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1600 East Lamar Blvd
Arlington, TX 76011-4511

SUBJECT: NRC INITIAL EXAMINATION ANALYSIS

GEXO: 2014/00048

Dear Mr. Garchow,

Enclosed is the NRC Initial Examination Analysis for the Initial License Written Examination administered on October 17, 2014.

- Written Exam questions with a greater than or equal to 50% failure rate.
- Written Exam questions requesting two answers correct or to be removed from the exam.

Please contact Steve or Gabe at (601) 437-2255 if you have any questions or need any further materials.

Sincerely,

Elizabeth Meaders
Manager, Training & Development
Grand Gulf Nuclear Station

Ricky Liddell
Superintendent, Operations Training
Grand Gulf Nuclear Station

2014 NRC Exam Analysis

> or = 50% miss and challenged questions

Question 6 69% (9/13)

Correct answer was taken directly ONEP 05-1-02-V-1, Loss of Component Cooling Water.

'A' is wrong. With the conditions given a SCRAM is not required per ONEP 05-1-02-V-1, Loss of Component Cooling Water.

'B' is correct. Step 3.2.2 of ONEP 05-1-02-V-1, Loss of Component Cooling Water.

'C' is wrong. The RWCU system is to be shutdown prior to closing the P42-F103.

'D' is wrong. Core flow should only be reduced if Recirc Pump Temps are rising.

Exam team reviewed the other answers and determined that the question is acceptable and no changes are required to the question or lesson material.

Question 18

The keyed answer states the "Upscale HI-HI-HI setpoint is **varied** throughout the operating cycle by Chemistry". The term 'is' implies that the setpoint is expected to be change at some point during the operating cycle. This is not correct as shown on the setpoint log sheet currently published in the Control Room setpoint log book. The setpoint has been 'fixed' at 1.0 E+5 cpm for several operating cycles, beginning in August 2003.

The listed correct answer of 'D' is justified based on the Note prior to step 6.5.1 which states "Setpoints may be calculated at management discretion". This statement does not mean the setpoint value can be varied throughout the cycle at management discretion but rather, the setpoint calculation may be initiated at times other than the required surveillance frequency. Initiation of the setpoint calculations does not necessarily, and has not resulted in changing the actual Offgas Post-treat HI-HI-HI-setpoints.

The preceding sentence in the same Note prior to step 6.5.1 states that " Existing setpoints remain valid if monitor volume efficiency as determined in surveillance 06-CH-1D17-A-0024 meets acceptance criteria". Discussions with plant chemists indicate that the Offgas Post-Treat HI-HI-HI setpoints are not varied from cycle-to-cycle, or during the operating cycle due to monitor volume efficiency meeting this acceptance criteria and isotopic analysis as described in 08-S-03-22, Installed Radiation Monitoring System Alarm Setpoint Determination & Control. Additionally, the setpoints are fixed because they are at the maximum allowable value as described in the note prior to step 6.5.1.I.

Therefore, based on the above discussion, there is no correct answer to this question.

Exam team reviewed the materials and requesting this question to be removed from the exam

6.5 Offgas Post-Treatment Radiation Monitors, N1D17K601A&B

CAUTION

Setpoints for Offgas Post-Treatment Channels A & B should be based on the same methodology. For example, if N1D17K601A is based on the isotopic method then N1D17K601B should be based on the same isotopic method. This may require calculating setpoints for both monitors simultaneously. This is required due to the logic for the HI and HI HI HI alarm. Conservative setpoints should also be calculated simultaneously for both monitors.

NOTE

The ODCM Isotopic Method in Step 6.5.1 should be used when valid isotopics are available. Use the ODCM Conservative Method in Step 6.5.2 only when there are no valid current or previous isotopics. Chemistry Supervision approval is required for ODCM conservative method setpoints.

Existing setpoints remain valid if monitor volume efficiency meets acceptance criteria (06-CH-1D17-A-0024). Setpoints may be calculated at management discretion.

6.5.1 ODCM Isotopic Method (Use CH-104)

a. The High-High-High Alarm Setpoint (SHiHiHi) should be determined using an actual isotopic analysis and the ODCM isotopic methodology. An isotopic analysis cannot be used if nuclides are not detected in the grab sample. The isotopic analysis is performed on Surveillance Procedure 06-CH-1N64-M-0033, Offgas Post-Treatment Exhaust Gaseous Isotopic. Calculate the alarm setpoints using the following steps and CH-104.

NOTE

The Offgas Post-Treatment monitor must be Operable during the isotopic surveillance before this method can be used. A previous representative isotopic analysis may be used to calculate the alarm setpoints if a current isotopic analysis is not available.

Do not use N-13 in the following calculation.

b. Record the release rate, Qi' (μCi/sec), for all detected noble gas and Ar-41 nuclides on CH-104 (obtained from the isotopic analysis).

6.5.1 (Cont.)

