UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

June 19, 2006

South Carolina Electric & Gas Company
ATTN: Mr. Jeffrey B. Archie
Vice President, Nuclear Operations
Virgil C. Summer Nuclear Station
P. O. Box 88
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC INSPECTION REPORT 05000395/2006010

Dear Mr. Archie:

The Nuclear Regulatory Commission (NRC) conducted the onsite portion of an inspection at your Virgil C. Summer Nuclear Station from May 1-5, 2006. The enclosed report documents the inspection results which were discussed with you and members of your staff at an exit meeting on May 5, 2006.

This inspection was conducted as a result of the high failure rate on the V.C. Summer 05000395/2005301 initial operator license written examination that was administered on January 10, 2006. The purpose of the inspection was to provide assurance that the applicants who had applied for NRC Operators' licenses met all requirements of 10 CFR 55.31, "How to apply." This inspection also reviewed aspects of the licensed operator initial and requalification training programs to determine if the programs were based on a *Systems approach to training* as defined in 10 CFR 55.4 and detailed by NUREG-1220, "Training Review Criteria and Procedures." Detailed observations, assessments, and conclusions are presented in the enclosed inspection report.

The results of this inspection indicate that there is reasonable assurance that the applicants completed the V. C. Summer Reactor Operator (RO) and Senior Reactor Operator (SRO) initial license training programs and met all requirements of 10 CFR 55.31. The results also indicate that your RO and SRO initial license training programs, as well as your licensed operator requalification program, are based on a systems approach to training. The applicants' poor performance resulted from reduced time on the simulator, an inconsistent level of detail in systems lectures, and on-the-job training evaluations that lacked rigor and consistency.

No findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the

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Sincerely,

/RA/

Victor M. McCree, Director
Division of Reactor Safety

Docket No.: 50-395
License No.: NPF-12

Enclosure: NRC Inspection Report 05000395-2006-010

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Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www/nrc.gov/readingrm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Victor M. McCree, Director
Division of Reactor Safety

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NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	05000395
License No.:	NPF-12
Report No.:	05000395/2006010
Licensee:	South Carolina Electric and Gas (SCE&G)
Facility:	V. C. Summer Nuclear Station
Location:	576 Stairway Road Jenkinsville, SC 29065
Dates:	May 1- May 5, 2006
Team Leader:	G. Laska, Senior Operations Examiner
Inspectors:	J. Williams, Senior Operations Engineer (RI) B. Caballero, Operations Engineer R. Pelton, Training Specialist, Reactor Operations Branch Office of Nuclear Reactor Regulation
Approved by:	James H. Moorman, III, Chief Operations Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000395/2006010; 05/01/2006 - 05/05/2006; Virgil C. Summer Nuclear Station; For-Cause Training Inspection.

This for-cause training inspection was conducted by three region-based operations inspectors and one headquarters training specialist. No findings of significance were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Eight of nine applicants failed the written portion of the V.C. Summer 05000395/2005301 initial operator license written examination administered on January 10, 2006. In accordance with NRC Manual Chapter 2515, Appendix C, the Regional Administrator, Region II, authorized performance of this for-cause training inspection in response to the high failure rate. The NRC performed this inspection to determine if the most recent class of operator applicants had successfully completed the V. C. Summer initial operator licensing training program as required by 10 CFR 55.31(a)(4), "How to apply." This inspection objectives also included: 1) Determine if the Reactor Operator (RO) and Senior Reactor Operator (SRO) initial license programs and the Licensed Operator Requalification (LOR) Training Program were established, implemented, and maintained using a Systems Approach to Training (SAT); 2) Assess the competency of SRO Instructors who conduct LOR training; and 3) Assess the effectiveness of initial and continuing training programs.

The inspection team concluded that the most recent class of operator applicants had successfully completed the V. C. Summer initial operator licensing training program as required by 10 CFR 55.31(a)(4). The team also concluded that the RO and SRO initial license training programs as well as the LOR program were based on a systems approach to training. The SRO Instructors who conduct LOR training demonstrated competent behavior. The LOR training program was found to be effective. The applicants' poor performance resulted from reduced time on the simulator, an inconsistent level of detail in systems lectures, and on-the-job training evaluations that lacked rigor and consistency.

No findings of significance were identified.

B. Licensee-Identified Violations

None

Report Details

01 INSPECTION SCOPE

Eight of nine applicants failed the written portion of the V. C. Summer 05000395/2005301 Initial Operator License Examination administered on January 10, 2006. In accordance with NRC Manual Chapter 2515, Appendix C, the Regional Administrator, Region II, authorized performance of this for-cause training inspection in response to the high failure rate. The NRC performed this inspection to determine if the most recent class of operator applicants had successfully completed the V. C. Summer initial operator licensing training program as required by 10 CFR 55.31(a)(4), "How to apply." The inspection objectives also included: 1) determine if the Initial RO/SRO and Licensed Operator Requalification (LOR) Training Programs were established, implemented, and maintained using a Systems Approach to Training (SAT); 2) Assess the competency of SRO Instructors who conduct LOR training; and 3) Assess the effectiveness of initial and continuing training programs.

The team developed an inspection plan based on the guidance of NRC inspection procedure 41500, "Training and Qualification Effectiveness" and NUREG 1220, Rev. 1, "Training Review Criteria and Procedures." The team reviewed documents and interviewed licensee training and operations staff personnel. The team also interviewed eight of the nine applicants.

