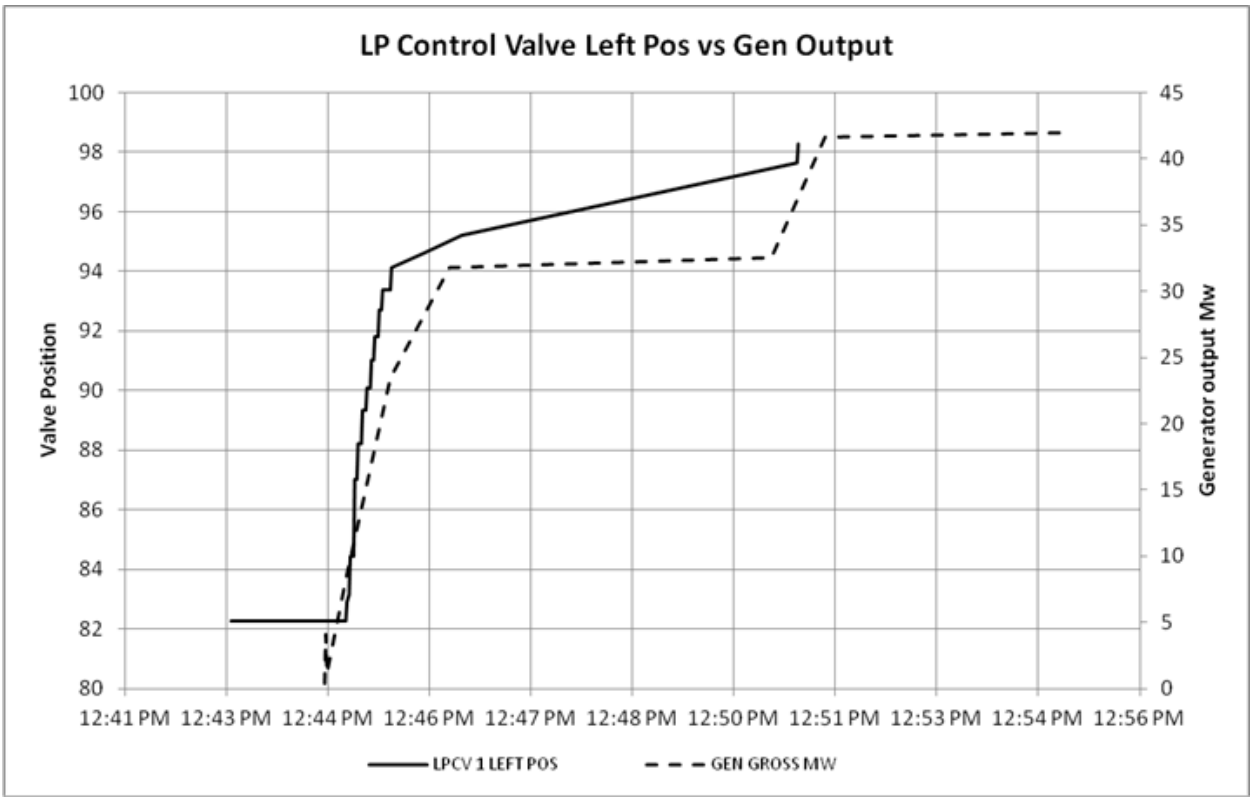
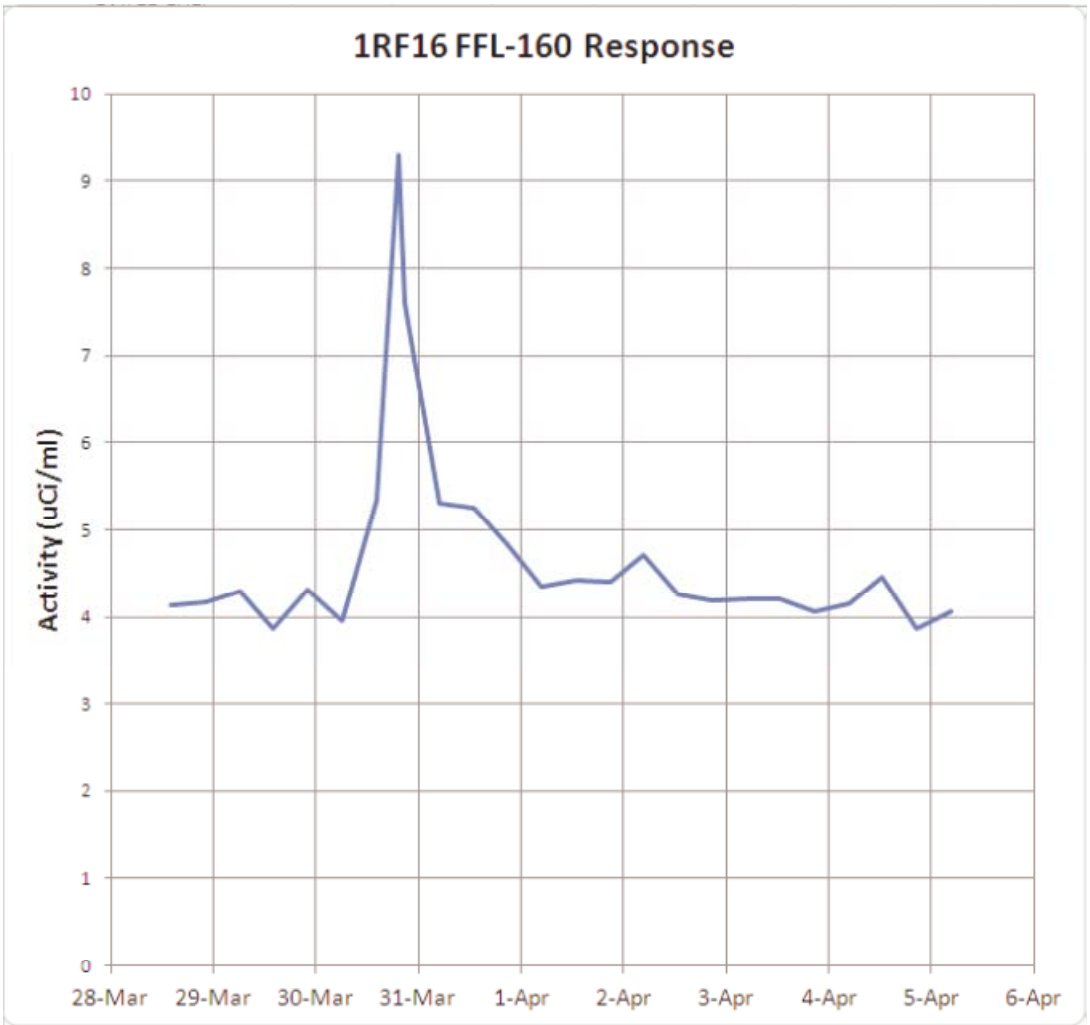
- **Question 036** – In accordance with plant data obtained from a recent plant startup (Figure 1) and in accordance with the simulator model where the candidates received their low power operation training, the LP Turbine Control Valves are at 86% OPEN at the stated plant conditions. Thus the correct position for the LP Turbine Control Valves is NOT FULLY OPEN making the correct answer D. This was a bank question and was not identified as being incorrect during on site validation. The question was significantly modified during the NRC review process but did not meet the requirements to be considered a modified question. **Recommended action is to change the correct answer from C to D**.