NOTE

If necessary, obtain unlisted Ki, Li and Mi values from ODCM Table 2.1-1.

c. Multiply Qi' times Ki to obtain KiQi' for each nuclide listed.

d. Multiply Qi' times (Li + 1.1Mi) to obtain (Li + 1.1Mi)Qi' for each nuclide listed.

e. Sum each KiQi' to obtain ΣKiQi'.

f. Sum each (Li + 1.1Mi)Qi' to obtain Σ(Li + 1.1Mi)Qi'.

g. Determine isotopic monitor background count rate (BKGiso) in cpm. (Obtained from the isotopic analysis.)

h. Calculate monitor reading

(1) Calculate the net count rate (C) in cpm.

(C)= Gross monitor reading (cpm) - Isotopic Background reading (cpm)

(2) Calculate the minimum detectable net monitor reading (C') in cpm.

(C') = 2 * Square Root of Isotopic Background (cpm)

(3) Use the larger of C or C' as the net count rate (C) in Section 6.5.1j.

i. Obtain a monitor reading after a 5 minute purge. This is the current background (BKGcur).

6.5.1 (Cont.)

j. Calculate TB and S using the following equations:

$$TB(cpm) = \left| \frac{(2.82\ E+7)(C)}{\Sigma KiQi'} \right| + [BKGcur]$$

and

$$S(cpm) = \left| \frac{(1.69\ E+8)(C)}{\Sigma(Li + 1.1Mi)Qi'} \right| + [BKGcur]$$

Where: 2.82 E+7 = The constant for total body derived from the Sv equation and terms in the ODCM Section 2.1.1, AF = 1.0, SF = 0.4

1.69 E+8 = The constant for skin derived from the Sv equation and terms in the ODCM Section 2.1.1, AF = 1.0, SF = 0.4

C = The Larger of C or C'net count rate in cpm from the monitor requiring setpoints as determined in Step 6.5.1h

BKGcur = Current Background count rate in cpm from Step 6.5.1i

$\Sigma KiQi'$ = As determined in Step 6.5.1e

$\Sigma(Li + 1.1Mi)Qi'$ = As determined in Step 6.5.1f

k. Determine the High-High-High Alarm Setpoint (SHiHiHi) using the following equation:

SHiHiHi(cpm) = The lesser of either TB_{cpm} or S_{cpm}

> NOTE
>
> If SHiHiHi exceeds 1.0 E+5 cpm, then set SHiHiHi equal to 1.0 E+5 cpm.

l. Calculate the High-High Alarm Setpoint (SHiHi) using the following equation:

SHiHi(cpm) = (SHiHiHi - BKGcur) 0.75 + BKGcur

Where: SHiHiHi = Value obtained in Step 6.5.1k

BKGcur = Value obtained in Step 6.5.1i

m. Calculate the High Alarm Setpoint (SHi) using the following equation:

SHi(cpm) = (SHiHiHi - BKGcur) 0.50 + BKGcur

Where: SHiHiHi = Value obtained in Step 6.5.1k

BKGcur = Value obtained in Step 6.5.1i

6.5.1 (Cont.)

n. Attach to CH-104 a copy of the isotopic analysis printout that shows the nuclide release rates used to calculate the alarm setpoints.

6.5.2 ODCM Conservative Method (Use CH-103)

CAUTION

The conservative setpoint methodology results in setpoints that may cause nuiscance alarms depending on plant conditions. This methodology should be used only with approval of Chemistry Supervision.

a. Calculate the High-High-High Alarm Setpoint using the following equation: (Use a separate CH-103 form for each A and B monitor setpoint calculation.)

$$SHiHiHi\,(cpm) = \left[\frac{(AF)(D_{TB})(3.53\ E\text{-}5)(60)(SF')}{\overline{(X/Q)}(K)(V)(X)} \right] + [BKG]$$

reducing:

$$SHiHiHi\,(cpm) = \left[\frac{3.95\ E+05}{V} \right] + [BKG]$$

Where: AF = 1.0

SF′ = 0.4

D_{TB} = 500 mrem/yr (10 CFR 20 total body dose rate limit)

3.53 E-5 = Conversion factor, ft^3 per cc

60 = Conversion factor, sec per min

$\overline{X/Q}$ = 7.1 E-6 sec/m^3, the highest sector annual average atmospheric dispersion factor from the ODCM

K = 1.51 E+3 mrem/yr per $\mu Ci/m^3$, the total body dose factor based on a historical mixture of GGNS effluents, reference 3.7

V = Offgas flow rate obtained from N64R620 flowmeter in the Control Room in cfm

X = 1.0 E-4 $\mu Ci/cc/cpm$, the Xe-133 volume efficiency factor of the detector system as determined by the primary calibration

BKG = Current monitor background count rate in cpm (should be obtained from the current Kr-85 gas calibration procedure or the monitor reading after a five-minute purge on the monitor)

6.5.2 (Cont.)

b. The Offgas Post-Treatment High-High Alarm Setpoint (SHiHi) is set at 75% of the High-High-High Alarm Setpoint using the following equation:

