

U. S. NUCLEAR REGULATORY COMMISSION  
REGION II

Docket No.: 50-261

License No.: DPR-23

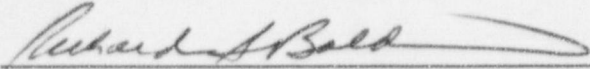
Report No.: 50-261/98-300

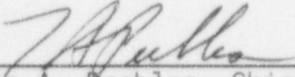
Licensee: Carolina Power & Light Company

Facility: H. B. Robinson Steam Electric Plant

Location: 3581 West Entrance Road  
Hartsville, SC 29550

Dates: February 23-26, 1998

Examiners:   
Richard S. Baldwin, Chief, License Examiner  
Michael E. Ernstes, License Examiner  
Paul M. Steiner, License Examiner

Approved by:   
Thomas A. Peebles, Chief,  
Operator Licensing and  
Human Performance Branch  
Division of Reactor Safety

## EXECUTIVE SUMMARY

### H. B. Robinson Steam Electric Plant

### NRC Examination Report 50-261/98-300

During the period of February 23 - 26, 1998, NRC examiners conducted an announced operator licensing initial examination in accordance with the guidance of Examiner Standards, NUREG-1021, Interim Revision 8. This examination implemented the operator licensing requirements of 10 CFR §55.41, §55.43 and §55.45.

#### Operations

- Control room activities were observed during the examination validation week and examination administration week. The operators were found to be attentive and professional in their duties. (Section 01.1)
- The examiners identified discrepancies with one procedure. (Section 03.1)
- Two Senior Reactor Operator (SRO) and three Reactor Operator (RO) applicants received written and operating examinations. One SRO applicant received an operating retake examination. (Section 05.1)
- The submitted written examination was acceptable with the exception of a limited number of written question distractors which lacked plausibility. The submitted operating examinations were acceptable, however, five prescribed JPM questions contained incomplete answers, resulting in licensee generated post-examination comments. (Section 05.2)
- The facility administered the written examination on February 27, 1998, and the NRC administered operating examinations February 23-26, 1998. (Section 05.3)
- Applicant Pass/Fail Results

	SRO	RO	Total	Percent
Pass	3	2	5	83%
Fail	0	1	1	17%

- The examiners identified potential generic knowledge weaknesses, based on written examination evaluation, in the following areas: Technical Specification design of Spent Fuel Pool Reactivity, operator actions for seal failures, trip logic for S/G low level, adjustment of Power Range Nuclear Instruments during testing, reactivity control during reactor start up with both Source Range Nuclear Instruments failing, prediction of plant parameters following a Reactor Coolant Pump trip, effects of a safety valve failing open, basis for tripping the turbine following an ATWS, actions and basis for rod insertion limits following a turbine

runback, and boric acid addition following two stuck rods. (Section 05.3)

- The examiners identified operating test generic performance weaknesses in the following areas: Subcooling Margin calculation, the use of plant curves to determine Emergency Diesel Generator Loading, and the prediction of plant response during nuclear instrument testing. (Section 05.3)
- The examiners identified generic strengths in the following areas: communications and the use of plant announcements. (Section 05.3)
- No violations or deviations were identified.



## Report Details

### Summary of Plant Status

During the period of the validation and examinations the unit was at 100 percent power.

### I. Operations

#### 01 Conduct of Operations

##### 01.1 Control Room Observations

During validation and administration of the examination, the examiners observed the conduct of the operators in the control room. The ROs were attentive to evolutions in progress. The SROs limited personnel access for official business. This contributed to a quiet, and professionally run control room. Operators adhered to communications standards and appeared attentive to evolutions in progress.

#### 03 Operations Procedures and Documentation

##### 03.1 Review of Operations Procedures

###### a. Scope

The examiners reviewed normal, abnormal, and emergency operating procedures during the examination development and administration for clarity, accuracy and ease of use.

###### b. Observations and Findings

The examiners observed operator license applicant performance utilizing licensee procedures. One procedure was identified as needing improvement.

(1) EPRAD-03, "DOSE PROJECTIONS", Revision 3, Attachment 8.3.5.5

Attachment 8.3.5.5. requires the operator to evaluate the effectiveness of filtration systems in service. The attachment, as written, is confusing and did lead one applicant to determine that the filtration flow was not effective while it was effective.

Additionally, this procedure identifies a main steam line break as a main steam line rupture. This terminology is confusing and conflicting with terminology used in the Emergency Operating Procedure.

###### c. Conclusion

The licensee verbally committed to corrected this concern prior to the examiners leaving site.

