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CP-201200667
TXX-12102

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

June 26, 2012

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

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

REFERENCE 1. NUREG-1021, Revision 9, Supplement 1, Examiner Standard ES-403

Dear Mr. Hedger:

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 June 19, 2012 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. The enclosures with this letter contain sensitive information which should be withheld from public disclosure until after the examinations are complete.

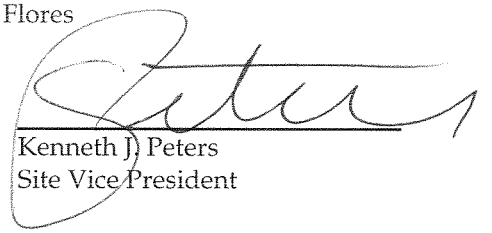
This communication contains no new licensing basis commitments regarding Comanche Peak Units 1 and 2.

If there are any questions concerning this submittal, contact Mr. Garry W. Struble at (254) 897-0628 or (254) 897-6286.

Sincerely,

Luminant Generation Company LLC

Rafael Flores

By: 

Kenneth J. Peters
Site Vice President

JRW
Enclosures

c - E. E. Collins, Region IV clo
Mark Haire, Region IV clo
B. Singal, NRR clo
Resident Inspectors, CPNPP clo

CPNPP 2012 NRC WRITTEN EXAM RESULTS																											
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
Date: 3/8/2012		KEY ANSWERS:	B	D	C	C	D	B	C	B	A	A	C	D	C	A	A	C	B	D	C	D	D	B	B	D	A
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
Victor Alanis	89.3	67.0			B															A							
Joe Best	82.7	62.0		A	A		C					D							C			A					
Trey Lanham	92.0	69.0										D															
Mark Bowden	90.7	68.0			B		B	A				D															
Ben Welch	80.0	60.0										D							C							A	
Dillon Richey	92.0	69.0		A																						A	
Chuck Lewis	84.0	63.0		A	B							D	A		A				D	B							
David Rose	78.7	59.0			A			C				D	A													A	
John Ferrara	86.7	65.0										D	A				B										
Tommy Thompson	89.3	67.0		A			C									D											
Sam Perez	87.0	87.0			A							D				D											
Luke Moore	92.0	92.0			A							D															
Rod Sheets	90.0	90.0																									
Tom Morales	91.0	91.0										D															
Rick Singer	90.0	90.0										D														A	
Tony Pate	90.0	90.0															B										
Chris Harrington	91.0	91.0					B																				
Hunter Schill	88.0	88.0																									
		Total Missed		4	7		4	2				11	3		1	2	2		3	2		1				4	

Name	TOTAL%	PTS	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
		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
		KEY ANSWERS:	D	A	D	B	B	A	B	B	A	B	C	A	D	B	C	C	B	D	A	D	C	B	D	C	A
Victor Alanis	89.3	67.0			C										A												
Joe Best	82.7	62.0		D						A										C							
Trey Lanham	92.0	69.0																									
Mark Bowden	90.7	68.0							C																		
Ben Welch	80.0	60.0	C						A			C					A			C			D				
Dillon Richey	92.0	69.0		B													A			A							
Chuck Lewis	84.0	63.0							C											C							
David Rose	78.7	59.0	C	C					A														D				
John Ferrara	86.7	65.0		D		D														B	D						C
Tommy Thompson	89.3	67.0				D				A																	
Sam Perez	87.0	87.0				D														A							
Luke Moore	92.0	92.0																									
Rod Sheets	90.0	90.0	C									A								B						B	
Tom Morales	91.0	91.0													A					A							
Rick Singer	90.0	90.0										D															
Tony Pate	90.0	90.0																		C							
Chris Harrington	91.0	91.0							C																		
Hunter Schill	88.0	88.0	C																	A							
		Total Missed	4	4	1	3			5	2		3			2		2			10	1		2			1	1