SHiHi(cpm) = (SHiHiHi - BKG) 0.75 + BKG

Where: SHiHiHi and BKG are obtained from Step 6.5.2a

c. The Offgas Post-Treatment High Alarm Setpoint (SHi) is set at 50% of the High-High-High Alarm Setpoint using the following equation:

SHi(cpm) = (SHiHiHi - BKG) 0.50 + BKG

Where: SHiHiHi and BKG are obtained from Step 6.5.2a

6.6 Eberline AXM Effluent Radiation Monitors

TABLE 3

Ventilation System Location	AXM Effluent Radiation Monitor	Maximum Designed Vent Flow Rate (cfm)
Radwaste Bldg	NSD17P017	48,000
Containment Bldg	N1D17P019	6,000
Fuel Handling Area	N1D17P021	31,000
Turbine Bldg	N1D17P023	15,000
SBGT B	N1D17P025	4,300
SBGT A	N1D17P027	4,300

6.6.1 Channel 1 Pig Monitor (Use CH-105)

a. Fixed Background = Value obtained from the Background Count Rate section in the I&C AXM calibration procedure

b. High Alarm Setpoint = 5.00 E+00 mR/hr

c. Alert Alarm Setpoint = 3.50 E+00 mR/hr

d. Trend Alarm Setpoint = 1.00 E+06 %/min

e. Calibration Constant = Value obtained from the Channel 1 Calibration Constant section in the I&C AXM calibration procedure, labeled Calibration Constant

6.6.2 Channel 2 Background (Use CH-105)

a. Fixed Background = Value obtained from the Background Count Rate section in the I&C AXM calibration procedure

b. Alert Alarm Setpoint = 5.00 E+00 cpm

c. Trend Alarm Setpoint = 1.00 E+06 %/min

Set points not changed. WO# 52273090 MV 4-21-11

WO# 52229371 ID17K601A setpoints did not change. MT 8-18-10

WO# 52201440 setpoints not changed MT 1-22-08

SET POINTS NOT CHANGED WO#52340389 R2 7/19/12

ALARM SETPOINT CONTROL FORM
GENERAL ELECTRIC OFFGAS POST-TREATMENT RADIATION MONITORS
(ODCM ISOTOPIC METHOD)

Set points. Not changed. WO# 26764 2/13-4-11

DATE: 8-6-03 TIME: 1030

Monitor # and Location: N1D17K601A & B, 118' Offgas/Radwaste Building

NUCLIDES	Qi' (uCi/sec)	Ki	KiQi'	(Li + 1.1Mi)	(Li + 1.1Mi)Qi'
Xe-138		0.83E+3		1.43E+4	
Xe-135m		3.12e+3		4.41E+3	
Kr-87		3.92E+3		1.65E+4	8-6-03 GM
Kr-88	1.45E-2	1.47E+4	213.2	1.91E+4	~~238.3~~ 277.0
Kr-85m	1.47E-1	1.17E+3	172.0	2.81E+3	413.1
Xe-135		1.81E+3	~~167~~ 8/01	3.97E+3	
Xe-133	5.53E-2	3.94E+2	16.3	6.94E+2	38.4
Ar-41	1.92E-1	9.84E+3	1697.3	1.29E+4	2476.8
Xe-133m		2.51E+2		1.35E+3	
Kr-85		1.61E+1		1.36E+3	

Σ KiQi' 2098.8 (8-6-03 GM)

Σ(Li + 1.1Mi)Qi' ~~3229.5~~ 3205.3 (8-6-03 GM)

WO# 51670812 setpoints not changed MT 8-27-08

Setpoints not changed. WO# 52463164

Setpoints NOT CHANGED ID17K601A TC 6/27/08

Setpoints NOT changed ID17K601A/B 11/19/08

Setpoints not changed WO# 52449732 RBT 9-20-13

WO# 52362521 RBT 4-10-14

Setpoints for both monitors should be calculated simultaneously

OFFGAS POST-TREATMENT A

BKG_{iso} = Background from Isotopic = 23 (cpm)

C = GROSS cpm − BKG_{iso}

C = 35 − 23 = 12 (net)

C' = 2 X $\sqrt{BKG_{iso}}$ (mder)

C' = 2 X $\sqrt{23}$ = 10 (mder)

NET = Larger of C or C' = 12 (cpm)

BKG_{cur} = Current Background = 23 (cpm)

TB = 1.61E+5 (cpm)

S = ~~6.33 6.32E+5~~ (8-6-03 GM) (cpm)

ALARM SETPOINTS 'A'

High-High-High: SHIHIHI = 1.00E+5 (cpm)

High-High: SHIHI = 7.50E+4 (cpm)

High: SHI = 5.08E+4 (cpm)

OFFGAS POST-TREATMENT B

BKG_{iso} = Background from Isotopic = 47 (cpm)

C = GROSS cpm − BKG_{iso}

C = 60 − 47 = 13 (net)

C' = 2 X $\sqrt{BKG_{iso}}$ (mder)

C' = 2 X $\sqrt{47}$ = 14 (mder)

