UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

June 25, 2004

EA-04-120

Randall K. Edington, Vice
President-Nuclear and CNO
Nebraska Public Power District
P.O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - NRC SUPPLEMENTAL INSPECTION REPORT 05000298/2004-011 AND NOTICE OF VIOLATION

Dear Mr. Edington:

The Nuclear Regulatory Commission (NRC) conducted the onsite portion of a supplemental inspection at Cooper Nuclear Station from April 5-9, 2004, and an in-office portion April 12 through May 12, 2004. Inspection debriefs were held onsite on April 8, by telephone on April 14, and May 5, and an exit meeting was held onsite with your staff on May 12, 2004. The enclosed report documents the inspection findings, which were discussed with you and other members of your staff.

The NRC issued a White inspection finding in a letter dated March 24, 2004, "Cooper Nuclear Station - NRC Inspection Report 05000298/2004-009 Biennial Licensed Operator Requalification Inspection - Final Significance Determination for a White Finding." This finding involved a high failure rate on the licensed operator biennial requalification written examinations. The performance deficiency associated with this finding involved the failure to adequately implement the systems approach to training process required by 10 CFR 55.59, “Requalification.” Failure to adequately implement the systems approach to training is notable because training and testing deficiencies resulted in a decline in licensed operator knowledge over time. The NRC found that this decline in operator knowledge was evident in both plant operating experience and biennial requalification examination performance.

This supplemental inspection was conducted to provide assurance that the root and contributing causes of the White inspection finding were understood and to provide assurance that the corrective actions were sufficient to address the causes, and prevent recurrence of the problems. Detailed observations, assessments, and conclusions of the inspection are presented in the enclosed inspection report. The inspection also reviewed aspects of the licensed operator requalification training program to determine if the program was implemented using a systems approach to training as defined in 10 CFR 55.4 and NUREG-1220, “Training Review Criteria and Procedures.”

The inspection concluded that your root cause analyses of the finding was appropriately evaluated and understood. The corrective actions identified as a result of your evaluations addressed the root and contributing causes, and should adequately address correction of the requalification program weaknesses if the corrective actions are consistently implemented. However, the inspection also concluded that your extent of condition and extent of cause evaluations of the high failure rate were not completed at the time of the inspection, and that other areas of the root cause lacked in-depth evaluation, including the adequacy of operator knowledge and the establishment of objective criteria to evaluate effectiveness of the corrective actions. The inspection also concluded that the analysis and evaluation elements of a systems approach to training, described in NUREG-1220, were implemented with significant weaknesses, and that the evaluation element was inadequate during the 2-year requalification program cycle beginning February 2002.

The NRC has also determined that the failure to consistently implement all elements of a systems approach to training in the licensed operator requalification program is a violation of 10 CFR 55.59(c), as cited in the attached Notice of Violation. The circumstances surrounding the violation are described in detail in the subject inspection report. In accordance with the NRC Enforcement Policy, NUREG-1600, the Notice of Violation would be considered escalated enforcement action because it is associated with a White finding, however, since the White finding was previously issued in NRC letter dated March 24, 2004, this Notice of Violation is not considered to be a separate escalated enforcement action.

Nevertheless, you are required to respond to this letter and should follow the instructions specified in the enclosed Notice of Violation when preparing your response.

The NRC also identified one finding that was evaluated under the risk significance determination process as having very low safety significance (Green). The NRC also determined that there was a violation associated with the finding. The violation is being treated as a noncited violation, consistent with Section VI.A of the Enforcement Policy. The noncited violation is described in the subject inspection report. If you contest the violation or significance of the noncited violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Cooper Nuclear Station facility.

In a telephone conversation on June 25, 2004, Anthony Gody of my staff discussed the apparent violation of 10 CFR 55.59(c) with Joe Waid, Training Manager. Mr. Waid indicated that Cooper Nuclear Station declined a predecisional enforcement conference and stated that no written response would be provided prior to issuance of the violation.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Reactor Safety

Docket: 50-298
License: DPR 46

Enclosure:
1. Notice of Violation
2. NRC Inspection Report 05000298-2004011

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ENCLOSURE 1

NOTICE OF VIOLATION

Nebraska Public Power District
Cooper Nuclear Station

Docket No. 50-298
License No. DPR-46
EA-04-120

During an NRC inspection conducted on April 5 through May 12, 2004, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

> Section 10 CFR 55.59(c) provides, in part, that "The requalification program must meet the requirements of paragraphs (c)(1) through (7) of this section. In lieu of paragraphs (c)(2), (3), and (4) of this section, the Commission may approve a program developed by using a systems approach to training." Section 10 CFR 55.4 defines a systems approach to training as "a training program that includes the following five elements. . . ." Element (4) is "Evaluation of trainee mastery of the objectives during training."
>
> Through Generic Letter 87-07 and the licensee's notification dated August 13, 1987, the NRC approved the licensee's requalification program, developed using a systems approach to training.
>
> Cooper Training Program Procedure 201, "CNS Licensed/SRO Certified Personnel Requalification Program," Revision 25, Step 4.1.1 requires that, "Cycle examinations shall be used to evaluate comprehension of training subjects presented during LOR (licensed operator requalification) training. . . ." Step 2.1.7 defines a cycle written examination as, "A written exam to demonstrate proficiency on material covered during cycle(s) training." The licensee divided the biennial requalification training program into 12 training cycles, each of which was approximately 6 weeks in duration.
>
> Contrary to the above, during the biennial requalification program period from February 25, 2002, through January 11, 2004, the licensee's use of cycle written examinations was not adequate to evaluate comprehension of training subjects presented during LOR training. During this biennial requalification program period, the licensee administered a total of three cycle written examinations. Two of the cycle examinations were administered following two cycles of training. The third cycle examination was administered following six cycles of training (a period of approximately 36 weeks) and failed to test comprehension of several training subjects, including, for example, changes to the severe accident management guidelines and modifications to the reactor vessel level control system.

