



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

August 1, 2018

Ken J. Peters, Senior Vice President
and Chief Nuclear Officer
Attention: Regulatory Affairs
Vistra Operations Company LLC
P.O. Box 1002
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 1 AND 2 - NRC
EXAMINATION REPORT 05000445/2018301; 05000446/2018301

Dear Mr. Peters:

On July 19, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an initial operator license examination at Comanche Peak Nuclear Power Plant, Units 1 and 2. The enclosed report documents the examination results and licensing decisions. The preliminary examination results were discussed on June 15, 2018, with members of your staff. A telephonic exit meeting was conducted on July 19, 2018, with Ms. Donna Christiansen, Training Director, who was provided the NRC licensing decisions.

The examination included the evaluation of six applicants for reactor operator licenses, six applicants for instant senior reactor operator licenses, and three applicants for upgrade senior reactor operator licenses. The license examiners determined that fourteen of the fifteen applicants satisfied the requirements of Title 10 of the *Code of Federal Regulations* (CFR) Part 55, and the appropriate licenses have been issued. There was one post examination comment submitted by your staff. Enclosure 1 contains details of this report and Enclosure 2 summarizes post examination comment resolution.

No violations were identified during this examination.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Vincent G. Gaddy, Chief
Operations Branch
Division of Reactor Safety

Docket Nos. 50-445, 50-446
License Nos. NPF-87, NPF-89

Enclosures:

1. Examination Report 05000445/2018301; 05000446/2018301
w/Attachment: Supplemental Information
2. NRC Post Examination Comment
Resolution

COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 1 AND 2 - NRC EXAMINATION
 REPORT 05000445/2018301; 05000446/2018301 DATED AUGUST 1, 2018

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket Nos.: 50-445, 50-446

License Nos.: NPF-87, NPF-89

Report Nos.: 05000445/2018301; 05000446/2018301

Licensee: Vistra Operations Company LLC

Facility: Comanche Peak Nuclear Power Plant, Units 1 and 2

Location: Glen Rose, Texas

Dates: June 11 – July 19, 2018

Inspectors: K. Clayton, Chief Examiner, Senior Operations Engineer
J. Kirkland, Senior Operations Engineer
C. Osterholtz, Senior Operations Engineer
M. Hayes, Operations Engineer

Approved By: Vincent G. Gaddy, Chief
Operations Branch
Division of Reactor Safety

Enclosure

SUMMARY

ER 05000445/2018301; 05000446/2018301; June 11 – July 19, 2018; Comanche Peak Nuclear Power Plant, Units 1 and 2; Initial Operator Licensing Examination Report.

NRC examiners evaluated the competency of six applicants for reactor operator licenses, six applicants for instant senior reactor operator licenses and three applicants for upgrade senior reactor operator license at Comanche Peak Nuclear Power Plant, Units 1 and 2.

The NRC developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 11. The written examination was administered by the licensee on June 20, 2018. NRC examiners administered the operating tests on June 11 – 17, 2018.

The examiners determined that fourteen of the fifteen applicants satisfied the requirements of 10 CFR Part 55, and the appropriate licenses have been issued.

A. NRC-Identified and Self-Revealing Findings

None.

B. Licensee-Identified Violations

None.

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA5 Other Activities (Initial Operator License Examination)

.1 License Applications

a. Scope

NRC examiners reviewed all license applications submitted to ensure each applicant satisfied relevant license eligibility requirements. Examiners also audited three of the license applications in detail to confirm that they accurately reflected the subject applicant's qualifications. This audit focused on the applicant's experience and on-the-job training, including control manipulations that provided significant reactivity changes.

b. Findings

No findings were identified.

.2 Examination Development

a. Scope

The NRC developed the written exam and operating tests in accordance the requirements of NUREG-1021. The NRC examination team conducted an on-site validation of the operating tests.

b. Findings

No findings were identified.

.3 Operator Knowledge and Performance

a. Scope

On June 20, 2018, the licensee proctored the administration of the written examinations to all applicants. The licensee staff graded the written examinations, analyzed the results, and presented their analysis and post examination comments to the NRC on June 25, 2018.

The NRC examination team administered the various portions of the operating tests to all applicants on June 11 – 17, 2018.

b. Findings

No findings were identified.

All applicants passed the written examination and fourteen of fifteen applicants passed all portions of the operating test. The final written examinations and post examination

analysis and comments may be accessed in the ADAMS system under the accession numbers noted in the attachment.

The examination team noted five generic weaknesses associated with applicant performance on the operating tests. All of the weaknesses were attributed to knowledge weaknesses on the topic and included the following items:

1. Several crews (2/4) could not adequately determine a fuel failure event was in progress during a scenario.
2. Several applicants (3/4) could not adequately operate the control room ventilation system.
3. Applicants had difficulty with anti-pump features of handswitches and their associated breakers.
4. Several crews (3/4) had difficulty diagnosing a faulted and ruptured steam generator during a scenario.
5. Several crews struggled with proper communications during the scenarios.