NET = Larger of C or C' = 14 (cpm)

BKG_{cur} = Current Background = 43 (cpm)

TB = ~~1.88E+5~~ 1.15 (8-6-03 GM) 1.88E5 (cpm)

S = ~~7.39 7.37E+5~~ (8-6-03 GM) (cpm)

ALARM SETPOINTS 'B'

High-High-High: SHIHIHI = 1.00E+5 (cpm)

High-High: SHIHI = 7.50E+4 (cpm)

High: SHI = 5.00E+4 (cpm)

Comments: Isotopic from 6/16/3 MWO 50727536 01 BKGcur from calibration

Performed: [signature] Reviewed: [signature] / Rob Beverly

A copy of this sheet has been placed in the Control Room Setpoint Logbook. M. Ford / 8-24-05

I&C Technician Date

ID17-A-1018 performed on both A&B channels Setpoints remained the same. MT 8-24-05

CH-104
REV. 5 (06/03)

X	QA RECORD	# of Pages
	RT : B2.37	Date
	Non QA Record	Related Doc Number
	Initials:	

IC-ID17-A-1018 PERFORMED ON BOTH A+B CHNLS SETPOINTS REMAINED THE SAME T.M. 11-17-06

WO# 51312784: Setpoints for D17K601A did not change. [illegible] 11-19-08

WO# 51671192: Setpoints did not change for ID17K601B [illegible] 11-4-09

Offgas Post Treatment Radiation Monitors

State/identify the purpose/function of the Offgas Post Treatment Radiation Monitoring Subsystem. (12.5)

Figure 14
♫Knowledge

12.5 The Offgas Post Treatment Radiation Monitoring Subsystem monitors the Offgas System discharge activity.

In order to prevent a release of radioactive materials above allowable environmental limits, the subsystem will generate an isolation of the Offgas System if a prescribed setpoint is reached.

This subsystem also provides indication of the Offgas activity.

The Offgas Post-Treatment Radiation Monitoring Subsystem can draw samples from four points in the Offgas System.

The normal sample point is the outlet of charcoal adsorbers, just before the after filters.

The three alternate sample points are as follows:

- Outlet of first charcoal bed in Train A,
- Outlet of first charcoal bed in Train B, and
- Charcoal adsorber entrance.

The charcoal adsorber entrance is accessible only by the vial sampler.

When it is being used, all sample inlets to the monitor must be secured to prevent untreated offgas from getting into the monitor.

The sample flow is returned to the Offgas System at the inlet to the Outlet Cooler/Condensers.

State/identify the location of the Offgas Post Treatment Radiation Monitor. (14.5)

14.5 The Offgas Post-Treatment Monitor skid is located at Area 29, Elevation 118', adjacent to the Chemistry Hot Lab.

The skid is identical to the GE Constant Flow Monitor skids except it has two Noble Gas sample chambers and detectors instead of one.

One of these detectors is the A channel and the other is the B channel.

It also has a parallel Vial Sample Panel similar to that of the Offgas Pre-Treatment Rad. Monitoring Subsystem.

NOTES	LESSON BODY
	Describe the control room indications and controls of the Process Radiation Monitoring System. (13)
	[13] The Post Treatment Log Count Rate Meters consists of two channels: Channel A (D17-RITS-K601A) and Channel B (D17-RITS-K601B). • Each channel has two ranges: 1-10,000 cpm and 1-1,000,000 cpm. • The LCRMs are located on panel P604. The functions on these units are identical to those of the GE Constant Flow Monitor Subsystem LCRM's.
	The radiation levels can be read on the LCRM's on panel P604 and on the Offgas Post Treatment Recorder, D17-RR-R601, a two-channel digital recorder located on P600.
	Discuss the types of alarms received on the Radiation Monitoring Systems. (8)
	[8] The following alarms are associated with the Offgas Post Treatment Radiation Monitoring Subsystem. A trip of <u>either</u> Channel A or B will cause the associated alarm to actuate.
P601-19A-G8	• OG POST-TREAT MON SMPL FLO HI/LO – This alarm will occur for either Hi/Lo Gas <u>or</u> particulate sample flow. – The set points are a low flow of ≤1" Hg or a high flow of ≥13" Hg
P601-19A-F8	• OG POST-TREAT RAD MON DNSC
P601-19A-E8 *P601-19A-D8*	– This alarm will be generated if the activity level should fall to ≤30 cpm or if the instrument fails. • OG POST-TREAT RAD HIGH – The setpoint of this alarm is 25% of the Hi-Hi-Hi setpoint. • OG POST TREAT RAD HI-HI – The setpoint of this alarm is 75% of the Hi-Hi-Hi setpoint. This is an alarm only and is generated by recorder D17-R601.
P601-19A-C8 Considered inop when the setpoint decreases by at least 25%	• OG POST-TREAT RAD HI-HI-HI/INOP – The setpoint for this alarm is determined by Chemistry. – This alarm will also be generated for a loss of high voltage to the detector or if the function switch is not in OPERATE.