## 05 Operator Training and Qualification

### 05.1 General Comments

NRC examiners conducted regular, announced operator licensing initial examinations during the period of February 23 - 26, 1998. NRC examiners administered examinations developed by members of the H. B. Robinson training staff, in accordance with the guidelines of the Examiner Standards (ES), NUREG-1021, Interim Revision 8. Two SRO license applicants and three RO license applicants received written and operating examinations. One SRO license applicant received a retake operating examination only.

### 05.2 Pre-Examination Activities

#### a. Scope

The NRC reviewed the licensee's examination submittal using the criteria specified for examination development delineated in NUREG-1021, Interim Revision 8. This examination was the third initial examination developed by the licensee used for the NRC's initial operating licensing process.

#### b. Observations and Findings

The licensee developed the RO and SRO written examination, three JPM sets, and five dynamic simulator scenarios, for use during the examination. All materials were submitted to the NRC on or before the pre-arranged deadlines. The NRC conducted an on-site preparation visit during the week of February 9, 1998, to review and validate the examination. The training staff was very responsive to the NRC examiners' comments. The training staff met in the Region II offices to explain the examination submittal.

##### (1) Written Examination Development

The initial submittal did not contain generic Knowledges and Abilities (K/As) for the Tier 1 and 2 groupings. The training staff reviewed this and modified the initial outline submitted to the NRC prior to the deadline for the thirty day submittal. For the development of the sample plan the licensee utilized a newly acquired instructor that had no prior knowledge of the plants training history. This individual identified all K/As that were utilized on the last two NRC examinations and randomly selected topic areas that were not covered previously.

In general, the written examination was acceptable, however, some of the distractors lacked plausibility. The NRC examiners proposed changes to those distractors that did not meet requirements of NUREG-1021, Interim Revision 8. Licensee response to examiner changes and comments was prompt.

The NRC examiners reviewed and validated the written examination prior to the preparation week. Although the examiners found many questions were of high quality, the NRC examiners ensured all questions provided the level of discrimination set forth in the Examiners Standards. The examination was validated to take 4.5 hours. The examination time was pre-approved to allow the applicants 4.5 hours.

(2) Operating Test Development

The NRC reviewed and validated all portions of the operating test on February 9 - 12, 1998, using the H. B. Robinson simulator and plant for the walkdown of the JPMs. In general, the JPMs were considered acceptable for applicant evaluation and at the appropriate level of difficulty. The NRC requested that a JPM developed for the systems portion of the examination be moved to the administrative portion of the examination where it was better suited. The NRC examiners determined that the Administrative portion of the examination contained direct look-up questions. These questions were re-written or replaced.

The examiners considered the facility proposed simulator scenarios to be discriminating. The examiners worked with the training staff to re-arrange the as-written scenarios to place the required malfunctions prior to the major transient. This was done to ensure all required evolutions were observed.

The NRC received five post-examination comments concerning the prescribed JPM questions. One question was considered technically incorrect. One question was proposed to be split into two questions in order to cover the question that was technically incorrect. Comments concerning three questions contained additional information for consideration when grading the applicants response.

c. Conclusion

The NRC concluded that the facility licensee's third effort at developing the NRC initial operator licensing examination was improved from last examination submitted. The NRC concluded that the sample plan development for this examination was acceptable, however, future sample plan submittals need to be more clear and scrutable. The NRC concluded that the answers to prescribed JPM question needed closer review in order to include necessary information to fully evaluate the applicants response. The NRC concluded that the submitted examination was above average for Region II facilities.



### 05.3 Examination Results and Related Findings, Observations, and Conclusions

#### a. Scope

The examiners reviewed the results of the written examination and evaluated the applicants' use of plant procedures during simulator scenarios and JPMs. The guidelines of NUREG-1021, Forms ES-303-3 and ES-303-4, "Competency Grading Worksheets for Integrated Plant Operations," were used as a basis for the operating test evaluations.

#### b. Observations and Findings

Five of six applicants passed the examination. Two of the six applicants passed the examination but exhibited weaknesses. The applicant that did not pass the written exhibited weaknesses on the administrative portion as well as on the JPM portion of the operating examination. One applicant exhibited weaknesses on the administrative portion of the examination. One applicant exhibited weaknesses on the JPM portion of the examination. Detailed applicant performance comments have been transmitted under separate cover for licensee training department management review and to allow appropriate applicant remediation, as necessary.