This violation is associated with a White significance determination process finding that was previously issued in an NRC letter of March 24, 2004.

Pursuant to the provisions of 10 CFR 2.201, Nebraska Public Power District is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive,

Suite 400, Arlington, Texas 76011, and a copy to the NRC Resident Inspector at Cooper Nuclear Station of this Notice of Violation, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; EA-04-026" and should include for each violation: (1) the reason for the violation or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice of Violation, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within 2 working days.

Dated this 25th day of June 2004

ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket.:	50-298
License:	DPR 46
Report No.:	05000298/2004-011
Licensee:	Nebraska Public Power District
Facility:	Cooper Nuclear Station
Location:	P.O. Box 98 Brownville, Nebraska
Dates:	April 5 - May 12, 2004
Team Leader	R. Lantz, Senior Emergency Preparedness Inspector Operations Branch Division of Reactor Safety
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Approved By:	Anthony T. Gody, Chief Operations Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000298/2004011; 04/5-5/12/2004; Cooper Nuclear Station; Supplemental Inspection for one White finding in the Mitigating Systems Cornerstone.

The supplemental inspection was conducted by three region-based operations engineers and one headquarters training specialist. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter 0609, "Significance Determination Process." Findings for which the significance determination process does not apply are indicated by the severity level of the applicable violation. 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.

Cornerstone: Mitigating Systems

The NRC performed this supplemental inspection to assess the licensee's evaluation associated with the high failure rate on the November through December 2003 licensed operator biennial requalification written examinations. This performance issue was previously characterized as having low to moderate risk significance (White) in NRC Inspection Report 05000298/2004-009. During this supplemental inspection, performed in accordance with Inspection Procedure 95001, the inspectors determined that the licensee satisfactorily evaluated the White finding, however, the extent of condition and cause review was incomplete. The licensee's evaluation identified the root cause of the performance issue to be inadequate management oversight of the requalification training program standards, policies, and administrative controls regarding the training and examination process.

The White finding associated with this issue will remain open pending future NRC inspection to review the completion of the extent of condition and cause evaluations, and evaluation of the adequacy of the implementation and effectiveness of the identified corrective actions. The issue was identified in the first quarter of 2004, and if the NRC determines that corrective actions were effective, could be removed from consideration in assessing plant performance at the end of the fourth quarter of 2004, in accordance with the guidance in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

Inspector Identified Findings

- WHITE. A violation of 10 CFR 55.59(c) was identified. Specifically, the licensee failed to adequately implement a systems approach to training for licensed operator requalification training during the February 25, 2002, through January 11, 2004, requalification training cycle. Reduction of training on plant systems and technical specifications, lack of periodic examinations to test training effectiveness, examination administration issues, and other failures to follow program guidance resulted in a high failure rate on requalification examinations administered in November and December 2003. The failure rate on the biennial written examination exceeded 25 percent.

Immediate corrective actions implemented by the licensee included remedial training and retesting those operators who failed prior to returning operators to licensed duties. The licensee also conducted a root-cause analysis, identified several programmatic failures, and initiated corrective actions to address those programmatic issues.

Since this violation was associated with the previously issued White finding, described in Section 1R11 of NRC Inspection Report 05000298/2004-009, it is not being considered as a separate escalated enforcement action. (Section 2.05)

- GREEN. A noncited violation of 10 CFR 55.59(b) was identified. Specifically, due to errors in resolution of regrading the 2003 licensed operator requalification biennial written examinations, three licensed operators were returned to licensed duties, but were later determined to have failed their requalification examinations. As a result, remedial training and re-examination was not completed before returning the affected operators to licensed duties.

  The failure to accurately grade the requalification written examinations was a performance deficiency that was more than minor because the licensee did have an opportunity to identify and correct the grading errors prior to returning operators to licensed duties. If this performance deficiency was left uncorrected it could result in inadequately trained or incompetent operators performing licensed duties. The finding is of very low safety significance because it resulted in six operators passing the requalification examination who should have been evaluated as failed. (Section 2.04)

Report Details

01 **INSPECTION SCOPE**

The NRC performed this supplemental inspection to assess the licensee's evaluation associated with the high failure rate on the licensed operator biennial requalification written examinations administered November through December 2003. This performance issue was previously characterized as having low to moderate risk significance (White) in NRC Inspection Report 05000298/2004-009 and is related to the mitigating systems cornerstone in the reactor safety strategic performance area. The licensee's evaluation consisted of:

- Notification 10284648, "High Failure Rate Week 4 LRO Exam"
- Notification 10284833, "Inaccurate Tasks assigned to ROs"
- 2003 Annual Examination Failure Rate "White Paper," incorporated into Significant Condition Report 2003-1966
- Root Cause Investigation Significant Condition Report 2003-1966, "Licensed Operator Examination Failure Rate," Final Revision - 2/24/04, Revision 1
- Cooper Nuclear Station white paper, "Explanation of Review Efforts Related to the Recent Biennial Licensed Operator Requalification Comprehensive Written Examinations Question Modifications: Packages Presented to Region IV on March 22, 2004"
- Examination Question review packages for 13 written examination questions

02 **EVALUATION OF INSPECTION REQUIREMENTS** (95001, 41500, 71111.11B)

02.01 Problem Identification (95001)

a. Determination of who (i.e., licensee, self-revealing, or NRC) identified the issue and under what conditions.

This issue was considered to be self-revealing since it was developed over the course of approximately 6 weeks of administration and grading of the biennial licensed operator requalification written examinations. After several failures during the fourth examination week, the licensee formally reviewed the examination failures and documented their conclusions in a white paper, "2003 Annual Written Examination Failure Rate." This analysis was added as Section C-7 to the root-cause investigation report. Following several failures during the sixth examination week, the licensee initiated the root-cause investigation Significant Condition Report 2003-1966. The causes of the examination failures were documented in the report of this root-cause investigation.

b. Determination of how long the issue existed, and prior opportunities for identification.