NOTES	LESSON BODY
	Describe the automatic actions initiated by the Process Radiation Monitoring. (15)
♫ *Control*	**15** There are two automatic actions generated by the Offgas Post Treatment Radiation Monitoring Subsystem. • Offgas system isolation. • The second is generated by the UPSCALE HI or DOWNSCALE which removes the system from the bypass mode. The trip logic for the isolation requires <u>both</u> channels to trip to actuate the trip function as follows: • <u>Two</u> UPSCALE HI-HI-HI trips • <u>Two</u> DOWNSCALE trips • <u>One</u> DOWNSCALE trip <u>and</u> <u>one</u> UPSCALE HI-HI-HI trip This trip will generate a complete offgas isolation by closing the Offgas isolation valve, N64-F060. F060 closing will cause the following valves to also close: – holdup line loop seal isolation valve, N64-F023 – cooler/condenser drain isolation valves, N64-F034A/B – prefilter inlet drain, N64-F054. The trip logic for the second trip function requires only <u>one</u> UPSCALE HI trip to actuate the trip function. • This trip will cause the OG Adsorber Train Bypass valve, N64-F045, if open, to close. • It also opens the selected Charcoal Adsorber train inlet valve, N64-F051A/B/C/D, closes the N64-F340 and opens N64-F339 if in AUTO.
The alarms on P601 will then clear.	All trip functions auto-reset after rad levels decrease below the trip setpoint. The alarm indicating lamps on LCRM's must be manually reset with the RESET pushbutton.

State/identify the power supplies of the Radiation Monitoring Systems. (9)

[9] The Offgas Post Treatment Monitors are powered from the Process Monitor Inverters K699A and K699B located on panel P604.

These inverters are powered from BOP 125 VDC distribution panels 1DD6 and 1DE1, respectively.

The recorder and purge logic are powered from BOP inverter 1Y80.

The sample pumps and sample/purge control are powered from BOP 120 VAC.

Carbon Bed Vault Radiation Monitor

State/identify the purpose/function of the Offgas Post Treatment Radiation Monitoring Subsystem. (12.6)

Figure 15

[12.6] The Carbon Bed Vault Radiation Monitoring Subsystem monitors and indicates levels of radioactivity inside the Offgas Carbon Bed Vault.

When radiation levels exceed a predetermined setpoint, a trip circuit annunciates an alarm but provides NO automatic actions.

- This subsystem consists of a Geiger-Muller (G-M) type detector on the outside wall of the Charcoal Bed Vault and an indicating trip unit located on NMS panel P669 (Upper Control Room).
- The trip unit has a range of 1-1,000,000 mR/hr.

Discuss the types of alarms received on the Radiation Monitoring Systems. (8)

P601-19A-C7

[8] The following alarms are associated with the Carbon Bed Vault Radiation Monitoring Subsystem:

- OG CHAR VAULT RAD MON DNSC
  - This alarm occurs at a setpoint of 1.6 mR/hr. The white indicating lamp on trip unit must be manually reset after the condition clears.

P601-19A-B7

Setpoint is periodically re-calculated by Chemistry staff.

- OG CHAR VAULT RAD HI
  - This alarm occurs at a setpoint of 2x full power background.
  - The yellow indicating lamp on trip unit must be manually reset after the condition clears.

Question 26 84% (11/13)

Correct answer was taken directly from 04-1-01-E12-1, RHR System Operating Procedure, precautions and limitations.

A is Correct on the KEY

B is wrong: The flowrate is correct however the temp for a required shutdown is 65 degrees.

C and D is wrong; The flowrate is incorrect per system SOI.

This question has no correct answer. The basis for keyed answer 'A' states that "***a caution in the procedure has you secure Suppression Pool cooling before you go below 65°F.***"

However, the referenced caution states the following:

CAUTION

WHEN operating the Suppression Pool Cooling System, DO NOT allow Suppression Pool average temperature to fall below 70°F. This limit complies with FSAR temperature limit on the "B" feedwater flued head of 65°F. IF average Suppression Pool temperature falls below 70°F, MONITOR AND RECORD the Suppression Pool temperature. RECORD that reading in the Control Room Operators log. ENSURE Suppression Pool cooling is secured, Unless operating per required surveillance, THEN SECURE before Suppression Pool average temperature falls below 65°F. IF average Suppression Pool temperature falls below 65°F, start RCIC per SOI 04-1-01-E51-1 with suction aligned to the Suppression pool and operating with minimum flow path open. Operate RCIC until Suppression Pool temperature is greater than or equal to 65°F.

The caution states to ensure Suppression Pool Cooling is secured if average Suppression Pool temperature falls below 70°F, ***Unless operating per required surveillance.*** A review of surveillance 06-OP-1E51-Q-0003, RCIC System Quarterly Pump Operability Verification, does not provide any guidance that allows suppression pool temperature to drop below the limit of **70°F** as stated in the Caution in the SOI. The only guidance for Suppression Pool Cooling operation in the surveillance is to "***initiate Suppression Pool Cooling BEFORE Suppression Pool temperature reaches 95°F.***"

The surveillance does not provide any guidance concerning the securing of Suppression Pool cooling; therefore there is no basis for allowing Suppression Pool temperature to fall below the stated temperature of 70°F.

