UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-400/94-14

Licensee: Carolina Power and Light Company

Docket Nos.: 50-400 License Nos.: NPF-63

Facility Name: Shearon Harris Nuclear Power Plant

Inspection Conducted: August 29 - September 16, 1994

Inspector: Stephen J. Cahill 10-11-94
Stephen J. Cahill Date Signed

Accompanying Personnel: Bill Hemming, INEL

Approved by: Lawrence L. Lawyer 10/12/94
Lawrence L. Lawyer, Chief Date Signed
Operator Licensing Section
Operations Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine, announced inspection was conducted in the area of the Licensed Operator Requalification (LOR) program during the period August 29 - September 16, 1994. The purpose of the inspection was to (1) verify that the licensee's requalification program for licensed operators ensures safe power plant operation by evaluating how well the individual operators and crews had mastered training objectives; (2) assess the licensee's effectiveness in evaluating and revising the requalification program based on operational performance, including requalification examinations; and (3) assess the licensee's effectiveness in ensuring that the licensed operators satisfy the conditions of their licenses as specified in 10 CFR 55.53. The inspectors reviewed and observed annual requalification examinations conducted by the facility licensee and conducted inspection activities as specified in Inspection Procedure 71001. Activities reviewed included examination development, examination administration, remedial training, and license condition tracking.

Enclosure

Results:

The examination team concluded that (1) the licensee's LOR program was adequate to ensure safe power plant operations; (2) the licensee was effective in evaluating and revising the subject program; and (3) the licensee was effective in ensuring that individuals who are licensed to operate the facility satisfy the conditions of their licenses.

The inspectors identified simulator scenario examination administration and evaluation as strengths (paragraphs 2.c.2 & 2.c.4).

The inspectors identified walkthrough examination security as a weakness (paragraphs 2.c.3 & 2.e.1).

The inspectors identified examination and remediation documentation as a weakness. The inspectors identified this weakness as Inspector Follow-up Item 50-400/94-14-01 (paragraph 2.d).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

K. Bailey, Licensed Operator Requalification (LOR) Instructor
*J. Bryan, Manager, Simulator Services
*J. Collins, Training Manager
*R. Garner, Manager, LOR Training
J. Johnson, LOR Instructor
*W. Powell, Manager, Operations Training
*R. Prunty Jr., Manager, Licensing and Regulatory Programs
R. Smith, LOR Instructor
T. Toler, LOR Instructor
*M. Wallace, Senior Specialist, Regulatory Affairs
*A. Williams, Operations manager

Other licensee employees contacted included instructors, technicians, operators, and office personnel.

NRC Personnel

*J. Tedrow, Senior Resident Inspector
*D. Roberts, Resident Inspector

*Attended exit interview

2. Licensed Operator Requalification Program Evaluation (71001)

a. Summary

The NRC conducted a routine, announced inspection of the Shearon Harris Nuclear Power Plant Licensed Operator Requalification (LOR) program during the period August 29 - September 16, 1994. The purpose of the inspection was to evaluate the effectiveness of the licensee's LOR program and to assess the licensee's effectiveness at ensuring that the licensed operators satisfy the conditions of their licenses. The report identifies one item as an Inspector Follow-up Item regarding the inconsistent and minimal documentation of both operating examination results and individual remediation program contents. The inspectors reviewed training department procedures, on-the-job-training activity documentation, and training on operator deficiencies. The inspectors observed examination activities and reviewed records of previously administered examinations. From this, the inspectors noted several deficiencies but concluded that the training department was effective in administering written and simulator retraining examinations and evaluating operator performance. No violations or deviations were identified.

b. Examination Development

The inspectors reviewed the licensee's sample plan, examination banks, and examination materials developed for the first three weeks of the annual requalification evaluations. The inspectors found these items to be consistent with the guidelines of NUREG 1021, "Examiners Standards," Revision 7, and the requirements of licensee Training Instructions (TI) except for specific deficiencies discussed below.

(1) Sample Plan and Examination Banks

The inspectors determined the sample plan was adequate to develop a comprehensive and representative examination for the requalification training cycle. However, the licensee's computerized examination database was incapable of cross-referencing a written exam question to a learning objective. The inspectors were unable to verify the specific learning objective for many of the written examination questions. To construct the test, an instructor would query the database based on topic or lesson plan titles. An effective implementation of the systems approach to training method would require construction of a test based on the applicable learning objectives. The licensee indicated that a imminent upgrade of the system was expected to correct this problem.

