



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-338/95-17 and 50-339/95-17

Licensee: Virginia Electric and Power Company
Glen Allen, VA 23060

Docket Nos.: 50-338 and 50-339

License Nos.: NPF-4 and NPF-7

Facility Name: North Anna Power Station Units 1 and 2

Inspection Conducted: September 18-22, 1995

Inspector: Michael E. Ernstes for O&P 10-18-95
D. Charles Payne Date Signed

Accompanying Personnel: Michael Ernstes

Approved by: Thomas A. Peebles 10/19/95
Thomas A. Peebles, Chief Date Signed
Operator Licensing & Human
Performance Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted in the area of the licensed operator requalification program during the period September 18-22, 1995. The purpose of the inspection was to verify that the licensee's requalification program for reactor operators (ROs) and senior reactor operators (SROs) ensures safe power plant operation by evaluating how well the individual operators and crews had mastered training objectives. Activities observed included licensee conduct of the dynamic simulator portion of the operating test and Part A of the written test, as well as licensee implementation of security measures to prevent exam compromise.

Results:

The inspectors concluded that the licensee's requalification program for ROs and SROs was adequate to ensure safe power plant operations.

9511140241 951019
PDR ADOCK 05000338
G PDR

Enclosure 1

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *M. Allen, Supervisor-Operations Training
- K. Barnette, Supervisor-Safety/Loss Prevention
- *B. Delamorton, Supervisor-Nuclear Training
- *L. Edmonds, Superintendent-Nuclear Training
- *J. Hayes, Superintendent-Operations
- *P. Kemp, Supervisor-Licensing
- *A. Kozak, Nuclear Training-Simulator Support
- N. Lane, Supervisor-Shift Operations
- J. Lengalis, Lead Simulator Instructor
- *W. Matthews, Assistant Station Manager-Operations and Maintenance
- A. Neuper, Operations
- *W. Willaford, Supervisor-Quality Assurance (Operations)
- *G. Winks, III, Supervisor Nuclear Training-Operations

Other licensee employees contacted included training department instructors, licensed operators, and office personnel.

NRC Personnel

- *R. McWhorter, Senior Resident Inspector

*Attended exit interview

2. Licensed Operator Requalification Program Evaluation (71001)

a. Summary

The NRC conducted a routine, announced inspection of the North Anna licensed operator requalification program in accordance with Inspection Procedure (IP) 71001 during the period September 18-22, 1995. The purpose of the inspection was to verify that the licensee's requalification program for reactor operators (ROs) and senior reactor operators (SROs) ensures safe power plant operation by evaluating how well the individual operators and crews had mastered training objectives. Due to the licensee's requalification schedule, the inspector observed only the dynamic simulator portion of the operating test and the Part A portion of the written test for two crews of Shift "C" (week 6 of 10 of the annual examination schedule). During the conduct of these tests, the inspector evaluated the effectiveness of the licensee's examination security process and the fidelity of the simulator facility. The inspector also conducted an administrative review of the written examinations and operating tests for the other nine weeks of testing. Based on a review of records, interviews of selected plant personnel, and observation of examinations, those activities appeared to be satisfactorily conducted.

b. Examination Development

The inspectors reviewed the licensee's requalification dynamic simulator and Part A written examinations to assess their ability to evaluate operators and determine areas for retraining. The inspectors found that the licensee-developed examinations were adequate. The inspectors identified several areas, addressed below, where improvement may be made. A review of selected examinations indicated that test items were constructed to test adequate knowledge and abilities levels. The examinations tested operator proficiency at performing tasks that were identified as important to risk by the North Anna probabilistic risk assessment.

Generally, the North Anna simulator scenarios were technically accurate, operationally oriented tools designed to effectively measure the operators' familiarity and understanding of plant design, operation, and procedures. The inspector noted that the scenario sequence of events followed the same predictable outline each time. First, an instrument or minor equipment malfunction occurs that requires the crew to evaluate Technical Specifications (TS). Second, a process upset occurs that requires the crew to utilize an Abnormal Operating Procedure (AOP). Finally, a major transient occurs that requires implementation of various aspects of the Emergency Operating Procedures (EOP). The inspector identified that the TS event often had little or no bearing on subsequent events in the scenario. The inspector also observed that the "Response Not Obtained" (RNO) column of the AOPs was rarely exercised. The scenario could be improved by selecting an instrument or component malfunction that would help exercise an alternate flowpath in the AOPs or EOPs later on. Additionally, altering the order of event sequencing or adding one or two other supporting equipment malfunctions should enhance the evaluation ability of the scenario while avoiding pre-event anticipation by the operators.

The inspector identified one example of inadequate validation of a dynamic simulator scenario and incomplete documentation of how to conduct the scenario. During the first evaluation scenario (on the first crew), the simulator responded in a manner contrary to that experienced during the pre-examination validation process. Using the same scenario for the second crew evaluation, the simulator responded consistent with the validation run. Subsequent facility investigation determined that the exam team validated the scenario based on not performing the bistable trips and bypasses associated with the TS malfunction (event #1 - Failure of "A" RCS Loop Channel I RTD High). For the first crew, the exam team allowed this task to be performed and completed. This simple oversight extrapolated into a different set of plant responses and operator actions than anticipated causing confusion among the exam team and simulator operators. Fortunately for the team, the new conditions still deteriorated into the desired

major plant transient though an additional 10 minutes of run time were required to reach that point. Complete and accurate scenario validations are required to ensure the plant responds as desired and the required crew competencies are evaluated.

