

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Operator Licensing Examination Report No. 50-298/OL 91-02

Operating License No. DPR-46

Licensee: Nebraska Public Power District
P.O. Box 499
Columbus, Nebraska 68602-0499

Examinations at: Cooper Nuclear Station

Examinations Conducted: Weeks of November 18 and 25, 1991

Chief Examiner: K. M. Kennedy, Examiner, Operator Licensing Section
Division of Reactor Safety

Approved by:

J. L. Pellet
J. L. Pellet, Chief
Operator Licensing Section
Division of Reactor Safety

1-31-92
Date

Summary

NRC Administered Examinations Conducted During the Weeks of November 18 and 25, 1991 (Report 50-298/91-02)

NRC administered requalification examinations to two reactor operators (ROs) and ten senior reactor operators (SROs). One senior reactor operator failed the simulator examination, one senior reactor operator failed the simulator and walkthrough examination, and one of three crews was evaluated as unsatisfactory. The CNS requalification training program was evaluated as satisfactory.

Several strengths were noted during the administration of the requalification examinations. These include operators' performance on the written examination and prompt and accurate emergency action level classification by the SROs.

Several weaknesses were also identified.

- o Although the facility's requalification examination bank had improved since the previous examination, deficiencies continued to exist in the simulator scenarios and parts of the written examination.
- o Operators demonstrated weaknesses in performing three tasks during the plant walkthrough examinations. These tasks included performing the control room operator's immediate actions for shutdown outside the

control room, calculating a release rate, and establishing shutdown cooling.

- A lack of effective command, control, and communication during the dynamic simulator examinations reduced the crews' ability to respond to events and mitigate errors. This degraded accident response and was a primary contributor to the failure of one crew. This weakness has been observed on previous examinations at CNS.

NRC also administered retake examinations (partial operating test only) to one SRO and one RO candidate. Both candidates passed the examination and have been issued the appropriate licenses.

DETAILS

1. PERSONS EXAMINED

		<u>CREW</u>	<u>SRO</u>	<u>RO</u>
Requalification Examinations:	Pass -	2	8	2
	Fail -	1	2	0
			<u>SRO</u>	<u>RO</u>
Licensee Examinations:	Pass -		1	1
	Fail -		0	0

2. EXAMINERS

K. M. Kennedy, Chief Examiner
J. L. Pellet
J. A. Canady
M. Daniels
R. K. Miller

3. EXAMINATION REPORT

Performance results for individual examinees are not included in this report as it will be placed in the NRC Public Document Room and these results are not subject to public disclosure.

3.1 Examination Material

The licensee submitted material for examination construction as required by NUREG-1021, "Operator Licensing Examiner Standards," Section 601. The licensee also submitted proposed requalification examinations which they developed from the same material. The material was found to be acceptable with some deficiencies noted. The staff was very responsive to NRC comments made during the preparation week and revised examination items as necessary to satisfy the guidelines of NUREG-1021.

3.1.1 Written Examination Items

The facility staff continues to have difficulty developing and constructing questions for the written examination which meet the guidelines of NUREG-1021. While improvement was noted in the items developed for Section A, "Plant and Control Systems," the items developed for Section B, "Administrative Controls/Procedural Limits," contained weaknesses similar to those observed during the July 1989 requalification examination (Examination Report 50-298/OL 89-02). Item construction deficiencies included:

- Items that were of low cognitive order such that the examinee would be led by the question to the answer or reference with no synthesis or analysis of information required.
- Multiple choice questions in which the distractors were not plausible.
- Questions that required such a low level of knowledge that they would not discriminate a competent operator from one who is not.

In addition to these construction deficiencies, the RO written examination proposed by the facility contained several questions which tested at the SRO level of knowledge.

