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TXX-16091

Ref: 10 CFR 55.5(b)(2)
10 CFR 55.25

July 21, 2016

U.S. Nuclear Regulatory Commission
Regional Administrator, Region IV
1600 East Lamar Boulevard
Arlington, Texas 76011-4511
ATTN: Mr. Brian Larson

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT
DOCKET NOS. 50-445 & 50-446
TRANSMITTAL OF LICENSED OPERATOR EXAMINATION MATERIALS

REFERENCE 1. NUREG-1021, Revision 10, Examiner Standard ES-403

Dear Mr. Larson:

Enclosed please find the graded written examinations and one completed Form ES-403-1, "Written Examination Grading Quality Checklist," for the initial operator licensing written examinations administered on July 18, 2016 at Comanche Peak Nuclear Power Plant (CPNPP). These examinations were graded and are submitted based on the guidance in Reference 1. Also enclosed in electronic form are the as-given operational and written examinations. CPNPP requests that the written examination and operating test be withheld from public disclosure for the allowed two year period.

This communication contains no new licensing basis commitments regarding Comanche Peak Units 1 and 2.

If there are any questions concerning this submittal, contact Mr. Garry W. Struble at (254) 897-6628 or (254) 396-6286.

Sincerely,

Luminant Generation Company LLC

Kenneth J. Peters

By: _____
Thomas P. McCool
Site Vice President

SCD
Enclosures

c - Kriss Kennedy, Region IV clo
Vincent Gaddy, Region IV clo
M. Watford, NRR clo
Resident Inspectors, CPNPP clo

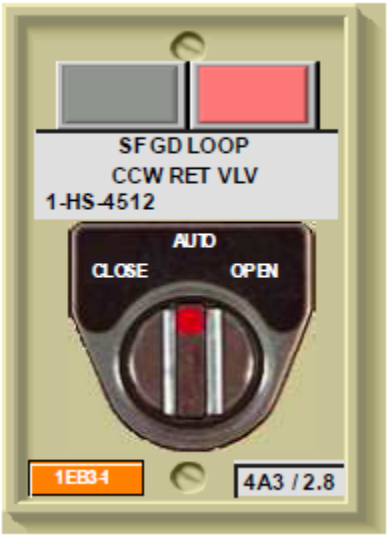
CP-2016-07 Post-Exam Analysis

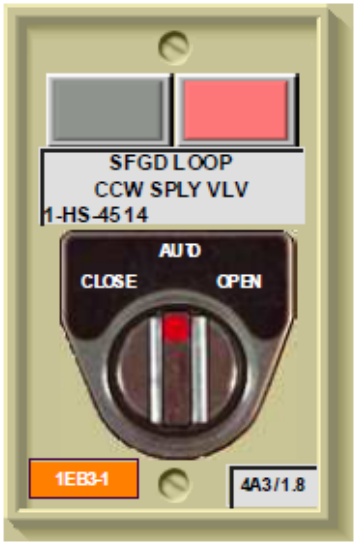
| CPNPP 2016 NRC WRITTEN EXAM RESULTS |
|---|---|---

Question 43

Problem: During the written examination review of the CPNPP 2016 NRC exam it was identified that Question 43 lacks the necessary information in the stem in accordance with NUREG-1021 to determine the correct answer.

- The correct answer as approved on the worksheet and answer key is 'A'
- Answer 'A' is a specific Train A valve manipulated in the field in accordance with ABN-502, "1CC-0021, CCW SRG TK 1-01 TRN A OUT VLV"
- Based on the information provided in the stem the applicants were unable to ascertain which train was the affected train. This resulted in all applicants incorrectly determining that Train B was the affected train based on the valve numbers being 'even' numbers.
- The Train A valves, which are designated as Train A in the procedure, do not have Train A in the valve nomenclature provided in the stem.
- The originally validated question, prior to proposed exam submittal, did NOT include a picture and provided ONLY that the CCW Surge Tank Train A HI-HI/LO alarm was LIT. However, upon revision of the question a picture was inserted that indicated both the Train A AND Train B CCW Surge Tank HI-HI/LO Alarms were LIT, which is correct for the malfunction in progress. With both of these alarms LIT, it is not reasonable to believe that an applicant can determine which Train is the affected Train based on valves that are operated in the Control Room that have no indication in the nomenclature of which Train they belong to.
- Every applicant chose the distractor that would have been the correct answer if the affected Train were Train B, which is Distractor 'C'. Based on applicant selection, CPNPP believes that the applicant's selections on the exam DO NOT display a knowledge weakness but that the question is lacking the necessary information for the applicants to make the correct decision.





Operations Management (Director, Nuclear Operations and Shift Operations Manager) agrees that it is NOT reasonable to expect a licensed operator to have valve numbers memorized to the extent that they would know what train the valve belongs to from sight on a written exam. Furthermore, when operating the valve from the Control Board the specific valves in question are delineated via a mimic as to their proper train. The power supplies indicating their train are also located below the hand switch on the control board with an orange background indicating they are Train A valves (see above).

Therefore, CPNPP believes that Question 43 lacks the information necessary for the applicants to recall from memory which valve needs to be closed in order to isolate the given leak in the CCW system.

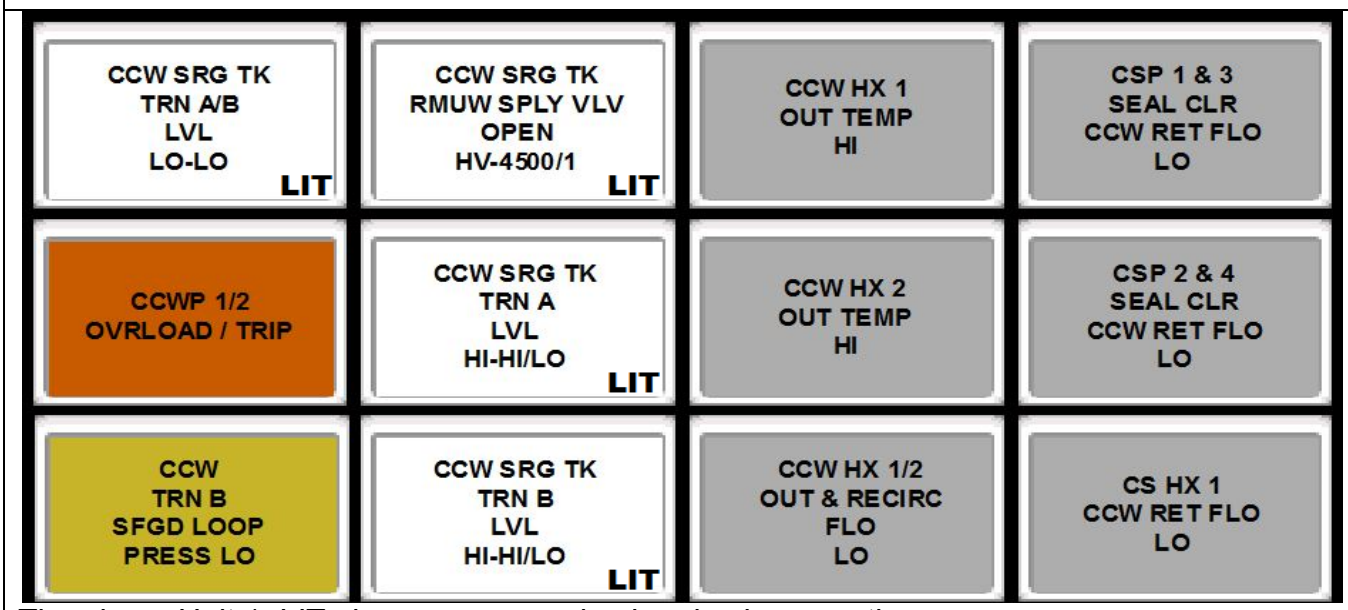
Solution: CPNPP recommends removing the question from the Reactor Operator written examination. Without adequate information in the stem it is not reasonable to expect the applicants to successfully answer the question.