		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
	KEY ANSWERS:		B	C	D	C	A	A	B	B	A	D	A	C	C	A	A	C	C	B	D	A	B	B	C	D	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
Victor Alanis		89.3										C			A				B				C				
Joe Best		82.7					C	D					D						B								
Trey Lanham		92.0					C	D				C				C			B								
Mark Bowden		90.7														D							C				
Ben Welch		80.0					C	D	D						B		C		B								
Dillon Richey		92.0											B														
Chuck Lewis		84.0					B								A				B								
David Rose		78.7		D			B						C		B	B					C		C				
John Ferrara		86.7					C					C															
Tommy Thompson		89.3										C							B				C				
Sam Perez	88.0	86.7					B									B			B	C	C						
Luke Moore	88.0	93.3	A				C									D											
Rod Sheets	88.0	90.7							D							D			B								
Tom Morales	92.0	90.7					C	D											A				C				
Rick Singer	80.0	93.3																	B				C				
Tony Pate	84.0	92.0							A							D			B		C						
Chris Harrington	88.0	92.0					C						B						B		B						
Hunter Schill	80.0	90.7					C		D				B						B		C						
		Total Missed	1	1			11	4	4			4	5		4	7	1		13	1	5		6				

Name	SRO %	RO %	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
		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
	KEY ANSWERS:		B	B	C	A	B	A	D	D	A	B	D	A	B	B	C	C	B	C	D	B	A	C	C	D	A
Victor Alanis		89.3																									
Joe Best		82.7																									
Trey Lanham		92.0																									
Mark Bowden		90.7																									
Ben Welch		80.0																									
Dillon Richey		92.0																									
Chuck Lewis		84.0																									
David Rose		78.7																									
John Ferrara		86.7																									
Tommy Thompson		89.3																									
Sam Perez	88.0	86.7				C	D													D							
Luke Moore	88.0	93.3				C							C							D							
Rod Sheets	88.0	90.7														C				D						B	
Tom Morales	92.0	90.7																		D						B	
Rick Singer	80.0	93.3			D					A			C							D	B						
Tony Pate	84.0	92.0			D															D						B	C
Chris Harrington	88.0	92.0				C											A			D							
Hunter Schill	80.0	90.7				C								B		C	A			D							
		Total Missed			2	4	1			1			2	1		2	2			8	1					3	1

SRO Total Points =	100
RO Only Points =	75
SRO Only Points =	25

RO Questions Average =	**88.6**
SRO Questions Average =	**86.0**

Class Average =	**88.0**

Question 10 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 22
Question 43 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 23
Question 55 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 24
Question 64 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 25
Question 67 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 26
Question 79 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 27
Question 93 addressed per CPNPP NRC & Audit 2012 Enhancement Opportunities Item 28

The following information is submitted to request acceptance of alternate answers for three questions as annotated. These changes are made at the request of the applicants following written examination review.

Question 71

Which of the following is required if a liquid radioactive release is terminated due to a high radiation alarm on the associated release monitor?

A. Document the alarm in the unit logs. Once the high radiation alarm clears the release may be recommenced with the current permit.

B. When the cause of the high radiation alarm is determined, the release may be recommenced once a new permit is issued.

C. Initiate a Condition Report to determine the cause of the high radiation alarm, obtain Shift Manager approval to recommence the release with a new permit.

D. Raise the high radiation alarm setpoint with Chemistry Manager's approval and obtain Shift Manager's concurrence to recommence release with the current permit.

Applicant feedback is that Answer C can also be considered a correct answer in addition to Answer B as contained in the approved answer key.

Support for Answer C:

- The first part of the answer is correct in that STA-421 would require that a Condition Report be initiated. Additionally, the Shift Manager is the individual responsible for approving a release in accordance with STA-603. As such, the applicants believed that obtaining Shift Manager approval for a new permit (also required by STA-603) implied that the cause of the alarm had been determined which was in contradiction to the intent of the answer key, however, is plausible within the operating construct of licensing applicants.

References:

1. STA-421 Initiation of Condition Reports

CPNPP STATION ADMINISTRATION MANUAL	INFORMATION USE	PROCEDURE NO. STA-421
INITIATION OF CONDITION REPORTS	REVISION NO. 18	PAGE 15 OF 26

CONDITIONS DOCUMENTED ON A CONDITION REPORT

2.2 (cont.)

- Conditions involving a Stop Work Order in accordance with STA-417
- Conditions involving Reactivity Management
- Condition involving ABN-907 PRA Escalation Determination

2.3 Radiation Release

- Accidental, unplanned, or uncontrolled radioactive releases

2.4 Spills

- Spill or release of hazardous material or petroleum product

2. STA-603 Control of Station Radioactive Effluents

CPNPP STATION ADMINISTRATION MANUAL		PROCEDURE NO. STA-603
CONTROL OF STATION RADIOACTIVE EFFLUENTS	REVISION NO. 20	PAGE 7 OF 31

5.0 RESPONSIBILITIES

5.1 Director, Operations

- Ensuring that processing of liquid and gaseous waste streams is performed when required by Radiological Effluent Controls 3.11.1.3 and 3.11.2.4 and in a manner consistent with station commitments for maintaining both onsite and offsite doses "As Low As Reasonably Achievable" (ALARA). [C00009]
- Determining when a batch release (liquid or gaseous) is necessary and initiating the appropriate radioactive effluent release data sheets.
- Performing and verifying all radwaste system alignments required for processing and releasing the effluents.
- Establishing appropriate responses to high and alert alarms generated by radioactive effluent monitoring instrumentation alarms.

