



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

June 30, 2015

Mr. Mark E. Reddemann  
Chief Executive Officer  
Energy Northwest  
P. O. Box 968 (Mail Drop 1023)  
Richland, WA 99352-0968

**SUBJECT: COLUMBIA GENERATING STATION - NRC EXAMINATION  
REPORT 05000397/2015301**

Dear Mr. Reddemann:

On May 5, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an initial operator license examination at the Columbia Generating Station. The enclosed report documents the examination results and licensing decisions. The preliminary examination results were discussed on May 6, 2015, with Mr. W. Hettel, Vice President, Operations, and other members of your staff. A telephonic meeting was conducted on June 2, 2015, with Mr. R. Hayden, Examination Developer, who was provided with the NRC licensing decisions. A telephonic exit meeting was conducted on June 17, 2015, with Mr. W. Hettel, Vice President, Operations.

The examination included the evaluation of 4 applicants for reactor operator licenses, 12 applicants for an instant senior reactor operator license, and 2 applicants for an upgrade senior reactor operator license. The license examiners determined that 12 of the 18 applicants satisfied the requirements of 10 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.

Additionally, the NRC identified two findings involving simulator fidelity (two examples) and examination security. The simulator fidelity finding was evaluated under the risk significance determination process as having very low safety significance (Green), and the examination security finding was evaluated under traditional enforcement and determined to be Severity Level IV. Because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these findings as non-cited violations, consistent with Section 2.3.2.a of the NRC Enforcement Policy. If you contest these violations or the significance of the non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 1600 E. Lamar Blvd., Arlington, TX 76011-4125; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001; and the NRC Senior Resident Inspector at the Columbia Generating Station. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this

inspection report, with the basis for your disagreement, to the Regional Administrator, Region IV, and the NRC Senior Resident Inspector at the Columbia Generating Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," 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 No. 50-397  
License No. NPF-21

Enclosures:

1. NRC Examination Report 05000397/2015301  
w/Attachment
2. NRC Review of Columbia Generating Station Written Post-Examination  
Comments
3. Simulator Fidelity Form

cc w/enclosure: Electronic Distribution

M. Reddemann

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Letter to Mark E. Reddemann from Vincent G. Gaddy, dated June 30, 2015

SUBJECT: COLUMBIA GENERATING STATION - NRC EXAMINATION  
REPORT 05000397/2015301

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Regional Administrator (Marc.Dapas@nrc.gov)  
Deputy Regional Administrator (Kriss.Kennedy@nrc.gov)  
DRP Director (Troy.Pruett@nrc.gov)  
DRP Deputy Director (Ryan.Lantz@nrc.gov)  
DRS Director (Anton.Vegel@nrc.gov)  
DRS Deputy Director (Jeff.Clark@nrc.gov)  
Senior Resident Inspector (Jeremy.Groom@nrc.gov)  
Resident Inspector (Dan.Bradley@nrc.gov)  
Site Administrative Assistant (Douglas.Bodine@nrc.gov)  
Acting Branch Chief, DRP/A (John.Dixon@nrc.gov)  
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Team Leader, DRS/TSS (Don.Allen@nrc.gov)  
RITS Coordinator (Marisa.Herrera@nrc.gov)  
ACES (R4Enforcement.Resource@nrc.gov)  
Regional Counsel (Karla.Fuller@nrc.gov)  
Technical Support Assistant (Loretta.Williams@nrc.gov)  
Congressional Affairs Officer (Jenny.Weil@nrc.gov)  
RIV Congressional Affairs Officer (Angel.Moreno@nrc.gov)  
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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION IV**

Docket: 05000397

License: NPF-21

Report: 05000397/2015301

Licensee: Energy Northwest

Facility: Columbia Generating Station

Location: 76 North Power Plant Loop  
Richland, WA 99352

Dates: April 24, 2015, through June 17, 2015

Inspectors: K. Clayton, Chief Examiner, Senior Operations Engineer  
C. Cowdrey, Chief Examiner (Under Instruction), Operations Engineer  
S. Garchow, Senior Operations Engineer  
J. Kirkland, Senior Operations Engineer (Under Instruction)  
M. Bloodgood, Operations Engineer  
M. Hayes, Operations Engineer  
M. Kennard, Operations Engineer

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

## SUMMARY

ER 05000397/2015301; 04/24/2015 – 06/17/2015; Columbia Generating Station; Initial Operator Licensing Examination Report.