02 EVALUATION OF INSPECTION REQUIREMENTS (Inspection Plan, 41500, NUREG-1220)

2.01 Verify that the most recent class of operator applicants completed the facility licensee's requirements to allow the applicants to take the NRC Examination to be licensed as an Operator/Senior Operator pursuant to Title 10, Code of Federal Regulations, Part 55.

a. Review the RO & SRO task-to-training matrix to identify the required initial training program curricula. Verify that the training schedule for the most recent license class included the required curricula.

The licensee Task-to-Training Matrix was a Microsoft Access Database that linked RO and SRO tasks to the associated training material. Simulator scenarios (versus classroom lesson plans) were the required training setting material linked to the RO and SRO tasks. A comparison of the Microsoft Access Task-to-Training Matrix curriculum to the actual simulator scenarios which were conducted for the most recent license class (04-01) indicated that the licensee competed training on these required tasks for the nine operator applicants.

A different database, named the Plateau Training Database, identified the optional training setting portion of the RO and SRO curricula. The classroom systems lesson plans for the RO and SRO Initial Training Program were considered an "optional" training setting portion of the curricula since the simulator scenarios identified in the Microsoft Access Task-to-Training Database form the "required" training setting portion of the curricula. A comparison of the Plateau Training Database curriculum list for "optional" classroom lesson plans to the actual classroom schedule indicated that

classroom training on these lesson plans was conducted for the nine operator applicants.

b. Compare program curricula (as listed or described in training procedures and/or accreditation documents) with actual training schedules/rosters. Ensure that there is consistency between initial license classes.

The licensee's requirements for the RO and SRO Training Programs were delineated in NTM Appendix II.3 and II.4, respectively. The Training Program consisted of the following five segments:

Technical Training (this prepared RO applicants for the NRC Generic Fundamentals Examination)
Operating Practices Training (plant systems review and procedures training)
Simulator Training
On-the-Job Training
Audit Exams & Review

The licensee's Microsoft Access Task-to-Training Matrix Database identified the training material (simulator scenarios) that was required for the RO and SRO Training Programs. Additionally, the licensee's Plateau Training Database identified the "optional" classroom lesson plans that were targeted for delivery to the most recent license class.

The team compared the upcoming license class (RO Class 06-01) Plateau Curriculum List for the "Reactor Operator" classification to the most recent RO Class 04-01 class schedule in order to identify whether substantial curriculum changes had been made since the class with the excessive failure rate. The Team identified that several administrative procedures and operating experience items (which had not been conducted for the RO 04-01 class) had been targeted for the RO Class 06-01 class curriculum. (Examples included: 0-RO-SAP-1285, Engr Diagnostic & Analysis Program, 0-RO-SAP-209, Operability Determination Process, 0-RO-SAP-210, Operational Decision Making, 0-RO-SAP-363, FME, 0-RO-SOER-83-3, Inverter Failures, 0-RO-SAP-1100, and Boric Acid Corrosion Control.) The Team did not consider these substantial changes.

The team reviewed simulator scenarios for content and time validation, and compared this to the schedule and completion dates for the scenarios against the attendance sheets to determine if the scenarios were performed in the time allotted. For example on 10/04/2005, the following scenarios were scheduled to be conducted:

RO SIM-W3 S12	Intro to EOPs 2.0 and 3.0 series.
RO SIM-W4 S16B	FT 487 fails, Steam line Break EOP 1.0, 3.0, 2.0, and 1.2
RO SIM-W4 S19B	HTR leak, Stuck Rod, Ejected Rod, EOP 1.0, 2.0, 2.1

Each of these scenarios would take at least 1.5 hours with the exception of the first, i.e., the total run time for each of the last two scenarios listed is two hours. At a minimum, it would take about 5.5 hours to cover all three of these scenarios for one crew. In order to accomplish this training for 3 crews in class 04-01, the training staff would have to

schedule a 16.5 hour day. However, all applicants were scheduled to work the same 8 hour shift.

Scenarios scheduled for 10/07/2005 included:

RO SIM-W2 S6	75% MOL Power decrease due to earthquake, SG A Stm FLO FT-474 fails as is, A MFWP Trip, DRPI coil failure. (Time listed on Guide 2 hrs.)
RO SIM-W2 S7	MOL Reactor S/U 24 hours after trip, SR NI failure low, Loss of 1DB (51BX), Stator cooling R/B Small Steam Leak, Plant Shutdown. (Time listed on Guide 2 hrs.)
RO SIM-W5 S22C	PT-464 and PT-444 Fails, STM Space Break, EOP 1.0, 2.0, 2.1.

At a minimum, these scenarios would require a 15 hour day in order to train the 3 crews. However, all applicants were scheduled to work the same 8 hour shift.

In an effort to further understand this simulator schedule discrepancy, the team reviewed copies of several scenario guidelines to understand what was to be covered and found that the scenario guidelines lacked detail. The scenario guidelines included some training objectives and a list of malfunctions; however, these guidelines lacked detail with respect to expected operator actions, Technical Specifications entered, emergency plan implementation, etc. The lack of detail in the scenario guidelines did not promote consistent delivery of instruction and may have contributed to the applicants' poor performance on the NRC exam with respect to integrated plant operations. Examples of scenarios with minimal detail included the following scenarios scheduled for 10/17/2005:

RO SIM-W3 S14	Intro to EOP 6.0 Series
RO SIM-W3 S15	Intro to FRGS
RO SIM-W5 S25B	Turbine Runback, Station Blackout EOP 6.0, 6.2.
RO SIM-W6 S27C	Inadequate Core Cooling EOP 1.0, 2.0, 14.0, 14.1.
SRO SIM AOP-118.1	Loss of CCW Demo.

c. Interview lead instructors & supervisors to determine how the licensee identifies required lesson plans, scenarios, demos, etc. to fulfill the RO and SRO Initial Training Program requirements.

