



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

October 21, 2013

Mr. Thomas D. Gatlin
Vice President - Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
P.O. Box 88
Jenkinsville, SC 29065

**SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION – NOTIFICATION OF LICENSED
OPERATOR INITIAL EXAMINATION 05000395/2013301**

Dear Mr. Gatlin:

During the period of August 19 - 26, 2013, the Nuclear Regulatory Commission (NRC) administered operating tests to employees of your company who had applied for licenses to operate the VC Summer Nuclear Power Plant. At the conclusion of the tests, the examiners discussed preliminary findings related to the operating tests and the written examination submittal with those members of your staff identified in the enclosed report. The written examination was administered by your staff on September 4, 2013.

Four Reactor Operator (RO) and six Senior Reactor Operator (SRO) applicants passed both the operating test and written examination. One RO failed the operating examination and one SRO applicant failed the SRO written examination. The post examination comments were identified in a letter dated September 11, 2013. These comments, and the NRC resolution of these comments, are summarized in Enclosure 2. A Simulator Fidelity Report is included in this report as Enclosure 3.

The initial written SRO examination submitted by your staff failed to meet the guidelines for quality contained in NUREG-1021, Operator Licensing Examination Standards for Power Reactors, Revision 9, Supplement 1, as described in the enclosed report

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

If you have any questions concerning this letter, please contact me at (404) 997-4550.

Sincerely,

/RA/

Malcolm T. Widmann, Chief
Operations Branch 1
Division of Reactor Safety

Docket No.: 50-395

License No.: NPF-12

Enclosures:

1. Report Details
2. Post Exam Feedback
3. Simulator Fidelity Report

cc: Distribution via Listserv

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ADAMS: X ☐ Yes ACCESSION NUMBER: _ML13297A335_____

☐ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

OFFICE	RII:DRS	RII:DRS					
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NAME	KSchaaf	WIDMANN					
DATE	10/18//2013	10/21/2013					
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Letter to Thomas D. Gatlin from Malcolm T. Widmann dated October 21, 2013.

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION – NOTIFICATION OF LICENSED
OPERATOR INITIAL EXAMINATION 05000395/2013301

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 05000395

License No.: NPF-12

Report No.: 05000395/2013301

Licensee: South Carolina Electric and Gas

Facility: Virgil C. Summer Nuclear Station, Unit 1

Location: Jenkinsville, South Carolina

Dates: Operating Test – Aug 19-26, 2013
Written Examination – September 4, 2013

Examiners: K. Schaaf, Chief Examiner, Operations Engineer
P. Capehart, Examiner, Senior Operations Engineer
A. Goldau, Examiner, Operations Engineer
B. Monk, Examiner, Senior Resident Inspector Watts Bar Nuclear Station

Approved by: Malcolm T. Widmann, Chief
Operations Branch 1
Division of Reactor Safety

SUMMARY OF FINDINGS

ER 05000395/2010301; Operating test, August 19 - 26, 2013, and written examination, September 4, 2013; VC Summer; Operator License Examinations.

Nuclear Regulatory Commission (NRC) examiners conducted an initial examination in accordance with the guidelines in Revision 9, Supplement 1, of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." This examination implemented the operator licensing requirements identified in 10 CFR §55.41, §55.43, and §55.45 as applicable.

Members of the VC Summer Nuclear Power Plant staff developed both the operating tests and the written examination. The NRC developed the written examination outlines.

The NRC administered the operating tests during the period of August 19-26, 2013. Members of the VC Summer Nuclear Power Plant staff administered the written examination on September 4, 2013. Four RO applicants and six SRO applicants passed both the operating test and written examination, and were issued licenses commensurate with the level of examination administered.

One RO applicant failed the operating examination and one SRO applicant failed the written examination

There were three post-examination comments on the written examination. The NRC resolution to these comments are summarized in Enclosure 2.

No findings were identified.

Report Details

4. OTHER ACTIVITIES

4OA5 Operator Licensing Initial Examinations

a. Inspection Scope

Members of the VC Summer Nuclear Power Plant staff developed both the operating tests and the written examination. All examination material was developed in accordance with the guidelines contained in Revision 9, Supplement 1, of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors." The NRC examination team reviewed the proposed examination. Examination changes agreed upon between the NRC and the licensee were made per NUREG-1021 and incorporated into the final version of the examination materials.

The NRC reviewed the licensee's examination security measures while preparing and administering the examinations in order to ensure compliance with 10 CFR §55.49, "Integrity of examinations and tests."

The NRC examiners evaluated five Reactor Operator (RO) and seven Senior Reactor Operator (SRO) applicants using the guidelines contained in NUREG-1021. The examiners administered the operating tests during the period of August 19-26, 2013. Members of the VC Summer Nuclear Power Plant staff administered the written examination on September 4, 2013. Evaluations of applicants and reviews of associated documentation were performed to determine if the applicants, who applied for licenses to operate the VC Summer Nuclear Power Plant, met the requirements specified in 10 CFR Part 55, "Operators' Licenses."

b. Findings

No findings were identified.