Short-Term

The high requalification examination failure rate occurred during the 6-week period of examination administration. All licensed operators who failed their examinations were either retested following one or more weeks of remedial training and returned to licensed duties, or a determination was made by plant management that the license was no longer required.

Prior opportunities to identify and correct the conditions that contributed to the high failure rates were missed both during validation and administration of the examinations, as well as, during the 2-year requalification training cycle activities conducted prior to administration of the examinations.

During validation of the first week examination, it was identified that the 3-hour time limit to complete the examination presented a significant challenge. The inspector's analysis of week one examination results showed an increased percentage of missed questions for the last five examination questions, whereas, this was not observed for subsequent examination weeks where the examination time was extended to 4 hours. A legitimate reduction in failure rate could have been achieved by extending the week one examination time to 4 hours in response to validation comments. Additionally, comments concerning the use of electronic references were not thoroughly addressed to reduce the impact of that factor on examination performance. This was the first requalification examination administered in a 100 percent open-reference format, and the first time that electronic references were provided. The search software was different from that used in the plant control room, and minimal training was conducted on use of the electronic references. Also, more references were available through the electronic reference system than were available by hard copy during past examinations or are normally available in the control room. These factors increased operator stress by effectively increasing the time required to answer each question. When remedial examinations were given after only minimal retraining, examination scores greatly improved, mainly because of to the removal of these stress factors. (Section 2.05 (b) 5.)

Additional stress factors could have been identified and eliminated prior to administration of the examination in subsequent weeks. Some operators stated during interviews that they had been working a night shift just prior to taking their examination. During week six, the operators were split into two groups. The second group was required to wait in excess of 4 hours, sequestered in a room in the training center, until the first group had completed their examinations. Another stress factor the inspectors considered to be relatively minor, but also avoidable, was conducting examinations during the Thanksgiving and Christmas holiday periods. These factors further increased operator stress and demonstrated a lack of consideration for operator fatigue and potential personal family related conflicts.

Long-Term

Root and contributing causes of the high examination failure rate had evolved over the past several requalification training cycles. The root cause was poor management oversight of the requalification training program. Contributing factors included a failure to consistently follow administrative procedures associated with the requalification program, failure to identify marginal performers, reduction of training time spent on plant systems and technical specifications, and failure to periodically test operators to evaluate training mastery and familiarize operators with new examination methods. Plant management had multiple opportunities to identify the degradation of the requalification program as discussed in Section 2.02.c, however, the inspectors concluded that this identification was unlikely due to weaknesses in the fundamental managerial oversight of the training and examination process.

c. Determination of the plant-specific risk consequences (as applicable) and compliance concerns associated with the issue.

The root-cause investigation report acknowledged that licensed operator failure rate on requalification examinations was a potential compliance issue because of the operator licensing significance determination process. The root-cause investigation report did not analyze the plant-specific risk consequences of the high failure rate since the conclusion of the investigation was that performance on this examination was not representative of operator performance. Based on that conclusion, the root-cause investigation report stated that human error probabilities had not significantly changed and, therefore, the high failure rate event would have little impact on risk. The root-cause investigation report did review recent plant events and concluded that a small percentage of those events were related to weaknesses in operator knowledge and skill.

The inspectors concluded that some decline in operator knowledge and skill had occurred. This conclusion is discussed in Section 2.02(b) of this report. The inspectors also concluded that decline in operator knowledge was not a significant contributor to the examination failures, and that an adequate level of operator knowledge had been maintained albeit degraded. One observation supporting this conclusion was the significant improvement in examination scores after minimal retraining and removal of certain examination stress factors. The inspectors reviewed past operating performance and specifically those events, which could be related to operator knowledge weaknesses. Several recent events could be attributed to operator knowledge weaknesses, including a loss of condenser vacuum due to a valve misalignment (May 2003); a reactor power transient due to failure to properly restore a feedwater heater level controller to automatic (July 2003); numerous technical specification violations, tagging errors, and failures to follow plant administrative and operating procedures. Although a decline in licensed operator knowledge could affect the ability of the operators to mitigate the consequences of an event, as well as, increase the frequency of operator error related event initiations, the inspectors concluded that determination of that consequence was not required for investigation of the examination failures, and that the examination results were not sufficiently clear to quantify the decline in operator knowledge and potential effect on plant risk. There was no evidence that a decline in operator knowledge effected overall safe operation of the facility.

02.02 Root Cause and Extent of Condition Evaluation (95001)

a. Evaluation of methods used to identify root causes and contributing causes.

The licensee used a combination of structured root-cause analysis techniques to evaluate this issue including event and causal factors analysis, “Why Staircase,” and the Taproot method. The inspectors determined that the licensee followed its procedures for performing a root-cause investigation.

b. Level of detail of the root-cause investigation.

Overall, the inspectors concluded that the root-cause investigation identified and evaluated the potential contributors to the high failure rate on the requalification examinations in sufficient detail to identify appropriate corrective actions. However, the inspectors identified one area where the investigation lacked sufficient depth to thoroughly evaluate one contributing cause.

The inspectors concluded that the root-cause investigation did not thoroughly evaluate the degree to which a decrease in licensed operator knowledge may have contributed to the examination failures. The root-cause investigation analyzed average operator performance on past examinations, and determined that scores on this examination were much lower for the senior operators than on past examinations. The analysis noted that some core topics had been removed from training and replaced with special or emergent topics, and that cycle quizzes had not been regularly conducted to evaluate the effectiveness of training given during the requalification training cycle. The conclusion of the analysis was that some of the examination failures could be attributed to decline in training on some core topics, combined with ineffective evaluation of student knowledge due to a lack of cycle quizzes. The analysis stated that the increased focus on special topics over core topics on the examinations also created a perception of a more challenging examination. The inspectors agreed with this conclusion, but noted that the analysis should have been more thorough.
The inspectors conducted an independent analysis of examination scores to ascertain how much impact the lack of core topics and periodic examinations had in operator examination performance. The inspectors compared examination scores for those operators, who had received their initial operating license during this requalification cycle to those operators who had been participating in the requalification program for the entire February 2002 through January 2004 cycle. This review showed that the experienced operators’ failure rate on the examination (47 percent) was more than twice that of the newly licensed operators (21 percent). None of the newly licensed reactor operators failed, whereas, 40 percent of the experienced reactor operators failed. The failure rate of newly licensed senior operators (43 percent) was not significantly different than experienced senior operators (50 percent). Average scores for the newly licensed operators were 6.5 percent higher than for the experienced operators. The inspectors concluded that this analysis more fully supported the licensee’s conclusion that some examination failures could be attributed to training and evaluation weaknesses by showing that the requalification program had not maintained operator knowledge.