3.1.2 Job Performance Measures (JPMs)

A number of deficiencies were noted in the construction of JPMs. JPM deficiencies included:

- JPMs did not correctly identify critical steps. JPMs contained steps that should have been critical but were not identified as such, as well as steps identified as critical that should not have been.
- Verbal system response cues necessary to simulate the tasks were sometimes not provided. A number of cues were also interpretive, that is, they provided the operator with information rather than indications.
- The JPMs were constructed so that the facility evaluators, when administering the JPMs, cued examinees that each task was completed rather than requiring the examinee to indicate when the task was complete. This practice can provide a cue to an examinee that the task has not been correctly performed, through the absence of the evaluator cue that the task is complete and therefore should be avoided. No inappropriate cues from this practice were observed during the examinations.
- Two JPMs proposed by the facility for the examination had not been updated to reflect the current revision of the procedure for which the JPM was written.

3.1.3 Dynamic Simulator Scenarios

The simulator scenarios contained in the facility's examination bank did not test the full scope of the emergency operating procedures (EOPs) and, in general, did not require the crews to rediagnose events, address multiple events, or alter their mitigation strategy once they entered the EOPs. The scenarios also had a predictable pattern of malfunctions: an event requiring operators to address Technical Specifications, a minor malfunction, then a major transient requiring entry into EOPs and the emergency plan implementing procedures. The examination bank should contain scenarios which cover all

aspects of the EOPs with sufficient variation in the type and scope of initiating events as well as the level of degradation.

The identification and use of performance standards for individual simulator critical tasks (ISCTs) was inconsistent throughout the scenario bank. Performance standards were not developed for every ISCT. Additionally, some performance standards did not adequately describe the criteria for successful completion of an ISCT. Performance standards were often worded differently for the same ISCT in different scenarios.

3.2 Examination Administration

3.2.1 Written Examinations

Written examinations were administered to 12 operators. NRC evaluated all operators as passing on this portion of the examination. The facility failed one RO on this portion of the examination. As a result of a post-examination review, the NRC deleted one question from the RO examination after it determined that the question tested SRO knowledge rather than RO knowledge. This resulted in the difference in grading between the NRC and facility evaluators.

Performance on the written examination improved compared to the requalification examinations administered in 1989. The average grade for all operators was 92 percent, with only one operator scoring below 85 percent.

3.2.2 Plant Walkthrough Examinations

Plant walkthrough examinations were administered to 12 operators in the form of JPMS. Each examinee performed five JPMS and answered ten questions. Eleven out of 12 operators passed this portion of their examinations and there was agreement between NRC and facility pass/fail results.

Operators demonstrated weaknesses performing several JPMS, resulting in one individual failure and marginal performance by four additional operators.

- o Three of four operators could not correctly perform from memory the control room operator's immediate actions for shutdown outside the control room in accordance with Emergency Procedure 5.2.1, "Shutdown From Outside the Control Room."
- o Two of four operators could not perform successfully a release rate determination for the elevated release point using the steam jet air ejector (SJAE) pathway in accordance with Emergency Plan Implementing Procedure 5.7.16, "Release Rate Determination." Both operators read the SJAE monitor incorrectly, resulting in an erroneous release rate calculation.
- o Two of two operators were slow to start Residual Heat Removal Loop B in the shutdown cooling mode and establish the desired temperature band.

System Operating Procedure 2.2.69.2, "RHR System Shutdown Operations," directs the operator to throttle open the outlet valve for the B heat exchanger (RHR-MO-12B) in order to establish a cooldown. Because the breaker for this valve is normally open, the operators did not have indication of valve position. It took one operator 23 minutes and the other operator 36 minutes to realize that the valve was closed and take actions to throttle the valve open.

3.2.3 Dynamic Simulator Examinations

Dynamic simulator examinations were administered to 12 operators making up 3 crews. The NRC failed two operators and one crew and there was agreement between NRC and facility pass/fail results.

