

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Operator Licensing Exam Report: 50-498/OL 90-02 Operating Licenses: NPF-76
50-499/OL 90-02 NPF-80

Docket Nos.: 50-498
50-499

Licensee: Houston Lighting & Power Company
P.O. Box 1700
Houston, Texas 77251

Facility Name: South Texas Project Electric Generating Station

Examination at: South Texas Project Electric Generating Station

Chief Examiner: John Fellet 11/20/90
for Mark A. Satorius, Chief Examiner Date
Operator Licensing Section
Division of Reactor Safety

Approved by: John Fellet 11/20/90
J. L. Fellet, Chief Date
Operator Licensing Section
Division of Reactor Safety

Summary

NRC Administered Examinations Conducted During the Week of September 17, 1990
(NRC Report 50-498/OL 90-02; 50-499/OL 90-02)

NRC administered written and operating examinations to ten senior reactor operator (SRO) applicants and four reactor operator (RO) applicants; in addition, one SRO applicant was administered an operating examination (the written portion of the examination being waived). All of the applicants passed all portions of the examination and have been issued the appropriate licenses.

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DETAILS

1. PERSONS EXAMINED

		<u>RO</u>	<u>SRO</u>	<u>Total</u>
Licensee Examinations:	Pass -	4	11	15
	Fail -	0	0	0

2. EXAMINERS

- M. A. Satorius, Chief Examiner
- K. M. Kennedy
- J. M. Keeton
- S. L. McCrory
- P. T. Isaksen
- M. W. Parrish

3. EXAMINATION REPORT

Performance results for individual candidates are not included in this report because examination reports are placed in the NRC Public Document Room. Individual performance results are not subject to public disclosure.

3.1 Pre-examination Activities

The facility submitted their written examination bank, consisting of approximately 375 objective, multiple choice questions to the NRC. The training staff was informed that in accordance with NUREG-1021, a maximum of 10 percent of their bank can be used in the final written examination, if the questions discriminate at a high cognitive level of knowledge. Thirty percent of the submitted questions were considered by the NRC to test at an adequate level and sixteen questions were chosen for use in the written examination. The NRC pointed out to the staff that a substantial benefit would result from enlarging their examination question bank and improving its quality, because of the greater number of facility generated questions that would ultimately appear on the written examination administered to license candidates.

The following observations were made concerning the quality of the submitted reference material and were communicated to the training staff while drafting the written examination or during the examination week:

- o Reference material provided to the NRC was incomplete in that lesson plans did not contain the simplified drawings, tables, or figures used in the classroom presentation. This deficiency was previously noted in Examination Report 50-498/OL 88-01, dated June 30, 1988. In addition, lesson plans were not updated with plant and procedural changes. Six questions were identified by the facility prereview team as having an

incorrect answer, as a result of plant or procedural changes that were not reflected in the lesson plans. These questions were changed to reflect the correct answer prior to administering the written examination.

- o Some procedures required to be provided by Enclosure 1 of the scheduling confirmation letter, dated June 8, 1990, were not originally provided until specifically requested by the Chief Examiner. The omitted procedures included standing orders and fire brigade operating procedures.

3.2 General Comments

Performance on both the written and operating examinations was satisfactory. The written examination consisted entirely of multiple choice and matching test items. The average grade on the SRO examination was 90.2 percent and the average grade on the RO examination was 88.6 percent.

3.3 Site Visit Summary

The facility licensee was provided a copy of the examination and answer key for the purpose of commenting on the examination content validity. The facility licensee was informed that examination results could be expected the week of October 15, 1990, if comments on the written examination could be provided by the end of the examination visit.

An exit meeting was held September 21, 1990, with the following persons in attendance:

NRC

M. Satorius
K. Kennedy
J. Tapia

STP

P. Appleby
C. Ayala
J. Bartlett
M. Chakravorty
D. Coffey
J. Constantin
L. Giles
A. Khosla
J. Loesch
M. McBurnett
G. Weldon

NRC expressed appreciation for the cooperation and professionalism exhibited by the control room staff during the walkthrough portion of the examination. Also, the personnel responsible for dosimetry and body counting were very cooperative in arranging their schedule to help the examiners meet the desired schedule. In addition, the health physics staff was commended for their preparation and foresight in ensuring that access into and out of the radiological controlled area was a smooth, and efficient evolution.