NUREG-1021 justification: The proposed revision is in agreement with NUREG-1021 Rev. 10 ES-403.D.1.b 1st bullet which states “a question with an unclear stem that confused the applicants or did not provide all the necessary information.” As well as Appendix B paragraph C.1.e which states, “Avoid questions that are unnecessarily difficult or irrelevant.”

Examination Outline Cross-reference:	Level	RO		SRO
Revision: 4	Tier	1		
	Group	1		
	K/A	026 AA2.03		
	Importance Rating	2.6		

Loss of Component Cooling Water: Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The valve lineups necessary to restart the CCWS while bypassing the portions of the system causing the abnormal condition

Question # 43



The above Unit 1, LIT alarms were received and subsequently

- 1-HS-4512, SFGD LOOP CCW RET VLV and 1-HS-4514, SGFD LOOP CCW SPLY VLV were closed on affected train
- The leakage was NOT stopped

Per ABN-502, Component Cooling Water System Malfunction, what additional valve must be closed to isolate affected train and restore normal operation in unaffected train?

A. 1CC-0021, CCW SRG TK 1-01 TRN A OUT VLV

B. 1CC-0023, CCW PUMP 1-01 SUCT ISOL VLV

C. 1CC-0071, CCW SRG TK 1-01 TRN B OUT VLV

D. 1CC-0067, CCW PUMP 1-02 SUCT ISOL VLV

Answer: A	Answer A is correct, but the question is removed from the exam.

K/A Match:
The question matches the K/A as it requires the operator to demonstrate procedural knowledge on how to position valves to isolate the leaking train from the non-leaking train so that operation can continue with the unaffected train. Explanation:
A. Correct. Per ABN-502, the affected train surge tank outlet valve must also be closed in order to allow the surge tank to be refilled for the operating train. B. Incorrect. Plausible as this is the manual pump suction valve. This valve is plausible if thought that the Train is isolated with the exception of the small portion of the system from the surge tank to the suction of the pump. However, this isolation would not isolate the section of piping from the surge tank to the suction piping which may be the location of the leak. Further, the procedure does not call out for this valve to be isolated as it does the surge tank isolation valve. C. Incorrect. Plausible as this is the same valve as the correct Train A valve for Train B. The applicant must recognize the configuration and determine the train which must be isolated. D. Incorrect. Plausible for Train B as described in 'B' above for the affected Train A.

Technical Reference(s)	ABN-502,	Attached w/ Revision # See Comments / Reference
	M1-0229-A	
	M1-0229-B	
	CCW Study Guide	

Proposed references to be provided during examination: None

Learning Objective: **ANALYZE** the response to Leakage Out of the CCW System in accordance with ABN-502, Component Cooling Water System Malfunction. (LO21ABN501OB106)

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
Level of Difficulty 5

10 CFR Part 55 Content:
55.41 4
55.43 _____

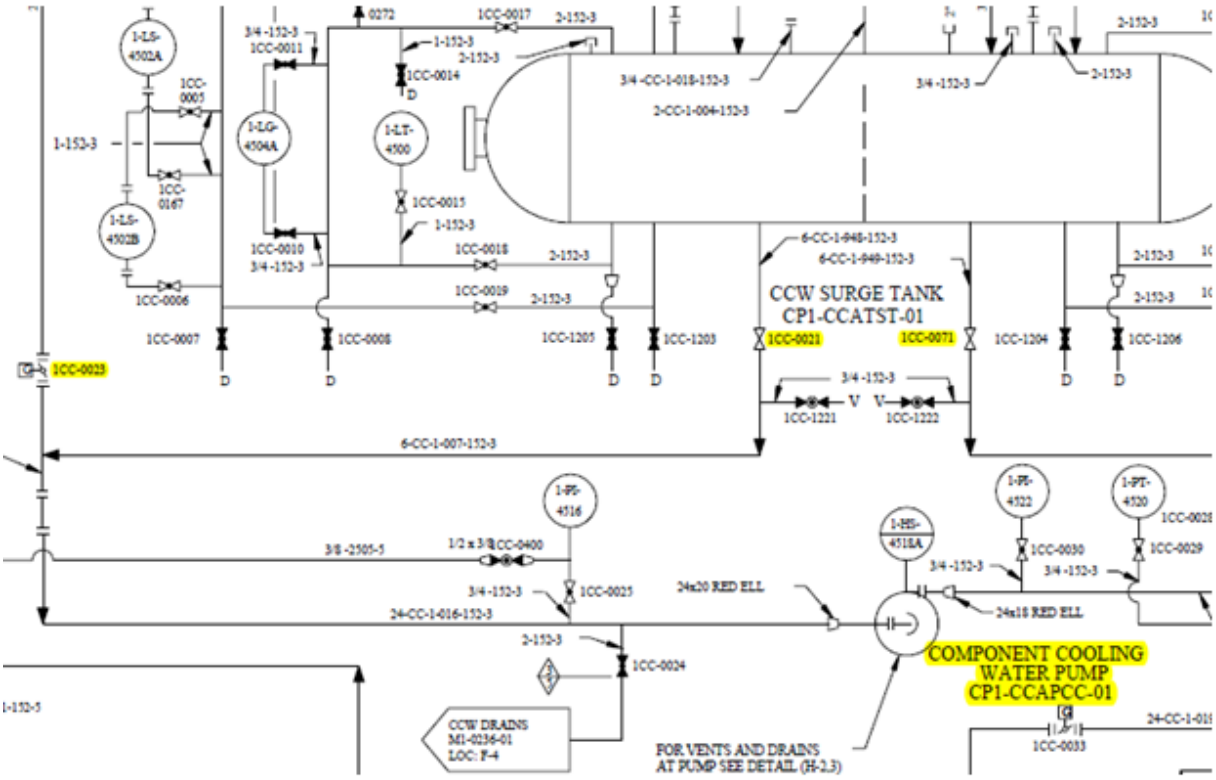
Comments / Reference: ABN-502	Revision: 6 PCN: 17