Figure 1



- **Question 062** – The activity increase is definitely due to an oxygen induced CRUD burst. However, the manner in which the Failed Fuel Monitor FFL160 responds is incorrect. Distractor C was intended to be incorrect by using the expression "spiking and returning to normal" which is used in ABN-102, High Reactor Coolant Activity to indicate a condition that is not a real failed fuel or RCS activity problem and as such does not require sampling. A steady or sustained increase over time was believed to be the real indication of failed fuel/RCS activity problems. Based on candidate feedback further investigation utilizing CPNPP actual FFL-160 data (Figure 2) from the 1RF16 induced CRUD burst yielded that the plant response is an activity spike with the indication returning to normal over the next day using the demineralizers as efficient particulate filters in the letdown stream. **Recommended action is to change the correct answer from A to C**.

Figure 2



- **Question 067** – In accordance with STA-617 Attachment 8.B, Breaker Operation Checklist the Source Range High Flux at Shutdown Switches are placed in BLOCK prior to breaker operation in MODE 6 (Procedural excerpts attached). This guidance in conjunction with the caution which states the reason for blocking the source range is to avoid an unnecessary containment evacuation makes Distractor B correct. This was a bank question and was not identified as being incorrect during validation. Further the listed reference for the bank question was RFO-102, which did not contain the guidance identified in STA-617. **Recommended action is to accept both B and C as correct**.

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-617
HIGH VOLTAGE SWITCHING AND CLEARANCE	REVISION NO. 8 INFORMATION USE	PAGE 29 OF 32

ATTACHMENT 8.B
PAGE 1 OF 4

BREAKER OPERATION CHECKLIST

Breaker Opening:

☐ 1. Prior to opening a breaker, verify the following:

☐ • Plant is NOT in MODE 2 with Source Range energized OR while in MODE 3 with rod referencing activities in progress for Reactor Startup.

• Source Range N-31 & N-32 HIGH FLUX AT SHUTDOWN switches to BLOCK when in MODE 3 - 6

☐ UNIT 1: ☐ Source Range N-31 ☐ Source Range N-32

☐ UNIT 2: ☐ Source Range N-31 ☐ Source Range N-32

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-617
HIGH VOLTAGE SWITCHING AND CLEARANCE	REVISION NO. 8 INFORMATION USE	PAGE 31 OF 32

ATTACHMENT 8.B
PAGE 3 OF 4

BREAKER OPERATION CHECKLIST

Breaker Closing:

☐ 1. Prior to closing a breaker, verify the following:

☐ • Plant is NOT in MODE 2 with Source Range energized OR while in MODE 3 with rod referencing activities in progress for Reactor Startup.

• Source Range N-31 & N-32 HIGH FLUX AT SHUTDOWN switches to BLOCK when in Mode 3 - 6

☐ UNIT 1: ☐ Source Range N-31 ☐ Source Range N-32

☐ UNIT 2: ☐ Source Range N-31 ☐ Source Range N-32

CAUTION: • High Voltage Switching may cause spiking of the Source Range Nuclear Instrumentation System Channels; resulting in possible HIGH FLUX AT SHUTDOWN and Containment Evacuation alarms.

Examination Outline Cross-reference:

Level	RO	SRO
Tier #	2	
Group #	2	
K/A #	045 A3.05	
Importance Rating	2.6	

Main Turbine Generator System: Ability to monitor automatic operation of the MTG System, including: Electrohydraulic control

Proposed Question: Common 36

Given the following conditions:

- Unit 1 Main Turbine startup is in progress as follows:
  - Turbine Speed is 1800 rpm.
  - Exhaust Hood temperature is 174°F.
  - Turbine Stress Evaluator (TSE) Margin is GREEN.
  - No operator action has been taken since establishing 1800 rpm.

What is the status of the LP Turbine Control Valves and the HP Turbine Control Valves at this point in Main Turbine startup?

	LP Turbine Control Valves	HP Turbine Control Valves
A.	FULLY OPEN	FULLY OPEN
B.	NOT FULLY OPEN	FULLY OPEN
C.	FULLY OPEN	NOT FULLY OPEN
D.	NOT FULLY OPEN	NOT FULLY OPEN

Proposed Answer: C

Explanation:

A. Incorrect. Plausible if thought that latching the turbine and raising speed to 1800 rpm (full speed) would open all control valves.

B. Incorrect. Plausible if thought that the HP vice the LP control valves would be fully open on turbine startup and the LP control valves throttle to control speed and the throttle to control load once synchronized to the Grid.

C. Correct. Given the conditions listed and with no operator action once the Main Turbine reaches 1800 RPM the LP control valves will be fully open and HP control valves throttle to control speed and will throttle to control load once synchronized to the Grid.

D. Incorrect. Plausible if thought that both the LP and HP control valves throttle to control load.

Technical Reference(s) LO21.SYS.MT1 Attached w/ Revision # See Comments / Reference

Proposed references to be provided during examination: None

Learning Objective: **LIST** and **DESCRIBE** the purpose of in-plant and Control Room System controls, indications, and alarms for the Main Turbine components.

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 5, 7
55.43 _____

Comments / Reference: From LO21.SYS.MT1	Revision 5/4/11

The Turbine-Generator load is controlled by stop and control valves. The stop valves admit steam to the turbine as operating conditions require, and provide extremely fast closure to isolate the turbine from the steam supply system in the event of a protective device actuation. This rapid closure of the stop valves is referred to as a turbine trip. The control valves regulate the amount of steam admitted to the Main Turbine to control the output load of the Main Generator or the speed of the turbine during startup.

Steam flow to the LP Turbines is regulated by the EHC system which uses hydraulic fluid pressure to position control valves in response to various inputs much like the HP Stop and Control valves. The LP Stop and Control valves are normally fully open with Turbine-Generator load being controlled by the HP Turbine.

During normal operation the LP Control Valves are fully open and will only throttle down upon a large loss of electrical load to help prevent overspeeding of the Main Turbine.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	2	
	Group #	2	
	K/A #	045 A3.05	
	Importance Rating	2.6	

Main Turbine Generator System: Ability to monitor automatic operation of the MTG System, including: Electrohydraulic control

Proposed Question: Common 36

Given the following conditions:

- Unit 1 Main Turbine startup is in progress as follows:
  - Turbine Speed is 1800 rpm.
  - Exhaust Hood temperature is 174°F.
  - Turbine Stress Evaluator (TSE) Margin is GREEN.
  - No operator action has been taken since establishing 1800 rpm.

What is the status of the LP Turbine Control Valves and the HP Turbine Control Valves at this point in Main Turbine startup?

	LP Turbine Control Valves	HP Turbine Control Valves
A.	FULLY OPEN	FULLY OPEN
B.	NOT FULLY OPEN	FULLY OPEN
C.	FULLY OPEN	NOT FULLY OPEN
D.	NOT FULLY OPEN	NOT FULLY OPEN

Proposed Answer: D

Explanation:

A. Incorrect. Plausible if thought that latching the turbine and raising speed to 1800 rpm (full speed) would open all control valves.

B. Incorrect. Plausible if thought that the HP vice the LP control valves would be fully open on turbine startup and the LP control valves throttle to control speed and the throttle to control load once synchronized to the Grid.

C. Incorrect. Plausible as this is the normal position of the LP and HP control valves under most plant conditions, however the LP Turbine Control Valves have not reached their full open status under the stated conditions.

D. Correct. In accordance with the CPNPP simulator which models is modeled on actual plant data, the LP Turbine Control Valves are at approximately 86% open under the stated plant condtions.

Technical Reference(s) LO21.SYS.MT1
CPNPP U2 2012 Benchmark Data

Attached w/ Revision # See Comments / Reference

Proposed references to be provided during examination: None

Learning Objective: **LIST** and **DESCRIBE** the purpose of in-plant and Control Room System controls, indications, and alarms for the Main Turbine components.