NRC examiners evaluated the competency of 4 applicants for reactor operator licenses, 12 applicants for instant senior reactor operator licenses, and 2 applicants for upgrade senior reactor operator licenses at the Columbia Generating Station.

The licensee and the NRC developed the examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Revision 9, Supplement 1. The written examination was administered by the licensee on April 24, 2015. NRC examiners administered the operating tests on April 27 – May 5, 2015.

The examiners determined that 12 of the 18 applicants satisfied the requirements of 10 CFR Part 55 and the appropriate licenses have been issued.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

Green. Title 10 CFR Part 55.46(c), "Plant-referenced Simulators," states, in part, that a "plant-referenced simulator used for the administration of the operating test or to meet experience requirements in § 55.31(a)(5) must demonstrate expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond." Contrary to this,

- The licensee failed to ensure simulator modeling of condensate storage tank level was consistent with the actual plant, introducing the potential for negative operator training. Due to failure to have adequate job performance measures in training for emergency core cooling systems and failure to recognize these conditions during scenario-based testing of the simulator, the condensate storage tank level would never go below five feet when any pump was taking a suction from this tank due to a modeling error that erroneously added water back into the tank to keep level at five feet under all conditions. As a result of this simulator deficiency, a job performance measure had to be replaced on the examination. To correct this issue, the licensee implemented the simulator deficiency report (DR) process and documented their corrective actions for this issue in Action Request AR-2015-00325641.
- The licensee failed to ensure that the simulator modeling of reactor protection system (RPS) 'B' fuses was consistent with the actual plant, introducing the potential for negative training and challenging the completion of an initial operating test scenario. Specifically, the simulator software failed to de-energize the appropriate RPS scram lights on panel P603 and therefore failed to fully insert the remaining control rods (47) when the correct fuses were pulled. To correct this issue, the licensee implemented the simulator deficiency report (DR)

process and documented their corrective actions for this issue in Action Request AR-2015-00326763.

The failure of the plant-referenced simulator to demonstrate expected plant response to operator input and to accident conditions for which the simulator has been designed to respond was a performance deficiency. The performance deficiency is more than minor because it adversely impacted the human performance attribute of the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Additionally, if left uncorrected, the performance deficiency could have become more significant, in that, training on related accident scenarios and job performance measures could have a negative impact on how licensed operators would respond to an actual event in the control room. Using Inspection Manual Chapter 0609, "Significance Determination Process," Phase 1 worksheets, and the corresponding Appendix I, "Licensed Operator Requalification Significance Determination Process," the finding was determined to have very low safety significance (Green) because this deficiency did not contribute to an actual event in the plant. This finding has a cross-cutting aspect in the area of human performance associated with training because the organization did not provide adequate training to maintain a knowledgeable and technically competent workforce through the use of training materials covering emergency core cooling systems and reactor protection systems that would have exposed simulator infidelity [H.9]. (Section 40A5)

SL-IV. Title 10 CFR Part 55.49, "Integrity of examinations and tests," states, in part, that a licensee "shall not engage in any activity that compromises the integrity of any application, test, or examination required by this part. The integrity of a test or examination is considered compromised if any activity, regardless of intent, affected, or, but for detection, would have affected the equitable and consistent administration of the test or examination." Contrary to this, the licensee failed on multiple occasions to clean marked-up procedures between simulator scenarios and job performance measures during administration of the operating tests. To correct this issue, the licensee wrote Action Request AR-2015-00327006 and researched industry best practices for scenario-specific simulator procedure checklists.

The failure of the licensee's staff to ensure that previously used examination materials were not available for the next crew during the initial examination administration was a performance deficiency. The performance deficiency was evaluated through the traditional enforcement process because it impacted the ability of the NRC to perform its regulatory oversight function. This resulted in assignment of a Severity Level IV violation because it involved a non-willful compromise of examination integrity and is consistent with Section 6.4.d of the NRC Enforcement Policy. (Section 40A5)

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 four 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

NRC examiners reviewed integrated examination outlines and draft examinations submitted by the licensee against the requirements of NUREG-1021. The NRC examination team conducted an on-site validation of the operating tests.