CPSES ABNORMAL CONDITIONS PROCEDURES MANUAL	UNIT 1 AND 2	PROCEDURE NO. ABN-502
COMPONENT COOLING WATER SYSTEM MALFUNCTIONS	REVISION NO. 6	PAGE 14 OF 75

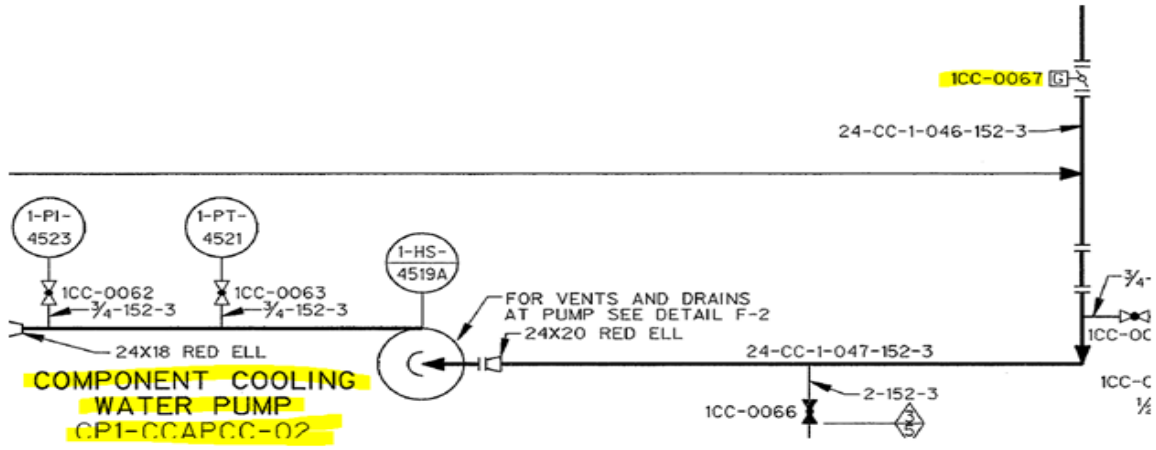
3.3 Operator Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8 Determine if CCW train should be isolated.	
☐ a. Verify Train A OR Train B CCW surge tank level - DECREASING	a. GO TO Step 12
☐ b. Isolate the train which continues to decrease:	
Train A	
• Ensure u-HS-4512, SFGD LOOP CCW RET VLV - CLOSED	
• Ensure u-HS-4514, SFGD LOOP CCW SPLY VLV - CLOSED	
• Locally close uCC-0021, CCW SRG TK u-01 TRN A OUT VLV (AB 873 Rm X-245)	
Train B	
• Ensure u-HS-4513, SFGD LOOP CCW RET VLV - CLOSED	
• Ensure u-HS-4515, SFGD LOOP CCW SPLY VLV - CLOSED	
• Locally close u-CC-0071, CCW SRG TK u-01 TRN B OUT VLV (AB 873 Rm X-245)	

Comments / Reference: M1-0229-A	Revision: CP-21



Comments / Reference: M1-0229-B	Revision: CP-25



Comments / Reference: CCW Study Guide	Revision: 5/1/2011

Surge Tank

There is one surge tank per unit located in the Auxiliary Building at the 873' level. This is approximately 73 feet higher than the pump to provide approximately 34 psig of available NPSH. The tank volume is approximately 4600 gallons, operates at atmospheric pressure and is vented to the Safeguards Building Ventilation System exhaust duct. The surge tank acts as a high point to fill and vent the system, provides a thermal expansion volume, provides a means to prevent overpressure of the system due to in-leakage from the Reactor Coolant System, and is also a collection volume for leakage into the system from various components.

The surge tank is divided into two individual compartments by a partition plate to provide a separate surge volume for each train. Each compartment is sufficient for its respective train. The partition plate extends to within 6 inches of the top of the tank with a six-inch high by thirty six-inch wide opening cut in the partition. Above the bottom of this opening, the surge tank will act as one volume with the trains separated below the opening. The bottom of this opening is at ≈58% level in the Unit 1 surge tank and ≈37 % level for the Unit 2 surge tank, creating a unit difference. The partition is designed to maintain its integrity with one side of the surge tank empty.

Each compartment of the surge tank is equipped with a local reading level gauge glass which is normally isolated. There is also a level transmitter for each compartment, u-LT-4500 for train A and u-LT-4501 for train B. These level transmitters actuate the Low-Low and Empty alarms, provide a signal for the indication in the control room, and initiate automatic actions. There are two additional level switches on each compartment that actuate the Hi-Hi/Low alarms only. These are u-LS-4502A and B for train A and u-LS-4503A and B for train B.

An alarm is generated in the control room at a low level setpoint (65% for Unit 1 and 46% for Unit 2, see figure 6), to alert the operator of the need for makeup. The operator will open the compartment makeup valve and the Reactor Makeup Water System (RMUW) isolation to begin makeup. Normal makeup is from RMUW due to the lower oxygen content of the water. If RMUW is not available, makeup may be from the Demineralized Water System (DWS), but RMUW is the preferred source.

If level continues to decrease, makeup will be automatically initiated at the low-low level setpoint, (63% for Unit 1 and 39% for Unit 2). This signal also causes the compartment isolation valve and the RMUW isolation valve to automatically open.

When level is restored to the Hi level setpoint (77% for Unit 1 and 65% for Unit 2), the compartment isolation valve receives a signal to close. The RMUW isolation valve will remain open until closed by the operator. If level continues to increase, a Hi-Hi level alarm is generated at 88% on Unit 1 and 75% on Unit 2.

If the level in the surge tank reaches the empty setpoint (57% on Unit 1 and 33% on Unit 2), an empty alarm is generated. The empty setpoint will also send a signal to close the safeguards loop isolation valves for the train with the empty alarm. If the signal was generated by the running train, this will isolate flow to the other safeguards train and the non-safeguards loop.