A review of surveillances that require operation the RHR System in the Suppression Pool Cooling mode did not find any surveillance that **requires** continued Suppression Pool cooling when Suppression Pool temperature falls below 70°F. A review of surveillance 06-OP-1E12-Q-0023, LPCI/RHR A Quarterly Functional Test, and 06-OP-1E12-Q-0024, LPCI/RHR B Quarterly Functional Test, which demonstrate Suppression Pool Cooling mode of RHR A and RHR B, provide instructions to isolate SSW flow through the RHR heat exchangers if Suppression Pool Cooling is **NOT** desired due to pool temperatures.

Based on this information, none of the provided answers are correct since no potential answer has a Suppression Pool temperature of 70°F.

Exam team reviewed the materials and requesting this question to be removed from the exam.

3.7 **WHEN** operating the Suppression Pool Cooling System, Do **NOT** allow Suppression Pool average temperature to fall below 70°F. This limit complies with FSAR temperature limit on the 'B' feedwater flued head of 65°F. **IF** average Suppression Pool temperature falls below 70°F, **MONITOR AND RECORD** the Suppression Pool temperature. **RECORD** that reading in the Control Room Operators log. **ENSURE** Suppression Pool Cooling is secured, Unless operating per required surveillance, **THEN SECURE** before Suppression Pool average temperature falls below 65°F. **IF** average Suppression Pool temperature falls below 65°, **START** RCIC per SOI 04-1-01-E51-1 with suction aligned to the Suppression Pool **AND** operating with minimum flow path open. Operate RCIC until Suppression Pool temperature is greater than or equal to 65°F.

3.8 Fill and Vent

3.8.1 **OBSERVE** all radiation control procedures for potentially contaminated liquids and gases.

3.9 The LPCI Mode of RHR 'A', 'B' and 'C' is inoperable whenever the associated test return to Suppression Pool valve (E12-F024A, E12-F024B and E12-F021) is OPEN. **REFER** to LCO 3.5.1 and 3.5.2. (This information included as permanent information on 1H13-P601-17C and 20C.)

3.10 RHR A **AND** RHR B Jockey pumps supply Feedwater Leakage Control System. RHR C Jockey pump supplies water to Div 2 Suppression Pool Wide and Narrow Range Level indication.

3.11 Opening F024A(B) without associated RHR PMP A(B) running, **OR** with F003A(B) **AND** F048A(B) Closed, results in draining a large portion of RHR piping to Suppression Pool.

3.12 Manually starting an RHR pump starts SSW, **AND** automatically establishes an adequate SSW flow path for RHR pump seal cooler, but Does **NOT** automatically establish SSW Flow through RHR Hx's. During cold weather outages the AUTO start function of SSW May be defeated by **INSTALLING** Temporary Alteration to maintain SSW temperature above minimum required temperature of 40 degrees.

3.13 RHR System Should **NOT** be operated in LPCI INJECTION mode Unless required during an emergency condition. Even though flow deflectors were installed to minimize core instrumentation impingement due to LPCI operation, impingement damage Could still occur.

5.2 Suppression Pool Cooling - Startup and Shutdown

NOTE

Suppression pool cooling can be placed in service with other loops in various RHR modes. Care must be exercised to avoid dumping Reactor coolant directly to Suppression Pool. During an emergency Attachment VI may be used to initiate maximum Suppression Pool Cooling.

CAUTION

Stirring up Suppression Pool when using Suppression Pool Cooling may cause a rise in noble gas concentration. Radiation Protection should be notified before starting Suppression Pool Cooling.

WHEN operating the Suppression Pool Cooling System, DO NOT allow Suppression Pool average temperature to fall below 70°F. This limit complies with FSAR temperature limit on the "B" feedwater flued head of 65°F. IF average Suppression Pool temperature falls below 70°F, MONITOR AND RECORD the Suppression Pool temperature. RECORD that reading in the Control Room Operators log. ENSURE Suppression Pool cooling is secured, Unless operating per required surveillance, THEN SECURE before Suppression Pool average temperature falls below 65°F. IF average Suppression Pool temperature falls below 65°F, start RCIC per SOI 04-1-01-E51-1 with suction aligned to the Suppression pool and operating with minimum flow path open. Operate RCIC until Suppression Pool temperature is greater than or equal to 65°F.

5.2.1 Prerequisites

a. Respective RHR loop in STANDBY per Section 4.1 of this instruction.

b. SSW available to applicable loop heat exchangers.

c. ADHR System is **NOT** in operation.

d. Respective CTMT Spray Logic is reset.

Title: RCIC System Quarterly Pump Operability Verification	No.: 06-OP-1E51-Q-0003	Revision: 136	Page: 1

1.0 PURPOSE

1.1 To demonstrate (once per quarter) RCIC System monthly operability in accordance with Tech Specs SR 3.5.3.1 **AND** SR 3.5.3.2.