Following the root-cause investigation, the licensee conducted Quality Assurance Surveillance S201-0401, which identified several additional weaknesses in the root-cause investigation, and initiated four notifications. Two of these notifications concerned administrative requirements and technical errors in the root-cause investigation report (10306458 and 10306460.). Notification 10306457, "SCR 2003-1966 Report Missing an Evaluation," identified that the significant condition report did not evaluate the adequacy of the examination creation and grading process and the potential affects if the process were followed adequately. Notification 10305418, "Generic Procedure Non-compliance," captured the concern stated in the significant condition report that several administrative procedures for training program content and examination development were not followed during the 2-year requalification cycle. The licensee stated that these notifications could result in a revision to the root-cause investigation report.

The inspectors conduced an independent analysis of operator performance during the license operator requalification cycle. As indicated earlier, a number of operator performance issues could be attributed to knowledge deficiencies.

The licensee identified one root cause and six contributing causes for the high examination failure rate:

- Management oversight of standards, policies, and/or administrative controls did not prevent the high failure rate on the comprehensive written requalification examination (root-cause)

- Lessons on core training topics were replaced with specialized topics, resulting in a more challenging examination

- Training supervision and management of the examination development and validation process was limited

- Inadequate change management planning was evidenced by use of unfamiliar electronic references, supervision and management changes, and an inexperienced Training Manager

- Operator cycle examinations were not written to the same cognitive order/level of difficulty as the biennial comprehensive written examination

- Marginal performers in requalification training were not identified

- Examination administration factors increased operator stress

The licensee identified two associated causal factors that were not characterized as contributing causes:

- The formal remediation process was not consistently followed

- Examination validation was ineffective

The inspectors evaluated the root-cause investigation report against the requirements of the licensee's Procedure 0.5.Root Cause, "Root Cause Analysis Procedure," and determined that the root-cause investigation followed the administrative procedure requirements.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

The licensee conducted a key-word search of their corrective action database for the period February 2002, to February 2004. Of 14 events found, 2 were identified as being associated with operator knowledge errors. These events were associated with technical specification usage. The licensee identified one similar prior operating experience event from the Indian Point, Unit 2, which received a Yellow finding for high failure rate on the licensed operator requalification annual operating test (NRC Inspection Report 05000247/2001-013.). The root cause of the failures at the Indian Point, Unit 2, was considerably different than the root cause of the failures at the Cooper Nuclear Station, and the lessons learned from this operating experience would not likely have prevented the high written examination failure rates.

Experience at the Cooper Nuclear Station demonstrated some problems in implementation of both the initial and requalification program, and in the development and grading of written examinations.

For example, during post-examination evaluation and grading of an initial license examination in September 1998, the NRC determined that six of nine license candidates had failed the written examination. Following post-administration analysis and evaluation of feedback from the license candidates, the facility recommended changes to 43 written examination questions. The NRC chief examiner reviewed the recommended changes, accepted 14, modified 4 questions differently than recommended, and rejected the remaining 25 comments as invalid. Following final grading, two additional candidates passed their examination. As documented in NRC Examination Report 50-298/98-301, the NRC concluded that the licensee conducted a poor validation of the written examination prior to submittal to the NRC for review and approval. Subsequently, a meeting was held at the NRC Region IV office on November 30, 1998, for the licensee to address the root cause of the low written examination grades. During that meeting, the licensee staff stated that the root cause was a poor validation effort with several contributing factors, including training material and program weaknesses and failure of management to ensure implementation of a systematic training process, including changes in the class training schedule and lesson content. These training process weaknesses contributed to applicants that were inadequately prepared for the 1998 NRC initial license examination. This experience displayed past weaknesses in examination development, question comment resolution, and management oversight of the training and examination process.

In NRC Inspection Report 05000298/2001-012, the NRC issued a White finding and violation for compromise of the year 2000 licensed operator requalification examinations. These examinations were determined to be compromised by the process

used to validate the examinations, and management oversight was unable to recognize and prevent the compromise, although at least one opportunity had existed. Several training management changes occurred following these events, but were ineffective to ensure adequate oversight of the requalification program.

Potential training program and examination development problems could have been identified earlier in 2003 following the initial license examinations in June 2003. Low examination scores, particularly on the senior operator examinations, could have identified marginal performers from the initial license class, or deficiencies in that training program. As discussed in Section 2.02(b), the senior operators from this initial examination class performed overall at the same level as the experienced senior operators on the requalification written examinations, although the reactor operators from the same class performed much better than the experienced reactor operators.

The inspectors concluded that the licensee had numerous prior indications that their licensed operator training programs were deficient. These deficiencies resulted in a decline in operator knowledge over time. This decline in operator knowledge was apparent in both plant operations and examination performance. Nevertheless, operator knowledge had not declined to the point where knowledge-related operator errors affected overall safe operation of the facility.

d. Consideration of potential common cause(s) and extent of condition of the problem.

The NRC defines Extent of Condition as “the extent to which the actual condition exists with other plant processes, equipment, or human performance.” High failure rates on the requalification examinations is an indication that one training program had not been effective in maintaining operator knowledge. The licensee had not completed a review of the extent of condition for other training programs, but did identify that this deficiency could potentially affect other training programs, such as, non-licensed operator, maintenance, and other technical initial and continuing training programs.