The inspectors concluded that the size of the examination banks was adequate and that the establishment of separate banks of scenarios for training and testing was a beneficial practice. The Job Performance Measures (JPM) bank contained 145 separate JPMs, 17 of which were alternate path. The inspectors concluded that while this was a generally adequate number of alternate path items, the licensee had not effectively developed many of the alternate path options. The inspectors observed several operators exhibit familiarity with the alternate path of one emergency boration JPM. This was the only JPM in the bank of this type. The operators were therefore knowledgeable that this JPM would utilize a particular procedural path and not the several other options the procedure could have taken. The licensee discussed several options such as altering JPMs prior to administering them and incorporating annunciator response instructions to diversify the bank and alleviate this problem.

The familiarity of the operators resulted from the licensee's practice of releasing the written and JPM examination banks to the operators. Although the licensee was frequently updating the banks when items were used for testing, they could not certify that the entire bank reflected current plant equipment and procedure status. No formal system existed to mandate periodic revisions of the exam bank or to identify and revise questions that were outdated. New questions were not required to be

developed for the examinations. The inspectors concluded that the potential existed for outdated information to cause negative training. The inspectors also concluded that limited scope of alternate path utilization in the JPM bank created the potential for predictable examinations. The release of the banks allowed the students to study examination materials instead of the source documents that their learning objectives were based on.

(2) Written Exams

The inspectors noted that one Part A "Static Simulator" examination had a question that contained information that aided in answering a subsequent question. The licensee did not have any method or requirement for ensuring that two questions of this nature were not used on the same examination and failed to notice the problem in their pre-exam review. The inspectors noted another question had two correct answers due to inconsistent guidance in two procedures. This issue had been previously identified by the licensee two months earlier when the question was used in a weekly quiz. The licensee initiated a change to the procedure but did not have a method to ensure the question was not used again. The inclusion in the annual examination was not noted until after the exam was administered at which time the question had to be deleted.

The inspectors reviewed the written examinations against the guidelines of NUREG 1021 for developing open reference questions. The inspectors noted that problems previously identified in NRC Examination Report 50-400/93-301, regarding easily eliminated distractors that were lists of true\false statements, had been corrected. However, the inspectors observed that many questions annotated as relevant to the static scenario did not require using the simulator to get any information to answer the question and were simple look-ups. The inspectors also noted several problems with the balance of the various distractor choices and with excess information that invalidly assisted the operator in ascertaining the correct answer. The inspectors concluded that the licensee Part A Static Scenario written examinations had room for improvement to fully encompass the guidelines of NUREG 1021.

(3) Simulator Exams

The inspectors noted that each scenario had a variable list of initial conditions and concluded that it was a beneficial practice for ensuring examination validity. One of the proposed scenarios contained a failure of the main turbine to automatically trip, although the scenario required the turbine to be manually tripped on low condenser vacuum. The operators were therefore never aware a malfunction was present. The inspectors concluded this critical task was of minimal testing value.

Procedure TI-207, Section 4.3.4.1, required simulator scenario validation prior to use. No formal system existed for documenting and tracking the validation process although each scenario had a section to document this information. The instructor assembling the exams informally tracked that validation took place and verbally verified that the validation was performed to training management. The inspectors were unable to verify validation of scenarios in the licensee bank due to this lack of documentation.

(4) Walkthrough Exams

The licensee attempted to utilize alternate path and time-critical JPMs as much as possible. However, 12 of the 17 alternate path JPMs in the bank were utilized for this LOR examination which increased the predictability of the examination. The inspectors noted minor discrepancies with unrealistic cues and inappropriate critical steps that were discussed in detail with the licensee training staff. The inspectors also noted that the development of cues for each simulator JPM were very versatile in that each cue was annotated for use on an active simulator or when walking through in the plant control room.

c. Examination Administration

The inspectors observed the training department evaluators and licensed operators during all phases of the examinations administered during the inspection. The inspectors concluded that these activities were consistent with the guidelines in NUREG-1021 and the requirements of the licensee's procedures except for specific items discussed below.

(1) Written Exams

The licensee administered the written examination to all LOR program participants this year. They were not planning to administer a written next year as they convert to a biennial written exam. No discrepancies were noted during administration of the written exams.