The team interviewed the Supervisor of Initial Operator Training and the Operations Instructors to determine how training materials were identified for inclusion in the RO and SRO Initial Training Programs. Based on these interviews, there were three inputs to the initial training programs: 1) required training consisting of topics selected for training on-the-job task list, 2) training commitments, such as operating experience, NRC, INPO, etc. and 3) "optional trainig".

The Task-to-Training Matrix is a Microsoft Access Database that links RO and SRO tasks to the associated training material. Simulator scenarios (versus classroom lesson plans) were the primary training setting material linked to most all of the RO and SRO

tasks. These scenarios were the "required" curricula used to fulfill RO and SRO task training requirements.

The classroom systems lesson plans for the RO and SRO Initial Training Program were considered an "optional" training setting portion of the curricula. Since In-depth systems training was a part of the Auxiliary Operator (AO) Initial Training Program previously completed by the applicants to support their qualification as AO. A different Plateau Training Database identifies this "optional" training setting portion, i.e., classroom lesson plans, of the RO and SRO curricula. It is not necessary to provide classroom training on systems identified in the class schedule. The "optional" training material can be modified, i.e., from simulator to classroom to self-study, or cancelled. Consequently, the Program Lead Instructor may add to or delete courses (i.e., lesson plans, scenarios, etc.) from the licensed operator training program curriculum which was identified in the Plateau Training Database. The process used at V. C. Summer, as described above and discussed with instructors and supervisors, made the RO and SRO initial training programs vulnerable to inconsistent delivery from class to class.

d. Review qual cards, attendance records, and activities related to on-the-job training, including reactivity manipulations, to ensure that the training was completed and the required number of hours/weeks on-shift were fulfilled.

The Team reviewed the reactivity manipulations listed on the applicants' 398 forms and verified that they matched with the manipulations on the qualification cards. In several cases, more than the required five manipulations were performed and documented.

The Team reviewed on shift training records including qualification cards, and on shift attendance records. One RO and one SRO applicants' qualification cards and attendance records were reviewed with the following results:

On one applicant's qualification card, 25 Task Performance Evaluation (TPE) items were signed as being completed on September 22, 2005. The licensee later provided a written statement from the licensed SRO who performed these evaluations. The written statement indicated that several of the evaluations had been performed on days prior to 9/22/05 but since the qualification card was not immediately available at that time, the completion signatures were documented on 9/22/05 in an effort to comply with the Operations policy for not backdating signatures.

Furthermore, the SRO performing the evaluations stated "For procedure type TPE's, I typically expect the student to be able to carry out the duties of the qualifying watch station (in this case RO). If the procedure had any Immediate Actions, I would expect the student to be able to carry them out without referring to the procedure. Next, I would read the steps of the procedure to the student and evaluate him on his ability to locate and manipulate the controls as directed. After working our way through a sufficient portion of the procedure, I would quiz the student on some of the bases for particular steps and evaluate his response. Based on my observations of his abilities, and the nature of the task, this could be a fairly quick evolution or might take some time to fully evaluate the student's proficiency at the task." This type of TPE protocol conflicts with industry guidance for the evaluator to not prompt, cue, or otherwise interact with the

applicant being evaluated. Additionally, Attachment 1, Task Performance Evaluation Checklist, of NTM Appendix VII, Enclosure 1, was not completed as required.

One other applicant had 33 on-the-job training (OJT) items which were documented as being completed on September 9, 2005. The licensee later provided a written statement from the licensed operators who performed training on these tasks. The statement went on to explain that the training was actually conducted over a three day period prior to 9/9/2005, but that the qualification card was not immediately available at that time. The completion signatures were documented on 9/9/2005 in an effort to comply with Operations policy for not backdating signatures.

These are additional examples of where the actual training was documented as occurring on a date other than when it was conducted. The team determined that the applicants completed all of the program requirements for the OJT segment even though the documentation was inaccurate.

e. Interview license class applicants to determine whether all the scheduled training material was presented to the class.

The Team interviewed four SRO applicants and four RO applicants about the simulator training, i.e., these applicants were asked to describe a typical simulator training day. The applicants stated that on most days they would receive approximately 2 hours of actual simulator training time. The applicants stated that the remainder of the training day was spent in unsupervised self study while the other crews were on the simulator. The team presented the applicants with the validation time of the scenarios and asked them “How could all of this training be completed on one day?” The applicants stated that if they did not complete the simulator training on the day it was originally scheduled then they would either complete it on the next day or come in on the weekend to make up the training. Simulator training conducted on these extra days was not documented. Virtually all of the minimum required training material for the RO and SRO training programs was identified in the licensee’s Task-to-Training Matrix as simulator scenarios.