Question Source:
Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level:
Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content:
55.41 5, 7
55.43 _____

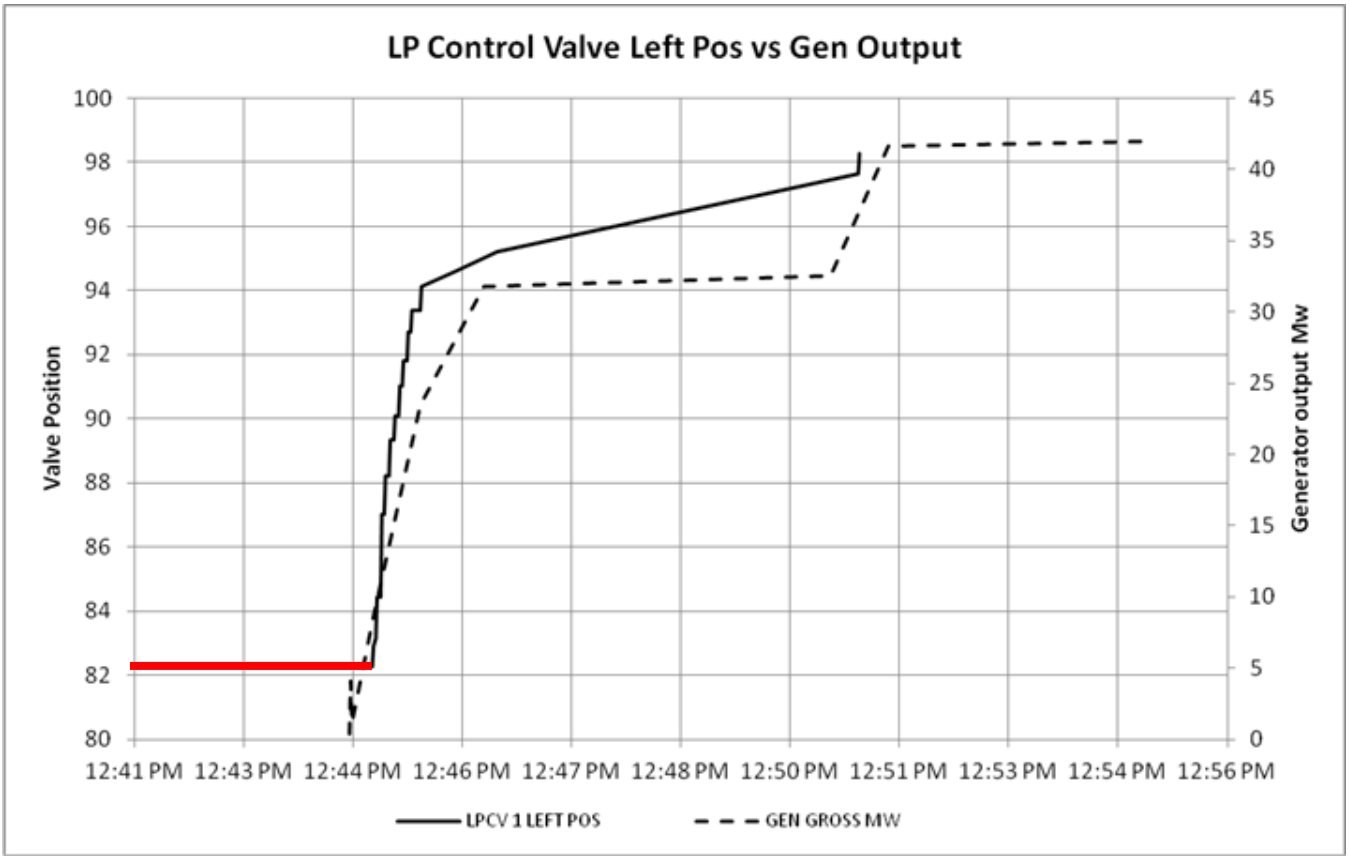
Comments / Reference: From LO21.SYS.MT1	Revision 5/4/11

The Turbine-Generator load is controlled by stop and control valves. The stop valves admit steam to the turbine as operating conditions require, and provide extremely fast closure to isolate the turbine from the steam supply system in the event of a protective device actuation. This rapid closure of the stop valves is referred to as a turbine trip. The control valves regulate the amount of steam admitted to the Main Turbine to control the output load of the Main Generator or the speed of the turbine during startup.

Steam flow to the LP Turbines is regulated by the EHC system which uses hydraulic fluid pressure to position control valves in response to various inputs much like the HP Stop and Control valves. The LP Stop and Control valves are normally fully open with Turbine-Generator load being controlled by the HP Turbine.

During normal operation the LP Control Valves are fully open and will only throttle down upon a large loss of electrical load to help prevent overspeeding of the Main Turbine.

Comments / Reference: From CPNPP U2 2012 Benchmark Data	11/12 Startup



Examination Outline Cross-reference:

Level	RO	SRO
Tier #	1	
Group #	2	
K/A #	076 AK2.01	
Importance Rating	2.6	

High Reactor Coolant Activity: Knowledge of the interrelations between High Reactor Coolant Activity and the following: Process radiation monitors

Proposed Question: Common 62

Given the following conditions:

- Unit 1 has experienced a problem with the Volume Control Tank (VCT).
- Charging Pump suction has been shifted to the Refueling Water Storage Tank (RWST) per SOP-103A, Chemical and Volume Control System.
- Chemistry has sampled the Reactor Coolant System and determined that Co-58 and Co-60 levels are increasing.

Which of the following lists the expected indication and the most probable cause for the indication?

1-RE-406 (FFL160) indication…

A. …rising at a steady rate due to an oxygen induced CRUD burst.

B. …rising at a steady rate due to oxygen induced cladding creep.

C. …spiking and returning to normal due to an oxygen induced CRUD burst.

D. …spiking and returning to normal due to oxygen induced cladding creep.

Proposed Answer: A

Explanation:

A. Correct. An increase in Co-58 and Co-60 are the result of oxygen induced CRUD burst from shifting to the Refueling Water Storage Tank.
B. Incorrect. Plausible because a FFL160 indication would be rising but cobalt is not an indication of cladding damage.
C. Incorrect. Plausible because FFL160 indication would rise not spike and return to normal and cobalt comes from a CRUD burst not clad failure.
D. Incorrect. Plausible because FFL160 indication would rise not spike and return to normal and cobalt comes from a CRUD burst not clad failure.

Technical Reference(s) ABN-102, Steps 1, 6 & 7 NOTES
SOP-103A, Step 5.5.15.A CAUTION
Attached w/ Revision # See Comments / Reference

Proposed references to be provided during examination: None

Learning Objective: **ANALYZE** the response to High Reactor Coolant Activity per ABN-102, High Reactor Coolant Activity.

Question Source: Bank # _____
Modified Bank # _____ (Note changes or attach parent)
New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge _____
Comprehension or Analysis X

10 CFR Part 55 Content: 55.41 10, 12
55.43 _____

Comments / Reference: From SOP-103A, Step 5.5.15.A CAUTION	Revision # 17

CPNPP SYSTEM OPERATING PROCEDURE MANUAL	UNIT 1	PROCEDURE NO. SOP-103A
CHEMICAL AND VOLUME CONTROL SYSTEM	REVISION NO. 17	PAGE 88 OF 131

5.5.15 Shifting Charging Pump Suction Between the VCT and RWST

CAUTION: Charging pump suction should normally remain aligned to the VCT due to dissolved oxygen concerns when suction comes from the RWST. When entering a plant outage, suctions should NOT be rolled to the RWST prior to crud burst. When time allows, Chemistry should be notified prior to rolling suction to the RWST.

