



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
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ATLANTA, GEORGIA 30303-8931

September 15, 2000

South Carolina Electric & Gas Company  
ATTN: Mr. Stephen A. Byrne  
Vice President, Nuclear Operations  
Virgil C. Summer Nuclear Station  
P. O. Box 88  
Jenkinsville, SC 29065

SUBJECT: NRC EXAMINATION REPORT NO. 50-395/00-301

Dear Mr. Byrne:

During the period August 7 through August 10, 2000, the Nuclear Regulatory Commission (NRC) administered operating examinations to employees of your company who had applied for licenses to operate the Virgil C. Summer Nuclear Station. At the conclusion of the examination, the examiners discussed the examination questions and preliminary findings with those members of your staff identified in the enclosed report. The written examination was administered by your staff on August 11, 2000.

All six Senior Reactor Operator applicants who received the written examinations and operating tests, passed the examination. The one Reactor Operator applicant who received the written examination and operating test failed the written examination. A Simulation Facility Report is included in this report as Enclosure 2.

In accordance with 10 CFR 2.790 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/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Michael E. Ernstes, Chief  
Operator Licensing and Human  
Performance Branch  
Division of Reactor Safety

Docket Nos. 50-395  
License Nos. NPF-12

Enclosures: 1. Report Details  
2. Simulation Facility Report  
3. NRC Resolution of Comments

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NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-395

License No.: NPF-12

Report No.: 50-395/2000-301

Licensee: South Carolina Electric and Gas

Facility: Virgil C. Summer Nuclear Station

Location: P. O. Box 88  
Jenkinsville, SC 29065

Dates: August 7 through 10, 2000  
Written Examination - August 11, 2000

Examiners: Michael E. Ernstes, Senior Operations Engineer  
Mark S. Miller, Senior Operations Engineer  
Marvin Sykes, Operations Engineer

Approved by: Michael E. Ernstes, Chief  
Operator Licensing and Human Performance Branch  
Division of Reactor Safety

SUMMARY OF FINDINGS  
NRC Examination Report No. 50-395/2000-301

During the period August 7 through 10, 2000, NRC examiners conducted an announced operator licensing initial examination in accordance with the guidance of Examination Standards, NUREG-1021, Revision 8. This examination implemented the operator licensing requirements of 10 CFR §55.41, §55.43, and §55.45.

Six senior reactor operator (SRO) applicants and one reactor operator (RO) applicant received written examinations and operating tests. The NRC administered the operating tests during the week of August 7, 2000. The licensee administered the written examination on August 11, 2000.

## Report Details

Summary of Plant Status: During the period of the examinations, the plant operated at 100 percent power.

### 4. **OTHER ACTIVITIES**

#### 4OA5 Initial Operator Licensing Examinations

##### a. Scope

NRC examiners conducted regular, announced operator licensing initial examinations during the period August 7-10, 2000. The examiners administered examinations developed by the NRC in accordance with the guidelines of the Examination Standards (ES), NUREG-1021, Revision 8. The licensee reviewed and validated the written exam. The simulator scenarios and JPM set were validated during a preparation visit conducted during the week of July 24, 2000. The written examination was administered by the licensee on August 11, 2000. Six senior reactor operator (SRO) applicants and one reactor operator (RO) applicant received written examinations and operating tests. The examiners reviewed the results of the written examination and evaluated the applicants' compliance with and use of plant procedures during the simulator scenarios and JPMs.

##### b. Observations and Findings

Six of six SRO applicants passed the written examination. The RO applicant failed the written examination.

Five questions on the written examination involved the consideration of various technical specifications. Three of these involved the applicants working from provided pages of the technical specifications to determine required actions for a given set of conditions. The average success rate for the five questions was 62.8%.

The licensee submitted seven post-examination comments on the written examinations and three comments on the operating examination (ADAMS Accession Number: ML003750597). A copy of NRC's resolution of these comments is provided in Enclosure 3. The NRC accepted all seven of the written examination comments and revised the final RO and SRO written examination answer keys accordingly (ADAMS Accession Number: ML003750624). The NRC noted the comments provided on the operating examination. The comments were a result of technical and editorial errors that were not identified during the technical review process.

The examiners noted a procedural weakness during the simulator and plant walkthrough examinations, listed below.

- STP-114.002, revision 10, "Operational Leakage Test," was found to contain weaknesses in the methodology described for performing a manual leak rate calculation. Specifically, the procedure, through the use of tank curves with low readability, created the potential for a wide variance of results for a given set of input values. In the example used during the examination, parameters chosen to result in a calculated RCS unidentified leak rate of 1.21 gpm would have produced results ranging from -.72 gpm to 2.78 gpm through readability errors alone. Additionally, the procedure included the use of factors to correlate

indicated tank level to volume of fluid which were not defined in the procedure (i.e. it was unclear how these factors were to be obtained).

Details of these and other discrepancies are described in each individual's examination report, Form ES-303-1, "Operator Licensing Examination Report," which have been forwarded under separate cover to the Training Manager.