(2) Simulator Exams

The inspectors observed that the simulator booth operator's communications with the operators were very realistic and were enhanced by the use of a communications log sheet. This tracked all operator requests for outside support, ensured that the response was in real time, and that a historical perspective was considered. The inspectors concluded this was a beneficial practice. The licensee conducted the scenarios in accordance

with a scripted timetable which contained allowances for deviations if the evaluators noted deficiencies. This was facilitated by the licensee practice of maintaining wireless communications between the lead evaluator and the simulator operator. Simulator setup was very methodical and thorough and included the updating of plant status boards. The licensee always used certified plant Shift Technical Advisors for each crew to enhance realism. The inspectors noted one deficiency with the use of nonevaluated stand-in operators to complete a crew. The licensee did not consider which shift position the stand-in should occupy. This resulted in one stand-in operator receiving four of five critical tasks in a two scenario set. The inspectors concluded that a non-evaluated stand-in operator should be placed in the role where he is likely to have the least responsibility in order to maximize the opportunities to assess the performance of the other operators. The inspectors observed that several scenarios allowed the crews to recover equipment after it had failed. This positive feedback for recovery efforts encouraged the type of performance expected during a real plant casualty. Operators often made persistent efforts to recover failed equipment. Overall, the inspectors concluded that the licensee administration of simulator scenarios was very realistic and was a strength.

(3) Walkthrough Exams

The licensee required all of the evaluated operators to sign security agreements. The licensee did not fully sequester the operators during the walkthrough examinations during the first week of the inspection and relied on the security agreements to ensure the examination contents were not jeopardized. They did this due to the difficulty with administering all of the walkthrough examinations in one day and the logistics of transporting operators between the training center and the plant. When each operator was finished with their walkthrough examination, they were directed to leave the site. The licensee practice did not ensure the contact from one group of operators to the next was prevented. NUREG 1021 did discuss the use of security agreements, but only for licensee staff who acquire specific knowledge about the contents of an NRC-administered examination for validation purposes. The NRC finds it to be an unacceptable practice to use the security agreement as a sole means of positively preventing operators from compromising the examination contents. The licensee fully sequestered all operators following the first week of the inspection. The inspectors concluded the licensee's walkthrough examination security process was a weakness.

The inspectors observed several inconsistencies with the use and validation of time critical JPMs. The inspectors also observed a few isolated instances of inconsistent cuing and improper coaching. The inspectors discussed these discrepancies in detail with licensee training supervision. The licensee's preexamination briefing emphasized that the operator must determine the completion of the JPM and should not expect any feedback from the evaluator to assist in determining if he had fully completed his assigned task. The task scopes were clearly defined to facilitate this, and the evaluators ensured the operator determined the completion of the task.

Seven of twelve operators failed a single JPM during the intervening week of the inspection when the inspectors were not onsite. This contributed to the individual failures of three operators. The inspectors reviewed the licensee's graded results and their corrective actions. The inspectors also observed the reexaminations for two of the failed operators. The JPM in question was conservatively graded. The licensee promptly determined the root cause to be operator unfamiliarity with an emergency procedure attachment. The licensee conducted "Real Time Training" to address the cause immediately following the failures. All licensed operators were required to attend this training. The two operators successfully completed their reexaminations. The inspectors concluded the licensee response was timely and thorough.

(4) Evaluators

The inspectors reviewed the qualifications of the licensee LOR training staff. Five of the six evaluators maintained senior reactor operator (SRO) licenses and most were ex-shift supervisors. Two of them had held this position at other utilities which enhanced the staff's diversity. The licensee utilized a rotation program from their Operations Department so one of the six was a recent transfer from Operations. The extensive backgrounds of the staff were evident during the examination process. The evaluators displayed very good awareness of inconsistencies between crews on similar scenarios. Evaluations were thorough and discussion of weaknesses and root causes was consistently performed. The inspectors concluded the experience and evaluation capability of the licensee staff was a strength.

(5) Operator Performance

The inspectors concluded that licensee operator performance was satisfactory but noted several deficiencies. The simulator crews exhibited consistent communication problems which the licensee evaluators also noted. Board operators often reported alarms but

did not ensure the SRO received the information. Board operators also frequently did not acknowledge orders or provide repeat backs of communications. The SROs did not demand this of their board operators.

The inspectors observed numerous individuals experience difficulty operating the steam dump system when cooling the plant down. Operator control of cooldown rates was erratic which indicated unfamiliarity with the system operation. The licensee evaluators noted the deficiencies and remediated deficient operators where appropriate.