The NRC defines Extent of Cause as “the extent to which the root causes of an identified problem have impacted other plant processes, equipment, or human performance.” The inspectors observed that a corrective action was written to evaluate other training programs for potential similar weaknesses in oversight.

The inspectors concluded that the extent of condition and extent of cause reviews had not been completed and, therefore, could not be evaluated during this inspection.

02.03 Corrective Actions (95001)

a. Appropriateness of corrective actions

The licensee took several immediate corrective actions while the requalification examinations were in progress, which included:

1. All licensed operators, who were initially determined to have failed their respective examinations, were removed from license duties pending successful remediation and retesting.

2. Following the week one examination, Operations Training Procedure 805, "Licensed Operator Requalification Annual/biennial Exam Development," was changed to allow 4 hours to complete the comprehensive requalification written examination

3. Additional hard-copy references were made available after the week one examination based on examinee feedback

4. Following week four, a focused evaluation was performed of the prior weeks' examination failures. Based on this evaluation, additional operators were utilized for examination validation and greater emphasis was placed on evaluation of specific failures for knowledge weaknesses

5. Following week six, the root-cause investigation, Significant Condition Report 2003-1966, was initiated.

One of the licensee's conclusions in the root-cause investigation report was that immediate corrective actions were not effective to reduce the environmental and external factors, which effected examination performance. The inspectors agreed with this conclusion. For example, the action to extend the examination time from 3 to 4 hours could have been taken before the week one examination. Comments during validation of the week one examination indicated that it was a time-limiting examination, and question analysis shows a high percentage of failed questions in the last five examination questions. After the examination was extended to 4 hours starting in week two, failed questions were evenly distributed throughout the examinations. Also, a training session using the electronic reference system could have been conducted prior to taking the examinations to remove some of the difficulties of using the electronic references. The scheduled time and date of some of the examinations could have been changed to reduce examinee fatigue and stress. For example, examinations were given to some operators, who had been working a midnight shift just prior to the examination, and in week six, the operators were split into two groups, with the second group having to wait over 4 hours in a sequestered classroom prior to starting their examinations.

The inspectors determined that corrective actions for the 1998 licensed operator initial written examination validation weaknesses, the 2000 licensed operator requalification written examination compromise, and the 2003 licensed operator initial examination failures were incomplete, in that ineffective management oversight prior to and during those events could have been identified and corrected, to prevent the high failure rate observed on the 2003 licensed operator requalification written examinations.

The licensee's long-term corrective actions included:

1. Change the operations training organization to align with the Entergy Operations, Inc., standard model.

2. Determine the adequacy of the recently instituted job familiarization guides for the operations and operations training managers.

3. Validate that the training program complies with procedural requirements.

4. Proceduralize the involvement of the operations performance improvement committee.

5. Review and revise as appropriate licensed operator task list, and evaluate the effectiveness of the process used to change topics chosen for the requalification training cycle.

6. Formalize the identification and remediation of marginal performers in licensed operator requalification.

7. Formalize the cycle examination strategy to prepare operators for the end of cycle comprehensive examination.

8. Benchmark industry on examination validation, development, and post examination comment resolution practices and modify processes accordingly.

9. Extend the licensed operator requalification training week to 40 hours.

10. Conduct training for Operations and Operations Training management on NRC regulations and guidance for licensed operator requalification programs.

11. Conduct a corrective actions effectiveness review.

The root-cause investigation clearly indicated which corrective actions were identified to address each root and contributing cause. The inspectors determined that the corrective actions associated with the root-cause investigation were responsive to the root and each of the contributing causes identified by the licensee.

b. Prioritization of corrective actions.

The inspectors concluded that the corrective actions were reasonably prioritized. Implementation of a 40-hour training week, training organization and training content revision process changes, and performance enhancing periodic cycle examinations were given the highest priority for longer term corrective actions. A completion date and a responsible manager were assigned for each corrective action, and these were tracked through the corrective action system. The completion dates for each corrective action appeared reasonable.

c. Establishment of a schedule for implementing and completing the corrective actions.

Several corrective actions for the root-cause investigation and associated notifications were not yet completed, as well as the corrective action effectiveness review. The inspectors reviewed the completed corrective actions and concluded that they had been generally implemented successfully and within their assigned completion dates, although one example of failure to follow a corrective action was observed. During the onsite inspection, the inspectors noted that a change to the content of the training program planned for the current week (Cycle three, week one) was being implemented

to include training on a new abnormal Procedure 2.4RR, "Reactor Recirculation Abnormal." However, during interviews with training staff, the inspectors noted that none of the training analysis to support the emergent training had been conducted. The licensee investigated and stated that a training work request had not been written when the need for the emergent training was discussed between the Operations and Operations Training departments on March 3, 2004. Therefore, the inspectors determined that the training content change process that had been established as a corrective action to Significant Condition Report 2003-1966 had not been followed. The licensee wrote Notification 10306525 on April 7, 2004, to address the failure to follow Nuclear Training Procedure 1.1, "Processing Notifications/Training Work Order." The emergent training was postponed, and a training work request was written to invoke the Nuclear Training Procedure 1.1 process to change the planned training content. The inspectors determined that no violation of NRC regulations occurred since the actual training was not effected, immediate actions were taken to follow Nuclear Training Procedure 1.1, and the failure to follow an administrative procedure was entered into their corrective action system.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

The inspectors determined that the root-cause investigation established minimal effectiveness review criteria for determining the future effectiveness of corrective actions. The criteria in the effectiveness review evaluated completion of corrective actions, such as development of Job Familiarization Guides, and implementation of procedure changes, but only evaluated the effectiveness of actions for tracking of marginal performers and implementation of performance enhancing cycle examinations. The effectiveness review did not give criteria to evaluate management oversight, compliance with training program requirements and guidelines, nor a re-evaluation of operator knowledge to ensure any potential decreasing trend had been reversed. The licensee wrote Notification 10312950, "SCR 2003-1966 Effectiveness Review," to document and address the inspector's observation.