#### V. Management Meetings

##### X1. Exit Meeting Summary

An exit interview was conducted on August 10, 2000 to reiterate the purpose of the site visit and to discuss the findings. The licensee had no comments and the examiner received no dissenting comments. No proprietary information was received.

#### PARTIAL LIST OF PERSONS CONTACTED

##### Licensee

\*S. Byrne, Plant Manager  
 \*M. Foulkes, Operations Manager  
 \*A. Koon, Supervisor, Operations Training  
 \*T. Matlosz, Training Manager  
 \*P. Ramicone, Instructor  
 R. Ray, Instructor

\*Attended Exit Interview

#### INSPECTION PROCEDURES USED

NUREG-1021, Rev. 8: Operator Licensing Examination Standards for Power Reactors

#### ITEMS OPENED, CLOSED, AND DISCUSSED

##### Opened

None

##### Closed

None

##### Discussed

None

## SIMULATION FACILITY REPORT

Facility Licensee: Virgil C. Summer Nuclear Station Unit 1

Facility Docket No.: 50-395

Operating Tests Administered on: August 7-10, 2000

This form is to be used only to report observations. These observations do not constitute audit or inspection findings and are not, without further verification and review, indicative of noncompliance with 10 CFR 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information that may be used in future evaluations. No licensee action is required in response to these observations.

While conducting the simulator portion of the operating tests, the following items were observed:

<u>ITEM</u>	<u>DESCRIPTION</u>
Annunciator XCP-614 (2-6), CCW to CHG PP VLV	Did not properly model the 20 sec. time delay as in the plant.
XCP-621, "CRB INSERT LIMIT LO"	Alarm would come in inappropriately

## FACILITY COMMENTS

### NRC RESOLUTION OF FACILITY COMMENTS

1. RO/SRO Exam: Question #5

Recommendation accepted. Because the step of the question did not specify that Tavg had deviated from Tref by 5 or more degrees as a result of the dropped control rod, and because Tavg following the event could vary depending upon what point in core life the event occurred, operators could perform either step 3.a (decrease main turbine load to maintain Tavg within 5°F of Tref) or step 4.a (adjust main turbine load to reduce reactor power to less than 75%) of AOP-403.6, revision 2, "Dropped Control Rod," as the next positive action in response to this event. Choice B was accepted as an additional correct answer.

2. RO/SRO Exam: Question #13

Recommendation accepted. A value of 260°F could reasonably be achieved as a solution for the question. In that 260°F is a boundary value for choices A and B (the lower bound of A and the upper bound of B), there are two acceptable answers to the question. Choice B was accepted as an additional correct answer.

3. RO/SRO Exam: Question #16

Recommendation accepted. Because the conditions of the question relate to the instrumentation associated with the pressurizer pressure control function and a single channel of the reactor protection system, the reactor protection system would experience only the tripping of a single channel, as opposed to multiple channels which would result in a reactor trip. As the written form of the choices available to the applicants imply a reactor trip (as opposed to a reactor protection system channel trip), there is no correct answer to the question.

4. RO/SRO Exam: Question #40

Recommendation accepted. Because release permits work in conjunction with automatic hardware actions to prevent releases from inadvertently exceeding desired quantities (in that the generation of the permits establish the automatic isolation setpoints), choice C is not the only acceptable response. Choice B was accepted as an additional correct answer.

5. RO/SRO Exam: Question #43

Recommendation accepted. As the licensee cannot show that the information provided in the training material from which this question was derived is accurate, the actual answer to the question posed cannot be determined. Consequently, it was concluded that there was no correct answer for this question.

6. RO/SRO Exam: Question #61

Recommendation accepted. Because the definition from which the correct answer was originally developed is expanded upon within the body of the SAP-123, revision 2, "Procedure Used and Adherence," choice A, which was drawn from the body of the procedure, is also correct. Choice A was accepted as an additional correct answer.

## 7. RO/SRO Exam: Question #70

Recommendation accepted. Because the stem did not include a description of initial conditions existing prior to the postulated leak or the rate at which parameters were changing, the applicants could not differentiate between two leakage sources which each satisfied the conditions provided in the stem. Choice B was accepted as an additional correct answer.

## 8. RO/SRO JPM A.1.a

The recommendation to accept values from 41.0 to 41.5 gallons for the RCS density factor is accepted based in the readability of Figure V-7.

The recommendation to accept a deviation of 150-200 gallons for PRT level deviation is not accepted. The examiners reviewed the applicable curve correlating indicated PRT level to volume and determined that, by applying a readability standard of  $\frac{1}{2}$  of one minimum subdivision to the curve, values between 100 and 300 gallons are possible. These values were obtained by applying the standard to develop two values for both the initial and final PRT levels. The lower acceptable limit was considered to be the difference between the "lowest" final value (7200 gal.) and the "highest" initial value (7100 gal.). The upper acceptable limit was considered to be the difference between the "highest" final value (7300 gal.) and the "lowest" initial value (7000 gal.). The values between these limits were considered acceptable.