###### b. Findings

No findings were identified.

###### c. Other Observations

NRC examiners provided outline, draft examination, and post-validation comments to the licensee. The licensee satisfactorily completed comment resolution prior to examination administration.

NRC examiners determined the written examinations initially submitted by the licensee were not within the range of acceptability expected for a proposed examination. The NUREG-1021 standard for an unsatisfactory submittal requires that 20 percent or more of the written examination questions must be classified as unsatisfactory based on criteria in Section ES-401 and this criterion applies for the reactor operator portion, the senior reactor operator portion, or both. The statistics for the written examination were as follows:



Reactor Operator (RO) written examination (75 total questions)

1. Twenty-two questions were unsatisfactory (29 percent)
2. Thirty-four questions required editorial changes (45 percent)

Senior Reactor Operator (SRO) written examination (25 total questions)

1. Thirteen questions were unsatisfactory (52 percent)
2. Seven questions required editorial changes (28 percent)

Total written examinations (100 total questions)

1. Thirty-five questions were unsatisfactory (35 percent)
2. Forty-one questions required editorial changes (41 percent)

Because the 20 percent threshold was exceeded for both sections of the written examination, it was classified as an unsatisfactory submittal. Also, based on the number of unsatisfactory questions, the written examinations required substantial work by the NRC examiners and additional staff at Columbia Generating Station. Most of the written examination questions either required significant repair or complete rewrite to meet the requirements in NUREG-1021. To meet the required dates of administration, the NRC Region IV Operations Branch Chief took control of the examination process and directed his staff to develop substitute questions for the SRO section of the examination. The NRC Region IV examiners completely rewrote 13 of the 25 SRO questions. On the examination validation trip to Columbia Generating Station, the chief examiner and chief examiner under instruction spent several hours per day, after operating test validation activities were completed, correcting the RO written examination and making final changes necessary for submittal to the Region IV Operations Branch Chief. Additionally, each licensee is offered the opportunity to submit 5 to 10 draft written questions for a "free-review" by the chief examiner per the guidance contained in NUREG-1021. The chief examiner stressed the importance of the "free review" process early during examination development as it is designed to give the licensee's examination writer an understanding of what constitutes a satisfactory question and provides an opportunity to the licensee to submit questions without questions being assessed as unsatisfactory on the draft submittal. The licensee submitted questions for free review to which the NRC examiners responded with comments. Upon submittal of the draft written examination, it was determined that the majority of the "free review" comments on the RO questions had not been addressed by the licensee and the SRO questions had been replaced with questions containing similar flaws to those submitted for "free review." The failure by the licensee to adequately respond to the "free review" comments further contributed to the substantial amount of additional effort required to correct the draft written examination submittal. The licensee wrote Action Request AR-2015-00325643 to address the issues with the unsatisfactory written examination submittal. As required in NUREG-1021 for an unsatisfactory submittal, "all future submittals should incorporate any lessons learned from this effort."

NRC examiners determined the operating tests initially submitted by the licensee were within the range of acceptability expected for a proposed examination. However, there were several issues with the operating test that the NRC examination team observed during operating test development and administration. These issues included the lack