1.2 To demonstrate (once per quarter) Remote Shutdown System (RCIC Turbine Speed Instrumentation) monthly operability in accordance with Tech Spec SR 3.3.3.2.1,Table TR3.3.3.2-1.7.

1.3 To demonstrate quarterly RCIC System operability in accordance with Tech Specs SR 3.5.3.3, 5.5.6, **AND** TRM 7.6.3.3. Also, this procedure Shall be performed within 12 hours after RCIC Steam Supply Pressure is ≥ 945 psig **AND** ≤ 1045 psig, **IF NOT** performed within the last 92 days.

1.4 To exercise check valves for the Inservice Testing Program.

1.5 To perform pump condition monitoring for the Inservice Testing Program.

1.6 To perform 30 minute run as recommended by Terry Turbine Owner's Group to eliminate any condensate from the RCIC oil system. Performance of this run in this surveillance takes credit for monthly run per 04-1-03-E51-2.

1.7 **WHEN** 06-OP-1E51-Q-0003 is performed, it is **NOT** necessary to perform 06-OP-1E51-M-0001. Performance of 06-OP-1E51-Q-0003 completes all requirements of 06-OP-1E51-M-0001.

1. 8 Changes required for implementation of 1994 TSIP were incorporated in Revision 100. For historical reference, this statement Should **NOT** be deleted.

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Avoid injection of water to Reactor during test.

2.2 RCIC Turbine Should be tripped **IF** any of the following occurs:

2.2.1 Excessive vibration in turbine **OR** pump

2.2.2 High oil temperature (> 155°F)

2.2.3 Loss of oil pressure (< 3 psig at Governor Actuator **AND** Bearing)

2.2.4 Any unusual noises, **OR** unexplained operating conditions develop

2.3 Suppression Pool temperature Shall be monitored per 06-OP-1M24-V-0001 **AND** Suppression Pool Cooling initiated **BEFORE** Suppression Pool temperature reaches 95°F.

2.4 Suppression Pool level Shall be maintained below high level limit during operation of RCIC Turbine.

DATA SHEET I (Cont.)
RCIC SYSTEM QUARTERLY PUMP OPERABILITY VERIFICATION
SAFETY RELATED

STEP	ACTION REQUIRED	INITIALS PERFORMER	INITIALS VERIFIER
5.2.29	(Cont.)		
	TECH SPEC TRIGGER (SR 3.6.2.1.1)		
$	g. **MONITOR** Suppression Pool Temperature per 06-OP-1M24-V-0001 while RCIC Turbine is exhausting to Suppression Pool.	_____	
	(1) **IF** necessary, **THEN INITIATE** Suppression Pool Cooling per SOI 04-1-01-E12-1.	_____	
5.2.30	**TEST** RCIC pump to verify Tech Spec Criteria by **PERFORMING** the following:		
	a. **USING** E51-F551 **AND** RCIC FLO CONT, **ADJUST** pump speed **AND** valve position to establish ≥ 800 gpm **AND** discharge pressure ≥ Rx vessel pressure. **RECORD** time that 800 gpm was reached on Data Sheet II. (RCIC Must run ≥ 30 minutes from this time for Step 5.2.41)	_____	
	b. **RECORD** RCIC flow rate from E51-R606 on Data Sheet II.	_____	
$	c. **VERIFY** RCIC flow rate is ≥ 800 gpm.		
	Yes [ ] No [ ]	_____	_____

DATA SHEET I
LPCI/RHR SUBSYSTEM B QUARTERLY FUNCTIONAL TEST (Cont.)
SAFETY RELATED

STEP	ACTION REQUIRED	INITIALS PERFORMED BY	INITIALS VERIFIED BY
5.3.2	(Cont.)		
m.	**START** SSW B System **AND PLACE** RHR B HX in service per SOI 04-1-01-P41-1.	_____	

NOTE

IF Suppression Pool Cooling is **NOT** desired due to pool temperature, **THEN** isolate SSW flow through the RHR HX by **PERFORMING** steps 5.3.2m(1) **AND** 5.3.2m(2). Otherwise N/A.

(1) **CLOSE** RHR HX OUTL VLV P41F068B. _____

(2) **OPEN OR VERIFY OPEN** SSW PMP B RECIRC VLV P41F006B. _____

CAUTION

RHR Pump B Should be shutdown anytime suction pressure drops below 2.5 psig to prevent damage to pump. A CR Should be initiated to determine cause AND INITIATE corrective actions.

n. **START** RHR Pump B. _____

o. **ENSURE** that 1E12-F064B, RHR B MIN FLO TO SUPP POOL, is Open **OR** automatically Opens. _____

p. **VERIFY** that RHR RM B FAN COIL UNIT (T51-B004) automatically starts on 1H13-P870-7C. _____

q. **VERIFY** that "ADS B RHR B/RHR C PERM" annunciator, 1H13-P601-19A (E-2), Alarms. _____

Question 48 61% (8/13)

Correct answer was taken directly from lesson material.

