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CP-201800389
TXX-18044

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

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

6/25/2018

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

REFERENCES: 1. NUREG-1021, Revision 11, Examination Standard ES-403

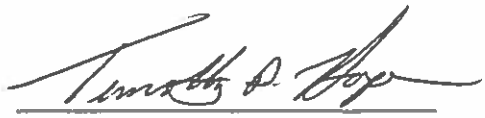
Dear Mr. Clayton:

Enclosed please find the written examination answer sheets, cover pages, and one completed Form ES-403-1, "Written Examination Grading Quality Checklist," for the initial operator licensing written examinations administered on June 20, 2018 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. Jordan Ruby at (254) 897-0585 (office) or at (214) 808-6506 (cell).

Sincerely,



Timothy A. Hope

Enclosure – 2018 Licensed Operator Written Examinations

c –

Kriss M. Kennedy, Region IV (clo)
Vincent Gaddy, Region IV (clo)
Margaret M. O'Banion, NRR (clo)
Resident Inspectors, Comanche Peak (clo)

CPNPP 2018 NRC WRITTEN EXAM ANALYSIS

1-75 RO / 75-100 SRO Only		VALUE:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		KEY ANSWERS:	D	A	C	A	C	D	B	D	C	D	A	B	A	D	A/B	C	C	D	B	B	B	A	D	D	C	C	C	C	B	B	C	C	A	A	D	A	D	D	A	C	C	B	A	C	A	C	A	B
NAME	TOTAL%	PTS	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	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
	92.0	69.0																							C								A	A					D				C					
	84.0	63.0																			C	C		B			B		D	D			A										B					
	85.3	64.0					D																A	D									D						B			D			C				C	
	85.3	64.0																	B					C			B						D									D			B					
	97.3	73.0																			C												B																	
	82.7	62.0								A														D	C								A						B					C				D	
	80.0	80.0					D			C															C				D	D											B				C				C	C
	80.0	80.0										C									C			B					D				D						B			D			D				C	
	85.0	85.0																						D			B						A								B							D	
	89.0	89.0																						D					D														D						
	91.0	91.0																						D		B							A										B						C
	89.0	89.0							A																			D				A	A									C				C	
	93.0	93.0																						D																				D						
	89.0	89.0																						D																				C						
	91.0	91.0																						C																				B						
		Total Missed:					2		1	2		1							1		3	1	1	11	3	1	3		3	3	1		10	2	1				3		2	6			14				6	2

1-75 RO / 75-100 SRO Only		VALUE:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
		KEY ANSWERS:	A	C	B	D	A	D	A	B	B	C	D	D	C	B	C	B	A	A	A	A	C	B	D	C	D	A	C	B	D	A	A	C	C	B	D	A	B	A	C	B	A	D	C	B	B	D	C	A
NAME	SRO %	RO %	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	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
		92.0															A																																	
		84.0			D														D				D	A																										
		85.3		A						D									D																															
		85.3			D						A			A							D																													
		97.3																																																
		82.7			D						A			A											B	D																								
	72.0	82.7		B						D									D					C				C	D								D	D		B		B		C					
	72.0	82.7								C									D		B												C			A		C	C		A			B	A					
	88.0	84.0								D			C				D							A	B	D																	B	A			C				
	84.0	90.7		A					B											C									D									C		C				A						
	96.0	89.3															A				B			A																				A						
	80.0	92.0																															B					C		C				A				A		
	84.0	96.0																																				C						A		D		A		
	72.0	94.7															A				B								A				B					C		C	B			A			C			
	76.0	96.0		A																								C										C	A	C				A						C
		Total Missed:		4	3				1	4	2		1	2			4		4	2	3		1	4	2	2		2	3			3			1		7	3	4	3		1	9	1	2	2	2		1

SRO Total Points =	100
RO Only Points =	75
SRO Only Points =	25
RO Questions Average =	**90.8**
SRO Questions Average =	**84.0**
Class Average =	**89.6**

1-75 RO / 75-100 SRO Only		VALUE:	1	1
		KEY ANSWERS:	A	B
NAME	TOTAL%	PTS	49	50
	92.0	69.0		
	84.0	63.0		
	85.3	64.0		
	85.3	64.0	D	
	97.3	73.0		
	82.7	62.0	D	
	80.0	80.0		
	80.0	80.0		
	85.0	85.0		
	89.0	89.0		
	91.0	91.0		
	89.0	89.0		
	93.0	93.0		
	89.0	89.0		
	91.0	91.0		
		Total Missed:	2	