of measurable performance indicators (proper bounding) for some of the critical tasks used in the scenarios. This specific issue was discussed during the exam kick-off call and at an examination writing workshop attended by Region IV examiners in February of 2015. Two of the licensee's examination writing staff attended this workshop. Also, the initial operating test submittal contained a significant number of job performance measures that covered operations of non-safety-related equipment. For example, the job performance measure associated with the "Heat Removal from the Core" safety function was initially submitted as a re-latch of the main turbine, followed by raising turbine speed to 1800 rpm. The NRC asked that this job performance measure be replaced with a job performance measure on a safety-related emergency core cooling system (ECCS). The licensee responded by stating that they did not have any ECCS job performance measures in their examination bank and that they would have to write a new one. The lack of job performance measures on ECCS systems is a significant training concern and likely contributed to the failure of the licensee to identify that the simulator did not correctly model ECCS pump suction from the condensate storage tank (CST). After writing a replacement job performance measure, it was determined that the simulator did not adequately model ECCS pump suction swap-over from the CST to the suppression pool. Therefore, this job performance measure had to be removed from the examination and replaced by another ECCS job performance measure. This job performance measure was the first of two approved job performance measures that had to be replaced on the final operating test. Also, during the draft examination and post-examination comment resolution reviews, the NRC examiners had to request additional resources to review examination materials that were not provided as part of the reference material submittal as required by Attachment 3 of ES 201 of NUREG-021. This attachment provides specific guidance on the references required for this submittal and should be a standard submittal each time the licensee submits initial examination materials for review. This attachment was specifically discussed with the licensee during the kick-off call and numerous times during the examination process due to the number of procedures that were not sent that were needed to complete each activity. The licensee also did not submit an index for the procedures as required by the same attachment. The licensee wrote Action Request AR-2015-00329948 to address the operating test issues.

During the administration of the operating test, it was determined that one administrative job performance measure (SRO A2) was not operationally valid. One applicant identified that the initial conditions associated with the job performance measure were not consistent with the task that was being performed. This inconsistency prevented the applicant from addressing the intent of the job performance measure. As a result, this job performance measure was replaced during examination administration with another approved and validated administrative job performance measure. The licensee wrote Action Request AR-2015-00329948 to address this issue.

During the administration of the operating test simulator scenarios, several instances of inaccurate statements within the scenario D-2 forms were identified. On one scenario (scenario 2), it was determined that the major accident strategy that was outlined in the D-2 was not correct. This condition was identified when all four applicant crews assigned to this scenario took a different approach. It was determined through discussions with operations department management that the path taken by the

applicants was correct and the original strategy, which had been approved through operations management, was an incorrect strategy for the given scenario. On the same scenario (scenario 2), the technical specification call that had been approved through Operations management was determined to be incorrect. Again, this was identified when all four SRO applicants decided against entering the specific technical specification during the scenario. Subsequent discussions with Operations management confirmed that the technical specification call in the original D-2 was incorrect. Another scenario (scenario 4) had to be revised to include a clarification for an RPS fuse-pulling event for one crew (it was added into the D-2 forms that there was a software issue in the simulator that prevented one crew from meeting the critical task of scrambling the remaining 47 rods into the core due to not pulling all of the group B fuses. This scenario was also updated to reflect the need to manually trip recirculation pumps at -50 inches of reactor water level because the setup for the anticipated transient without scram in this scenario used an instrument failure that also caused a failure of the recirculation pumps to trip and was not added to the D-2 forms after validation). During the validation week, the examination team specifically requested that the scenario D-2 forms, in particular, the technical specification calls and critical tasks, be approved through Operations management to ensure that they were accurate prior to the administration of the examination. Additionally, the licensee's operating test validation process contributed to the inaccurate scenario D-2 forms. The examination team requested an on-shift operating crew with experience for the validation of the simulator scenarios. However, the validation crew that was provided was a mix of off-shift licensed operators. During validation week, this validation crew implemented the accident strategy that was eventually determined by Operations management to be incorrect during examination week. The licensee wrote Action Request AR-2015-00329948 to address the issue.

The examination team noted a series of other scheduling and logistics issues which challenged the successful implementation of the operating test. These items were discussed in detail with the licensee staff. These problems included a change to the final examination schedule that had not been cleared through the NRC chief examiner prior to the start of the operating test. The licensee wrote Action Request AR-2015-00329948 to address these issues.

### .3 Operator Knowledge and Performance

#### a. Scope

On April 24, 2015, the licensee proctored the administration of the written examinations to all 18 applicants. The licensee staff graded the written examinations, analyzed the results, and presented their analysis to the NRC on May 13, 2015.

The NRC examination team administered the various portions of the operating tests to all applicants on April 27 – May 5, 2015.

b. Findings

No findings were identified.