Question 48

Problem: During the written examination review of the CPNPP 2016 NRC exam it was identified that Question 48 lacks sufficient detail in accordance with NUREG-1021 to eliminate a distractor as a correct answer. In particular:

- The correct answer as approved on the worksheet and answer key is 'D'.
- Answer 'C' is a statement which is true during initial load shedding of Attachment 2.A, it specifically states: "plant monitoring and control until AC power restored"
- However, based on information from the bases of ECA-0.0A for all Attachment 2's (including Attachments 2.A, 2.B, 2.C, and 2.D) which states, "These attachments provide instructions for shedding of DC safeguards bus loads in order to conserve capacity to assist in future actions to restore AC power, while maintaining that minimum instrumentation necessary to monitor plant conditions.", the applicants were unable to discern whether answer 'D' was a specific subset of answer 'C'
- Therefore, the applicants were unable to eliminate answer 'C' as an incorrect answer.

Therefore, CPNPP ascertains that Question 48 answer 'D' and distractor 'C' should both be accepted as correct answers.

The first part of answer 'D' and distractor 'C' was reviewed and deemed to be accurate, thus making both 'C' and 'D' correct answers.

Solution: CPNPP recommends accepting distractor 'C' and answer 'D' as correct answers. With the inability of the applicants to eliminate distractor 'C' as it appears to include the specific subset called out in answer 'D' it is not reasonable to expect the applicants to successfully eliminate distractor 'C' as a possible answer to the question.

NUREG-1021 justification: The proposed revision is in agreement with NUREG-1021 Rev. 10 ES-403 D.1.c which states, "If it is determined that there are two correct answers, both answers will be accepted as correct."

Examination Outline Cross-reference:	Level	RO		SRO
Revision: 4	Tier	1		
	Group	1		
	K/A	055 EA2.04		
	Importance Rating	3.7		

Station Blackout: Ability to determine or interpret the following as they apply to a Station Blackout: Instruments and controls operable with only dc battery power available.

Question # 48

During a Station Blackout additional load shedding is performed when safeguards battery voltage is less than 110 volts to allow for _____ and _____.

A. battery charger restoration with portable generator
plant monitoring and control until AC power restored

B. battery charger restoration with portable generator
Safeguards Bus supply breaker closure

C. Diesel Generator field flashing
plant monitoring and control until AC power restored

D. Diesel Generator field flashing
Safeguards Bus supply breaker closure

Answer: C/D	Accept both C/D as correct answers on the exam.

K/A Match:
The question matches the K/A as it requires the applicant to demonstrate knowledge of actions necessary regarding DC power supplies in order to operate controls to reestablish safeguards AC power. Explanation:
A. Incorrect. Plausible because Attachments 2.A and 2.B when performed ensure sufficient time to restore battery chargers using a portable generator, however this is not what is accomplished by Attachment 2.C. The second part is correct (See C below). B. Incorrect. First part is incorrect but plausible (See A above). Second part is correct (See D below). C. Correct. First part is correct (See D below). The second part is correct because load shedding does provide for plant monitoring and control until AC power is restored per the bases for Attachment 2. D. Correct. If battery voltage lowers to less than 110 volts the associated bus is further load shed to ensure adequate voltage remains for flashing the diesel generator field or closing safeguards bus supply breakers for power restoration.

Technical Reference(s)	DC Electrical Study Guide	Attached w/ Revision # See Comments / Reference
	ECA-0.0A	

Proposed references to be provided during examination: None

Learning Objective: Given a procedural step, or sequence of steps from ECA-0.0, **STATE** the purpose/basis for the step(s). (LO21ERGC00OB105)

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

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X
Comprehension or Analysis _____
Level of Difficulty 3

10 CFR Part 55 Content: 55.41 10
55.43 _____

Comments / Reference: DC Electrical Study Guide	Revision: 5-5-2011

ECA-0.0, Loss of All AC

While dealing with the effects of a loss of All AC power, the operators will initiate shedding of unnecessary DC loads per Attachment 2 of ECA 0.0. They also shift the common XED1 & 2 panels to the other unit, which should have diesel power available. The DC system is designed to supply all required loads for at least four hours following a loss of AC power. We shed unnecessary loads in order to conserve battery capacity and to extend the time the batteries can function.

Following the load shedding, the DC bus voltages are monitored. The minimum 125 VDC system voltage required for equipment operation is approximately 105 volts. When uED1 or uED2 bus voltage drops to 110 volts additional loads may be shed per Attachment 2. This is done in order to conserve the ability to flash the EDG field if the EDG becomes available. It also ensures breaker control power for AC system alignments when an AC source has been restored.

Comments / Reference: ECA-0.0A	Revision: 9

CPNPP EMERGENCY RESPONSE GUIDELINES	UNIT 1	PROCEDURE NO. ECA-0.0A
LOSS OF ALL AC POWER	REVISION NO. 9	PAGE 123 OF 136

ATTACHMENT 9
PAGE 45 OF 58

BASES

ATTACHMENT 2

These attachments provides instructions for shedding of DC safeguards bus loads in order to conserve capacity to assist in future actions to restore AC power, while maintaining that minimum instrumentation necessary to monitor plant conditions. The intent of DC load shedding is to remove large loads not necessary for the Loss of All AC Power event as soon as practical. However, the specific battery sizing calculation for CPNPP Station Blackout shows that, even without load shedding, the heaviest loaded battery with an assumed electrolyte temperature of 65°F, has sufficient capacity to not only carry its loads for a four (4) hour period, but also provide sufficient DC power for Diesel Generator field flashing.

Comments / Reference: ECA-0.0A	Revision: 9

ATTACHMENT 9
PAGE 18 OF 58

BASES

STEP 18: Following loss of all AC power, the station batteries are the only source of electrical power. The station batteries supply the DC busses and the AC vital instrument busses. Since AC safeguards power is not available to charge the station batteries, battery power supply must be conserved to permit monitoring and control of the plant until AC power can be restored.

The intent of load shedding is to remove non-essential loads as soon as practical, consistent with preventing damage to plant equipment. Prioritized shedding of additional loads is performed in case AC power cannot be restored within the projected life of the station batteries. These initial loads are identified in Attachment 2.A. Additional load shed is directed by Step 24 using Attachment 2.B. Personnel dispatched to perform load shed activities should have Attachments 2.A and 2.B in their possession to prevent a return trip to the Control Room when Step 24 directs performing Attachment 2.B.

CPNPP analysis for Station Blackout has identified that even without load shedding, the heaviest loaded battery has sufficient capacity to not only carry its loads for a 4 hour period, but also provide sufficient DC power for AC power restoration.

In cases where power cannot be restored within 4 hours, station batteries may be exhausted in 12 hours. Attachments 2.A and 2.B load shed must be completed within 2 hours to ensure sufficient time to restore battery chargers to service using a portable generator. Since it will not always be possible to predict when AC safeguards power will be restored, Attachments 2.A and 2.B load shed will need to be initiated as soon as possible and in all cases completed within 2 hours of loss of power.