1-75 RO / 75-100 SRO Only		VALUE:	1	1
		KEY ANSWERS:	D	D
NAME	SRO %	RO %	99	100
		92.0		
		84.0		
		85.3		
		85.3		
		97.3		
		82.7		
	72.0	82.7		
	72.0	82.7		
	88.0	84.0		
	84.0	90.7		
	96.0	89.3		
	80.0	92.0		
	84.0	96.0		
	72.0	94.7		
	76.0	96.0		
		Total Missed:		

SRO Total Points =	100
RO Only Points =	75
SRO Only Points =	25
RO Questions Average =	**90.8**
SRO Questions Average =	**84.0**
Class Average =	**89.6**

Examination Outline Cross-Reference	Level	RO
004 Chemical and Volume Control	Tier #	2
	Group #	1
Knowledge of the effect of a loss or malfunction on the following CVCS components: K6.17 Flow paths for emergency boration	K/A #	004 / K6.17
	Rating	4.4
	QREV	7

Question 15

Unit 1 has a reactor trip from 100% power with the following conditions:

- four control rods failed to insert
- The US has entered EOP-0.0A, "Reactor Trip or Safety Injection," and ABN-107, "Emergency Boration."

Step 1 of ABN-107 states:
"Check RWST TO CHRG PMP SUCT VLVs, 1/1-LCV-112D AND 1/1-LCV-112E – CLOSED."

For some unknown reason the RWST TO CHRG PMP SUCT VLV, 1/1-LCV-112D is OPEN and WILL NOT CLOSE.

The Response Not Obtained (RNO) column of ABN-107 directs the operator to emergency borate _____ because it is the preferred method for these plant conditions.

A. from the RWST via 1/1-LCV-112D OR 1/1-LCV-112E using Attachment 4

B. through emergency borate valve 1-8104 using Attachment 1

C. through manual emergency borate valve 1CS-8439 using Attachment 3

D. through normal boration valves 1-FCV-0110A and 1/u-FCV-0110B using Attachment 2

Answer: A
Explanation:
A is correct because according to ABN-107, step 1 if 1/1-LCV-112D and 1/1-LCV-112E are not closed, the RNO directs you to step 7 which states that Attachment 4 is the preferred method to emergency borate from the RWST. If it is open (LCV-112D) and won't close, the interlock to allow the other valves to open and borate through other normally preferred methods is not available so this is the preferred method.
B is incorrect because according to ABN-107, Attachment 1 is the preferred method if 1/1-LCV-112D and 1/1-LCV-112E are closed, and at least one Boric Acid pump is available.
C is incorrect because according to ABN-107, Attachment 3 is another method if 1/1-LCV-112D and 1/1-LCV-112E are closed, and at least one Boric Acid pump is available.
D is incorrect because according to ABN-107, Attachment 3 is another method if 1/1-LCV-112D and 1/1-LCV-112E are closed, and at least one Boric Acid pump is available.

Technical References:
ABN-107, Emergency Boration, Rev. 9, pages 4-5

References to be provided to applicants during exam: None.

Learning Objective: LO21.ABN.105.OB06; LO21.SYS.CS1.OB04

Question Source: (note changes; attach parent)	Bank #	
	Modified Bank #	
	New	X
Question History:	Last NRC Exam	No
Question Cognitive Level:	Memory/Fundamental	
	Comprehensive/Analysis	3
10CFR Part 55 Content:	55.41.7	

Question 15

Recommend accepting two correct answers A and B

During written examination review of the CPNPP 2018 NRC exam it was identified that Question 15 has two correct answers.