"If the DC source has low or no voltage IN SYNC is not required." ESF inverters WILL NOT auto transfer back to normal source.

'A' is wrong. IN SYNC is not required and it will NOT auto transfer

'B' is wrong. It will NOT auto transfer

'C' is wrong. IN SYNC is not required.

'D' is correct.

Exam team reviewed the other answers and determined that the question is acceptable and no changes are required to the question or lesson material.

Question 64 61% (8/13)

Correct answer was taken directly from P&ID for the Offgas system.

Instrument air is the only air used to operate valves and per P&ID the N64-F016A/B will fail open.

'A' is correct.

'B' is wrong. It will NOT fail close

'C' is wrong. Service air is not used.

'D' is wrong. Service air is not used

Exam team reviewed the other answers and determined that the question is acceptable and no changes are required to the lesson material.

Question 71 76% (10/13)

Correct answer was taken directly from 02-S-01-17, Control of Limiting Conditions for Operations.

If a valve is re-positioned to satisfy an LCO a CAUTION tag should be used.

Answer key shows D as correct.

Answer 'D' correct however, at GGNS the Control of LCO procedure states:

> ***6.2.2 Only those components re-positioned to satisfy the requirements of a TS/TRM/ODCM Required Action May be documented on an LCOTR for the purposes of configuration control.***
>
> ***a. WHEN components are re-positioned AND the LCOTR is the configuration control document, a Caution Tag Must be PLACED on the component OR control switch per Reference 3.13.***
>
> ***b. The Caution Tag Should include the LCOTR number AND required equipment condition.***

However, if the LCOTR is not being utilized for configuration control, then another configuration control method is required. Procedure 02-S-01-37, Configuration Control states the following:

> ***6.1 To maintain control of position of equipment controlled by Operations, one of the following methods shall be used during troubleshooting, support of other departments' activities, etc.***
>
> ***6.1.1 Approved plant procedure that restores the component to SOI position.***
>
> ***6.1.2 An approved WR/WO, STI, OR Engineering test that restores the component to SOI position. CPC tags may also be used at the discretion of Shift Management.***
>
> ***6.1.3 Red tag clearance (IF an On-shift SRO deems it to be required for personnel OR equipment safety)***
>
> ***6.1.4 Component Position Control Tag (Attachment I OR similar) (Will be used as DEVIATION tags when the Deviation process is phased in).***

Therefore, CPC tags are an acceptable method to control the position of a component which satisfies a required LCO action. With this, 'B' is also a correct answer.

Exam team reviewed the materials and requesting answers D and B be accepted as correct.

5.0 DEFINITIONS

5.1 Component Position Control (CPC) Tag - A 2 part tag posted by Operations personnel on equipment to identify equipment **NOT** in its normal configuration control position **AND NOT** controlled by another means. Each tag Will be numbered to simplify tracking. **WHEN** generating a DEVIATION tag, the number Will be the Deviation number in ESOMs **AND** the line item on the tag hang. For multiple tags associated with the same deficiency (WO, CR, WR, etc), the tags May be on one Deviation.

5.2 Component Position Control (CPC) Tag Log - An index of CPC tags listing the WR/WO number, affected component number, reason for the tag, **AND** date the tag was hung.

5.3 Component Position Control (CPC) Sheet – A sheet designed to support troubleshooting by controlling component configuration changes. Normally the CPC Sheet Will be part of the WR/WO issued by planning But May be added at a later time. CPC Sheets are **NOT** required **IF** specific steps are included with work instructions. CPC sheets are only to be used as part of a WR/WO **AND** are **NOT** stand alone documents.

5.4 Component Deviation - a process using ESOMs to track components that are out of SOI position. The ESOMs Component Deviation Folder will replace the CPC log and allow electronic tracking and auditing of components that are out of position.

6.0 DETAILS

6.1 To maintain control of position of equipment controlled by Operations, one of the following methods Shall be used during troubleshooting, support of other departments' activities, etc.

6.1.1 Approved plant procedure that restores the component to SOI position.

6.1.2 An approved WR/WO, STI, **OR** Engineering test that restores the component to SOI position. CPC tags May also be used at the discretion of Shift Management.

6.1.3 Red tag clearance (**IF** an On-shift SRO deems it to be required for personnel **OR** equipment safety)

6.1.4 Component Position Control Tag (Attachment I **OR** similar) (Will be used as DEVIATION tags **WHEN** the Deviation process is phased in).

6.1.5 Component Position Control Sheet (Attachment III **OR** similar) (Will be phased out **WHEN** all existing CPC sheets are converted to DEVIATIONs.

Question 72 53% (7/13)

Correct answer is taken directly from ARM surveillance, when the mode switch is taken to OFF the HIGH ALARM/RESET pushbutton will NOT illuminate.

Exam team reviewed the other answers and determined that the question is acceptable and no changes are required to the question or lesson material.