If DC bus voltage continues to decrease below 110 Volts, then Plant Staff is consulted to determine if the affected DC bus should be removed from service. Removing the DC bus from service will ensure adequate DC voltage remains to flash the diesel generator field or close safeguards bus supply breakers to support power restoration when an AC power source becomes available. During an ELAP event, battery life is extended using the strategy of FSI-4.0A, DC BUS LOAD MANAGEMENT AND PHASE 2 480 VAC GENERATOR ALIGNMENT instead of performance of Attachment 2.C.

Comments / Reference: ECA-0.0A	Revision: 9

CPNPP EMERGENCY RESPONSE GUIDELINES	UNIT 1	PROCEDURE NO. ECA-0.0A
LOSS OF ALL AC POWER	REVISION NO. 9	PAGE 96 OF 136

ATTACHMENT 9
PAGE 18 OF 58

BASES

STEP 18: Following loss of all AC power, the station batteries are the only source of electrical power. The station batteries supply the DC busses and the AC vital instrument busses. Since AC safeguards power is not available to charge the station batteries, battery power supply must be conserved to permit monitoring and control of the plant until AC power can be restored.

The intent of load shedding is to remove non-essential loads as soon as practical, consistent with preventing damage to plant equipment. Prioritized shedding of additional loads is performed in case AC power cannot be restored within the projected life of the station batteries. These initial loads are identified in Attachment 2.A. Additional load shed is directed by Step 24 using Attachment 2.B. Personnel dispatched to perform load shed activities should have Attachments 2.A and 2.B in their possession to prevent a return trip to the Control Room when Step 24 directs performing Attachment 2.B.

ATTACHMENT 9
PAGE 18 OF 58

BASES

STEP 18: Following loss of all AC power, the station batteries are the only source of electrical power. The station batteries supply the DC busses and the AC vital instrument busses. Since AC safeguards power is not available to charge the station batteries, battery power supply must be conserved to permit monitoring and control of the plant until AC power can be restored.

The intent of load shedding is to remove non-essential loads as soon as practical, consistent with preventing damage to plant equipment. Prioritized shedding of additional loads is performed in case AC power cannot be restored within the projected life of the station batteries. These initial loads are identified in Attachment 2.A. Additional load shed is directed by Step 24 using Attachment 2.B. Personnel dispatched to perform load shed activities should have Attachments 2.A and 2.B in their possession to prevent a return trip to the Control Room when Step 24 directs performing Attachment 2.B.

CPNPP analysis for Station Blackout has identified that even without load shedding, the heaviest loaded battery has sufficient capacity to not only carry its loads for a 4 hour period, but also provide sufficient DC power for AC power restoration.

In cases where power cannot be restored within 4 hours, station batteries may be exhausted in 12 hours. Attachments 2.A and 2.B load shed must be completed within 2 hours to ensure sufficient time to restore battery chargers to service using a portable generator. Since it will not always be possible to predict when AC safeguards power will be restored, Attachments 2.A and 2.B load shed will need to be initiated as soon as possible and in all cases completed within 2 hours of loss of power.

Comments / Reference: ECA-0.0A	Revision: 9

CPNPP EMERGENCY RESPONSE GUIDELINES	UNIT 1	PROCEDURE NO. ECA-0.0A
LOSS OF ALL AC POWER	REVISION NO. 9	PAGE 18 OF 136

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check DC Bus Loads:	
	a. Initiate shedding of DC loads per Attachment 2.A.	
	b. Check ELAP - HAS BEEN DECLARED	b. Perform the following: 1) IF Voltage is less than 110 Volts, THEN determine necessity of shedding additional DC loads per Attachment 2.C. 2) Go to Step 19.

Comments / Reference: ECA-0.0A	Revision: 9

CPNPP EMERGENCY RESPONSE GUIDELINES	UNIT 1	PROCEDURE NO. ECA-0.0A
LOSS OF ALL AC POWER	REVISION NO. 9	PAGE 23 OF 136

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
*24	Complete DC Bus Load Shedding:	
	a. Check Main feedwater lines and instrument air to MSIVs - ISOLATED	a. Perform the following: 1) WHEN Main feedwater lines and instrument air to MSIVs isolated, THEN perform Step 24b. 2) Go to Step 25.
	b. Continue DC load shedding per Attachment 2.B	

Question 73

Problem: During the written examination review of the CPNPP 2016 NRC exam it was identified that Question 73 lacks sufficient detail in accordance with NUREG-1021 to discriminate between the approved answer and one of the distractors. In particular:

- The correct answer as approved on the worksheet and answer key is 'B'.
- Answer 'B' is a specifically delineated responsibility of the Relief Reactor Operator in accordance with ODA-102, specifically, "Operate the common system equipment as directed."
- In contrast, distractor 'D' stated, "keep the OSC Manager informed of NEO activities"
- The action in distractor 'D' is considered incorrect as it was an action assigned to the Field Support Supervisor per ODA-102. However, the stem states the "Field Support Supervisor position is NOT filled"
- Therefore, the applicants were unable to discriminate this action as being incorrect in that the duties and responsibilities of the Relief Reactor Operator also includes, "Assist the Emergency Coordinator." "Assist the Emergency Coordinator" duty is further justified as being included in the discrimination process by the use of the word "may" in the second fill in the blank statement.
- Based on this lack of discrimination in what the Relief Reactor Operator can and cannot do in assisting the Emergency Coordinator, keeping the OSC Manager informed of NEO activities could not be ruled out as incorrect.

Therefore, CPNPP ascertains that Question 73 answer 'B' and distractor 'D' should both be accepted as correct answers.

The first part of answer 'B' and distractor 'D' were reviewed and deemed to be accurate, thus making 'B ' and 'D' correct.

Solution: CPNPP recommends accepting answer 'B' and distractor 'D' as correct answers. With the inability of the applicants to eliminate distractor 'D' as it is inclusive of 'Assist the Emergency Coordinator' it is not reasonable to expect the applicants to successfully eliminate distractor 'D' as a possible answer to the question.

NUREG-1021 justification: The proposed revision is in agreement with NUREG-1021 Rev. 10 ES-403 D.1.c which states, "If it is determined that there are two correct answers, both answers will be accepted as correct."

Examination Outline Cross-reference:	Level	RO		SRO
Revision: 4	Tier	3		
	Group			
	K/A	G.2.4.39		
	Importance Rating	3.9		

Knowledge of RO responsibilities in emergency plan implementation.

Question # 73

- Crew composition:
  - Shift Manager
  - 3 other Senior Reactor Operators
  - Field Support Supervisor position is NOT filled
  - 5 Reactor Operators
  - 8 Nuclear Equipment Operators
  - Non Operations Staffing is at MINIMUM Shift Crew Composition
- An ALERT has been declared on Unit 1
- After initial notifications were completed, NRC requested ENS line be manned by a dedicated individual

Per ODA-102, Conduct of Operations _____ should be assigned to the ENS line, and that individual may also _____.