A. IF desired to shift charging pump suction from the VCT to the RWST, THEN perform the following:

1) OPEN ONE or BOTH of the following valves:

☐ • 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV

☐ • 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV

Comments / Reference: From ABN-102, Step 7 NOTE	Revision # 7

CPSES ABNORMAL CONDITIONS PROCEDURES MANUAL	UNIT 1 AND 2	PROCEDURE NO. ABN-102
HIGH REACTOR COOLANT ACTIVITY	REVISION NO. 7	PAGE 5 OF 6

NOTE:
- An increase of RCS activated corrosion products may indicate a "CRUD" burst. (e.g., Fe-59, Co-58, Co-60, Mn-54, Mn-56, Cr-51, and Zr-95).
- The stepping or tripping of control or shutdown rods should be kept to a minimum when reactor coolant CRUD levels are high to reduce the potential for CRDM mis-stepping due to CRUD contamination of CRDM latch assemblies (CR 2009-008942).

☐ 7. IF RCS activity increase is believed to be result of RCS transient OR "CRUD" burst, THEN refer to Technical Specification 3.4.16.

Comments / Reference: From ABN-102, Step 1 & 6 NOTES	Revision # 7

CPSES ABNORMAL CONDITIONS PROCEDURES MANUAL	UNIT 1 AND 2	PROCEDURE NO. ABN-102
HIGH REACTOR COOLANT ACTIVITY	REVISION NO. 7	PAGE 4 OF 6

2.3 Operator Actions

NOTE:
- Reactor Coolant System transients such as power changes, temperature changes, pressure changes, and starting and stopping RCPs can cause temporary increases in RCS activity.
- Monitor spiking and return to normal is not a real indication of failed fuel and as such does not require sampling. A steady or sustained increase over time would be a real indication of failed fuel/RCS activity problems.

☐ 1. Request additional reactor coolant specific activity samples be taken in accordance with CHM-111 for isotopic content analysis per Technical Specification 3.4.16, SURVEILLANCE REQUIREMENTS.

☐ 2. Notify Chemistry to review chemistry data and Core Performance Engineering to review chemistry data and core follow trends. Chemistry will determine if a "CRUD" burst has occurred. Core Performance Engineering will determine if the source of RCS activity is failed fuel and the extent of failed fuel, if any.

☐ 3. Increase letdown flow to 120-140 gpm as follows:

a) IF PDP is in operation, THEN start up a centrifugal charging pump AND shutdown PDP per SOP-103A/B.

b) Increase letdown flow to 120-140 gpm per SOP-103A/B.

☐ 4. Notify Radiation Protection that radiation levels may increase in Auxiliary and Safeguards Buildings AND on any ARMs.

☐ 5. Make a plant announcement via Gai-Tronics of indication of an increase in RCS Activity AND a possibility of increased radiation in Auxiliary and Safeguards Buildings.

NOTE: A rapid increase of RCS fission product isotopes during steady state operation may indicate fuel cladding damage. (e.g., Xe-133, Kr-85M, Cs-137, Cs-136, Sr-84, Sr-90, Iodine).

☐ 6. IF Core Performance Engineering Review of the chemistry data indicates failed fuel, THEN proceed as follows:

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	1	
	Group #	2	
	K/A #	076 AK2.01	
	Importance Rating	2.6	

High Reactor Coolant Activity: Knowledge of the interrelations between High Reactor Coolant Activity and the following: Process radiation monitors

Proposed Question: Common 62

Given the following conditions:

- Unit 1 has experienced a problem with the Volume Control Tank (VCT).
- Charging Pump suction has been shifted to the Refueling Water Storage Tank (RWST) per SOP-103A, Chemical and Volume Control System.
- Chemistry has sampled the Reactor Coolant System and determined that Co-58 and Co-60 levels are increasing.

Which of the following lists the expected indication and the most probable cause for the indication?

1-RE-406 (FFL160) indication…

A. …rising at a steady rate due to an oxygen induced CRUD burst.

B. …rising at a steady rate due to oxygen induced cladding creep.

C. …spiking and returning to normal due to an oxygen induced CRUD burst.

D. …spiking and returning to normal due to oxygen induced cladding creep.

Proposed Answer: C

Explanation:

A. Incorrect. An increase in Co-58 and Co-60 are the result of oxygen induced CRUD burst from shifting to the Refueling Water Storage Tank, however the increase is not a rise at a steady rate but is a spike with return to normal.

B. Incorrect. Plausible because a FFL160 indication would be rising but cobalt is not an indication of creep induced cladding damage.

C. Correct. An increase in Co-58 and Co-60 are the result of oxygen induced CRUD burst from shifting to the Refueling Water Storage Tank. The radiation monitor indication would indicate a spike shortly after an oxygen induced CRUD burst with a return to normal based on system cleanup as depicted in plant reference data. These indications are consistent with a plant induced CRUD burst for outage dose reduction.

D. Incorrect. Plausible because FFL160 indication would rise and return to normal but cobalt comes from a CRUD burst not creep induced cladding damage.

Technical Reference(s): ABN-102, Steps 1, 6 & 7 NOTES; SOP-103A, Step 5.5.15.A CAUTION; 1RF16 FFL-160 Response — Attached w/ Revision # See Comments / Reference

Proposed references to be provided during examination: None

Learning Objective: **ANALYZE** the response to High Reactor Coolant Activity per ABN-102, High Reactor Coolant Activity.

Question Source:
- Bank # _____
- Modified Bank # _____ (Note changes or attach parent)
- New X

Question History: Last NRC Exam _____

Question Cognitive Level:
- Memory or Fundamental Knowledge _____
- Comprehension or Analysis X

10 CFR Part 55 Content:
- 55.41 10, 12
- 55.43 _____

Comments / Reference: From SOP-103A, Step 5.5.15.A CAUTION	Revision # 17

CPNPP SYSTEM OPERATING PROCEDURE MANUAL	UNIT 1	PROCEDURE NO. SOP-103A
CHEMICAL AND VOLUME CONTROL SYSTEM	REVISION NO. 17	PAGE 88 OF 131

5.5.15 Shifting Charging Pump Suction Between the VCT and RWST

CAUTION: Charging pump suction should normally remain aligned to the VCT due to dissolved oxygen concerns when suction comes from the RWST. When entering a plant outage, suctions should NOT be rolled to the RWST prior to crud burst. When time allows, Chemistry should be notified prior to rolling suction to the RWST.

A. IF desired to shift charging pump suction from the VCT to the RWST, THEN perform the following:

1) OPEN ONE or BOTH of the following valves:

☐ • 1/1-LCV-112D, RWST TO CHRG PMP SUCT VLV

☐ • 1/1-LCV-112E, RWST TO CHRG PMP SUCT VLV

Comments / Reference: From ABN-102, Step 7 NOTE	Revision # 7

CPSES ABNORMAL CONDITIONS PROCEDURES MANUAL	UNIT 1 AND 2	PROCEDURE NO. ABN-102
HIGH REACTOR COOLANT ACTIVITY	REVISION NO. 7	PAGE 5 OF 6

NOTE: • An increase of RCS activated corrosion products may indicate a "CRUD" burst. (e.g., Fe-59, Co-58, Co-60, Mn-54, Mn-56, Cr-51, and Zr-95).

• The stepping or tripping of control or shutdown rods should be kept to a minimum when reactor coolant CRUD levels are high to reduce the potential for CRDM mis-stepping due to CRUD contamination of CRDM latch assemblies (CR 2009-008942).

☐ 7. IF RCS activity increase is believed to be result of RCS transient OR "CRUD" burst, THEN refer to Technical Specification 3.4.16.