Reason

- The question exhibits a normal reactor trip with NO Safety Injection, 4 Control Rods failing to insert into the core, and 1/1-LCV-112D open for some unknown reason
- The US then enters EOP-0.0A, Reactor Trip or Safety Injection AND ABN-107, Emergency Boration
- When the Reactor Operator notes all rods failed to insert, there is no RNO action to be performed in EOP-0.0A and the crew proceeds to step 2. After the completion and verbalization of the Immediate Operator Actions (Steps 1-4) of EOP-0.0A, the Reactor Operator will Emergency Borate for the stuck rods per the Fold Out Page guidance contained in EOP-0.0A, Attachment 1A, Foldout For EOP-0.0A Reactor Trip Or Safety Injection.
- The action to perform Emergency Boration is performed independently of US direction as a Foldout Page action. The US will not direct the action, only ensure that it takes place and verify its initiation
- EOP-0.0A Foldout Page states to Emergency Borate, per ABN-107, if two or more control rods are NOT fully inserted (1800 gallons of 7000 ppm boric acid for each control rod not fully inserted)
- ABN-107 contains a NOTE prior to Step 1 stating: “Attachment 1 and Attachment 4 have been developed into Operator Aids for use during emergency boration and may be entered independently of this procedure.”
- This NOTE is what allows the Reactor Operator to initiate Emergency Boration per the Operator Aid independently of ABN-107. The operator will execute either page 1 or page 2 of the operator aid by diagnosing the current plant conditions and determining if a Safety Injection has occurred or not. In this case there is no Safety Injection present, therefore Emergency Boration will be conducted per Attachment 1 (Page 2 of the Operator Aid)
- The Operator Aid (PLR# 2013-0023-S) is contained at the Main Control Board (MCB) Panel CB-06
- The first page of the operator aid is an exact replica of ABN-107, Attachment 4, Transfer of Charging Pump Suction to the RWST, Page 1 ONLY. This page of the operator aid would be used to initiate Emergency Boration anytime a Safety Injection HAS occurred
- The second page of the operator aid is an exact replica of ABN-107, Attachment 1, Emergency Boration Through Emergency Borate Valve u-8104. This page of the operator aid would be used to initiate Emergency Boration anytime a Safety Injection has NOT occurred and there are no known issues with either u-8104 or the Boric Acid Transfer Pumps.
- The Reactor Operator may either Emergency Borate per the second page of the operator aid that is a replica of Attachment 1 of the ABN or the first page of the operator aid that is a replica of page 1 of Attachment 4 of the ABN
- Based on the information provided above CPNPP has determined both selections ‘A’ and ‘B’ are correct

- Answer choices ‘C’ and ‘D’ are incorrect because these attachments CANNOT be entered independently of ABN-107 and are NOT directed by the procedure based on the given conditions
- The original correct answer as approved on the worksheet and the answer key is ‘A’
- See attached figure of the Operator Aid marked as PLR# 2013-0023-S
- See attached figure of ABN-107 NOTE prior to Step 1

EMERGENCY BORATION VIA
TRANSFER OF CHARGING PUMP SUCTION TO THE RWST (ABN-107, Attachment 4)

[L]

CAUTION: Injecting through a CCP SI ISOL VLV (8801A/B) requires CCP SI injection check valve leak test within 24 hours per SR 3.4.14.1 (requires MODE 3, 4, or 5).

1. IF Safety Injection actuated (1/u-LCV-112D OR 1/u-LCV-112E OPEN),
   THEN
   perform the following steps:

   a. Verify ONE of the following valves OPEN:

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

      OR

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

   b. Verify the following valves CLOSED:

      ☐ • 1/u-LCV-112B, VCT TO CHRG PMP SUCT VLV.

      AND

      ☐ • 1/u-LCV-112C, VCT TO CHRG PMP SUCT VLV.

   c. Verify at least ONE CCP running:

      ☐ • 1/u-APCH1, CCP 1

      ☐ • 1/u-APCH2, CCP 2

   ☐ d. Verify u-FI-917, CCP SI FLOW indication.

   ☐ e. IF CCP SI FLOW can NOT be verified,
   THEN
   Initiate Emergency Boration flow per another method of ABN-107.

NOTE: TDM-201A/B provides equivalency values for boration from 2400 ppm source and a 7000 ppm source. A conservative approach is to borate the entire volume required for the condition from the 7000 ppm source once boration flow from the 2400 ppm source is terminated.

   ☐ f. WHEN the RWST is isolated (1/u-LCV-112D AND 1/u-LCV-112E CLOSED) per the applicable ERG,
   THEN
   Initiate Emergency Boration Flow per another method of ABN-107 until the desired amount of boration volume is injected (Reference Attachment 7 of ABN-107).

☐ 2. IF Safety Injection is NOT actuated (1/u-LCV-112D AND 1/u-LCV-112 E CLOSED),
THEN
initiate Emergency Boration Flow through 1/u-LCV-112D OR 1/u-LCV-112 E per Attachment 4 of ABN-107, OR initate Emergency Boration Flow per another method of ABN-107.

EMERGENCY BORATION
THROUGH EMERGENCY BORATE VALVE u-8104 (ABN-107, Attachment 1)

[L]

☐ 1. Ensure a charging pump is running:

- 1/u-APCH1, CCP 1
- 1/u-APCH2, CCP 2
- 1/u-APPD, PDP

☐ 2. Start a boric acid transfer pump:

- 1/u-APBA1, BA XFER PMP 1 - AUTO (AFTER START)
- 1/u-APBA2, BA XFER PMP 2 - AUTO (AFTER START)

☐ 3. Open 1/u-8104, EMER BORATE VLV

☐ 4. Verify flow on u-FI-183A, EMER BORATE FLO

☐ 5. Verify flow on u-FI-121A, CHRG FLOW

☐ 6. IF EMER BORATE FLOW OR CHRG FLOW can NOT be verified,
THEN
initiate Emergency Boration Flow per another method of ABN-107.