A. Unit 2 Balance of Plant Operator
operate common system equipment

B. Relief Reactor Operator
operate common system equipment

C. Unit 2 Balance of Plant Operator
keep OSC Manager informed of NEO activities

D. Relief Reactor Operator
keep OSC Manager informed of NEO activities

Answer: B	Accept both B/D as correct answers on the exam.

K/A Match:

The question is a K/A match as it requires the applicant to determine which Reactor Operator has specific duties during implementation of the Emergency Plan.

Explanation:

A. Incorrect. The first part is incorrect but plausible as ODA-102, states that the BOP on the unaffected unit is to perform the duties of the Relief Reactor Operator if the Relief Reactor Operator is unavailable. Knowledge of minimum shift staffing shows that the Relief Reactor Operator position is available. The second part is correct as described in 'B' below.

B. Correct. In accordance with ODA-102, the Relief Reactor Operator should be assigned these duties as the SROs are at minimum crew staffing and cannot be assigned to the ENS. ODA-102, lists other responsibilities that the Relief Reactor Operator can be asked to do during emergencies and states that they may operate the common equipment as directed.

C. Incorrect. The first part is incorrect but plausible as described in 'A' above. The second part is incorrect but plausible as described in 'D' below.

D. Correct. The first part is correct as described in 'B' above. The second part is correct as the Field Support Supervisor (FSS) position is unmanned; the Relief Reactor Operator (RRO) could assume the duty of keeping the OSC Manager informed of NEO activities in lieu of the FSS since one of the RRO's duties is to 'Assist the Emergency Coordinator.'

Technical Reference(s)	ODA-102	Attached w/ Revision # See Comments / Reference
	EPP-116	

Proposed references to be provided during examination: _____

Learning Objective: **RESPOND** to plant emergencies in accordance with station procedures, including deviation from Technical Specifications and normal recovery methods when required, and **EVALUATE** plant and personnel response to emergencies. (OPD1.ADM.XA1.OB21)

Question Source: Bank # _____

Modified Bank # _____ (Note changes or attach parent)

New X

Question History: Last NRC Exam _____

Question Cognitive Level: Memory or Fundamental Knowledge X

	Comprehension or Analysis	
	Level of Difficulty	3

10 CFR Part 55 Content:	55.41	10
	55.43	

Comments / Reference: ODA-102	Revision: 27 PCN 2

CPNPP OPERATIONS DEPARTMENT ADMINISTRATION MANUAL		PROCEDURE NO. ODA-102
CONDUCT OF OPERATIONS	REVISION NO. 27 INFORMATION USE	PAGE 20 OF 57

6.10 Duties/Responsibilities of the Balance of Plant Operator (BOP)

- Perform the duties and responsibilities of the RO in his absence after proper relief.
- Assist in the preparation, review and modification of tagging orders and maintenance work activities for the assigned unit(s).
- During emergencies, if not assigned to the affected unit, perform the duties of the RRO, if the RRO is not available.

Comments / Reference: ODA-102	Revision: 27 PCN 2

6.11 Duties/Responsibilities of the Relief Reactor Operator (RRO)

A. IF an extra RO is available, his function may include the following:

- Operate common equipment including switchyard, DRMS and HVAC panels.
- Aid in work order and clearance review. The Unit 1 & Unit 2 US should still review and approve the clearance.
- The normal work station for the Extra RO includes the Unit 1 & Unit 2 horseshoe, Unit 1 & Unit 2 backpanels, center desk console and Clearance Processing Center (CPC).
- Relief or additional support of either Unit RO or the BOP Operators.
- Immediately notify the US when unable to maintain critical parameters within the required control band(s) designated by the US.

B. During emergencies, the RRO should perform the following:

- Assist the Emergency Coordinator.
- Take notes and record data and information in the Narrative Log if directed.
- Operate the common system equipment as directed.
- Monitor DRMS and inform the affected unit RO of alarms or increasing trends.
- Communicate with the NRC as an emergency communicator, if required.

Comments / Reference: ODA-102	Revision: 27 PCN 2

6.8 Duties/Responsibilities of the Field Support Supervisor (FSS)

- Direct and coordinate Operations activities outside the Control Room in accordance with approved Operations procedures and station expectations as required by the US..

[C] - Supervise, direct and coordinate the work activities of NEOs to ensure proper equipment operation, completion of assigned tasks and compliance with department policies and expectations, including utilization of Self Verification techniques. [07321, 25729, 26091]

- Receive directions from the Control Room with regard to placing equipment out of service and the restoration of that equipment to service.
- Assure logs or records are completed, reviewed and approved.
- Perform visual inspections of work in progress as well as the entire work site to ensure safe work practices, a safe work environment and that proper processes/procedures are being followed at all times.
- Oversee NEOs in the performance of Infrequently Performed Tests or Evolutions when required by STA-122, high risk evolutions when required by OWI-107, first time evolutions, major system/component startups and major time-critical clearances.
- Participate in pre-job briefs which impact field activities.
- During declared emergencies, keep the OSC Manager informed of NEO activities.
- Contact the Duty Radwaste Supervisor and Unit Supervisor prior to performance of any Radwaste activity not contained in the current POD or RW Shift Order.

6.13 Duties/Responsibilities of Nuclear Equipment Operators Assigned to Radwaste Operations

[C]

- The NEOs assigned to the Radwaste Operations group are responsible to the Radwaste Supervisor for the timely processing and discharge of both liquid and gaseous radioactive wastes. [10783]

- Operate the following radwaste management systems and equipment under the direction of the Radwaste Supervisor, SM or the US in accordance with administrative, regulatory, and procedural requirements. Specific Radwaste/Shift Operations duties and responsibilities are delineated in Operations Guidelines.

  Boron Recycle System, Drain Channels A, B, C, NSSS and BLDN Spent Resin Systems, Filter-Demineralization System, Chemical Drain Tank System, Solid Waste Processing System, Gaseous Waste Processing System, Vents and Drains System, Wastewater Management System, Condensate Polishing

- Keep the US aware of Radwaste System conditions that affect unit operation or availability.

[C]6.14 Duties/Responsibilities of the Control Room Communicator [01454]

An individual designated by and responsible to the Emergency Coordinator. This position is normally filled by a qualified member of the Prompt Team. However, any individual trained in emergency communications may be utilized to fill this position. The Control Room Communicator performs tasks described in the Emergency Planning Control Room Communicator Position Assistance Document (PAD), including:

- Notifications to county, state and NRC officials (after initial notifications are made, a SRO or RO is preferred for communicating with the NRC on the ENS line).