Comments / Reference: From ABN-102, Step 1 & 6 NOTES	Revision # 7

2.3 Operator Actions

NOTE:
- Reactor Coolant System transients such as power changes, temperature changes, pressure changes, and starting and stopping RCPs can cause temporary increases in RCS activity.
- Monitor spiking and return to normal is not a real indication of failed fuel and as such does not require sampling. A steady or sustained increase over time would be a real indication of failed fuel/RCS activity problems.

☐ 1. Request additional reactor coolant specific activity samples be taken in accordance with CHM-111 for isotopic content analysis per Technical Specification 3.4.16, SURVEILLANCE REQUIREMENTS.

☐ 2. Notify Chemistry to review chemistry data and Core Performance Engineering to review chemistry data and core follow trends. Chemistry will determine if a "CRUD" burst has occurred. Core Performance Engineering will determine if the source of RCS activity is failed fuel and the extent of failed fuel, if any.

☐ 3. Increase letdown flow to 120-140 gpm as follows:

a) IF PDP is in operation, THEN start up a centrifugal charging pump AND shutdown PDP per SOP-103A/B.

b) Increase letdown flow to 120-140 gpm per SOP-103A/B.

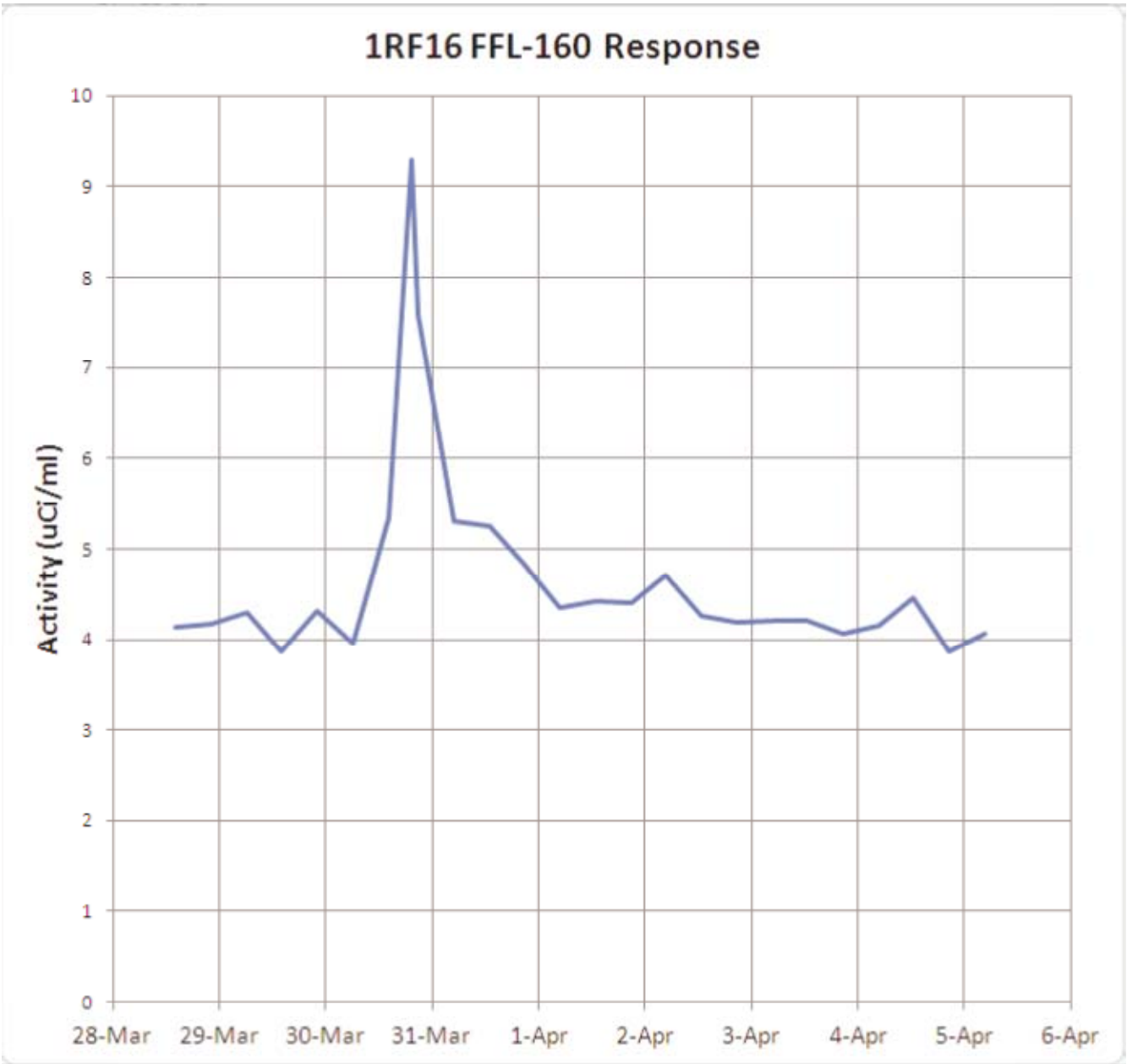
☐ 4. Notify Radiation Protection that radiation levels may increase in Auxiliary and Safeguards Buildings AND on any ARMs.

☐ 5. Make a plant announcement via Gai-Tronics of indication of an increase in RCS Activity AND a possibility of increased radiation in Auxiliary and Safeguards Buildings.

NOTE: A rapid increase of RCS fission product isotopes during steady state operation may indicate fuel cladding damage. (e.g., Xe-133, Kr-85M, Cs-137, Cs-136, Sr-84, Sr-90, Iodine).

☐ 6. IF Core Performance Engineering Review of the chemistry data indicates failed fuel, THEN proceed as follows:

Comments / Reference: From 1RF16 FFL-160 Response	Revision March 2013



Examination Outline Cross-reference:

Level	RO	SRO
Tier #	3	
Category #	1	
K/A #	G 2.1.36	
Importance Rating	3.0	

Conduct of Operations: Knowledge of procedures and limitations involved in core alterations

Proposed Question: Common 67

Given the following conditions:

- Unit 2 is in MODE 6.
- N-31 and N-32 are the OPERABLE Source Range Nuclear Instruments.
- STA-617, High Voltage Switching and Clearance, is about to be performed in the Switchyard.

Which of the following must be performed prior to implementing STA-617, High Voltage Switching and Clearance?

A. Place the High Flux at Shutdown Switch in BLOCK on both N-31 and N-32 to prevent loss of the Source Range Nuclear Instrumentation.

B. Place the High Flux at Shutdown Switch in BLOCK on both N-31 and N-32 to prevent a Containment evacuation.

C. Suspend CORE ALTERATIONS and positive reactivity additions due to the potential for spiking of the Source Range Nuclear Instrumentation.

D. Suspend CORE ALTERATIONS and positive reactivity additions due to the potential for loss of power to Refueling equipment.

Proposed Answer: C

Explanation:

A. Incorrect. Plausible because spiking of the Source Range Nuclear Instrumentation will occur, however, placing the High Flux at Shutdown Switch in BLOCK would violate Technical Specifications.
B. Incorrect. Plausible because spiking could activate the Containment Evacuation Alarm, however, the switch would not be placed in BLOCK.
C. Correct. Per the Precaution outlined in RFO-102.
D. Incorrect. Plausible because CORE ALTERATIONS would be suspended, however, not for the reasons listed.

Technical Reference(s) RFO-102, Steps 3.13 & 3.17 Attached w/ Revision # See Comments / Reference

Proposed references to be provided during examination: None

Learning Objective: **EXPLAIN** indication and Control/Trips for Source Range High Flux at Shutdown and Containment Evacuation Alarms.