The written examination review revealed an adequate knowledge level and adequate difficulty separation between RO and SRO questions. Some of the questions did not conform with the guidance of NUREG-0122, "Examiners' Handbook for developing Operator Licensing Examinations." Although NUREG-0122 is not a requirement, the lack of conformance with these guidelines, or any industry guidance, lowered the cognitive level of the questions resulting in a reduced ability to determine areas for retraining. Some examples where divergence from this guidance reduced the ability of questions to evaluate operators' knowledge include the following:

- (1) Distractors are a series of True/False statements. This type of question is unfocused and does not efficiently test any one topic to determine areas for retraining.
- (2) Distractors do not follow grammatically from the stem. Candidates can eliminate distractors which do not grammatically agree with the question stem.
- (3) Distractors teach the answer. Some distractors added unnecessary explanations as to why that distractor might be the right answer. These questions do the analysis for the operator. The operator need only concur with the line of reasoning in the distractor. This does not test the operator in his or her job setting and lowers the cognitive level of the question to recognition instead of analysis.
- (4) Distractors contain words such as "never" or "most". Stating that a situation will "never" occur or is the "most" severe can indicate a wrong answer.

The inspector noted that the requalification written examination bank (both Section A and Section B) was published on the Operations Department local area network. Widely disseminating the exam bank in this manner encourages the tendency by the operators to "study the bank" and not learn the underlying operating concepts. While the NRC does not require the bank to be locked up or withheld from the staff after it reaches a specified size, the practice of intentionally distributing the bank to operators for pre-examination review purposes is discouraged. Also the inspector noted that placing Section A questions in a computerized study bank was illogical since a static simulator setup for a specific scenario is needed to determine the correct answer to the associated question. Consequently, these questions would be useless to the operator for study/review purposes. The inspector did note that periodically providing systems and

procedure oriented questions to the operators outside the training weeks (no answers or references identified) could serve as a useful review tool.

No violations or deviations were identified

c. Examination Administration

The inspector observed the training department evaluators and licensed operators during the administration of the dynamic simulator portion of the operating tests to assess the licensee's effectiveness in evaluating its operators. The dynamic simulator test consisted of an evaluation on the plant reference simulator. The licensee evaluators administered the simulator examinations in accordance with plant procedures. Operations management participated in the evaluation process by observing operator performance during the simulator examinations. In addition to emphasizing the importance of training to the operators, Operations management can provide feedback directly to the operators and training department personnel on management expectations for operator performance and in specific areas that may require interpretation.

The inspector noted that several management observers outside the designated evaluation team, were feeding the team their own personal observations on crew performance. Management comments on exam team oversights or areas of improvement are useful for improving evaluator performance and are appropriate. However, they should be provided independently of the exam team to prevent possibly biasing evaluation results.

The inspector observed that between six to eight operations management and training department representatives were present in the simulator control booth (besides the two simulator operators) during the exam. From an exam security viewpoint and given the small size of the booth, this number of observers was considered to be excessive. The inspector noted that occasionally, the simulator operators were distracted by comments and questions from the observers. While having no notable effect in this instance, booth operator errors brought on by inattention could have compromised the evaluation scenario. The inspector determined that the facility's examination security practices were adequate.

No violations or deviations were identified.

d. Crew Evaluation and Operator Performance

Both crews of operators performed satisfactorily on both portions of the examination observed by the inspector. The facility evaluation team identified one SRO as requiring minor remediation in several areas of weakness. This remediation was satisfactorily completed and

documented before his returning to shift duties. Based on direct observation of evaluator discussions, post-scenario crew critiques, and crew simulator performance documentation, the inspector concluded that thorough and representative evaluations were made by the instructors. Good post-scenario crew debriefs were conducted as well. These debriefs were led by the Operation's representative on the examination team which increased the credibility of the team's conclusions. The inspector noted two areas of operator performance that, while satisfactory, still need additional training emphasis. Many operators of both crews were not at ease with the plant's new 3-way communications standard. During quiet, non-stressful periods the operator communications met the new site standard. However, once a complicated or rapidly evolving event occurred, the standard was sometimes forgotten or avoided for the sake of expediency. In the other area, the inspector noted that the SSs failed to effectively utilize crew briefs during events to inform the crew of plant status as well as direction and success of mitigation activities.

No violations or deviations were identified.

e. Simulator Fidelity

The plant referenced simulator, performed as expected during the dynamic simulator portion of the operating examinations except in one instance. Following a Loss of Coolant Accident and subsequent Safety Injection (SI) Signal, the operating charging (SI) pump tripped, and the two non-operating pumps failed to start due to a planned malfunction. However, when the operators checked the SI flow meter, normal SI flow was indicated. The simulator operator caused the meter to fail low so the operators' indications matched actual plant conditions. This problem had been previously identified by the training staff as a modeling error that is scheduled to be worked.

3. Exit Interview

At the conclusion of the site visit, the inspectors met with representatives of the plant staff listed in paragraph one to discuss the results of the inspection. The licensee did not identify as proprietary any material provided to, or reviewed by the inspectors. The inspectors further discussed in detail the inspection findings listed below. The licensee did not express any dissenting comments.

SIMULATOR FACILITY REPORT

Facility Licensee: North Anna Power Station

Facility Docket Nos.: 50-338 and 50-339

Operating Test Administered on: September 21, 1995

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>
SI Flow Meter	During a LOCA scenario, the only operating charging (SI) pump tripped and the two non-operating pumps failed to start due to a planned malfunction. Despite the malfunction and no operating SI pumps, the SI flow meter indicated normal SI flow.