A lack of effective command, control, and communication reduced the crews' ability to effectively respond to events and mitigate errors. This resulted in a degradation of the crews' response to the simulated accidents and was a primary contributor to the failure of one crew. Performance in this area continues to be weak. The following generic weaknesses in crew command, control, and communications were observed during the dynamic simulator scenarios.

- Operators demonstrated weaknesses in announcing alarms and their cause to the crew.
- Operators manipulated systems without informing the other board operator or shift management of the actions taken.
- Operators failed to use standard terminology when reporting plant parameters or conditions to the rest of the crew. Terminology utilized was informal, imprecise, and open-ended, resulting in incomplete and confusing reports.
- Shift management did not always give clear, precise directions to operators to perform critical functions such as scrambling the reactor, shutting main steam isolation valves, and establishing limits on cooldown rate.
- Shift supervisors failed to maintain an overall command function during a number of scenarios, instead becoming involved in very narrow issues. Shift supervisors were observed directing panel operations without informing the control room supervisor (CRS), thus complicating the CRS's ability to direct the crew. Shift supervisors also performed non-vital control board manipulations during accident events. These practices detracted from the shift supervisor's ability to evaluate the overall plant and anticipate further complications or formulate mitigation strategies.

Weaknesses in crew and individual communications have been observed on previous NRC examinations at CNS, including the license examinations administered in May 1991 (Examination Report 50-298/OL 91-01) and the requalification examinations administered in July 1989 (Examination Report 50-298/OL 89-02).

3.2.4 Emergency Plan Implementation

Emergency action level identification, event, classification, and initial emergency plan implementation by SROs was accurate and timely. The dynamic scenarios were developed to provide a broad scope of emergency action levels required.

3.2.5 Observed Facility Evaluator Performance

Facility evaluator performance in all phases of the examinations was satisfactory. They exhibited minor cuing problems but were responsive and effective in correcting their evaluation techniques when pointed out by NRC examiners.

3.3 Program Evaluation Criteria and Process

The evaluation of the facility requalification program was made using the guidance and criteria of NUREG-1021, ES-601, Revision 6. The areas that were evaluated included examination materials development, facility evaluator performance, individual performance, crew performance, and a comparison of NRC and facility grading. The CNS requalification training program was evaluated as satisfactory.

Because the requalification program is satisfactory, the facility may remediate and retest the failing individuals and return them to licensed duties in accordance with the facility program. The NRC will reexamine the individuals at a later date for license renewal purposes.

3.4 Exit Meeting

The NRC held an exit meeting with the licensee on November 26, 1991, and summarized the requalification training program evaluation and the results of the requalification examinations as presented in this report. The following personnel were present:

NRC

R. V. Azua
S. J. Collins
K. M. Kennedy
J. L. Pellet
W. Walker

NPPD

R. Brungardt
R. Creason
J. W. Dutton
R. Gardner
J. Meacham
D. Shallenberger
D. A. Whitman

3.5 Simulation Facility Report

All items on the attached Simulation Facility Report have been discussed with the facility personnel.

SIMULATION FACILITY REPORT

Licensee: Nebraska Public Power District

Docket Number: 50-298

Operating Tests Administered at: Cooper Nuclear Station

Operating Tests Administered: Weeks of November 18 and 25, 1991

This report does not constitute an audit or inspection and is not, without further verification and review, indicative of non-compliance with 10 CFR Part 55.45(b). These observations do not affect NRC certification or approval of the simulation facility other than to provide information which may be used in future evaluations. No licensee action is required in response to these observations.

During the conduct of the operating examinations identified above, the following items were observed:

1. During the initial licensing examinations, the simulator initiated an unexpected reactor scram following the closure of one turbine stop valve during performance of the main turbine stop valve closure and steam valves functional test.
2. During the administration of the requalification examinations, it appeared that reactor pressure vessel decreased faster than expected for a loss of coolant accident, especially as vessel level approached top of active fuel.

These deficiencies impacted realistic feedback to the control room operators but did not invalidate the evaluations.