Question Source: Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content: 55.41 6, 10
55.43 _____

Comments / Reference: From RFO-102, Step 3.13	Revision # 13

CPNPP STATION REFUELING MANUAL	UNIT COMMON	PROCEDURE NO. RFO-102
REFUELING OPERATION	REVISION NO. 13 CONTINUOUS USE	PAGE 7 OF 96

3.9 If the High Flux at Shutdown alarm is actuated, all personnel should evacuate Containment in an orderly manner. If the alarm is actuated during movement of fuel, fuel should be placed in a safe condition before evacuating Containment. The Fuel Handling Supervisor should designate personnel for Containment re-entry, when conditions allow, to investigate the cause of the alarm:

- The Fuel Handling Supervisor has the authority to determine if the High Flux at Shutdown alarm is spurious and whether to continue with evacuation.
- The Fuel Handling Supervisor or an operator designated by the Shift Manager will ensure that Containment is evacuated in a safe and orderly manner.

3.10 In case of malfunction or suspicion of malfunction of any fuel handling equipment, operation of the affected equipment will be terminated and the Fuel Handling Supervisor shall be notified immediately for resolution.

[C] |

3.11 The transfer tube gate valve shall not be opened until it has been verified that the boron concentration of the water, if any, in the Fuel Building transfer canal is greater than or equal to the boron concentration of the water in the Refueling Cavity OR boron concentration ≥2400 ppm in both areas. (Admin Limit) (TS 3.9.1 limit is specified in the COLR) [4408996] |

[C]

3.12 The 4-inch Refueling Cavity drain valves should be closed and the drain strainer removed from the refueling cavity (4-inch drain strainer CP1/CP2-SFSRDS-02 located in the Lower Internals Area). This will prevent contamination of the drain strainer which must be removed to enable cavity drain after refueling. The debris screens over the 6-inch drains (CP1/CP2-SFSRDS-03 and -04) should be rotated and the blind flanges installed over the two 6-inch drain lines from the lower internals storage stand prior to opening the transfer tube gate valve. This will minimize the effects of a transfer canal or SFP gate seal failure.

3.13 Prior to initiation of any switching per STA-617 AND Westinghouse Source Range detectors are the operable SR instruments, all CORE ALTERATIONS and positive reactivity additions should be suspended due to potential spiking on the Source Range nuclear instrumentation (N-31, N-32) and possibility of receiving the Source Range High Flux at Shutdown alarm, if N-31 and N-32 are the operable source range channels.

Comments / Reference: From RFO-102, Step 3.17	Revision # 13

CPNPP STATION REFUELING MANUAL	UNIT COMMON	PROCEDURE NO. RFO-102
REFUELING OPERATION	REVISION NO. 13 CONTINUOUS USE	PAGE 8 OF 96

3.15 Significant level differences between the Refueling Cavity and Spent Fuel Pool can occur due to atmosphere pressure differences. To avoid Spent Fuel Pool overflow, consideration of this effect should be given to any evolution which would change the pressure differential (manipulation of the Fuel Building or Containment Ventilation System, use of compressed gases in Containment, air displacement due to filling the cavity, temperature changes, etc.).

3.16 When possible, an additional DG or an additional offsite power source should be maintained available to augment the Technical Specification required AC sources during refueling operations.

3.17 Source range nuclear instruments shall be monitored by a Control Room operator at all times when CORE ALTERATIONS are being performed.

Examination Outline Cross-reference:	Level	RO	SRO
	Tier #	3	
	Category #	1	
	K/A #	G 2.1.36	
	Importance Rating	3.0	

Conduct of Operations: Knowledge of procedures and limitations involved in core alterations

Proposed Question: Common 67

Given the following conditions:

- Unit 2 is in MODE 6.
- N-31 and N-32 are the OPERABLE Source Range Nuclear Instruments.
- STA-617, High Voltage Switching and Clearance, is about to be performed in the Switchyard.

Which of the following must be performed prior to implementing STA-617, High Voltage Switching and Clearance?

A. Place the High Flux at Shutdown Switch in BLOCK on both N-31 and N-32 to prevent loss of the Source Range Nuclear Instrumentation.

B. Place the High Flux at Shutdown Switch in BLOCK on both N-31 and N-32 to prevent a Containment evacuation.

C. Suspend CORE ALTERATIONS and positive reactivity additions due to the potential for spiking of the Source Range Nuclear Instrumentation.

D. Suspend CORE ALTERATIONS and positive reactivity additions due to the potential for loss of power to Refueling equipment.

Proposed Answer: B or C

Explanation:

A. Incorrect. Plausible because spiking of the Source Range Nuclear Instrumentation will occur, however, placing the High Flux at Shutdown Switch in BLOCK would violate Technical Specifications.
B. Correct. In accordance with STA-617 Attachment 8.B, Breaker Operation Checklist the High Flux at Shutdown Switch is placed in BLOCK prior to performing High Voltage Switching in MODE 6. In accordance with STA-617 Caution the switch is placed in BLOCK to prevent a potential Containment Evacuation Alarm.
C. Correct. Per the Precaution outlined in RFO-102 and STA-617 Step 6.1.27.
D. Incorrect. Plausible because CORE ALTERATIONS would be suspended, however, not for the

reasons listed.

Technical Reference(s) RFO-102, Steps 3.13 & 3.17
STA-617, Step 6.1.27, Caution & Att. 8.B

Attached w/ Revision # See Comments / Reference

Proposed references to be provided during examination: None

Learning Objective: **EXPLAIN** indication and Control/Trips for Source Range High Flux at Shutdown and Containment Evacuation Alarms.

Question Source:
Bank # X
Modified Bank # _____ (Note changes or attach parent)
New _____

Question History: Last NRC Exam _____

Question Cognitive Level:
Memory or Fundamental Knowledge X
Comprehension or Analysis _____

10 CFR Part 55 Content:
55.41 6, 10
55.43 _____

3.9 If the High Flux at Shutdown alarm is actuated, all personnel should evacuate Containment in an orderly manner. If the alarm is actuated during movement of fuel, fuel should be placed in a safe condition before evacuating Containment. The Fuel Handling Supervisor should designate personnel for Containment re-entry, when conditions allow, to investigate the cause of the alarm:

- The Fuel Handling Supervisor has the authority to determine if the High Flux at Shutdown alarm is spurious and whether to continue with evacuation.
- The Fuel Handling Supervisor or an operator designated by the Shift Manager will ensure that Containment is evacuated in a safe and orderly manner.

3.10 In case of malfunction or suspicion of malfunction of any fuel handling equipment, operation of the affected equipment will be terminated and the Fuel Handling Supervisor shall be notified immediately for resolution.

[C] |

3.11 The transfer tube gate valve shall not be opened until it has been verified that the boron concentration of the water, if any, in the Fuel Building transfer canal is greater than or equal to the boron concentration of the water in the Refueling Cavity OR boron concentration ≥2400 ppm in both areas. (Admin Limit) (TS 3.9.1 limit is specified in the COLR) [4408996] |

[C]

3.12 The 4-inch Refueling Cavity drain valves should be closed and the drain strainer removed from the refueling cavity (4-inch drain strainer CP1/CP2-SFSRDS-02 located in the Lower Internals Area). This will prevent contamination of the drain strainer which must be removed to enable cavity drain after refueling. The debris screens over the 6-inch drains (CP1/CP2-SFSRDS-03 and -04) should be rotated and the blind flanges installed over the two 6-inch drain lines from the lower internals storage stand prior to opening the transfer tube gate valve. This will minimize the effects of a transfer canal or SFP gate seal failure.