☐ 7. WHEN desired to terminate emergency boration (Reference Attachment 7 of ABN-107),
THEN
GO TO Step 8 of ABN-107.

2.3 Operator Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION: CCP runout may occur with simultaneous flow through both charging and SI flowpaths.

NOTE: Attachment 1 and Attachment 4 have been developed into Operator Aids for use during emergency boration and may be entered independently of this procedure.

☐ 1 Check RWST TO CHRG PMP SUCT VLVs, 1/u-LCV-112D AND 1/u-LCV-112E - CLOSED — GO TO Step 7.

☐ 2 Verify BA pump - AT LEAST ONE AVAILABLE — GO TO Step 6.

☐ 3 Initiate and Continue EMERGENCY BORATION using one of the following methods.

NOTE: Attachment 1 is the preferred method of Emergency Boration. Train B Safeguards electrical power is required for operation of 1/u-8104.

- Attachment 1 - 1/u-8104

NOTE: Attachment 2 utilizes the normal boration flow path, which requires 1/u-LCV-112B and 1/u-LCV-112C to be open.

- Attachment 2 - Normal Boration
- Attachment 3 - Manual Emergency Boration Valve (uCS-8439)
- Attachment 9 - Mode 6 - Impaired CVCS

☐ 4 Verify EMERGENCY BORATION Flow — GO TO Step 6.

☐ 5 GO TO Step 8

EXAM FEEDBACK

Originator

Question:

Exam Material Code: 2018 NRC Exam Question Number: 15

Or Full Question ID Number: _____

Description of Problem: (Be as detailed as possible and include references when available)

ABN-107 allows the use of Att. 1 and 4 as job aids. We are trained to normally emergency borate using the Att. 1 job aid through valve 1-8104.

_____ 06/21/18 _____

Name Date Mail Code

Evaluator

Recommended Disposition:

A. Examination/Examination Key: Accept answers A & B

B. Examination Bank: Correct prior to addition to the bank

C. Other: None

Jack Wise 6/21/18

Name Date

1. Prepare and submit disposition for approval.
2. After approval, complete approved actions, forward copy to originator and file original with exam

Approval

Approval Disposition:

☒ As recommended

☐ Other/ additional

_____ 6/21/18

Training Supervisor Date

EXAM FEEDBACK

Originator

Question:

Exam Material Code: 2018 NRC EXAM Question Number: 15

Or Full Question ID Number: _____

Description of Problem: (Be as detailed as possible and include references when available)

NOTE IN ABN-107 GIVES PERMISSION TO USE OPERATOR AIDS ON ATTACHMENTS 1+4. WE EMERGENCY BORATE USING ATT. 1 THROUGH 1-8104 WHEN SI NOT PRESENT.

Name	Date	Mail Code
	6/21/2018	

Evaluator

Recommended Disposition:

A. Examination/Examination Key: Accept answers A & B

B. Examination Bank: Correct prior to addition to the bank

C. Other: None

Name	Date
Jack Wise	6/21/18

1. Prepare and submit disposition for approval.
2. After approval, complete approved actions, forward copy to originator and file original with exam

Approval

Approval Disposition:

☒ As recommended

☐ Other/ additional

Training Supervisor	Date
	6/21/18

WRITTEN EXAM ADMINISTRATION SHEET

Proctor Name: Jack Wise / Bill Gross / Jordan Ruby

Exam: LC26 NRC EXAM Date: 6/20/18

Time	Question #	Question	NRC Called YES	NRC Called NO	Proctor Response/NRC Response
0850	31	Is Attachment 4 part of FPI or the ABN	X		Attachment 4 is part of An ABN written on white board.
0830	86	IF A Technical Specification # is provided, the title of the Spec. should also be provided	X		Provide T.S. name To all candidates T.S. # & Title written on white board.
0900	22	C) Sump has a "Trash Rack" to keep big stuff out AND has a Large # of vertical Strainers to increase overall surface AREA; what is considered "Sump Surface" D) Are Grates (trash Rack) Considered Course Strainers?		X	None.
1022	93	Transition to SACRG-1 Requires >1200F and rising temp. Stem does not give enough info to make this determination.		X	No response provided. Answer question based on given information
1050	78	Are 8716 A/B available		X	No response provided - answer question based on given information
1110	91	Does it matter that the Procedures do not indicate Unit 1		X	No response - answer question based on information in stem of question

Instructions:

- Make multiple copies of the first page, as needed, for questions during exam.
- For all questions, document on Page 2 the receipt of any questions, the question #, and whether or not the NRC was called.
- **IF a question is NOT documented on page 1, THEN** document both the question, response provided and the NRC comments on this form.