Twelve of the 18 applicants passed the written examination and 17 of the 18 applicants passed all parts of the operating test. The final written examinations, the operating test, and post-examination analysis and comments may be accessed in the ADAMS system under the accession numbers noted in Enclosure 2. The licensee requested and received approval by the NRC to withhold the written examinations from the public document room for 2 years and 6 months after the administration date. This request was approved by the Office of Nuclear Reactor Regulation (NRR), Operator Licensing and Training Branch (IOLB), at NRC Headquarters. This special request was needed because of delays in training pipeline start times at Columbia Generating Station.

The examination team noted the following generic weaknesses during the operating tests:

1. Several applicants did not recognize the loss of compressed air system air compressors during simulator scenarios and, therefore, failed to reset and restart this important auxiliary system.
2. Several SRO applicants, in the control room supervisor position, exhibited weaknesses in the knowledge and selection of abnormal operating procedures.
3. The majority of operating crews failed to recognize the failure of DG-1 and DG-2 to start on 1.68 psig drywell pressure actuation.
4. Several instances of equipment operation with the potential to damage safety-related equipment, injure personnel, or start a fire were observed. In one case, an applicant made several attempts to power major buses from a locked-out startup transformer. Another applicant attempted to parallel DG-3 to the bus by closing the breaker at the 4 o'clock position on the synchroscope. On another occasion, an operator attempted to restart a pump with a seized rotor that was scorched and hot to the touch, without first investigating the reasons for why the pump tripped.
5. All four crews faced with an electrical anticipated transient without scram failed to adequately prioritize the power leg of PPM 5.1.2, reactor pressure vessel control anticipated transient without scram, and direct the crew to pull the appropriate 'B' RPS fuses to ensure the reactor was fully scrammed. It took the crews between 20 and 30 minutes from the time of the initial scram signal to pull these fuses and complete the reactor scram.
6. Several applicants demonstrated a weakness in their ability to identify the differences between the indications of pump cavitation and the indications of an air-bound pump.

The licensee noted the following generic weaknesses during the written examination reviews with the applicants:

1. Breaker control on loss of control power (Q18)
2. Inverter under-voltage settings and transfer sources (Q20)
3. Spurious followed by subsequent real fire alarms (Q57)
4. Fixed radiation detector types (Q73)
5. General emergency protective action recommendations (Q81)
6. Secondary containment sump high water level and equipment operability (Q85)
7. Recirculation loop controller operation and procedure selection (Q91)
8. System line-ups (Q94)

The licensee wrote Action Request AR-2015-00329948 to address all written examination and operating test generic weaknesses.

Additionally, the licensee submitted one post-examination comment (Q93) that required review and disposition by the chief examiner. The Region IV Operations Branch Chief assigned a panel of examiners that were not part of the examination team effort at Columbia Generating Station to review the question challenge. The panel reviewed the question and recommended accepting two answers for the question (C & D). The chief examiner, chief examiner under instruction, and Region IV Operations Branch Chief agreed with the panel's recommendation. As a result of the panel's recommendation, one additional applicant passed the written examination. More details are included in Enclosure 2 of this report and the entire licensee's post-examination comments and analysis can be found in ADAMS using Accession Number ML115167A133. Copies of all individual examination reports were sent to the facility training manager for evaluation and determination of appropriate remedial training.

#### .4 Simulation Facility Performance

##### a. Scope

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

##### b. Findings

One finding with two examples, was identified.

#### **Inadequate Simulator Fidelity with Two Examples**

Introduction. The examiners identified a non-cited violation of 10 CFR Part 55.46(c), "Plant-referenced simulators," with two examples.

Example 1: The simulator modeling of functions associated with CST level was not consistent with the actual plant, introducing the potential for negative operator training and required that a job performance measure be replaced on the examination.

Example 2: The simulator modeling of RPS 'B' fuses was not consistent with the actual plant, introducing the potential for negative operator training and challenging the completion of an initial operating test simulator scenario.

Description. For example 1, the licensee's simulator was found to be unable to effectively model the level of the CST and the associated swap-over of ECCS pump suction from the CST to the suppression pool. Specifically, while attempting to develop a job performance measure where the automatic swap-over function failed to occur, it was determined that the simulator did not model this safety-related function and that the simulator code was written to prevent ever emptying the CST. The simulator software was written to introduce an automatic refill of the CST (from an unknown source) at the five foot level to prevent the possibility of ever reaching a low-level in the CST. As a result, the job performance measure was deleted from the examination package and replaced with another ECCS job performance measure.