The team interviewed applicants and determined that, to best of the applicants knowledge, all required and necessary RO and SRO Training Program content was delivered. However, several RO applicants stated that they did not have any simulator time during the systems refresher training segment to help reinforce systems knowledge gained during this classroom training. Although time on the simulator during the classroom systems refresher segment is not required by the initial RO curriculum, it was provided for previous classes.

Interviews with applicants indicated that certain lectures during RO Class 04-01 were not as “in-depth” as they needed to be for ROs. For example, the abnormal operating procedures (AOPs) and emergency operating procedures (EOPs) lectures were conducted at the LOR level versus the level of depth that would adequately prepare the RO applicants. Additionally, the applicants stated that all systems training was presented at the Auxiliary Operator continuing training level and in their opinion was not sufficient for the licensing examination.

The team determined that the applicants were trained on all of the required and optional training topics, even though the training material was not always presented on the day that it was documented as having been delivered.

2.02 Verify on a sampling basis that the Initial RO/SRO and Licensed Operator Requalification (LOR) Training Programs are established, implemented, and maintained using a Systems Approach to Training (SAT).

10CFR55.4 defines a "Systems approach to training" as a training program that includes the following five elements:

(1) Systematic analysis of the jobs to be performed.
(2) Learning objectives derived from the analysis which describe desired performance after training
(3) Training design and implementation based on the learning objectives
(4) Evaluation of trainee mastery of the objectives during training
(5) Evaluation and revision of the training based on the performance of trained personnel in the job setting.

The team reviewed the licensee's implementation of a systems approach to training (SAT) process and compared it with the guidelines in NUREG-1220, "Training Review Criteria and Procedures." The team reviewed NTM procedures, program curricula, training documentation and conducted interviews with operations and training department managers to evaluate the processes used to implement a systems approach to training. The team attended classroom and dynamic simulator training sessions to assess delivery of training being conducted. The team reviewed the corrective action tracking system, self assessments, and post training effectiveness evaluations to determine how the training programs were maintained current and the adequacy of the processes used to modify the training program content.

The results of this evaluation primarily deal with the initial license operator training program; however, the LOR training program was assessed on a sampling basis. The results of the evaluation are summarized below.

a. Element 1 - Analysis

The team reviewed the task lists for the Control Room Supervisor (SRO) and Reactor Operator (RO) in the Microsoft Access Database Task-to-Training Matrix. These task lists differentiated between tasks selected for initial training, continuing training, and those tasks that had been de-selected and did not require training. Tasks have been added to the task list since completion of the initial job task analysis as required.

One analysis technique used by the licensee makes the RO and SRO Initial Training Programs vulnerable to inconsistent delivery. As described earlier, the Microsoft Access Task-to-Training Matrix Database identifies the training material that is the minimum required curricula for the RO and SRO Training Programs. All of the minimum required RO and SRO tasks are linked to simulator scenarios. The Plateau Training Database identifies the "optional" portion of the RO and SRO curricula, which includes the classroom lesson plans. Since the "optional" training material is not the primary training

material identified in the Microsoft Access Task-to-Training Matrix, instructional methods can be modified in accordance with the licensee's NTM, i.e., from simulator to classroom to self-study, or even cancelled. Consequently, the program lead instructor may add to or delete "optional" training material (e.g., classroom lesson plans,) from the RO and SRO training program curricula. The team determined that this task analysis technique was not well defined and could make the RO and SRO initial training programs vulnerable to inconsistent delivery from class-to-class. Additionally, several data transfer problems (previously identified by the licensee in Primary Identification Program (PIP) (0-C-05-2089 and 0-C-05-2244) involving either inaccurate or incomplete RO and SRO task information occurred during the migration from Taskmaster to the Plateau Training Database.

After reviewing all of the interview and document data in its entirety, the team determined that the licensee's training programs analysis activities fulfill the intent of the analysis element of the 10CFR55.4 definition of a systems approach to training.

b. Element 2 - Learning Objectives

The operator lesson plans contain detailed learning objectives; however, there was not a clear link between these training material learning objectives and the RO and SRO tasks in the licensee's Task-to-Training Matrix Database.

The team also reviewed simulator scenarios and verified that these training materials contained detailed learning objectives. Unlike the classroom lesson plans, the simulator scenarios contained a list of tasks that were covered during performance of the complete scenario.

After reviewing all of the document data in its entirety, the team determined that the licensee's training programs learning objectives fulfill the intent of the learning objective element of the 10CFR55.4 definition of a systems approach to training.

c. Element 3 - Design and Implementation

The licensee performed a Root Cause Evaluation (RCA 06-0171) and identified several causal factors associated with training program implementation that led to the high failure rate on the January 10, 2006, NRC initial license exam, including:

- Shortfalls in resource management and process guidance of the initial license class,
- Failure of licensee management to effectively monitor program health and applicant readiness, and
- The Audit Exam was not used as an indicator of applicant preparation even though five of the nine applicants originally failed the written portion.

The licensee determined that these implementation problems identified in the root cause analysis report were associated with and limited to the initial licensed operator training program and did not impact the licensed operator requalification program.

The team identified that, in general, student training attendance is not individually documented. Instead, the instructor responsible for the training completed an attendance checkoff sheet which was discarded after the attendance information was entered into the training computer system. During the RO 04-01 license class in question, the operator applicants participated in voluntary weekend simulator training sessions for which attendance records were not documented.