The following items were communicated at the exit meeting to the facility licensee representatives as comments, observations, suggestions, or deficiencies:

- o Simulator fidelity items were discussed. A list of these items is included in the Simulation Facility Report, which is included in this report. Two scenarios in the simulator portion of the operating examination were significantly affected by improper simulator modeling. During a loss of main condenser vacuum, the main turbine trip first out annunciator (alarm setpoint 22 inches of mercury) was received at approximately the same time as the main condenser low vacuum alarm (alarm setpoint 25 inches of mercury). When the alarms were received, the turbine was not tripped and was not required to be tripped as a result of the actual condenser vacuum being 25 inches, decreasing slowly. This resulted in inconsistent crew response because one crew tripped the turbine and the reactor, and a second crew attempted to restore vacuum and did not immediately trip the turbine or reactor. In a second scenario, while recovering from a pressurizer steam space rupture, 'D' steam generator (S/G) pressure consistently tracked 150-175 psi lower than any of the other three S/Gs. All parameters between the S/Gs were equivalent; the only difference was that the turbine driven auxiliary feedwater (TDAFW) pump was receiving its steam from 'D' S/G. A pressure drop of this magnitude would not be expected from the steam demand of the TDAFW pump. This resulted in inconsistent crew response because one crew evaluated the indications as an uncontrolled S/G depressurization and transitioned to STP POP05-E0-E030, while the second crew recognized the difference in pressure and did not take action.

The NRC is concerned that inconsistent crew response to identical simulated plant transients is resulting from deficient simulator fidelity. Because the simulator does not accurately model these two plant transients, candidate actions during these transients cannot be accurately predicted. As candidate predictability is reduced, evaluation is made more difficult and cannot be measured to consistent standards, resulting in a reduction of objectivity when determining satisfactory performance.

- o The licensee did not satisfactorily supervise simulator operator manning which caused inadequate day-to-day information turnover by the simulator operators. This resulted in the unauthorized videotaping of initial simulator operating examinations. The licensee was informed by the Chief Examiner on September 17, 1990, that videotaping is not allowed by NUREG-1021 on initial examinations; however, the simulator operators taped the morning simulator set on September 19, 1990.
- o The NRC suggested to the training staff that the simulator be manned by their most experienced instructors during simulator examinations given to initial license candidates. This would provide consistent and experienced simulator operations, removing the possibility of misdirecting a candidate's focus or adding other unnecessary distractions.

- o The examination team observed that during the simulator section of the operating examination, a generic weakness exists in unit supervisor communications with both outside plant personnel and plant management. Unit supervisor candidates would routinely order the starting and stopping of major plant equipment without announcing the status change on the plant announcing system. Additionally, unit supervisor candidates habitually neglected to inform plant management concerning plant status changes when Technical Specifications Limiting Conditions for Operation action statements were entered.

Job performance measures (JPMs) were discussed including the fact that all future NRC initial license examinations will utilize JPMs for the walkthrough portion of the operating examination. The recommendation was made to the training staff to increase candidate exposure to JPMs, and ensure JPMs are updated and validated against plant procedures and plant changes.

Two items concerning material conditions were communicated to the senior resident inspector and to the licensee staff:

- * Several leaks in Unit No. 2 near the deaerator tank resulted in a significant amount of water spraying down in the area of the feedwater booster pumps and the start-up feedwater pump.
- * Approximately 1 inch of water was observed on the floor of the turbine driven auxiliary feedwater pump room as a result of condensation from steam leaks.

3.4 Facility Comments on the Written Examination

In general, editorial comments or changes made as a result of facility reviews prior to the examination, during the examination, or subsequent grading reviews are not addressed by this section. The facility licensee postexamination comments, less the supporting documentation, are included in the report immediately following the master examination key. All facility licensee postexamination comments were incorporated into the answer keys.

3.5 Master Examination and Answer Key

A master copy of the STP license examinations and answer keys are attached. The answer keys reflects the accepted licensee postexamination comments.

3.6 Simulation Facility Report

All items in the attached Simulation Facility Report have been discussed with the facility simulator instructor personnel.

SIMULATION FACILITY REPORT

Facility Licensee: Houston Lighting & Power Company

Facility Licensee Docket Nos.: 50-498
50-499

Facility License Nos.: NPF-76
NPF-80

Operating Tests administered at: South Texas Project (STP)

Operating Test given on: September 18-20, 1990

1. SIMULATION FACILITY REPORT

During the conduct of the simulator portion of the operating test identified above, the following items were observed:

- o During a loss of main condenser vacuum, the main turbine trip first out annunciator (alarm setpoint 22 inches of mercury) was received at approximately the same time as the main condenser low vacuum alarm (alarm setpoint 25 inches of mercury). When the alarms were received, the turbine was not tripped nor was it required to be tripped due to actual condenser vacuum being 25 inches, decreasing slowly. This modeling problem has been previously identified by the facility.
- o While recovering from a pressurizer steam space rupture, 'D' steam generator (S/G) pressure consistently tracked 150-175 psi lower than any of the other three S/G's. All parameters between the S/G's were equivalent; the only difference being that the turbine driven auxiliary feedwater (TDAFW) pump was receiving its steam from 'D' S/G. A pressure drop of this magnitude would not be expected from the steam demand of the TDAFW pump. This modeling problem has been previously identified by the facility.
- o Routine annunciators and alarms such as those alarms associated with opening safeguards equipment cabinets are not routinely inserted by the simulator instructors.
- o During a loss of coolant accident, the safety injection accumulators were observed to inject into the reactor coolant system at a pressure of 850 psia, which is 200 psia greater than their actual injection pressure of 650 psia.