The licensee identified five generic weaknesses associated with applicant performance on the written examinations. All of the weaknesses were attributed to knowledge weaknesses on the topic and included the following items:

1. Applicants were unfamiliar with design features of the containment sump.
2. Applicants were unfamiliar with Abnormal Procedure ABN-901, Fire Protection System Alarms or Malfunctions.
3. Applicants had difficulty recalling safety-related battery capacities.
4. Applicants were unfamiliar with the immediate operability requirements regarding fuel oil for the emergency diesel generators and their Technical Specification requirements (day tank requirements).
5. Applicants had difficulty determining what system to use during emergency procedures to lower containment hydrogen during a Loss of Coolant Accident.

Copies of all individual examination reports were sent to the facility Training Manager for evaluation and determination of appropriate remedial training. The licensee generated Issue Report IR-2018-004425 for resolution of all operating test and written examination generic weaknesses.

.4 Simulation Facility Performance

a. Scope

The NRC examiners observed simulator performance with regard to plant fidelity during examination validation and administration.

b. Findings

No findings were identified.

.5 Examination Security

a. Scope

The NRC examiners reviewed examination security for examination development during both the onsite preparation week and examination administration week for compliance with 10 CFR 55.49 and NUREG-1021. Plans for simulator security and applicant control were reviewed and discussed with licensee personnel.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

Exit Meeting Summary

The chief examiner presented the preliminary examination results to Mr. Thomas McCool, Site Vice President, and other members of the staff on June 15, 2018. A telephonic exit was conducted on July 19, 2018 between Mr. K. Clayton, Chief Examiner, and Ms. Donna Christiansen, Training Director.

The licensee did not identify any information or materials used during the examination as proprietary.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. McCool, Site Vice President
D. Christiansen, Training Director
J. Lloyd, Operations Support Manager
J. Ruby, Exam Developer

NRC Personnel

J. Josey, Senior Resident Inspector

ADAMS DOCUMENTS REFERENCED

Accession No. ML18204A263 - FINAL WRITTEN EXAMS (DELAYED Release until 6/27/2020)
Accession No. ML18204A262 - FINAL OPERATING TEST (DELAYED Release until 6/27/2020)
Accession No. ML18204A264 - POST EXAM ANALYSIS-COMMENTS

NRC Resolution to the Comanche Peak Post Examination Comments

A complete text of the licensee's post examination analysis and comments can be found in ADAMS under Accession Number ML18204A264.

The chief examiner discussed the requested change to the key for one question (Q15) with the licensee prior to post examination comment submittal in accordance with NUREG-1021 and agreed that the requested change seemed reasonable pending formal documents to support the request. The final disposition of this comment is documented below.

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

Licensee Comments for 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.

NRC Resolution of Question 15

Licensee (CPNPP) requests that both answers A and B be accepted for Q15. Their analysis is included as item 6 in the post exam package. The Chief Examiner agrees and the key is changed to accept both 'A' and 'B' as correct answers for Q15.

The Chief Examiner reviewed the challenge, the applicant answer selections, and questions asked both during administration of the exam and during review of the exam with the applicant class and licensee training staff. Relevant information from this is the following:

1. The entire class either picked correct answer as originally keyed, 'A' or the proposed second correct answer, 'B.'
2. Two of the applicants asked direct questions regarding the reasons why distracter 'B' could be considered correct.

The Chief Examiner agrees with the licensee that distracter 'B' could be argued as correct because the NOTE on page 4 of the Abnormal Procedure ABN-107, prior to step 1, states that "Attachment 1 and Attachment 4 have been developed into Operator Aids for use during emergency boration and may be entered independently of this procedure." Also, the note occurs prior to the RNO step that is called out in the stem of the question. The licensee indicated in their submittal that operators (applicants) are trained to use the job aid for emergency boration activities from the Emergency Operating Procedures and these aids are entered independently of the ABN-107 procedure via the foldout page.

Additionally, the word "preferred" is a word that the NUREG-1021 discourages using in the stem of questions because it can be ambiguous or confusing. The word "preferred" is used in the stem of this question and also in the Abnormal Procedure ABN-107. Furthermore, the use of "preferred" in this procedure is confusing because it is mentioned several times and has several

steps in the procedure that use it for different attachments. For example, just below step 2.3.3 it states that Attachment 1 is the preferred source of emergency boration, which leads the Chief Examiner to believe that the procedure needs modification to clarify the actual preferred source for a given set of conditions with proper RNO steps for each Attachment as necessary. This would allow an operator to make the correct decision for completing foldout page actions or immediate operator actions for an abnormal event in a timely and successful manner.