5.2 Shift Manager

- The Shift Manager is responsible for reviewing and approving all batch and non-routine radioactive effluent release permits. This responsibility may be delegated to the Unit Supervisor.

6.2 Batch Liquid Radioactive Effluent Releases
[C00012]

The following programmatic requirements apply to batch liquid radioactive effluent releases to Outfall 004 from the Plant Effluent Tanks (PET), Waste Monitor Tanks (WMT), Laundry Holdup and Monitor Tanks (LHMT), and the Waste Water Holdup Tanks. The responsible organizations should ensure that these requirements are incorporated in appropriate procedures.

6.2.1 Data pertaining to a batch liquid release should be documented using form STA-603-10, "Batch Liquid Radioactive Effluent Release Data Sheet," to ensure a proper effluent release.

6.2.2 Releases from more than one PET, WMT or LHMT shall not be made simultaneously.

6.2.3 The simultaneous release of a PET, WMT or LHMT and a Waste Water Holdup Tank is permitted. Additionally, any other release inputs to Outfall 004 (e.g., LVW Pond discharge) may continue.

6.2.4 Operations shall isolate the tank to be released prior to initiation of recirculation for sampling. All inputs shall remain isolated until after the release is terminated or canceled.

6.2.5 The tank shall be sampled and analyzed for radioactivity in accordance with ODCM Table 4.11-1. [C02289, C02290, C23672]

6.2.6 The need to collect and analyze samples for non-radiological environmental parameters shall be determined.

6.2.7 A minimum of two circulating water pumps shall be operating during all radioactive liquid batch releases.

6.2.8 Pre-release calculations of radioactive effluent concentrations, radiation monitor alarm setpoints, and doses shall be based on the maximum tank volumes and effluent pump flow rates, and the minimum dilution (e.g., circulating water) flow rate. [C08717]

6.2.9 The Shift Manager should approve all batch releases to Outfall 004 from the PET, WMT, and LHMTs and the Waste Water Holdup Tanks.
[C00009]

6.2.10 IF a batch liquid release is automatically terminated due to a valid high radiation alarm from the liquid waste effluent monitor, X-RE-5253 (LWE-076), THEN the permit should be closed and a new permit initiated after the cause of the automatic termination is resolved.

Question 46

Which of the following describes the basis for the Component Cooling Water (CCW) System valve realignment upon receipt of a Containment Isolation Phase B actuation?

A. Reduces Diesel Generator loading requirements with Containment Spray in operation.

B. Reduces heat load on CCW System by eliminating unnecessary cooling requirements.

C. Ensures CCW System is not an additional potential radioactive release path from Containment.

D. Ensures that CCW System meets design cooling function for loads within Containment during Design Basis Loss of Coolant Accident.

Applicant feedback is that Answer D can also be considered a correct answer in addition to Answer C as contained in the approved answer key.

Support for Answer D:

- The question was intended to verify the applicant's knowledge of the purpose behind isolating portions of CCW system during a Design Basis Large Break LOCA which would result in a Phase B Containment Isolation at 18.2 psig. However, some of the applicants construed Answer D to be referring to the spectrum of Design Basis Loss of Coolant Accidents. As such, in accordance with Technical Specification Bases 3.3.2 ESFAS Instrumentation for Phase A Containment Isolation, "For these types of events, forced circulation cooling using the reactor coolant pumps (RCPs) and SGs is the preferred ... method of decay heat removal."
- Conversely the same Technical Specification Bases for Phase B Containment Isolation states, "For these events, forced circulation using the RCPs is no longer desirable."
- The Technical Specification Bases further discusses the reasoning for the Containment Isolations which support the approved answer key. However, with respect to interpreting Answer D as the "design cooling function" of the RCPs and thus CCW being isolated by Phase B as the RCPs are no longer needed, a reasonable logic path appears to exist resulting in concluding that Answer D is the correct answer.