The inspectors also observed a problem with several operators' interpretation of a step in FR-H.1, "Loss of Secondary Heat Sink," which directed the operators to maintain reactor coolant system (RCS) pressure below 1950 psig using the pressurizer power operated relief valve (PORV). One crew left the PORV open permanently causing the RCS to reach saturated conditions while a second crew was reluctant to use the PORV since they were unsure where they needed to maintain pressure. These actions had no direct consequence because the plant was in the process of being aligned for an RCS feed and bleed evolution. The licensee was evaluating if a band should be included in the procedure to set a lower limit on RCS pressure.

The inspectors observed that two of three SROs did not use Operations Procedure (OP) 156.02, "AC Electrical Distribution," to restore the 1A-SA emergency bus following a loss of off-site power to a transformer. This caused several non-critical actions to be delayed or omitted. Use of OP-156.02 was required for recovery actions when electrical power was subsequently restored per guidance in emergency procedure Path-1. The licensee determined the root cause of this was SRO unfamiliarity with the need to refer back to the initial steps of Path-1 where the requirement was located. The licensee covered the deficiency in the crew debriefs at the end of the exam week.

The inspectors observed that the licensee did not have any guidance or expectation on how various operational situations should have been addressed. Two of three crews elected to trip the reactor immediately upon receipt of a condenser low vacuum pre-trip alarm. The third crew waited until the low vacuum trip setpoint was reached. The inspectors observed a similar example when two SROs overclassified a loss of feedwater capability as a Site Area Emergency before attempting to start the main feed pumps. Although this was contrary to previous guidance the licensee had promulgated, the guidance was not permanently incorporated into a procedure or guideline so it's effectiveness was lost over time. The licensee practice was to issue memos to address operational deficiencies. The inspectors verified this

method worked for several problems, but only for the short term. The licensee did not have any method for ensuring these items remain corrected short of procedural revisions. The inspectors concluded the licensee performed a less than satisfactory job at ensuring consistent operations policies were promulgated and permanently enacted. The licensee was considering assembling an Operations Philosophy book to address these situations.

d. Documentation and Remediation

The inspectors reviewed the licensee's training records and procedures for compliance with the remediation and documentation requirements of 10 CFR 55.59(c)(5). The inspectors noted that the licensee did not have specific guidance for developing a remediation program for operators who failed an examination or who were evaluated as deficient. The licensee also did not have specific guidance on what operating examination documentation was required. The licensee's records documented all exam failures by recording grading results and retaining a copy of each examination. The documentation often did not include any discussion of the root cause of the operational deficiency. As a result, in several cases the inspectors were unable to determine the reason a particular critical action was performed incorrectly. The inspectors did find a few instances where an instructor would write a memo detailing an operator's deficiencies. These informal memos were inconsistent in content and quality between instructors. The written evaluations for each operator's examination performance also varied between instructors. The licensee utilized NUREG 1021 competency forms for grading operating tests and as such, did not develop their own guidance for completion of these forms. The comment section of each form was inconsistently utilized. The inspectors reviewed the documentation of an operator who was assigned the lowest possible grade of one for a given competency. The evaluation did not contain any discussion of the operator's actions that warranted that grade.

Although the licensee did document the operator's attendance and completion of a remediation program, they did not include details of the program contents. The inspectors could not verify from the licensee's records that remediation addressed the root cause of a deficiency and was being properly developed. This level of documentation was required to maintain a retrievable history of an operator's specific deficiencies. The inspectors concluded that although the licensee does a very good job of retaining original examination scores and tracking completion of training programs, specific guidance needs to be developed to ensure examination results and remediation are thoroughly and consistently documented. The inspectors identified the licensee's sparse and inconsistent documentation of examination results and remediation programs as a weakness and as IFI 50-400/94-14-01.

e. Licensed Operator Retraining Procedure Review

The inspectors reviewed the various procedures that define the accredited and approved licensed operator retraining program. Activities conducted by the training department were documented in a controlled set of procedures titled "Training Instructions (TI)." The TIs are approved by the Plant Training Section Manager.

(1) 10 CFR 55.49, "Integrity of Examination and Tests," requires that activities which could compromise the integrity of examinations be restricted. To ensure compliance with this requirement general guidance was provided in TI-905, "Proctoring, Security, and Analysis of Examinations." The guidance in TI-905 was applicable for all training programs administered by the training department and was directed at only written examinations. The licensee procedures did not directly address the concerns of maintaining security for simulator or walkthrough examinations. The inspectors concluded this contributed to the weakness in examination security observed during the walkthrough examinations.