For example 2, the examination team administered a simulator scenario to a crew of applicants where pulling three RPS 'B' fuses was a critical task for an electrical anticipated transient without scram event. While the crew pulled the correct three fuses, the simulator did not respond by extinguishing all remaining RPS 'B' lights and fully inserting all control rods. One RPS 'B' light remained lit, and one-quarter of the control rods remained not fully inserted. The other crews were successful with the critical task because they pulled all fuses. Upon investigation, it was determined that the simulator code was written incorrectly and that the crew had pulled the correct fuses.

Analysis. The failure to ensure that the simulator demonstrated expected plant response to operator input and to accident conditions was a performance deficiency. This performance deficiency was of more than minor safety significance because it is associated with the human performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the potential for negative training and/or ineffective evaluation of licensed operators could adversely affect a crew's ability to take appropriate actions to ensure reactor safety is being maintained.

Using Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012, the team determined that the finding was of very low safety significance (Green) because the finding: (1) was not a deficiency affecting the design and qualification of a mitigating structure, system, or component, and did not result in a loss of operability or functionality; (2) did not represent a loss of system and/or function; (3) did not represent an actual loss of function of at least a single train for longer than its technical specification allowed outage time, or two separate safety systems out-of-service for longer than their technical specification allowed outage time; and (4) did not represent an actual loss of

function of one or more non-technical specification trains of equipment designated as high safety significance in accordance with the licensee's maintenance rule program for greater than 24 hours. This finding has a cross-cutting aspect in the area of human performance associated with training because the organization did not provide adequate training to maintain a knowledgeable and technically competent workforce through the use of training materials covering emergency core cooling systems and reactor protection systems that would have exposed simulator infidelity [H.9].

Enforcement. Title 10 CFR Part 55.46(c), "Plant-referenced simulators," states, in part, that a "plant-referenced simulator used for the administration of the operating test or to meet experience requirements in § 55.31(a)(5) must demonstrate expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond."

Contrary to the above, from April 27, 2015, to May 5, 2015, the licensee did not ensure that the plant-referenced simulator demonstrated expected plant response for the automatic swap-over of ECCS pump suction from the CST to the suppression pool on low CST level. Further, the simulator did not demonstrate expected plant response to the removal of 'B' RPS fuses. To correct this issue, the licensee implemented the simulator deficiency report (DR) process and wrote Action Requests AR-2015-00325641 and AR-2015-00326763.

Because the violation was of very low safety significance (Green) and the issue was entered into the licensee's corrective action program as Action Requests AR-2015-00325641 and AR-2015-00326763, this violation is being treated as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy: NCV 05000397/2015301-01, "Inadequate Simulator Fidelity with Two Examples."

## .5 Examination Security

### a. Scope

The NRC examiners reviewed examination security for examination development during both the on-site 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/Observations

One finding was identified.

#### **Inadequate Examination Security on Several Simulator Resets**

Introduction. The examiners identified a Severity Level IV non-cited violation of 10 CFR Part 55.49, "Integrity of examinations and tests," for failure of the licensee to ensure the integrity of the initial examination process. Specifically, during the initial examination administration on April 28-30, 2015, the licensee failed on multiple

occasions to erase marked-up procedures between simulator scenarios and job performance measures (JPMs) during administration of the operating test.

Description. On nine separate occasions the licensee failed to erase hard-cards, abnormal operating procedures, or annunciator response procedures after simulator scenarios or JPMs. The subsequent applicants and the examiners found these procedures to be already filled-out during the next scenario or JPM. On these occasions, the examiners handed the procedures to licensee staff for cleaning prior to their use by the applicants. While the applicants gained no advantage from the filled-out procedures due to them being erased prior to their use, the filled-out procedures had the potential to affect the equitable and consistent administration of the operating test. The number of examples of a failure to prepare the simulator for follow-on examination activities was excessive and is indicative of a process failure of the licensee's examination security and simulator reset methodology or inadequate teamwork during resets by the licensee staff.