The team reviewed copies of several scenario guidelines used in the initial licensed operator training program and found that the scenario guidelines lacked detail. The scenario guidelines included some training objectives/tasks and a list of malfunctions; however, these guidelines lacked detail with respect to expected operator actions, Technical Specifications entered, emergency plan implementation, etc. The lack of detail in the scenario guidelines did not promote consistent delivery of instruction and may have contributed to the applicants' poor performance on the NRC exam with respect to integrated plant operations.

During interviews, instructors stated that the simulator demonstration time for plant systems (which was not provided to the RO class 04-01) was not structured with formal lesson plans and/or approved demonstration training materials.

During interviews, the applicants stated that some lectures during RO Class 04-01 were not as "in-depth" as they needed to be for ROs. AOPs and EOPs were covered at the LOR continuing training level and did not adequately prepare applicants for the written examination. Systems training was presented at the AO continuing training level and was not sufficient to prepare the applicants for the licensing examination.

The team attended two classroom sessions and one simulator session during the inspection. An LOR Classroom Training Session on EOP 14.0, Loss of Heat Sink, was observed. The procedures (EOP-14.0, Rev 15, 11/14/03, EOP-14.1, etc) and the lesson plan (EOP-14.0, Rev 15, 08/31/04) were provided to the students during the instructor presentation. The instructor was adequately prepared, the content was adequate, and the information was well received by the licensed operators.

The team observed a classroom OJT/TPE refresher training session for operations evaluators. The instructor distributed a PowerPoint handout which identified that NTM Appendix VII, Conduct of OJT & TPE, Attachment 1, Task Performance Evaluation Checklist was required to be completed at each task performance evaluation session. The instructor also shared the list of people who were qualified Operations Evaluators and stated that this list was also available in the control room. The instructor was adequately prepared, the content was adequate, and the information was well received by the licensed operators.

After reviewing all of the interview and document data, including the licensee's root cause analysis, the team determined that the licensee's training programs fulfill the intent of the design and implementation element of the 10CFR55.4 definition of a systems approach to training.

d. <u>Element 4 - Trainee Evaluation</u>

The team determined that NTM Requal Procedure NTM II.5 (Rev 9), Section VII.A.5.c, d, & e for Licensed Operators and Senior Operators did not specifically prohibit a licensed operator from returning to shift following a weekly exam failure. This procedure states that a makeup exam must be completed by the end of the next training cycle. When interviewed, the Licensed Operator Training Supervisor stated that licensed operators in fact did not simply return to shift if they were unsuccessful on a LOR exam. The team reviewed documentation associated with a licensed operator who did not pass a weekly LOR exam and determined that the licensed operator was indeed removed from licensed duties, remediated, and retested prior to performing licensed duties. The licensee initiated PIP 0-C-06-0171 Sequence # 25 while the inspection team was conducting this inspection to revise the NTM to reflect actual practice.

During the interviews, some license applicants stated that periodic exams provided to the combined RO and SRO class 04-01 were not challenging, did not include particularly difficult questions, and were not effective tools to prepare for the licensing examination. The team reviewed several of the weekly examinations that were given throughout the systems portion of the RO 04-01 class. This review determined that questions were mainly at the memory level and did not involve integrated plant operations or higher level comprehension/analysis-type questions. Although memory level questions are appropriate at the beginning of plant systems training, higher cognitive level questions involving integrated plant operations should be used towards the end of the systems training and at the introduction to procedures training. The licensee's root cause evaluation report identified the lack of higher cognitive level questions on the RO 04-01 class weekly exams as one of the contributing factors to the high failure rate. The team review of the LOR examinations determined that these exams contained an adequate number of questions at the comprehension/analysis level.

The licensee did not develop written remediation plans for the applicants who failed the audit exam. The remediation for applicants who failed the audit exam was limited to only those items missed on the audit exam. The licensee's root cause evaluation report identified inadequate remediation and failure to retest after the audit exam as a contributing factor to the RO Class 04-01 high failure rate. Additionally, the NTM required an academic evaluation letter to document the justification for allowing operator applicants who had not passed the audit exam to take the NRC exam. This documentation was not completed.

On one applicant's Qualification Guideline Card, 25 Task Performance Evaluations (TPEs) were signed off on September 22, 2005. The licensee provided a written statement from the on-shift licensed operator who performed these evaluations which indicated that the evaluations had been conducted over several days prior to 9/22/05 and that the "actual" date was not reflected on the qual card because it was not immediately available at the time of the TPE. Additionally, the on-shift licensed operator's statement indicated that the 25 tasks completed over the several day period were signed as being successfully completed on September 22 in an effort to adhere to the Operations policy for not backdating signatures.

NTM Appendix VII, Conduct of OJT & TPE, requires NTM Appendix VII, Attachment 1, Task Performance Evaluation Checklist, to be completed for each TPE session conducted regardless of the number of TPE conducted, i.e., the checklist can be utilized

for the observation of more than one TPE. The Task Performance Evaluation Checklist was not completed for any of the RO or SRO TPE.

A TPE evaluator who performed evaluations of RO applicants stated, in a written statement, that the evaluator had read the procedure steps to the applicant being evaluated, terminated the evaluation prior to completion when the evaluator determined that the applicant could adequately perform all remaining steps. i.e., the evaluator held the procedure and read the steps to the person being evaluated. According to NTM Appendix VII, the evaluator is only required to interact with the person being evaluated in the event of personal safety, etc.