3.13 Prior to initiation of any switching per STA-617 AND Westinghouse Source Range detectors are the operable SR instruments, all CORE ALTERATIONS and positive reactivity additions should be suspended due to potential spiking on the Source Range nuclear instrumentation (N-31, N-32) and possibility of receiving the Source Range High Flux at Shutdown alarm, if N-31 and N-32 are the operable source range channels.

Comments / Reference: From RFO-102, Step 3.17	Revision # 13

3.15 Significant level differences between the Refueling Cavity and Spent Fuel Pool can occur due to atmosphere pressure differences. To avoid Spent Fuel Pool overflow, consideration of this effect should be given to any evolution which would change the pressure differential (manipulation of the Fuel Building or Containment Ventilation System, use of compressed gases in Containment, air displacement due to filling the cavity, temperature changes, etc.).

3.16 When possible, an additional DG or an additional offsite power source should be maintained available to augment the Technical Specification required AC sources during refueling operations.

3.17 Source range nuclear instruments shall be monitored by a Control Room operator at all times when CORE ALTERATIONS are being performed.

Comments / Reference: From STA-617	Revision # 8

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-617
HIGH VOLTAGE SWITCHING AND CLEARANCE	REVISION NO. 8 INFORMATION USE	PAGE 9 OF 32

6.1.25 Only Plant Operations Supervisors who are familiar with switching procedures and rules regarding obtaining and releasing holds may request holds from the Transmission Grid Controller.

6.1.26 Initiate a clearance/hold on a Start-up, Main or Unit Auxiliary Transformer anytime a protective relay fuse or other support equipment is de-energized or rendered inoperable to allow work to be performed.

6.1.27 Prior to initiation of any switching per this procedure, suspend all core alterations involving positive reactivity additions (i.e. fuel assembly inserts) due to potential for spiking on the source range nuclear instrumentation (i.e., N-31 and N-32) and possibility of receiving the Source Range Hi Flux at shutdown alarm when Source Range is energized.

Comments / Reference: From STA-617	Revision # 8

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-617
HIGH VOLTAGE SWITCHING AND CLEARANCE	REVISION NO. 8 INFORMATION USE	PAGE 11 OF 32

6.2 Switching and Tagging Orders (STOs)

CAUTION:

- High Voltage Switching may cause spiking of the Source Range Nuclear Instrumentation System Channels; resulting in possible HIGH FLUX AT SHUTDOWN and Containment Evacuation alarms.
- High voltage switching operations should not be performed while in MODE 2 with the source range detectors energized OR while in MODE 3 with rod referencing activities in progress for Reactor Startup.

Comments / Reference: From STA-617 Attachment 8.B	Revision # 8

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-617
HIGH VOLTAGE SWITCHING AND CLEARANCE	REVISION NO. 8 INFORMATION USE	PAGE 29 OF 32

ATTACHMENT 8.B
PAGE 1 OF 4

BREAKER OPERATION CHECKLIST

Breaker Opening:

☐ 1. Prior to opening a breaker, verify the following:

☐
- Plant is NOT in MODE 2 with Source Range energized OR while in MODE 3 with rod referencing activities in progress for Reactor Startup.
- Source Range N-31 & N-32 HIGH FLUX AT SHUTDOWN switches to BLOCK when in MODE 3 - 6

☐ UNIT 1: ☐ Source Range N-31 ☐ Source Range N-32

☐ UNIT 2: ☐ Source Range N-31 ☐ Source Range N-32

Comments / Reference: From STA-617 Attachment 8.B	Revision # 8

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-617
HIGH VOLTAGE SWITCHING AND CLEARANCE	REVISION NO. 8 INFORMATION USE	PAGE 31 OF 32

ATTACHMENT 8.B
PAGE 3 OF 4

BREAKER OPERATION CHECKLIST

Breaker Closing:

☐ 1. Prior to closing a breaker, verify the following:

☐
- Plant is NOT in MODE 2 with Source Range energized OR while in MODE 3 with rod referencing activities in progress for Reactor Startup.
- Source Range N-31 & N-32 HIGH FLUX AT SHUTDOWN switches to BLOCK when in Mode 3 - 6

☐ UNIT 1: ☐ Source Range N-31 ☐ Source Range N-32

☐ UNIT 2: ☐ Source Range N-31 ☐ Source Range N-32

Question #36

Question format as validated:

Given the following conditions:

- Unit 1 Main Turbine startup is in progress as follows:
  - Turbine Speed is 1800 rpm.
  - Exhaust Hood temperature is 174°F.
  - Turbine Stress Evaluator (TSE) Margin is GREEN.
  - No operator action has been taken since establishing 1800 rpm.

Given the following Main Turbine auxiliary components:

1. Shaft Lift Oil Pump
2. Turning Gear Valves
3. Auxiliary Lube Oil Pumps
4. LP Turbine Control Valves
5. HP Turbine Control Valves

Which of the following indicates the status of the components at this point in Main Turbine startup?

A. 1 – OFF
   2 – CLOSED
   3 – RUNNING
   4 – OPEN
   5 – CLOSED

B. 1 – ON
   2 – OPEN
   3 – STOPPED
   4 – OPEN
   5 – NOT FULLY OPEN

C. 1 – OFF
   2 – CLOSED
   3 – RUNNING
   4 – OPEN
   5 – NOT FULLY OPEN

D. 1 – ON
   2 – CLOSED
   3 – STOPPED
   4 – NOT FULLY OPEN
   5 – NOT FULLY OPEN

Proposed Answer: C

Explanation:

A. Incorrect. Plausible because all conditions are correct with the exception of the HP Control Valves. These valves would be partially open to maintain speed at 1800 RPM.
B. Incorrect. Plausible because the HP and LP Control Valve positions are correct, however, the Shaft Oil Pump automatically stops at 540 RPM, the Turning Gear Valve closes at 260 RPM, and the Auxiliary Lube Oil Pumps must be stopped by the operator.
C. Correct. Given the conditions listed and with no operator action once the Main Turbine reaches 1800 RPM, this is the correct condition of the Main Turbine components.
D. Incorrect. Plausible because Turning Gear Valve position and HP Control Valve positions are correct, however, the other components are incorrect for the conditions listed.

Validator Answers:

RO1: C
RO2: C
RO3: C
SRO1: D
SRO2: C
SRO3: C

Pass Rate: 83.3%

Comments:

- Trivial knowledge
- Answer C is wrong. Aux Lube Oil Pumps are off at 1765 rpm. Change C to Aux L.O. Pumps to OFF.

Question #62

Question as validated:

Given the following conditions:

- Unit 1 has experienced a problem with the Volume Control Tank (VCT).
- Charging Pump suction has been shifted to the Refueling Water Storage Tank (RWST) per SOP-103A, Chemical and Volume Control System.
- Several hours after shifting Charging Pump suction, 1-RE-0406 (FFL106), Failed Fuel Monitor indication has begun rising at an increasing rate.
- Chemistry has sampled the Reactor Coolant System and determined that Mn-54 and Mn-56 levels are increasing.

Which of the following is the probable cause for the increasing reading on FFL-160, Failed Fuel Monitor?

A. Oxygen induced CRUD burst.

B. Hydraulically induced CRUD burst.

C. Oxygen induced cladding creep.

D. Chemically induced cladding pin-holing.

Proposed Answer: A

Explanation:

A. Correct. An increase in Mn-54 and Mn-56 are the result of an oxygen induced CRUD burst from shifting to the Refueling Water Storage Tank.
B. Incorrect. Plausible because a CRUD burst is in progress, however, a hydraulically induced CRUD burst is associated with Rod movement due to contamination of CRDM latch assemblies.
C. Incorrect. Plausible because
D. Incorrect. Plausible because any increase in RCS fission product isotopes during steady-state operation may indicate fuel damage, however, Mn-54 and Mn-56 are the result of a CRUD burst.