The NRC determined that the licensee's examination submittal was outside the range of acceptable quality specified by NUREG-1021. The initial written examination submittal was outside the range of acceptable quality because more than 20% (10 of 25) of the SRO questions sampled for review contained unacceptable flaws.

- Seven questions contained two or more implausible distractors.
- Three questions on the SRO examination were not written at the SRO license level.

Four RO applicants and six SRO applicants passed both the operating test and written examination, and were issued licenses commensurate with the level of examination administered.

One RO applicant failed the operating examination and one SRO applicant failed the written examination.

The following generic weaknesses were discussed at the exit meeting:

- The communications between the crew members during the scenarios was weak. Frequently the communication was incorrect and corrected by another crew member or repeated back incorrectly but still acknowledged as correct.
- Control board diagnostics of failed instrumentation was weak. There were multiple misdiagnoses of failures which led unnecessary transients up to and including a reactor trip. Some failures were not diagnosed for the entire scenario.
- Three crews (nine applicants) were in a scenario in which a Loss of Coolant Accident was occurring and the SI injection valves had failed closed. All three crews recognized the failure. All three crews were aware that the conduct of operations procedure allowed them to open the valves due to not performing automatically and yet all three crews waited (from 30 seconds to three minutes) to open the valves when addressed by an EOP enclosure.

Copies of all individual examination reports were sent to the facility Training Manager for evaluation of weaknesses and determination of appropriate remedial training.

The licensee submitted three post-examination comments concerning the operating test.

A copy of the final written examination and answer key, with all changes incorporated, and the licensee's post-examination comments may be accessed not earlier than September 4, 2015, in the ADAMS system (ADAMS Accession Number(s) (ADAMS Accession Numbers ML13262A066, ML13262A054 and ML13262A055).

4OA6 Meetings

Exit Meeting Summary

On August 27, 2013, the NRC examination team discussed generic issues associated with the operating test with Mr. George Lippard, General Manager, Nuclear Plant Operations, and members of his staff. The examiners asked the licensee if any of the examination material was proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee personnel

G. Lippard, General Manager, Nuclear Plant Operations
R. Garner, Manager - Training
A. Barbee, Director- Nuclear Training
R. Justice, Manager – Operations
R. Johnston, Exam Lead Developer
R. Goldstein, Instructor – Exam Developer
N. Okimosh, Shift Supervisor – Operations Rep
M. Youmans, Simulator Consultant
J. Lawter, Simulator Supervisor

NRC personnel

J. Reese, NRC SRI
B. Bishop, NRC Project Engineer, Branch 5
K. Schaaf, Operations Examiner
P. Capehart, Senior Operations Examiner

POST EXAM COMMENTS

A complete text of the licensee's post-examination comments can be found in ADAMS under Accession Number ML13262A066.

Question # 57, 103K1.02

Comment: The question gives a set of plant conditions and asks based on those conditions what isolation feature has not functioned correctly. The facility recommends that there is no correct answer and that the question should be deleted from the exam.

Facility Basis:

This question requires the candidate to determine, from the given information, the Containment Isolation function that has failed and the actions required by EOP-1.0, REACTOR TRIP/ SAFETY INJECTION ACTUATION to respond to the malfunction. The following is given as a condition:

- The following Containment Isolation Valve MCB Status Lights are BRIGHT:
 - RCP SL WTR ISOL 8100
 - LTDNISOL8152

During the examination, one candidate asked the proctor for the panel and the entire set of words as they are read on the status lights. While this does not have a bearing on any candidate's contention of this question, it is included here for completeness. After consultation with the chief examiner, the panel numbers were not given but the sub-bullets were expanded to read as follows (changes are bolded):

- The following Containment Isolation Valve MCB Status Lights are BRIGHT:
 - RCP SL WTR ISOL 8100 CLSD
 - LTDN ISOL 8152 CLSD

The BRIGHT indication as stated in the given condition is actually the condition that indicates that the associated valves have closed properly to isolate containment

This was true for both the original and changed version of the question. Thus, the premise of a malfunction is invalid because no information is given that indicates that either a Phase A or Phase B containment isolation failure has occurred. There is, therefore, no correct answer.

NRC Resolution: Recommendation accepted. There is no condition given in the question that would suggest that a failure of Phase A or Phase B had occurred. This question will be deleted from the exam.

Question # 62, G2.2.39

Comment: The question asks that if a RCP is lost while at 2% power, what actions would satisfy the TS requirement to be in Mode 3 in one hour. The facility recommends that there are two correct answers.

Facility Basis:

This question requires the candidate to identify an action that will satisfy technical specifications, if performed within one hour, after a RCP trip due to a loss of a 7.2 KV bus in while in Mode 2.

In accordance with 3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION, the plant must be taken to Mode 3 within one hour.