After reviewing all of the interview and document data in its entirety, including the corrective actions that have been initiated (PIP 0-C-06-0171, Sequence #25 and PIP 0-C-06-1523), the team determined that the licensee's training evaluation programs fulfill the intent of the training evaluation element of the 10CFR55.4 definition of a systems approach to training.

e. Element 5 - Program Evaluation and Revision

The team reviewed several modifications that had been installed in the plant, and checked lesson material for inclusion. All modifications reviewed were included in lesson material.

The team reviewed the following licensee self-assessments:

SA-04-TN-01 SA-04-TN-02 SA-04-TN-03 SA-04-TN-04

SA-04-TN-05 SA-05-TN-01 SA-05-TN-02

Two of these assessments were conducted to determine if accreditation objectives and criteria were being met; two were conducted to evaluate the effectiveness of corrective actions; and one each were conducted in the areas of OJT/TPE, the effectiveness of management observations of training, and selected training work processes. The licensee's assessment teams reviewed completed management and student observations conducted for all accredited programs, Condition Evaluation Reports (CER) that tracked training action items, and mechanisms used to track and trend management observation action items. CERs associated with the self-assessments were closed and all activities completed.

The team reviewed the Post Training Effectiveness Survey for the last licensed class (SRO-01-01 and RO-03-01). Respondents to the SRO survey were generally satisfied with the program. However, a majority of the respondents wanted increased emphasis on the administrative tasks in the classroom, plant, and on the simulator. The respondents also wanted additional emphasis on SRO supervisory duties. Respondents to the RO survey were also generally satisfied with the program. However, respondents wanted increased training and emphasis on the software programs and capabilities as well as the plant computer systems. Actions to be taken as a result of these surveys were added to existing training related CERs.

Several applicants interviewed stated that the systems training materials were not always kept current. The team reviewed one student handout that had as many as four errata sheets, dating back to January 2003. This indicated that the training materials were not always kept up to date. On 08/04/2005, a CER (PIP 0-C-05-3083) was written to document recommendations provided as a result of an audit by the Quality Assurance department (QA-AUD-200509-0). The detailed condition description states, in part: "due to the dissolving of the training development group and with training instructors being assigned duties outside of training, that a backlog of training feedback items increased from less than 25 items to 144 items for training material changes, and 41 examination questions that require revision." Since these items were typically captured in errata sheets, they could be corrected prior to use if desired. These observations corroborated the applicants contentions.

Although the applicants always received responses to written feedback given to the training department on the conduct of training, several applicants lost interest in submitting written feedback due to unsatisfactory responses. As a result, verbal feedback became the primary feedback method for the RO 04-01 class.

After reviewing all of the interview and document data in its entirety, the team determined that the licensee's plant and training staff use a systematic process to evaluate the effectiveness of the training and qualification programs and to determine and direct the needed revisions. These program evaluations meet the intent of the program evaluation and revision element of the 10CFR55.4 definition of a systems approach to training.

2.03 <u>Verify the competency of SRO Instructors who conduct LOR/Initial Training.</u>

a. Observe two or three of the SRO Instructors actually conduct a classroom and/or simulator session.

The team observed several classroom presentations for initial and requalification topics and two requalification simulator sessions. The instructors appeared to be prepared to teach the subject matter.

The team observed an LOR Classroom Training Session on EOP 14.0 "Loss of Heat Sink," taught by an LOR retraining instructor, and an Initial Classroom Training Session of Fuel Handling being taught by a subject matter expert. No deficiencies were noted.

The team observed a classroom OJT/TPE refresher training session for Operations Evaluators. The instructor distributed a PowerPoint handout which identified that NTM Appendix VII, Conduct of OJT & TPE, Attachment 1, Task Performance Evaluation Checklist was required to be completed at each task performance evaluation session. The instructor also shared the list of people who were qualified Operations Evaluators and stated that this list was also available in the control room.

The classes and simulator sessions observed were conducted in a professional manner and were effective.

b. Compare SRO Instructor training records with Nuclear Training Manual technical & instructional retraining requirements to identify delinquencies.

The requirements of NTM appendix V.2 “Continuing Instructor Training,” Sections 7.C, “Continuing Technical Skills Training,” lists several methods by which instructors were allowed to maintain technical skills. One of the methods to fulfill technical skills proficiency was listed as participation in specific discipline continuing/requalification training program with the provision that credit was given to instructors who presented the material to a related class. NTM technical proficiency requirements did not provide details for instructor in-plant time or completion of examinations associated with the requalifiction training program. “Participation in a requalification program” normally implies that an individual will complete all of the program requirements, including the annual exams; however, the licensee’s operations instructors were not required to take the operator annual written examination or operating test.

The team reviewed the list of qualified instructors and determined that all the instructors who taught RO Class 04-01 were current with respect to NTM technical skills continuing training requirements. The licensee initiated PIP 0-C-06-0283 on 01/25/2006 to identify three operations instructors who became delinquent to complete their LOR weekly exams for cycle 03-11 and 03-12. Although this delinquency did not violate NTM requirements, it did not meet management expectations for timeliness. The licensee’s root cause analysis for the high failure rate in the RO Class 04-01 identified that SRO instructor continuing training was not being accomplished in a manner to meet self-imposed industry requirements. The licensee had previously initiated CER-06-0283 to document and resolve this issue. Planned corrective actions included revising the NTM to include specific requirements for SRO certified instructors in order to maintain technical proficiency consistent with industry best practices.