2.04 Requalification Written Examination Grading and Validity (71111.11B)

a. Inspection Scope

The inspectors reviewed the 2003 biennial licensed operator requalification examinations to assess the adequacy of the facility licensee's written examinations for requalification. The inspectors reviewed the results of the licensee's re-evaluation of examination grading following post-administration examination comments. These results were assessed to determine if they were consistent with NUREG-1021, "Operator Licensing Examination Standard for Power Reactors," and Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process (SDP)," guidance. This review included examination test results for 46 licensed individuals.

b. Observations and Findings

(1) Examination Grading

Introduction. A Green, noncited violation of 10 CFR 55.59(b) was identified. Specifically, due to errors in resolution of regrading the 2003 licensed operator requalification biennial written examinations, six licensed operators were evaluated as having passed their requalification examinations who should have failed, and three of those licensed operators were returned to licensed duties before completion of remedial training and reexamination.

Description. Following initial grading of the 2003 requalification written examinations in December 2003, the licensee determined that 15 of 46 licensed operators failed their examinations. These results caused the licensee to initiate their root-cause review, and resulted in the NRC identification of the White finding in NRC Inspection Report 05000298/2004-009. In March 2004, the licensee reviewed 6 questions and determined that two licensed senior operators should have been evaluated as having failed their written examinations. Neither of these operators had performed licensed duties since completion of their requalification examinations. One of these senior operators was immediately entered into a remedial training program, then retested satisfactorily. The other senior operator was being processed for removal of his license based on unsuccessful completion of the retraining.

The licensee expanded their review of examination questions and determined that thirteen total questions would require a change in grading from that initially determined after resolution of question comments and analysis. During this regrading effort, the licensee determined that a reactor operator and a senior operator, both of whom had returned to licensed duties, should have failed their examinations. The reactor operator had stood watches from late January 2004 until he was removed from licensed duties due to the regrading on March 10, 2004. The senior operator had stood only two control room watches since his examination. Both of these operators were entered into a remedial training program, retested satisfactorily, and returned to licensed duties.

On April 7, 2004, the inspectors discussed the guidance in NUREG-1021 concerning the validity of written examination questions with members of the training department. Specifically, the inspectors discussed when a question would be considered invalid and therefore would be removed from an examination. Early the following week, the licensee informed the NRC that 1 of the 13 questions had been re-evaluated as required to be deleted based on NUREG-1021 guidance. The licensee also informed the NRC that deletion of this question caused the failure of another senior operator, who had not been performing licensed duties, and that the senior operator had been entered into a remedial training program. This senior operator had not yet completed the remedial training at the time of this report. The inspectors were informed that the senior operator would not perform licensed duties until successful completion of the remedial training and passing of a comprehensive written examination.

The inspectors continued with the in-office portion of the inspection, and conducted an independent review of the licensee's reevaluation of the grading of the 13 requalification examination questions, which they had determined required a change in grading. The

questions included 2 from the week one examination, 5 from the week four examination, 3 from the week six examination, and 1 question each from the weeks two, three, and seven examinations. The inspectors completed their evaluation of the 13 questions on April 14, 2004, and disagreed with the facility resolution on 3 questions. This evaluation resulted in one additional licensed reactor operator failing his examination. This reactor operator had been performing licensed duties from December 2003 through March 10, 2004, when the licensee removed the operator from licensed duties due to marginal performance. The reactor operator was entered into a remedial training program, retested satisfactorily, and was returned to licensed duties. After final evaluation by the NRC and the licensee, a total of 21 out of 46 licensed operators failed their 2003 requalification examinations.

The following is the inspector's resolution of the three questions that the inspectors disagreed with the facility final grading resolution:

- Question 18 of the week four examination asked how core inlet subcooling affected the potential for core flow instability and why core flow instability is undesirable. The facility evaluators chose to accept two answers, 'a' and 'b', as correct. Both of these answers were correct for the first half of the question, but differently answered why the core flow instability was undesirable. The justification for acceptance of 'b' also as an answer was primarily that a reasonably knowledgeable operator could have chosen 'a' or 'b' as the correct answer. Justification was not given as to why 'b' was a correct answer, but rather as to why it may have been interpreted as a correct answer. The inspectors reviewed the question and concluded that choice 'b' was not a correct answer, but was an acceptable distractor with good discrimination value. Choice 'b' involved linear heat generation rate, which was not a limit in itself and, therefore, could not be exceeded. Excessive linear heat generation rates can cause a departure from nucleate boiling ratio limit to be exceeded, which means 'a' is the only correct answer for the question.

- Question 28 of the week four examination posed a hypothetical emergency situation. The question asked what action would be required, and all of the possible answers involved an emergency declaration and some other personnel protective action. The facility evaluators chose to accept two answers, 'a' for an alert, and 'c' for a site area emergency, as correct. The justification given was that during administration of the examination, both the current Revision 31 and the recently superceded Revision 30 of the Emergency Plan Implementing Procedure 5.7.1, "Emergency Classification," were in the examination room and available for use. This was not known during administration of the examination. The licensee evaluated the two revisions for the condition given in the question, and determined that Revision 31 would require an alert declaration, and that Revision 30 would require a site area emergency declaration. Since there was no reasonable method to determine which reference was used by which operator, the licensee recommended accepting both answers. The inspectors reviewed the conditions given in the question and agreed that Revision 30 required a site area emergency. The inspectors disagreed with the licensee's evaluation of Revision 31. Therefore, the inspectors determined that, given the postulated situation, answer 'a' could not be correct.