Applicants were considered to have passed but exhibited weaknesses if they received an unsatisfactory grade on any one administrative topic area, completed only 80 percent of the JPMs successfully, or received a grade of 1.8 to 2.0 on any one competency during the dynamic simulator examinations. Applicants were considered to have passed the written examinations but exhibited weakness if they received a grade of 80 - 82 percent.

#### Written Examination

The written examination was administered by the facility licensee on February 27, 1998, transmitted to the NRC in Region II, the next week and received March 5, 1998. The facility had no post-examination comments to the written examination. The NRC's post-examination review of the written examination results identified seven SRO/RO combined questions, one RO only question and two SRO only questions that 50 percent or more of the applicants answered incorrectly. There are considered potential generic weaknesses and are being provided to the training staff for consideration and implementation into their Systematic Approach to Training based program.

Question Number	Knowledge Weakness Area
#5 RO/SRO	Technical Specification Spent Fuel Pool reactivity design. (3 ROs answered incorrectly)
#23 RO/SRO	Operator Actions and basis for Reactor Coolant Pump seal failure. (2 ROs and 1 SRO answered incorrectly)
#43 RO/SRO	Trip Logic for S/G low level. (3 ROs answered incorrectly)
#56 RO/SRO	Adjustment of Power Range Nuclear Instruments IAW OST-010. (1 RO and 2 SROs answered incorrectly)
#62 RO/SRO	Reactivity Control During Reactor Startup with both Source Range Nuclear Instruments failing. (3 ROs and 2 SROs answered incorrectly)
#67 RO/SRO	Steam Generator Pressure/Level/Loop $\Delta T$ prediction following a Reactor Coolant Pump Trip. (2 ROs and 2 SROs answered incorrectly)
#75 RO/SRO	Effects on plant parameters following a Steam Generator Safety Valve failing open. (3 ROs answered incorrectly)
#94 RO only	Basis for tripping the turbine following an ATWS (2 ROs answered incorrectly)
#82 SRO only	Actions and basis for rod insertion limits following a turbine runback. (2 SROs answered incorrectly)
#85 SRO only	Boric Acid addition based on 2 stuck rods. (2 SROs answered incorrectly)

### Operating Test

The operating test was administered during the period of February 23 - 26, 1998. Based on the examiners' post-examination review and discussion with the training staff, the NRC identified the following generic strengths and weaknesses:

### Strengths

- The applicants used good communications between crew applicants and plant announcements. The applicants used 3-way communications



as delineated in plant procedures. The SRO applicants ensured detailed announcements to the plant during normal, as well as, abnormal evolutions and was considered excellent.

#### Weaknesses

- Three of the applicants used  $T_{avg}$  for the calculation of subcooling margin vice  $T_{hot}$ .
- Three of the applicants were not familiar with the Emergency Diesel Generator Loading Figure 7.7 located in the plant curve book.
- Three of the applicants were not familiar with the plant response during nuclear instrumentation testing resulting from out-of-sequence actions.

#### c. Conclusion

The examiners concluded that applicant performance on the written and operating tests was satisfactory with the exception of one applicant failing the written examination. The examiners concluded that there were potential generic weaknesses exhibited on the written examination.

### V. Management Meetings

#### X1. Exit Meeting Summary

At the conclusion of the site visit, the examiners met with representatives of the plant staff listed on the following page to discuss the results of the examinations. The licensee's management representative provided no dissenting comments. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Boska, Manager, Operations  
H. Chernoff, Supervisor, Licensing/Regulatory Programs  
T. Cleary, Manager, Maintenance  
J. Clements, Manager, Site Support Services  
J. Keenan, Vice President, Robinson Nuclear Plant  
R. Duncan, Manager, Robinson Engineering Support Services  
R. Moore, Manager, Outage Management  
J. Moyer, Manager, Robinson Plant  
T. Natale, Acting Manager, Training  
D. Stoddard, Manager, Operating Experience Assessment  
R. Warden, Manager, Nuclear Assessment Section  
T. Wilkerson, Manager, Regulatory Affairs  
D. Young, Director, Site Operations

NRC

B. Desai, Senior Resident Inspector

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Closed

NONE

Discussed

NONE

## LIST OF ACRONYMS USED

ATWS	Anticipated Transient without Scram
CFR	Code of Federal Regulations
EOP	Emergency Operating Procedure
ES	Examiner Standards
IAW	In accordance with
K/A	Knowledges and Abilities
JPM	Job Performance Measures
RO	Reactor Operator
SRO	Senior Reactor Operator
S/G	Steam Generator
STAR	Stop, Think, Act, Review
TAVG	Temperature Average