(2) The inspectors reviewed licensee requirements for Operations Management involvement in the LOR program. The licensee's proceduralized requirements regarding Operations Input into the LOR program and observation of examinations were minimal and vague. The inspectors observed Operations meetings and interviewed licensee staff and trainees to assess the department's involvement. The inspectors concluded that Operations is adequately involved in the formulation of the LOR program. The licensee was in the process of formalizing the management observation process. The licensee was utilizing Administrative Instruction 11-C, "Evaluation of Instruction and Instructional Materials," when managers observed training. These guides were primarily geared towards evaluation of an instructor's skill. They did not reinforce management ownership of the training programs by soliciting programmatic feedback. The licensee also did not maintain records of management observations so the inspectors had difficulty verifying the frequency of their observations and if their feedback was effectively incorporated into the LOR program. However, the inspectors concluded that the feedback process was effective and resulted in changes to the program based on record reviews and staff interviews.

(3) The inspectors reviewed the licensee's incorporation of contractors and SRO-certified instructors in the LOR program and the tracking of operator attendance against the requirements of TI-200, "Licensed Operator Requalification Program," Revision 9. No discrepancies were noted.

(4) The inspectors reviewed TI-207, "Development & Administration of LOR Examinations," Revision 1, for adequacy. The inspectors concluded that the lack of specific procedural guidance contributed to several of the aforementioned problems, but that the instruction provided generally satisfactory guidance for the licensee to independently administer requalification examinations without relying on NUREG 1021.

f. Simulation Facility

The simulator performed adequately but occasionally experienced problems requiring interruption of the examinations. The licensee was in the midst of an upgrade to a Unix-based computer system. The upgrade was planned for completion in January 1995 and will replace the thermohydraulics, reactor core, containment, and main steam supply models with current state-of-the-art models. Inspectors have noted problems with several of these models and examination interruptions in previous Shearon Harris reports. The licensee stated the upgrades are expected to resolve these deficiencies.

g. On-the-job Training

The inspectors reviewed individual records of control manipulations required under 10 CFR 55.59(c)(3). In October of 1993 the licensee had stopped tracking these manipulations and deleted the requirement from procedure TI-200, "Licensed Operator Requalification Program." The licensee had assumed that since their retraining program was an accredited and approved licensed operator training program based on a systems approach to training, they no longer needed to meet the requirements of 10 CFR 55.59(c)(3). However, this exemption was only applicable if the licensee replaces the requirements with their own training methodology. Since the licensee had not developed an equivalent methodology they therefore resumed tracking the manipulations in the summer of 1994. The inspectors reviewed the records that were regenerated for the dormant period from simulator scenario records. No discrepancies were found in 1994 records. Several items were missing from 1993 records, but the licensee was able to prove the manipulations were completed and restored the tracking records by retrieving simulator scenario records. The licensee was in the process of restoring the tracking requirement to TI-200 at the end of the inspection.

h. License Conditions

Inspectors reviewed the system and records for restoring inactive licenses to active status against the requirements of 10 CFR 55.53. All applicable portions of the regulation were covered by licensee procedure TI-200. The inspector's review of records and interviews with operators did not reveal any discrepancies.

3. Action on previous inspection findings (IP 92701)

(Closed) IFI 50-400/93-301-01, "Failure to Initiate Safety Injection In FR-H.1." This item concerned several crew's reluctance to reinitiate safety injection (SI) in response to a loss of heat sink. This action was specifically directed in Procedure FR-H.1, " Response to Loss of Secondary Heat Sink." The operators were concerned that the SI would cause a feedwater and instrument air isolation that they would have to subsequently manually restore. The inspector reviewed the licensee's response to Operations Feedback Report 93-341 that was generated based on this problem. The inspector determined that the licensee's response was correct in that it directed that SI be initiated regardless of the aforementioned concerns. The inspector also observed three crews perform a loss of heat sink evolution during simulator examinations. All three crews initiated SI promptly in accordance with the FR-H.1 guidance. This Inspector Follow-up Item is therefore closed.

4. Exit Interview

At the conclusion of the site visit, the inspectors met with representatives of the plant staff listed in paragraph 1 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. Dissenting comments regarding the findings below were not received from the licensee.

Item Number	Description and Reference
IFI 50-400/94-14-01	Inconsistent and minimal documentation of operating examination results and individual remediation program contents. (paragraph 2.d)