References:

1. Technical Specification Bases 3.3.2 ESFAS Instrumentation.

BASES

3. Containment Isolation

Containment Isolation provides isolation of the containment atmosphere, and all process systems that penetrate containment, from the environment. This Function is necessary to prevent or limit the release of radioactivity to the environment in the event of a large break LOCA.

There are two separate Containment Isolation signals, Phase A and Phase B. Phase A isolation isolates all automatically isolable process lines, except component cooling water (CCW) to the reactor coolant pumps, at a relatively low containment pressure indicative of primary or secondary system leaks. For these types of events, forced circulation cooling using the reactor coolant pumps (RCPs) and SGs is the preferred (but not required) method of decay heat removal. Since CCW is required to support RCP operation, not isolating CCW on the low pressure Phase A signal enhances unit safety by allowing operators to use forced RCS circulation to cool the unit. Isolating CCW on the low pressure signal may force the use of feed and bleed cooling, which could prove more difficult to control.

Phase A containment isolation is actuated automatically by SI, or manually via the automatic actuation logic. All process lines penetrating containment, with the exception of CCW, are isolated.

CCW is not isolated at this time to permit continued operation of the RCPs with cooling water flow to the thermal barrier heat exchangers, motor air coolers, and upper and lower bearing coolers. All process lines not equipped with remote operated isolation valves are manually closed, or otherwise isolated, prior to reaching MODE 4.

Manual Phase A Containment Isolation is accomplished by either of two switches in the control room. Either switch actuates both trains.

Note that manual actuation of Phase A Containment Isolation also actuates Containment Ventilation Isolation.

The Phase B signal isolates CCW. This occurs at a relatively high containment pressure that is indicative of a large break LOCA or an SLB. For these events, forced circulation using the RCPs is no longer desirable. Isolating the CCW at the higher pressure does not pose a challenge to the containment boundary because the CCW System is continuously pressurized to a pressure greater than the Phase B setpoint. Thus, routine operation demonstrates the integrity of the system pressure boundary for pressures exceeding the Phase B setpoint. Furthermore, because system pressure exceeds the Phase B setpoint, any system leakage prior to initiation of Phase B isolation would be into containment. Therefore, the combination of CCW System design and Phase B isolation ensures the CCW System is not a potential path for radioactive release from containment.

Phase B containment isolation is actuated by Containment Pressure-High 3 or manually, via the automatic actuation logic, as previously discussed. For containment pressure to reach a value high enough to actuate Containment Pressure-High 3, a large break LOCA or SLB must have occurred. RCP operation will no longer be required and CCW to the RCPs is, therefore, no longer necessary. The RCPs can be operated with seal injection flow alone and without CCW flow to the thermal barrier heat exchanger.

Manual Phase B Containment Isolation is accomplished by the same switches that actuate Containment Spray. When the two switches in either set are turned simultaneously, Phase B Containment Isolation and Containment Spray will be actuated in both trains.

2. DBD-ME-229 Component Cooling Water

The CCW System shall be designed such that any operator action required outside the Control Room to mitigate the consequences of an accident or to perform other vital functions does not result in radiation doses in excess of GDC 19. [NUREG-0737:II.B.2. DBD-ME-024]

The quality assurance requirements for the installation, inspection, and testing of Class 1E instrumentation shall comply with RG 1.30, ANSI N45.2.4 and IEEE-336 as described in the FSAR (Appendix 1A(B)). See DBD-EE-035, Instrumentation Installation and Separation, for related information. See FSAR Chapter 17 for additional and related requirements. [10CFR50, Appendix B]

All tubing, valves, fittings, and associated instrumentation (not mounted in-line) shall be installed in accordance with the separation requirements of DBD-EE-035 to ensure separation of protection and control systems and redundant sensing lines and instrumentation. All other instrumentation shall be designed and installed in accordance with separation and independence requirements of DBD-EE-057, Separation Criteria, to ensure separation of protection and control systems and redundant instrumentation. [GDC 24]

The ESFAS (Engineered Safety Features Actuation System) [DBD-EE-021] is required to initiate several functions of the CCW System. The actions are required to be performed in two steps as described below.