Comments / Reference: ODA-102	Revision: 27 PCN 2

ATTACHMENT 8.A
PAGE 1 OF 3

[C] MINIMUM SHIFT CREW COMPOSITION
[00021, 00044, 00136, 01078, 05131, 05699, 06025, 06029, 06771, 07194, 08649, 22609, 22739, 23344]

POSITION	Number on Shift (4,13,16)
Shift Manager (5)	1 SM
Unit Supervisor (6,9,11)	2 US
Shift Technical Advisor (3)	1 STA
Field Support Supervisor (14)	1 FSS
Reactor Operator (7,8,10)	4 RO
Nuclear Equipment Operator(2,12)	8 NEO
RP Technician	2 RP TECH
Chemistry Technician	1 CHEM TECH
First Aid Team Member	1 FIRST AID TEAM MEMBER
Mechanic	1 MECH
Electrician	1 ELEC
I&C Technician	1 I&C TECH
Control Room Communicator (15)	1 CR COMM

POSITION (1)	USNRC LICENSE
SHIFT MANAGER	SRO
UNIT SUPERVISOR	SRO
FIELD SUPPORT SUPERVISOR	NONE
REACTOR OPERATOR	RO
NUCLEAR EQUIPMENT OPERATOR	NONE
SHIFT TECHNICAL ADVISOR	(3)

Comments / Reference: ODA-102	Revision: 27 PCN 2

ATTACHMENT 8.A
PAGE 3 OF 3

[C] MINIMUM SHIFT CREW COMPOSITION
[00021, 00044, 00136, 01078, 05131, 05699, 06025, 06029, 06771, 07194, 08649, 22609, 22739, 23344]

[C] (12) A site Fire Brigade of at least five members shall be maintained onsite at all times. The Fire Brigade shall not include the SM and the four other members of the minimum Operations shift crew necessary for safe shutdown of the unit and any personnel required for other essential functions during a fire emergency. The Fire Brigade may be less than the minimum requirements for a period of time not to exceed 2 hours to accommodate unexpected absence, provided immediate action is taken to fill the required positions.

[C] (13) The Operations shift crew composition may be one less than the minimum requirements for a period of time not to exceed 2 hours in order to accommodate unexpected absence of on-duty shift crew members provided immediate action is taken to restore the shift crew composition to within the minimum requirements. This provision does not permit any shift crew position to be unmanned upon shift change due to an oncoming shift crewman being late or absent.

[C] (14) The FSS position may be filled by an SRO provided minimum shift manning requirements are met for SROs. In those cases when the on-duty Crew Staff is limited to 3 Unit Supervisors, CPC SRO duties and responsibilities will be distributed between the applicable Unit 1 and Unit 2 Unit Supervisors. The FSS position may remain temporarily unfilled with Operations Management's approval.

(15) Two Control Room Communicators (CR COMM) shall be onsite at all times. One communicator shall be an individual trained and qualified in Emergency Plan communications with no additional duties during accident conditions. The second communicator is any onsite individual judged qualified by the SM and possessing sufficient plant knowledge to be able to communicate plant status information effectively to the NRC via the ENS during the initial phases of a declared emergency. The second communicator may be part of the shift manning and may perform additional duties as required during accident conditions.

Comments / Reference: EPP-116	Revision: 9

the OSC Manager, ERDC Team Leader and the ERDC team members will discuss the potential for working outside of normal procedures in the job brief and include decisions in the ERDC team's task instructions (EWP). [C-4679513]

3.4 Technical Support Center (TSC) - The onsite location utilized by station management, technical, and engineering support personnel to support the Control Room for assessment of plant status and potential offsite impact and for implementation of emergency response actions.

3.5 Operations Support Center (OSC) - The onsite location where support personnel report during an emergency and from where teams are dispatched for assignment or duties in support of emergency operations.

4.0 **RESPONSIBILITIES/INSTRUCTIONS**

4.1 The Manager, Nuclear Emergency Planning is responsible for:

4.1.1 Maintaining this procedure current.

4.1.2 Ensuring the control room and emergency coordinators are trained and qualified on this procedure.

4.2 The Control Room Shift Manager/Unit Supervisor is responsible for:

4.2.1 Providing assistance and support to OSC/TSC personnel once the TSC has assumed responsibility for prioritizing ERDC activities.

4.2.2 Supplying Nuclear Equipment Operators as required in support of ERDC activities.

4.2.3 Authorizing Deviation from normal work processes while functioning as the Emergency Coordinator during declared emergencies in accordance with this procedure.

4.3 The TSC Manager is responsible for:

Comments / Reference: EPP-116	Revision: 9

4.10.3 The TSC Onsite Radiological Assessment Coordinator, through the OSC Radiation Protection Coordinator, should advise ERDC teams in the field of known or suspected changes in radiological or plant conditions which could impact ERDC activities.

4.11 Prerequisites

Note: Nuclear Equipment Operators (NEO) dispatched from the Control Room are not considered ERDC Team members, unless requested by the OSC for a NEO to be a member on an ERDC team. The Control Room retains control of the Fire Brigade and Safe Shutdown NEO's.

Question 79

Problem: During the written examination review of the CPNPP 2016 NRC exam it was identified that Question 79 lacks sufficient detail in accordance with NUREG-1021 to obtain the answer previously approved as correct. In particular:

- The correct answer as approved on the worksheet and answer key is 'D'.
- Answer 'D' included a transition to EOS-1.1B, Safety Injection Termination vice a transition to EOP-1.0B, Loss of Reactor or Secondary Coolant.
- In accordance with EOP-2.0B, Step 8, in order for the transition to be made to EOS-1.1B, the RCS pressure is required to be "Stable or Increasing."
- In contrast with the above statement, the stem of Question 79 states that "RCS pressure is 2240 psig and decreasing"
- The provided justification for the original answer was that this was indication following the opening of a PORV on high RCS pressure; however, no other information was included in the stem which indicated that a PORV had opened. In particular, the inclusion of Tailpipe outlet temperature, PORV position indication, PORV Not Closed alarm or PRT parameters would have been required to determine that a PORV had indeed opened.
- During the exam review it was determined that two of the three SRO applicants had interpreted the indication as the existence of a possible steam space leak or other anomaly which would have resulted in decreasing pressure with increasing pressurizer level. Based on this interpretation, the selection of a transition to EOP-1.0B is correct.

Therefore, CPNPP ascertains that Question 79 has information in the stem that indicates the correct answer is distractor 'C' [based on RCS pressure is 2240 psig and decreasing] vice answer 'D' therefore it is not reasonable to expect the applicants to eliminate distractor 'C' as the correct answer and it is reasonable to expect the applicants to eliminate answer 'D' as a correct answer.

The first part of distractor 'C' was reviewed and deemed to be accurate, thus making distractor 'C' correct.