During interviews, instructors stated that they were required to take only the weekly LOR exams after either attending the requalification classes or self studying the material. Some of the instructors indicated that self-study was being used to fulfill their participation in the LOR training program. Addtionally, the instructor interviews indicated differences between the instructors’ understanding instructor in-plant time requirements, i.e., the number of in-plant hours required did not match up from one instructor to the next.

The team determined that all of the instructors on the qualified instructor list attended the annual Instructional Skills Training, and were current in the requirements for instructional skills.

With the exception of the three instructors that were identified by the licensee (PIP 0-C-06-0283), the team determined that all instructors on the qualified instructor list were current for technical and instructional skills.

c. Identify any delinquent SRO Instructors who have conducted LOR classroom and/or simulator training.

The team reviewed records for instructor continuing training and all instructors were current in this respect.

The team questioned the practice of having instructors review lesson material and then taking only the weekly exams to maintain technical competency. The licensee did not evaluate instructors in all of the different training settings to ensure technical competence for all settings. One CER (PIP 0-06-1071, Sequence #6) was written during the root cause evaluation as an additional corrective action to revise the NTM to include specific requirements for SRO certified instructors that maintain instructor proficiency consistent with industry best practices. The licensee identified the need to revisit, re-establish, and enforce expected plant contact time and participation in LOR classes, simulator, and requalifiction examinations and monitor expected outcomes. The NTM is scheduled to be revised to include actions to be taken if these requirements were not met and how to reestablish active instructor certification.

d. Identify the list of RO and SRO incumbents who are qualified to sign on-the-job qualification card checkouts. Verify that these individuals have received any required initial and/or refresher training.

The team reviewed the list of operators who were qualified as operations evaluators and observed a classroom OJT/TPE refresher training session for operations evaluators. The list of operators who were qualified operations evaluators was available in the control room.

PIP 0-C-05-2740 documented a problem with the Plateau Training Database not reflecting the most recent training codes related to OJT trainers or TPE evaluators. Corrective actions included updating the Plateau Training Database to reflect new qualifications, communicating changes to line organizations, training the line organizations on the Plateau Training Database, updating TPE lists as required, and establishing more guidance in the NTM on maintaining the Plateau Training Database.

e. Interview licensed operators to determine their opinion on adequacy of the training that they received. (instructors' technical knowledge adequate)

During interviews, the applicants stated that some lectures during RO Class 04-01 were not as "in-depth" as they needed to be for ROs. AOPs and EOPs were covered at the LOR continuing training level and did not adequately prepare applicants for the written examination. Systems training was presented at the AO continuing training level and was not sufficient to prepare the applicants for the licensing examination.

The team reviewed the post-training effectiveness survey for the previous licensed operator class (SRO-01-01 and RO-03-01). Respondents to the SRO survey were generally satisfied with the program. However, a majority of the respondents wanted increased emphasis on the administrative tasks in the classroom, plant, and on the simulator. The respondents also wanted additional emphasis on SRO supervisory duties. Respondents to the RO survey were also generally satisfied with the program. However, respondents wanted increased training and emphasis on the software programs and capabilities as well as the plant computer systems. Actions to be taken as a result of these surveys were added to existing training related CERs.

2.04 <u>Verify the effectiveness (and currency) of initial and continuing training programs</u>.

a. Review student feedback for initial and continuing training programs to identify the adequacy of training in providing necessary knowledge and skills.

The team also reviewed the written feedback for the initial RO and SRO license programs and determined that, as the class progressed, the feedback from the students declined. The written feedback from the applicants was targeted to the areas of Generic Fundamentals and the way the courses were sequenced throughout the class.

The team conducted interviews with the recent initial license applicants to determine why there was a gradual decline in feedback that they provided to the training department. Applicants stated that in most cases nothing was done as a result of the feedback and they felt it was not effective to give feedback. (Some applicants stated that they continued to give verbal feedback.)

The team reviewed corrective action documents to determine if training was effective. During 2005 LOR training, the Operations Manager identified that some operators were having problems with boration activities (during a Monday as-found simulator assessment). PIP 0-C-05-3964 was initiated to track the effectiveness of subsequent training that was accomplished to target this operator weakness. The training was documented as effective after eight out of nine crews successfully borated through the blender during a load reduction without receiving a boration deviation alarm. (Scenario LOR-SA-073B during Monday As-Found scenario in the LOR 05-01 cycle)

Another similar post-training effectiveness item related to diagnosing plant conditions/parameters when an RCP has been secured is documented in PIP 0-C-05-2358. The training provided to the LOR crews was subsequently determined by the licensee to be effective when eight of nine crews correctly diagnosed plant conditions and entered EOP-2.0 without being confused by the steam generator levels due to the securing of the RCP earlier in the scenario. (LOR scenario LOR-SA-021B in LOR cycle 03-12 from 6/06/05 to 7/07/05.) Due to a problem with the scenario execution for one crew, the RCP was not secured prior to the LOCA, so they were not presented with an opportunity to diagnose the abnormal condition. Still the acceptance criteria for determining the effectiveness of this training (eight of nine crews) has been satisfied.

Feedback for the continuing training programs appeared to be adequate and effective.

b. Review post-training effectiveness evaluation reports (from license classes that occurred prior to the most recent class) to identify jobs/tasks for which incumbents felt inadequately prepared to perform.