WRITTEN EXAM ADMINISTRATION SHEET

Proctor Name: Jack Wise / Bill Gross

Exam: LC26 NRC Exam Date: 6/20/18

Time	Question #	Question	NRC Called YES	NRC Called NO	Proctor Response/NRC Response
1120	55	Part 2 – How long after FK-455A placed in MANUAL is this?	☐	☒	No Response – Question Stands as written.
1132	90	Have any actions, such as placing SSWP in pull-out, been taken	☐	☒	No Response – question stem contains all necessary info to answer question
1138	55	Part 2 of Question: Is the question asking "At the exact initial moment going to manual is (HTRS OFF)? (OR) Where would HTRS be when adjusted for current plant conditions (Probably on).	☐	☒	Doesn't matter if immediately or later, answer question as written
1225	27	No answer matches calculated value of 93.3 minutes. What is question asking?	☐	☒	None – question stem asks max time before FWI
1237	83	Is question asking what Procedure directs of boration required for "Most Sk Rod" stuck	☐	☒	None – question stem provides all information required to answer question
1243	91	Is it desired to address trip of the RHRP or RCS leakage first?	☒	☐	Response given – Which procedure is the highest priority based on the given Conditions

Instructions:

- Make multiple copies of the first page, as needed, for questions during exam.
- For all questions, document on Page 2 the receipt of any questions, the question #, and whether or not the NRC was called.
- **IF a question is NOT documented on page 1, THEN** document both the question, response provided and the NRC comments on this form.

WRITTEN EXAM ADMINISTRATION SHEET

Proctor Name: Jack Wise / Bill Gross / Jordan Ruby

Exam: LC26 NRC Exam Date: 6/20/18

Time	Question #	Question	NRC Called YES	NRC Called NO	Proctor Response/NRC Response
1250	87	does PORV PCV-456 remain stuck open?	☐	☒	None – question stem provides all information required to answer question
1320	42	Should I assume Containment Spray or Just ECCS pumps	☐	☒	None – Stem Provides information Required to answer this question.
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	

Instructions:

- Make multiple copies of the first page, as needed, for questions during exam.
- For all questions, document on Page 2 the receipt of any questions, the question #, and whether or not the NRC was called.
- **IF a question is NOT documented on page 1, THEN document both the question, response provided and the NRC comments on this form.**

CPNPP NRC 2018 Written Examination
Senior Reactor Operator

1. D	18. D	35. D
2. A	19. B	36. A
3. C	20. B	37. D
4. A	21. B	38. D
5. C	22. A	39. A
6. D	23. D	40. C
7. B	24. D	41. C
8. D	25. C	42. B
9. C	26. C	43. A
10. D	27. C	44. C
11. A	28. C	45. A
12. B	29. B	46. C
13. A	30. B	47. A
14. D	31. C	48. B
Accept Answers A & B JR 6/21/18 15. B	32. C	49. A
16. C	33. A	50. B
17. C	34. A	51. A

Name _____ Date _____

CPNPP NRC 2018 Written Examination
Senior Reactor Operator

52. A B **C** D
53. A **B** C D
54. A B C **D**
55. **A** B C D
56. A B C **D**
57. **A** B C D
58. A **B** C D
59. A **B** C D
60. A B **C** D
61. A B C **D**
62. A B C **D**
63. A B **C** D
64. A **B** C D
65. A B **C** D
66. A **B** C D
67. **A** B C D
68. **A** B C D
69. **A** B C D
70. **A** B C D
71. A B **C** D
72. A **B** C D
73. A B C **D**
74. A B **C** D
75. A B C **D**
76. **A** B C D
77. A B **C** D
78. A **B** C D
79. A B C **D**
80. **A** B C D
81. **A** B C D
82. A B **C** D
83. A B **C** D
84. A **B** C D
85. A B C **D**
86. **A** B C D
87. A **B** C D
88. **A** B C D
89. A B **C** D
90. A **B** C D
91. **A** B C D
92. A B C **D**
93. A B **C** D
94. A **B** C D
95. A **B** C D
96. A B C **D**
97. A B **C** D
98. **A** B C D
99. A B C **D**
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Name _____ Date _____