)(k) SR 3.3.1.11(j)(k)	$\leq 1.3 \text{ E5 cps}^{**}$ $\leq 1.44 \text{ E5 cps}$	1.0 E5 cps
	3(e), 4(e), 5(e)	1	L	SR 3.3.1.1 SR 3.3.1.11	N/A	N/A
6. Overtemperature $\Delta T$	1,2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16 SR 3.3.1.17	Refer to Note 1 (Page 3.3.1-18)	Refer to Note 1 (Page 3.3.1-18)
7. Overpower $\Delta T$	1,2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16 SR 3.3.1.17	Refer to Note 2 (Page 3.3.1-19)	Refer to Note 2 (Page 3.3.1-19)
8. Pressurizer Pressure						
a. Low	1(f)	4	M	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	$\geq 1935 \text{ psig}$	1945 psig
b. High	1,2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	$\leq 2395 \text{ psig}$	2385 psig

(continued)

\*\* The  $\leq 1.3 \text{ E5 cps}$  Allowable Value applies to the Westinghouse-supplied boron trifluoride ( $\text{BF}_3$ ) Source Range neutron detectors. The  $\text{BF}_3$  neutron detectors are being replaced with Thermo Scientific-supplied fission chamber neutron detectors. The  $\leq 1.44 \text{ E5 cps}$  Allowable Value applies to the replacement fission chamber Source Range neutron detectors.

- (a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.
- (d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
- (e) With the RTBs open. In this condition, source range Function does not provide reactor trip but does provide indication.
- (f) Above the P-7 (Low Power Reactor Trips Block) interlock.
- (j) If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service.
- (k) The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures (field setting) to confirm channel performance. The methodologies used to determine the as-found and the as-left tolerances are specified in the UFSAR.

***Examination KEY for: ILT-31 MNS RO NRC Examination***

<b><i>Question Number</i></b>	<b><i>Answer</i></b>
1	B
2	B
3	A
4	D
5	D
6	B
7	A
8	D
9	B
10	C
11	B
12	D
13	B
14	C
15	D
16	C
17	D
18	A
19	A
20	D
21	C
22	C
23	B
24	D
25	C

***Examination KEY for: ILT-31 MNS RO NRC Examination***

<b><i>Question Number</i></b>	<b><i>Answer</i></b>
26	D
27	D
28	A
29	B
30	D
31	C
32	A
33	C
34	A
35	C
36	C
37	A
38	C
39	C
40	C
41	B
42	D
43	B
44	A
45	B
46	A
47	D
48	C
49	B
50	C

***Examination KEY for: ILT-31 MNS RO NRC Examination***

<b><i>Question Number</i></b>	<b><i>Answer</i></b>
51	A
52	D
53	B
54	C
55	D
56	C
57	B
58	A
59	D
60	D
61	D
62	C
63	B
64	C
65	B
66	A
67	D
68	B
69	B
70	B
71	D
72	D
73	B
74	B
75	A