The team reviewed the post-training effectiveness survey for the last licensed class (SRO-01-01 and RO-03-01). Respondents to the SRO survey were generally satisfied with the program. However, a majority of the respondents wanted increased emphasis on the administrative tasks in the classroom, plant, and on the simulator. The respondents also wanted additional emphasis on SRO supervisory duties. Respondents to the RO survey were also generally satisfied with the program. However, respondents wanted increased training and emphasis on the software programs and capabilities as well as the plant computer systems. Actions to be taken as a result of these surveys were added to existing training related CERs.

c. Review recent plant events and Condition Evaluation Reports (CERs) related to training or knowledge deficiencies to identify "holes" or "gaps" in the licensed operator training programs.

The licensee performed a Root Cause Evaluation (RCA 06-0171) for the excessive number of failures on the January 10, 2006 written examination and identified several problems with the implementation of the training program for the nine applicants. The root cause evaluation was thorough. The corrective actions appeared to be sufficient to prevent recurrence.

The team reviewed several lists of CERS obtained by using the keyword searches related to "training", "lack of knowledge", and other related topics . CER PIP-0-C-05-1041 documented an evaluation finding related to inconsistencies in the licensed operator response to plant annunciators. In response to this finding, operations management expectations for annunciator response (as described in OAP-100.4 "Communications") were discussed with each LOR crew as a focus area. The licensee also re-enforced these expectations in the simulator. However, the team observed that some reactor operators in LOR training sessions announced the annunciators to the crew and then handed the Annunciator Response Procedure (ARP) to the Control Room Supervisor whereas other reactor operators read and performed the ARP. The team determined that there were inconsistencies in the way that the ARPs were implemented.

d. Review Training Advisory Committee/Training Review Board meeting minutes to identify how the training programs were used to improve performance.

Decisions and followup actions from operations initial training program training advisory committee meetings were documented in PIPs. The team reviewed the minutes from the Training Advisory Committee/Training Review Board meeting minutes. The minutes from these meetings were determined to be acceptable.

03 MANAGEMENT MEETINGS

Exit Meeting Summary

On May 5, 2006, the team presented the preliminary observations from the for-cause inspection conducted the week of May 1-5, 2006, to Mr. J. Archie, Site Vice President, and other members of his staff. Mr. Archie acknowledged the observations presented. The team confirmed that proprietary information was not provided or examined during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Archie, Vice President, Nuclear Operations
J. Callicot, Supervisor, Craft and Technical Training
A. Cribb, Supervisor Licensing
C. Dickey, Quality Assurance Loanee
S. Furstenberg, Organizational Effectiveness
D. Gatlin, Plant Manager
R. Guerra, Shift Supervisor, Nuclear Training
T. Howell, Supervisor, Simulator
A. Koon, Operations Training Supervisor
D. Lavigne, General Manager, Organizational Development
G. Lippard, Operations Manager
T. Matlosz, Manager, Organizational Development
F. Miller, Jr., Q.S.
G. Moffat, Manager, Nuclear Training
K. Nettles, General Manager, Nuclear Site Services
J. Nolting, Quality Assurance
R. Philen, Quality Assurance
W. Quick, Supervisor, Initial Training
R. Ray, Operations Supervisor
S. Reese, Licensing Specialist
G. Steele, Nuclear Chemistry Lead
R. Sweet, Licensing
Z. Taylor, Training
B. Thompson, Supervisor, Licensed Operator Retraining
D. Watson, Supervisor Training Development
R. White, S. C. Public Service Authority

DOCUMENTS REVIEWED

Nuclear Training Manual appendix II.3 “Licensed Operator Training Program”
Nuclear Training Manual appendix II.4 “Senior Licensed Operator Training Program”
Nuclear Training Manual appendix II.5 “Requalification Program for Licensed Operators and Senior Operators”
Nuclear Training Manual appendix VII “Training Qualification and Conduct of OJT and TPE”
RO 04-01 Class Schedule
SRO 05-01 Class Schedule
Various Simulator Scenarios
Qualification Cards
List of Designated Individuals Qualified to Conduct Task Performance Evaluations
List of Scenarios Run during RO-04-01/SRO-05-01
Simulator Attendance Records
Classroom Attendance Records
Various Tasks from the Task List
RHR AB-7, Rev 16 (09/05) Student Handout
RCS AB-2, Rev 10 (04/02) Student Handout
Rx Makeup AB-5, Rev 9 (01/03) Student Handout
CCW IB-2, Rev 11 (05/05) Student Handout
EFW IB-3, Rev 15 (05/05) Student Handout
SWYD & SUB GS-12, Rev 9 (05/03), Student Handout
ROD CTL IC-5, Rev 8 (06/04), Student Handout
“Fuel Handling Overview” May 2006.
RO-04-01 Systems 2 Examination Version 0 dated 12/2/04
RO-04-01 Systems 4 Examination Version 0 dated 01/07/05
RO-04-01 Audit Examination
SRO-04-01 Audit Examination
Corrective Action Documents:
PIP 0-C-05-1229
PIP 0-C-05-2244
PIP 0-C-05-2089
PIP 0-C-05-3083
PIP-0-C-06-0171
PIP 0-C-06-1523
PIP 0-C-06-0283
CER-06-1517
RCA 06-0171 High Failure Rate on Written Portion of the NRC Initial License Exam, Revs 0,1,and 2.