The inspectors expressed a concern to the licensee that the 10 CFR 50.54(q) process had been used to make emergency action level changes such that conditions that should have been declared at least a site area emergency under Revision 30 of Emergency Plan Implementing Procedure 5.7.1 could now be interpreted as only requiring an alert under Revision 31. The licensee wrote Notification 10308445, "EPIP 5.7.1 Revision 31 - 50.54Q Evaluation," on April 15, 2004, to evaluate the inspector's concern. On April 16, 2004, in a phone conversation with the training manager, the licensee stated that their initial evaluation was incorrect and that the question had no correct answer. The training manager stated that the conditions given in the question should have been declared a general emergency by use of Emergency Action Level 8.4.1. The inspectors agreed with this re-evaluation. The training manager also stated that immediate training was being conducted through the use of required reading in the facility control room, and was being discussed with each crew by facility management as part of the "kickoff" for the third cycle of this requalification training cycle, which began April 5, 2004. The inspectors concluded that the licensee's actions to correct any negative training caused by this examination question were appropriate.

- Question 14 of the week seven examination asked what actions would be required by the Emergency Operating Procedure Flowchart 2A given that the plant was in a steam cooling mode due to loss of all cooling water injection capability. Associated plant conditions for reactor pressure and level were given, and that a leak developed in the reactor equipment cooling system requiring isolation of the non-critical header. The facility evaluators chose to accept two answers: 'a,' which stated no action was required, and 'c,' which was the original correct answer. The justification given to also accept 'a' as a correct answer was, that depending on the interpretation of conditions stated in the question, an operator may read that the reactor equipment cooling system had not yet been isolated and, therefore, no action would be required at that moment in time. The inspectors concluded that although immediate action may not have been required based on that interpretation, the question did not ask for what actions were required immediately, but what actions are required by the Emergency Operating Procedure Flowchart 2A. For the conditions given, regardless of the interpretation of the conditions in the question concerning status of the reactor equipment cooling system isolation valves, the actions that would need to be taken, either immediately or imminently, are 'c' only.

Analysis. The failure to accurately grade the requalification written examinations was a performance deficiency that was more than minor because the licensee had an opportunity to identify and correct the grading errors prior to returning operators to licensed duties and, if left uncorrected, could result in inadequately trained or incompetent operators performing licensed duties. When processed through the Operator Requalification Human Performance significance determination process, the finding was found to have very low safety significance (Green) because it was an operator requalification issue associated with grading of the written examination that resulted in six licensed operators passing the examination that should have failed.

Enforcement. Section 10 CFR 55.59(a) requires, in part, that "Each licensee shall - (1) Successfully complete a requalification program . . . that has been approved by the Commission. . .(2) Pass a comprehensive requalification written examination . . . ." Section 10 CFR 55.59(b) requires, in part, that "If the requirements of paragraphs (a)(1) and (2) of this section are not met, the Commission may require the licensee to complete additional training . . . before returning to licensed duties." The licensee's Nuclear Training Procedure 5.2, "Examination," Revision 19, Step 7.2.2, states, in part, that when licensed operators fail their requalification examinations, "the individual's line supervisor shall be informed immediately and remediation initiated in accordance with Nuclear Training Procedure 5.3, "Remediation." The individual should not be permitted to return licensed duties related to the failure until the remediation is completed and re-examination is successful." Nuclear Training Procedure 5.3, Revision 15, states, in part, "For failures that do impact task or position qualifications the student shall not be allowed to return to shift duties or task performance relevant to the failed evaluation until remedial training and re-evaluation are completed successfully."

Contrary to the above, three licensed operators were returned to licensed duties before being retrained and retested due to failing their requalification examination. Because the finding was determined to be of very low safety significance and was entered into the licensee's corrective action program as Notification 10306947, this violation is being treated as a noncited violation, consistent with Section VI.A of the NRC Enforcement Policy (NCV 05000298/2004011-01).

(2) Examination Validity

The inspectors reviewed the validity of the 2003 biennial licenced operator requalification written examination using guidance contained in NUREG 1021 and determined that both the discrimination and content validity of the examinations were affected.

The inspectors compared the licensed operator biennial written examination questions to the standards described in NUREG-1021. The examination author indicated that the examinations were developed using guidance contained in NUREG-1021, Draft Revision 9, which was publically available as a pilot effort. With some isolated exceptions, the biennial examination questions were well constructed and consistent with the guidance in Draft Revision 9 of NUREG-1021.

With respect to content validity, the inspectors identified one notable issue associated with the overall construction of the examinations not adhering to NUREG-1021 guidance for designation of senior operator only level questions. Many questions that were used on reactor operator examinations would have been classified as senior operator only level questions following the guidance in NUREG-1021. The inspectors observed that the reactor and senior operator examinations were very similar in content and did not differentiate between license levels. The senior operator examinations appropriately tested senior operator topics as required by 10 CFR 55.59(a)(2)(I) and § 55.43. However, the reactor operator examinations also tested a sample of § 55.43 topics in addition to the required § 55.41 topics.

The inspectors reviewed licensed operator job and task analysis, learning objectives, and examination bank items for the reactor operator and senior operator positions. The inspectors observed that the licensed operator requalification training (LORT) objectives were substantially identical for both license levels. In each of the 30 question examinations, the first 25 questions were common to both reactor operator and senior operator examinations, with the last 5 questions specific to the license level. However, a review of the reactor operator examinations found questions that addressed topics identified in 10 CFR 55.43, which are specific to the senior operator license level. Examples include questions on refueling operations, emergency plan classifications, in-depth technical specification interpretations, and operability determinations. The inspectors acknowledged the licensee's philosophy on the advantages of training the reactor operator and senior operator to the same license level. Nevertheless, learning objectives and test items not based on the job performed in the plant lead to an examination that is less content valid based on a loss of operational validity. NUREG-1021 states that content validity is one of the qualities necessary for an examination to be an effective evaluation and measuring tool of training mastery, and that operational validity means the test item should address an actual or conceivable mental or psychomotor activity performed on the job. The inspectors determined that due to the similar objectives for both positions, and the development of examinations based on those objectives, that the resultant reactor operator examinations had reduced content validity.