The first step is an S-Signal (which causes a Containment Isolation Phase "A"). The following actions are required to be automatically initiated:

a. CCW Pump bypass recirculation is stopped.
b. The non-operating CCW pump starts.
c. The CCW Return Valves from the RHR HXs open fully and return to a partially open position to prevent CCW pump runout. [11.2.1, 11.2.17, 11.2.18, 11.2.19]
d. The Containment CCW Drain Tank pumps stop.
e. The CCW to the Primary Sampling System is isolated.

f. The CCW to the containment is isolated except for the reactor coolant pumps.
g. CCW to the Non-Safety Ventilation Chillers and Letdown Chiller is isolated to offset the RHR HX flows.

The second step is a P-Signal (which causes a Containment Isolation Phase "B"). The following actions are required to be automatically initiated:

a. Isolation of CCW to containment is completed.
b. The non-safeguards loop is completely isolated.
c. The safeguards loops are fully isolated from each other.
d. If repositioned after the S-signal, the CCW Return Valves from the RHR HXs open fully and return to a partially open position to provide adequate RHR heat removal while ensuring CCW temperature remains below 135°F.
e. The CCW Return Valves from the CT HXs open fully and return to a partially open position to provide adequate containment heat removal while ensuring CCW temperature remains below 135°F.

Question 24

Given the following conditions:

- Unit 1 Station Service Water (SSW) was in an abnormal lineup with Station Service Water Pump (SSWP) 1-01 running and SSWP 1-02 in STANDBY.
- Component Cooling Water Pump (CCWP) 1-02 is out of service for preventative maintenance.
- Subsequently SSWP 1-01 trips and SSWP 1-02 automatically starts.

Which of the following describes the SSWP AUTO start feature and system alignment using ABN-501, Station Service Water System Malfunction?

SSWP 1-02 AUTO started when…

A. the header pressure in Train A SSW dropped to 10 psig.
Cross connect Train A SSW Unit 1 with Train A SSW Unit 2.

B. the return header flow in Train A SSW dropped to 16,456 GPM.
Cross connect Train A SSW Unit 1 with Train A SSW Unit 2.

C. the return header flow in Train A SSW dropped to 16,456 GPM.
Ensure CCWP 1-01 running with both Train Safeguards Loop Isolation Valves open.

D. the header pressure in Train A SSW dropped to 10 psig.
Ensure CCWP 1-01 running with both Train Safeguards Loop Isolation Valves open.

Applicant feedback is that Answer A can also be considered a correct answer in addition to Answer D as contained in the approved answer key.

Support for Answer A:

The lineup of Answer D does not ensure long term cooling of essential loads is met. The applicants recognized from their training that this was the case and thus looked for an answer which assured long term cooling of loads as opposed to the intended answer of the system alignment in accordance with ABN-501. As such, the applicants realized that ABN-501 also contained instructions for cross connecting SSW between the units and thus perceived Answer A as the correct answer.

Reference:

1. ABN-501 Station Service Water Malfunction

CPNPP ABNORMAL CONDITIONS PROCEDURES MANUAL	UNIT 1 AND 2	PROCEDURE NO. ABN-501
STATION SERVICE WATER SYSTEM MALFUNCTION	REVISION NO. 9	PAGE 23 OF 50

5.3 Operator Actions

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION: Cross connecting Station Service Water between units will render cross connected trains of BOTH units INOPERABLE in MODE 1, 2, 3, or 4.
-0R-
Cross connecting Station Service Water between Trains within a unit will render BOTH trains INOPERABLE in MODE 1, 2, 3, or 4.

NOTE: IF barriers designated as Fire or Security Barriers, such as manways, doors, hatchcovers, slabs, etc. are to be breached, THEN the Shift Manager and Security shall be notified and approval obtained prior to affecting the breach.

7 Restore SSW cooling flow by CROSS-TIEING Train A AND Train B as follows:

☐ a. Verify at least one SSW Train - AVAILABLE.

☐ b. Verify Cross Connecting SSW Trains - REQUIRED BY EQUIPMENT CONDITIONS:

1) Request permission From Emergency Coordinator to cross-connect SSW Trains.

2) Cross Connect A and B SSW Trains per SOP-501A/B.

3) Declare unaffected train INOPERABLE AND INITIATE APPROPRIATE LCOAR.

Perform the following:

1) Cross-tie SSW between units per SOP-501A/B, as directed.

2) Refer to TS 3.7.8

3) IF NO SSW cooling flow available,

AND

- Cooling is required for essential equipment, THEN perform Attachment 2, Train A and/or Attachment 3, Train B to align alternate cooling to required equipment

- Cooling not available by other methods is required to the diesels, THEN perform Attachment 1, Fire Protection Water Alignment to Diesel Generators.