Analysis. The failure to properly prepare the simulator for follow-on scenarios and JPMs was a performance deficiency. The performance deficiency was evaluated using traditional enforcement and was determined to be Severity Level IV because it fits the SL-IV example of Enforcement Policy Section 6.4.d, "Violation Examples: Licensed Reactor Operators." This section states, "Severity Level IV violations involve, for example: a non-willful compromise... of an application, test, or examination required by 10 CFR Part 55." The performance deficiency could have impacted the regulatory process if licensing decisions were made with applicants being aided by the existence of filled-out procedures from the previous scenario or JPM during aspects of their operating test. However, since the procedures were immediately erased prior to their use by the applicants, it was deemed that there was no actual effect on the equitable and consistent administration of the examination as a result of the compromise. There are no cross-cutting aspects assigned to traditional enforcement violations.

Enforcement. Title 10 CFR Part 55.49, "Integrity of examinations and tests," states, in part, that a licensee "shall not engage in any activity that compromises the integrity of any application, test, or examination required by this part. The integrity of a test or examination is considered compromised if any activity, regardless of intent, affected, or, but for detection, would have affected the equitable and consistent administration of the test or examination."

Contrary to the above, from April 27, 2015, to May 5, 2015, the licensee did not follow a consistent process nor use teamwork for ensuring the simulator procedures were free of all markings from previous crews and applicants prior to administering operating test activities on the simulator. To correct this issue, the licensee wrote Action Request AR-2015-00327006 and researched industry best practices for scenario-specific simulator procedure checklists.

Because the associated violation resulted in no or relatively inappreciable safety consequences (SL-IV), and the issue was entered into the licensee's corrective action program as Action Request AR-2015-00327006, this violation is being treated as a non-cited violation, consistent with Section 2.3.2.a of the Enforcement Policy:



NCV 05000397/2015301-02, "Inadequate Examination Security on Several Simulator Resets."

**4OA6 Meetings, Including Exit**

The chief examiner presented the preliminary examination results to Mr. W. G. Hettel, Vice President, Operations, and other members of the staff on May 6, 2015. A telephonic exit was conducted on June 17, 2015, between Mr. K. Clayton, Chief Examiner, and Mr. W. Hettel, Vice President, Operations, and other members of your staff.

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

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

W. G. Hettel, Vice President, Operations  
R. Schuetz, Plant General Manager  
R. Prewett, Manager, Operations  
G. Pierce, Manager, Training  
R. Meyers, Manager, Operations Training  
B. Cook, Manager, Training Support  
D. Gregoire, Manager, Regulatory Affairs  
J. Trautvettes, Supervisor, Compliance  
M. Hedges, Engineer, Principal Licensing  
K. Elliott, Supervisor, Initial License Class  
J. Redwine, Supervisor, Simulator and Examination Group  
J. Davis, Supervisor, Training Support  
R. Hayden, Examination Developer  
K. Hori, Examination Developer  
J. Stracener, Instructor, Initial License Class

#### **NRC Personnel**

J. Groom, Senior Resident Inspector  
D. Bradley, Resident Inspector

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### **Opened and Closed**

05000397/2015301-01	NCV	Inadequate Simulator Fidelity with Two Examples (Section 40A5)
05000397/2015301-02	NCV	Inadequate Examination Security on Several Simulator Resets (Section 40A5)

### **ADAMS DOCUMENTS REFERENCED**

Accession No. ML15167A123 - FINAL WRITTEN EXAMS  
(delayed release November 30, 2017)

Accession No. ML15167A127 - FINAL OPERATING TEST

Accession No. ML15167A128 - AS-GIVEN OPERATING TEST

Accession No. ML15167A133 - POST EXAMINATION ANALYSIS (AND COMMENTS)

## **Enclosure 2: NRC Review of Columbia Generating Station Written Post-Examination Comments**

**Note:** A complete text of the licensee's post-examination analysis and comments can be found in ADAMS under Accession Number ML15167A133.

The NRC Region IV Operations Branch Chief established a panel of three examiners that had no involvement in any part of the examination process for this examination at Columbia Generating Station to review the one post examination comment submitted by the licensee. The NRC resolution section below is a summary of the panel conclusions. The Region IV Operations Branch Chief, the chief examiner, and the chief examiner under instruction accepted the panel's recommendations.