The recommendation to accept a deviation of 21.0 to 24.0 gallons for RCDT level deviation is not accepted. The examiners reviewed the applicable curve correlating indicated RCDT level to volume and determined that, by applying a readability standard of  $\frac{1}{2}$  of one minimum subdivision to the curve, values between 17.5 and 27.5 gallons are possible. These values were obtained by applying the standard to develop two values for both the initial and final RCDT levels. The lower acceptable limit was considered to be the difference between the "lowest" final value (235 gal.) and the "highest" initial value (217.5 gal.). The upper acceptable limit was considered to be the difference between the "highest" final value (240 gal.) and the "lowest" initial value (212.5 gal.). The values between these limits were considered acceptable.

## 9. SRO JPM A.1.b

The recommendation that restoration sequence not be considered in this JPM is accepted for the reasons stated by the licensee (the restoration sequence is established while clearing the tagout, not at the inception of the tagout). The observation that tagging out control power breakers is not critical is accepted.

The recommendation that tagging out the auxiliary oil pump should not be considered critical was considered and was not accepted. It was concluded that, to the extent that the auxiliary oil pump was included on the tagout, the information related to this component must be correct. It is also noted that the initial cue given to applicants at the beginning of this JPM included the statement that a "danger tagout has been prepared which will completely isolate the pump (*including any auxiliaries directly associated with the pump*)" [emphasis added]. Therefore, any doubt as to whether the subject pump should have been included on the tagout should have been answered by this statement.

As in all NRC-administered examinations, applicants were encouraged to ask questions if aspects of the examination were unclear.

10. RO/SRO JPM A.2

In this JPM, the applicants were provided with a partially completed Removal and Restoration (R&R) Checksheet and were told to “perform a review of an R&R checksheet prior to approval.” With the checksheet, applicants were provided an R&R Index, which listed all components considered out of service for the purposes of the JPM. The components on the Index were selected such that, with the addition of the inoperable component listed on the checksheet, the unit would be forced to enter T.S. 3.0.3.

The licensee's comments concerning this JPM were reviewed and are summarized as follows:

- The task statement provided to the applicants and inconsistencies in administration of the JPM made it difficult for the applicants to understand how they were expected to complete the JPM.
- A lack of amplifying information or follow-up questions prevented at least one applicant from determining that T.S. 3.0.3 applied to the JPM.
- Applicants reported that the absence of “Date/Time Removed from Service” and “Date/Time Returned to Service” information made it impossible to tell if R&R Index items were still active. Since the information was not provided, the licensee stated that applicants may not have understood the reason they were given the index.
- At least one applicant read the “Assigned Task” and did exactly what was directed, doing nothing more than evaluating the R&R for adequacy and making the appropriate entry into the index. The licensee contended that, given no amplifying information, the applicant performed the JPM correctly even though T.S. 3.0.3 was not identified by the applicant as applying to the R&R.

The examiners reviewed the licensee's comments regarding this JPM and noted that the comments were not accompanied by a recommendation; consequently, there was no proposed action to consider. However, the licensee's comments are addressed as follows:

- It is acknowledged that the task statement placed before the applicants was not prescriptive, stating simply “perform a review of an R&R checksheet prior to approval.” It was assumed in the development and validation of the JPM that use of the phrases “review” and “prior to approval” would connote that the review was to be on a scale which, when complete, would satisfy the requirements for a review prior to approval as described in the governing procedure for this activity, SAP-205, revision 9, “Status Control and Removal and Restoration.” The criteria for performing such reviews are described in section 6.2.12, “Restoration Requirements and Plant Restrictions.” Step 6.2.12.E states, in part:

“SS Authorization indicates that the Shift Supervisor has:

1. Completed the responsibilities specified in Section 5.4.

Section 5.4 of the subject procedure states that the Shift Supervisor is responsible for (among other things) “[v]erifying the required Technical Specification actions are taken when a system or component is declared inoperable,” and “[m]aintaining the Index (Attachment II) and reviewing it as part of shift relief.” For these responsibilities to be met, a review of the R&R index would have to be performed. Consequently, for an applicant to have performed a satisfactory review of the R&R checksheet provided in the JPM, a knowledge of the contents of the R&R index would have to have been obtained.

- The licensee’s statement that dates and times were omitted from the R&R index is accurate. The omissions were not part of an effort to add increased complexity to the JPM, rather they were the result of an oversight in preparation and validation of the JPM material. Section 6.5 of the governing procedure requires that the “Removed from Service” and “Returned to Service” line items of the index be completed at the appropriate times in the life cycle of an R&R. As neither block was completed for any of the components listed on the index, it would not be technically correct to assume that the components were either operable or inoperable, and a valid question could have been raised in the mind of any applicant as to the meaning and purpose of the index provided with the JPM. Consequently, the task standard for this JPM was expanded to include the following elements:
  - Identification that the combination of the checksheet and index placed the unit in T.S. 3.0.3. - or -
  - Accurate completion of the R&R checksheet, including correctly determining the applicable technical specification action statement time limit for the subject component alone, correctly determining the required restoration time and date, and correctly entering the component into the R&R index.
- The licensee’s comment regarding the method of administration for this JPM, including variations which might have occurred between examiners, was considered. There did not appear to be a difference in administration. The request to assess the impact of the R&R by reviewing the index was a followup question by the examiner after the expected response was not observed.