The definitions for Modes 2 and 3, in accordance with V.C. Summer Technical Specifications, are as follows:

- Mode 2 (STARTUP) $KEFF > 0.99$, Rated Thermal Power $< 5\%$, and Average RCS Temperature $> 350^{\circ}\text{F}$
- Mode 3 (HOT STANDBY) $KEFF < 0.99$, Rated Thermal Power $< 0\%$, and Average RCS Temperature $> 350^{\circ}\text{F}$

Answer B. states that only the Control Rods will be driven in to 0 steps. During a Startup in accordance with GOP-3, REACTOR STARTUP FROM HOT STANDBY TO STARTUP (MODE 3 TO MODE 2), Mode 2 is procedurally entered after the withdrawal of Shutdown Banks and before withdrawal of Control Bank A. This procedure served as the technical basis for the question.

In GOP-5 REACTOR SHUTDOWN FROM STARTUP TO HOT STANDBY (MODE 2 TO MODE 3), however, Mode 3 is entered after all Control Banks have been fully inserted and the option is contained in the procedure to leave Shutdown banks withdrawn. It can be assumed that the Mode 3 shutdown margin requirements were met prior to the startup in accordance with Technical Specifications and procedures. Insertion of the Control Rods to 0 steps as stated in B. would therefore restore the reactivity required for Mode 3. This makes answer B. correct.

V.C. Summer requests that both answers B and D be accepted as correct answers.

NRC Resolution: Recommendation accepted. The question states that the plant is at low power when a loss of an electrical bus occurs. The question asks which condition will satisfy Technical Specification requirements for these plant conditions. The applicant is expected to determine that a shutdown to Mode 3 is required within one hour. The correct answer was a manual trip of the reactor. One other answer was to insert the Control Bank Rods ONLY. This was assumed to be incorrect due to being in the Startup procedure which required declaring transition to Mode 2 before the Shutdown Bank Rods were withdrawn. The logic being that the Shutdown Banks would have to be inserted before Mode 3 would be declared when shutting down.

The shutdown procedure however, directs insertion of the Control Bank Rods then gives the option of inserting the Shutdown Bank Rods before declaring Mode 3.

Integral Rod Worth data from the VC Summer curve book supports the fact that inserting Control Bank rods from Bank "D" at 115 steps (as stated in the question) to all Control Bank rods "in" would add sufficient reactivity to decrease Keff to < 0.99 . Therefore, with ONLY the Control Bank rods inserted, the plant meets the Tech Spec definition of Mode 3 and therefore, Tech Spec requirements are satisfied.

Answer selection "B" is to be used as the correct answer as well as choice "D".

Question # 96, G2.2.17

Comment: The question asks what position or group authorizes the start of work for an ORANGE risk activity. The facility recommends that there is no correct answer and that the question be deleted from the exam.

Facility Basis:

This question requires the candidate to identify the factors used for calculating EOOS (Equipment Out Of Service) Risk and the position or group that must approve the work for an ORANGE risk activity.

Candidates expressed that the second question was worded incorrectly, specifically, in the use of the words "authorizes the start of work". Procedure SAP-102, STATEMENT OF RESPONSIBILITIES, OPERATIONS establishes the responsibilities for authorizing work activities, as follows:

B. The 'Work Control Center Senior Reactor Operator (WCC SRO) is responsible for:

1. The WOO SRO reports to the Work Control Supervisor.
2. Acting as Tagout Authorizer and Work Authorizer for the implementation of scheduled activities.
3. An SRO or Shift Engineer can assume the duties of the WCC SRO.
 - a. The Work Control Center Auxiliary Operator (WOO AO) is a qualified Danger Tagger and reports to the WOO SRO.

6.0 PROCEDURE

6.1 Specific administrative procedures and implementing procedures detail the means of performance of specific tasks to fulfill the Operations Department responsibilities. While additional management approvals for elevated risk activities are required, authorization to actually start work is the responsibility of those individuals delineated in SAP-102 as stated above. Since the GMNPO, Management Duty Supervisor and the Plant Safety Review Committee are not cited in SAP- 102, there is not a correct answer.

NRC Resolution: Recommendation not accepted. In OAP-102.1 CONDUCT OF OPERATIONS SCHEDULING UNIT it specifically states in 6.1.a.4)c) the required approval levels for High, Elevated or Moderate Risk Level that (2) Elevated Risk level (ORANGE) – Requires GMNPO/MDS approval to work. This question was asking for upper level approval due to the risk impact with the choices being GMNPO / Management Duty Supervisor **OR** the Plant Safety Review Committee. The Work Control Center SRO does not appear in the

question as an option. Since there were no questions asked during the exam about this question, it is an adequate assumption that the applicants knew the intent of this question. No changes will be made.

SIMULATOR FIDELITY REPORT

Facility Licensee: VC Summer Nuclear Plant

Facility Docket No.: 05000395/2013-301

Operating Test Administered: Aug 19-26, 2013

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and, without further verification and review in accordance with Inspection Procedure 71111.11, are not indicative of noncompliance with 10 CFR 55.46. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating test, examiners observed the following:

<u>Item</u>	<u>Description</u>
On one scenario, the dropped control malfunction did not work properly.	During one scenario, a dropped control rod trigger failed to initiate the malfunction. The training staff removed the malfunction and reinserted it while the simulator was running. The malfunction then worked correctly. CR-13-03554 was created to address this issue along with other non-simulator exam issues.