### **Question 93**

Answer the following questions regarding refueling bridge hoist interlocks:

- 1) The \_\_\_\_\_ Interlock is required to be operable by technical specifications during in-vessel fuel movement.
  - 2) According to the Tech Spec Bases document, this interlock is intended to \_\_\_\_\_.
- A.     1) Fuel Hoist  
       2) ensure grapple is fully closed to prevent fuel damage when lifting a fuel bundle
- B.     1) Main Hoist Fuel Loaded  
       2) ensure grapple is fully closed to prevent fuel damage when lifting a fuel bundle
- C.     1) Fuel Hoist  
       2) prevent a prompt reactivity excursion during refueling could potentially result in fuel failure
- D.     1) Main Hoist Fuel Loaded  
       2) prevent a prompt reactivity excursion during refueling could potentially result in fuel failure

Proposed Answer: C

### **Licensee Comments for Question 93:**

C (CORRECT)

1) First part is correct -The Fuel Hoist Interlock (which is given the term "Refueling platform fuel grapple fuel loaded" interlock) is required by technical specifications on the basis that it prevents in-vessel fuel loading with any control rod not fully inserted. This term is used in System Description SD000207 page 27 of 51. Additionally, the term "Main hoist" is also used to describe the same interlock. The term Fuel Hoist is not used in Technical Specification SR 3.9.1.1 (page 3.9.1.2) or Technical Specification Bases (page B 3.9.1-1) to describe this interlock.

2) This interlock is intended to prevent a prompt reactivity excursion during fuel loading. SRO-only requirement met due to fuel handling and tech spec bases aspects to the question.

D (CORRECT)

1) First part is correct - The term "Main Hoist Fuel Loaded" more closely describes the terms used in SR 3.9.1.I "fuel loaded" and the technical specification bases B 3.9.I "fuel grapple (main hoist)". Therefore this term should be accepted to describe the technical specification required surveillance in SR 3.9 .1.1 c. The term "Main hoist fuel loaded" will be modified to "Hoist Loaded" in SD000207 page 27 of 51 to remove any future confusion and provide alignment with the term used in the LCS surveillance OSP-NSSE-C401 which is used to test the SD000207 described interlock as required per LCS SR 1.9.1.6.

2) Second part is correct (see answer C above).

### **NRC Resolution of Question 93**

Columbia Generating Station challenged one question on the SRO-only written exam, Question 93. The licensee proposed that the NRC accept two correct answers, C the original correct answer, and distractor D, because of confusing terminology between the system training materials, and the technical specification bases, for a main refueling hoist interlock. Although no one asked any questions during the administration of this question concerning its intent, 12 of the 14 SRO applicants selected distractor D as the correct answer and 2 applicants selected distractor B as the correct answer. No one selected the original proposed correct answer of C.

The panel of three NRC examiners, all three being chief qualified, reviewed Question 93. The licensee challenged that Question 93 had two correct answers because of terminology differences between training materials and the technical specification bases and the panel agreed in a 2-1 vote. Per NUREG-1021, Section 501, and because these two answers are not directly opposed, this is an allowed disposition of this question.

The panel recommended accepting both answer C and distractor D as correct answers for this SRO question. The chief examiner, the chief examiner under instruction, and the Region IV Operations Branch Chief agreed with the panel recommendation.

The licensee wrote an action request to address the training materials deficiencies, Action Request AR-2015-00327602.

Facility Licensee: Columbia Gen. StationFacility Docket No.: 50-397Operating Test Administered on: 04/27/2015

While validating and conducting the simulator portion of the operating tests, examiners observed the following items:

Item	Description
CST Level was not modeled correctly below 5 feet	See Green NCV in the content of this report. The licensee wrote Simulator Discrepancy Report DR 15-0027 and Action Request AR-2015-00325641 to address this issue.
RPS fuses not modeled correctly	See Green NCV in the content of this report. The licensee wrote Simulator Discrepancy Report DR 15-0029 and Action Request AR-00326763 to address this issue.