Solution: CPNPP recommends accepting distractor 'C' as the correct answer and not accepting answer 'D' as a correct answer.

NUREG-1021 justification: The proposed revision is in agreement with NUREG-1021 Rev. 10 ES-403 D.1.b 1st bullet which states "a question with an unclear stem that confused the applicants or did not provide all the necessary information."

Examination Outline Cross-reference:	Level	RO		SRO
Revision: 5	Tier			1
	Group			1
	K/A	040 AA2.05		
	Importance Rating			4.5

Steam Line Rupture: Ability to determine and interpret the following as they apply to the Steam Line Rupture: When ESFAS systems may be secured

Question # 79

- Unit 2 Steam Line Break OUTSIDE containment
- Fault occurred on 2ST, STATION SERVICE TRANSFORMER 2ST
- 2EA2, Safeguards 6.9KV received 86-1 lockout when Reactor tripped
- EOP-2.0B, Faulted Steam Generator Isolation, Step 8 'Check if ECCS Flow Should be Reduced' in progress with the following parameters:
  - SG 2-01 NR level 0%
  - All other SG NR levels 5% to 8% and increasing
  - AFW total flow 470 gpm and stable
  - RCS subcooling 52°F and stable
  - RCS pressure 2240 psig and decreasing
  - Pressurizer Level 70% and increasing

TDAFWP _____ be placed in Pull Out.

Unit Supervisor has announced transition to _____.

A. should
EOP-1.0B, Loss of Reactor or Secondary Coolant

B. should
EOS-1.1B, Safety Injection Termination

C. should NOT
EOP-1.0B, Loss of Reactor or Secondary Coolant

D. should NOT
EOS-1.1B, Safety Injection Termination

Answer: C	Changed answer from D to C on written exam.

K/A Match:

The question matches the K/A as it requires the applicant to determine and interpret the plant indications concerning whether ESFAS systems (ECCS) can be secured.

SRO Only:
The question is SRO only in that it requires the applicant to exhibit SRO level knowledge of the ERG beyond the overall mitigative strategies and requires the SRO to make a procedure choice beyond the major EOPs.

Explanation:

A. Incorrect. First part is incorrect but plausible (See B below). Second part is correct (See C below).

B. Incorrect. First part is incorrect but plausible if the applicant does not recognize that 2 of the 3 intact SGs are being fed by the TDAFWP even though a single MDAFWP can supply greater than the minimum 460 gpm for heat sink maintenance. Second part is incorrect (See D below).

C. Correct. First part is correct (See D below). Second part is correct as with the indicated conditions of RCS pressure decreasing continuing on to Step 9 of EOP-2.0B is required and a transition to EOP-1.0B is required.

D. Incorrect. First part is correct as the TDAFWP is feeding 2 of the 3 intact SGs and should not be secured. Second part is incorrect as SI termination criteria per EOP-2.0B are NOT met as RCS pressure is decreasing with no indication that a Pressurizer PORV has lifted causing the pressure to lower.

Technical Reference(s)	EOP-2.0B	Attached w/ Revision # See Comments / Reference
	EOP-0.0B	

Proposed references to be provided during examination: None

Learning Objective: **IDENTIFY** the proper transitions out of EOP-2.0. (LO21ERGE2AOB106)

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
Level of Difficulty 3

10 CFR Part 55 Content: 55.41 _____
55.43 5

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check Secondary Radiation:	
	a. Request periodic activity samples of all SGs.	
	b. Check available secondary radiation monitors - NORMAL • Condenser Off Gas radiation (COG-182, 1RE-2959) • Main steamline radiation (MSL-178 through 181, 1RE-2325 through 2328) • SG blowdown sample radiation (SGS-164, 1RE-4200)	b. Go to EOP-3.0A, STEAM GENERATOR TUBE RUPTURE, Step 1.
8	Check If ECCS Flow Should Be Reduced:	
	a. Secondary heat sink: • Total AFW flow to intact SGs - GREATER THAN 460 GPM -OR- • Narrow range level in at least one intact SG - GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT)	a. IF neither condition satisfied, THEN go to Step 9.
	b. RCS subcooling - GREATER THAN 25°F(55°F FOR ADVERSE CONTAINMENT)	b. Go to Step 9.
	c. RCS pressure - STABLE OR INCREASING	c. Go to Step 9.
	d. PRZR level - GREATER THAN 13% (34% FOR ADVERSE CONTAINMENT)	d. Go to Step 9.
	e. Go to EOS-1.1A, SAFETY INJECTION TERMINATION, Step 1.	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Go To EOP-1.0B, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	

-END-

Comments / Reference: EOP-0.0B Foldout Page	Revision: 9 PCN 1

CPNPP EMERGENCY RESPONSE GUIDELINES	UNIT 2	PROCEDURE NO. EOP-0.0B
REACTOR TRIP OR SAFETY INJECTION	REVISION NO. 9	PAGE 20 OF 121

ATTACHMENT 1.A
PAGE 1 OF 1

FOLDOUT FOR EOP-0.0B REACTOR TRIP OR SAFETY INJECTION

1. RCP TRIP CRITERIA

> NOTE: ABN-101, REACTOR COOLANT PUMP TRIP/MALFUNCTION criteria for tripping an RCP is applicable during use of the Emergency Procedures.

Trip all RCPs if BOTH conditions listed below occur:

a. RCS subcooling - LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT)
b. CCP or SI pump - AT LEAST ONE RUNNING

2. SHUTDOWN MARGIN CRITERIA
Emergency borate per ABN-107 if either of the following conditions below occur:

- Two or more control rods NOT fully inserted (1800 gallons of 7000 ppm boric acid for each control rod not fully inserted).
- Control rod position indication is NOT available (3600 gallons of 7000 ppm boric acid).

> NOTE: During the performance of the immediate operator actions, AFW FOP verbalization is neither required nor expected.

3. CONTROL AFW FLOW TO MAINTAIN ADEQUATE HEAT SINK

- Ensure both MDAFWPs started following a Reactor Trip with NO Blackout or SI actuation. (Start TDAFWP, if necessary)
- Ensure AFW flow throttled following a Reactor Trip/SI (normally 150 gpm to 200 gpm).
  AND
  Maintain total AFW flow GREATER THAN 460 gpm UNTIL at least ONE SG NR Level greater than 10%(18% for ADVERSE CONTAINMENT).
- IF any SG identified as faulted, THEN stop AFW flow to the SG.
- IF any SG identified as ruptured, THEN:
  Stop AFW flow after ruptured SG level greater than 10%(18% for ADVERSE CONTAINMENT).
  AND
  Control AFW flow to maintain ruptured SG level greater than 10%(18% for ADVERSE CONTAINMENT).
- IF BOTH MDAFWPs are running with flow THEN, secure the TDAFWP.