Validator Answers:

RO1: A
RO2: A
RO3: A
SRO1: A
SRO2: A
SRO3: A

Pass Rate: 100%

Comments:

- None

Question #67

Question as validated:

Given the following conditions:

- Unit 2 is in MODE 6.
- N-31 and N-32 are the OPERABLE Source Range Nuclear Instruments.
- STA-617, High Voltage Switching and Clearance, is about to be performed in the Switchyard.

Which of the following must be performed prior to implementing STA-617, High Voltage Switching and Clearance?

A. Place the High Flux at Shutdown Switch in BLOCK on both N-31 and N-32 to prevent loss of the Source Range Nuclear Instrumentation.

B. Suspend CORE ALTERATIONS and positive reactivity additions due to the potential for spiking of the Source Range Nuclear Instrumentation.

C. Place the High Flux at Shutdown Switch in BLOCK on both N-31 and N-32 to prevent an inadvertent Containment evacuation.

D. Suspend CORE ALTERATIONS and positive reactivity additions due to the potential for loss of power to Refueling equipment.

Proposed Answer: B

Explanation:

A. Incorrect. Plausible because spiking of the Source Range Nuclear Instrumentation will occur, however, placing the High Flux at Shutdown Switch in BLOCK would violate Technical Specifications.
B. Correct. Per the Precaution outlined in RFO-102.
C. Incorrect. Plausible because spiking could activate the Containment Evacuation Alarm, however, the switch would not be placed in BLOCK.
D. Incorrect. Plausible because CORE ALTERATIONS would be suspended, however, not for the reasons listed.

Validator Answers:

RO1: B
RO2: B
RO3: C
SRO1: C
SRO2: B
SRO3: C

Pass Rate: 50%

Comments:

- None

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

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

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

Question	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Answer	**B**	**B**	**A**	**B**	**D**	**C**	**A**	**B**	**C**	**D**	**D**	**C**	**B**	**D**	**D**	**A**	**C**	**A**	**B**	**D**	**C**	**C**	**B**	**C**	**A**
	B	B	A	B	D	C	A	B	C	D	D	A	B	D	D	A	C	B	D	D	C	C	B	C	A
	B	B	A	B	D	C	A	B	C	D	D	C	B	D	D	A	C	B	D	D	C	C	B	C	A
	B	B	A	D	D	D	B	B	B	D	D	C	B	D	D	A	C	B	B	D	C	C	B	C	A
	B	B	A	B	D	B	A	B	C	D	D	A	B	D	D	A	C	B	B	D	C	C	B	C	A
	B	B	A	B	D	B	A	B	C	D	D	A	B	B	D	A	C	A	A	C	C	C	C	D	A

	Number Missed		Percent Correct		OVERALL
	RO	SRO	RO	SRO	
	10		86.7		
	10		86.7		
	13		82.7		
	18		76.0		
	13		82.7		
	10		86.7		
	17		77.3		
	4	3	94.7	88.0	93.0
	6	2	92.0	92.0	92.0
	17	5	77.3	80.0	78.0
	6	3	92.0	88.0	91.0
	12	7	84.0	72.0	81.0

Notes:
Questions with ≥ 50% miss rate:

3: 50% miss rate. The question asks for the initial method to restore residual heat removal in accordance with ABN-104, Residual Heat Removal Malfunction. Six candidates incorrectly selected actions that are contained in ABN-104 but are not the initial method used to restore residual heat removal.

32: 50% miss rate. Six candidates incorrectly used Hot Leg Temperature or RVLIS indication vice Core Exit Thermocouples to determine the state of the coolant in the vessel.

34: 50% miss rate. Eleven of twelve candidates understood the requirement to maintain containment pressure less than pressure in the safeguards building. Six candidates incorrectly believed that transferring water between the refueling cavity and the spent fuel pool was the reason for the containment ventilation lineup. Since both doors of the personnel airlock are open, there is insufficient differential pressure to transfer water. Containment ventilation is aligned to maintain containment at a slight negative pressure with respect to the safeguards building, thereby minimizing spread of airborne contamination.

36: 58% miss rate. Seven candidates chose answer B, believing that the LP Turbine Control Valves are not fully open with the conditions given in the stem of the question. Further investigation on the simulator shows that for the conditions given in the stem of the question, the LP Turbine Control Valves are 86% open. This is a bank question that validated at 83% correct. After review of actual plant data it was determined that answer D is the correct answer. Documentation submitted to support changing the correct answer.

43: 67% miss rate. Seven candidates selected securing CCP 1-01 to improve NPSH of RHRP 1-01 while one candidate selected securing SIP 1-01 to improve NPSH. While both of these actions will improve NPSH, the note prior to step 3 of EOS-1.3A, requires stopping an ECCS pump that is cavitating. Additionally, since 1-8807A/B are open, a suction source to the CCP and SIP is maintained with the train RHRP stopped. The associated CCP and SIP need not be stopped prior to stopping the RHRP.

49: 50% miss rate. Six candidates incorrectly assumed that an alternate indication for determining that a Protection Bus is deenergized is that the associated row of Trip Status lights are lit. A note in ABN-603, Loss of Protection or Instrument Bus, gives an alternate indication of Protection Bus uPC4 being deenergized as "all Channel IV bistables (Trip Status Lights) will NOT be lit." Although some Row 4 Trip Status lights may be lit with a loss of Protection Bus uPC4, this is NOT an alternate indication of Protection Bus uPC4 being de-energized.

52: 58% miss rate. Seven candidates did not know the capacity of the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) steam supply valve air accumulator, the reason for the accumulator, or both.

57: 50% miss rate. Four candidates did not account for power defect when calculating the change in reactivity due to a dropped control rod. Two candidates subtracted power defect from the reactivity change due to temperature vice adding the two reactivity changes.

Notes:
Questions with ≥ 50% miss rate (continued):

62: 58% miss rate. Seven candidates thought that radiation monitor indication would spike following a crud burst vice steadily rising. This was based on observations during pre-outage chemical crud bursts and cleanup with demineralizers. After reviewing actual plant trend data is was determined that answer C is the correct answer. Documentation submitted to support changing the correct answer.

81: 60% miss rate. Three SRO candidates did not know the transition criteria of ECA-2.1A, Uncontrolled Depressurization of All Steam Generators, Attachment 1A, which requires a transition to EOP-3.0A if level in any steam generator is rising uncontrollably.

87: 60% miss rate. All SRO candidates correctly selected COG-282 as the indication used to verify the existence of a Steam Generator Tube Leak. Three SRO candidates believed that the unit could remain at power for 24 hours. ABN-106, Abnormal Secondary Activity, requires the unit to be in MODE 3 within two hours.

93: 80% miss rate. Four SRO candidates did not know that both RCP 1-01 and 1-04 must be secured to secure flow from stuck open spray valve 1-PCV-455B as discussed in the bases of EOP-0.0A, Reactor Trip or Safety Injection.

94: 60% miss rate. Three SRO candidates were unfamiliar with the short term relief allowance during shifts credited for maintaining active license status.

General comments:

1. Question 67was reviewed and it was determined that answers B or C are correct. Documentation submitted to support either answer as being correct.
2. Initial License Operator Training (ILOT) program provides training in the areas of knowledge deficiencies demonstrated by the license candidates on the written exam. Performance on the high miss-rate questions is due to individual knowledge gaps.
3. CR-2013-003892 has been initiated to determine if enhancements to the ILOT training program and curriculum are warranted to improve future candidate performance in these specific knowledge/performance areas.