With respect to discrimination validity, the inspectors found a number of factors, which impacted the ability of the examinations to discriminate at the minimum level of knowledge required. These factors included examination timing, reference material familiarity, and other stress factors. The inspectors found that in each case, these factors resulted in a decrease in operator performance on his/her examination. As a result, most operators would have performed better on their examination had those factors been eliminated. Additionally, the inspectors concluded that, since the examination questions were adequate and no examination administration factors improved examination performance, no operators with inadequate levels of knowledge would have passed the examination if grading issues had not occurred.

2.05 Evaluation of Systems Approach to Training Process (41500)

a. Inspection Scope

The inspectors evaluated the effectiveness of the licensee's training and qualification programs using NRC Inspection Procedure 41500, "Training and Qualification Effectiveness." The inspectors 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 inspectors conducted interviews with operations and training department managers, licensed operators, and members of the training staff to evaluate the administration of the written examinations, use of trainee feedback, and general perceptions of the requalification training program. The inspectors attended classroom and dynamic simulator training sessions to assess delivery of training lesson content, as well as observe student feedback and response to the training being conducted. The inspectors reviewed recent plant events and industry experience to assess the adequacy of the licensee's process for maintaining the

requalification program content up to date. The inspectors evaluated the process used to identify weaknesses in licensed operator performance and modify the training program content accordingly. The results of this evaluation are summarized below.

b. Observations and Findings

Introduction. The inspectors identified a violation of 10 CFR 55.59(c). Specifically, the licensee failed to adequately implement a systems approach to training-based licensed operator requalification training program, which resulted in a decline in operator performance. The finding associated with this violation was previously identified in NRC Inspection Report 05000298/2004-009, and was previously determined to be of low to moderate safety significance (White).

Description. The inspectors evaluated the licensee's use of the five elements of a systems approach to training in the implementation of the licensed operator requalification training program. The following are the inspectors' observations and conclusions of that evaluation:

1. Element 1 - Analysis

Based on information obtained from interviews, root-cause investigation report Significant Condition Report 2003-1966, evaluation of the performance on the biennial examination, and other documents listed in the attachment to this report, the inspectors concluded that the analysis element of the SAT process was implemented inconsistently, with significant weaknesses.

Root Cause Investigation Report Significant Condition Report 2003-1966 was consistent with the inspectors' observation that emergent topics were added to LORT schedule by removing or reducing the scope of previously scheduled training on operator core topics such as plant systems, technical specifications, and other job task related training. Requests for training by the operations department and other facility organizations resulted in changes to the planned training for licensed operator requalification. The licensee indicated that the changes were implemented without following Nuclear Training Procedure 1.1, "Processing Notifications/Training Work Orders." Nuclear Training Procedure 1.1 required a formal request for the training to ensure that a process was initiated for analyzing the requested training for job relevance and importance, but did not require the licensee to perform a comparison to previously scheduled training, and evaluate the potential impact on LORT effectiveness. Correction of the failure to evaluate the impact to the previously scheduled training, as well as strengthening management involvement in this process, was a fundamental corrective action identified in the licensee's root-cause investigation report. Nevertheless, the inspectors observed an example of failure to use the revised process during the onsite inspection, which was previously described in Section 2.03 (c) of this report.

The inspectors reviewed Administrative Procedure 0-CNS-47, "Performance Improvement Committee," and performance improvement committee meeting minutes covering the 2-year requalification training cycle. The inspectors determined that, contrary to the guidance in Procedure 0-CNS-47, neither the performance improvement committee's involvement in originating the LORT schedule nor the committee's use of in-plant performance problems as an input to the LORT program were documented in their meeting minutes. Based on the number and type of changes made to the program with no justification, the inspectors concluded that the performance improvement committee was not effective for ensuring that modifications to the requalification training program were appropriately reviewed and implemented.

The inspectors concluded that the process for revising the requalification training program objectives and content based on emergent training needs had not been implemented adequately nor consistently, and was a significant weakness in the analysis element of the systems approach to training.

2. Element 2 - Learning Objectives

The inspectors reviewed the construction of learning objectives from the job tasks analysis. The inspectors noted that job tasks for reactor and senior operators were not significantly differentiated. This was most notable in the use of technical specifications and emergency operating procedures. Associated skills and knowledge required to perform those tasks were adequately identified, and appropriate learning objectives were developed from those defined knowledges and skills. The learning objectives were then used to develop training material, and then logically grouped together to form lesson plans and student training materials.

The inspectors concluded that this element of the SAT process was being used effectively, even though the input from the job task analysis was flawed, which resulted in development of reactor operator learning objectives at the senior operator level.

3. Element 3 - Design and Implementation

The review of the design and implementation of LORT was found to be in conformance with the guidance of NUREG-1220. It should be noted that Element 3 is focused on the design and implementation of training as it was derived from Elements 1 and 2. Effective implementation of Elements 2 and 3 will not result in an effective overall implementation of the LORT program if the initial training needs analysis, Element 1, was ineffectively implemented.

Operators stated that since the 2003 requalification written examinations, training had become much more regimented. Operators know what training is planned and when the training will be presented. Having a firm schedule allows operators to review the topic and identify areas where they believed the instructor should focus the lesson. Operators believed that adhering to the approved cycle training schedule more effectively prepares the operators for the examinations and resulted in better training on plant system and improved plant operations.

4. Element 4 - Trainee Evaluation

The inspectors agreed with the root-cause report, which identified several deficiencies in the area of student evaluations. The report stated that over the 2-year requalification training period there were only 3 cycle written examinations given. The licensee divided the biennial period into 12 training cycles, each approximately 6 weeks in duration. Training Program Procedure 201, "CNS Licensed/SRO Certified Personnel Requalification Program," Revision 25, Step 4.1.1 states that, "Cycle examinations shall be used to evaluate comprehension of training subjects presented during LOR training..." Step 2.1.7 defines a cycle written examination as, "A written exam to demonstrate proficiency on material covered during cycle(s) training. Typically administered every other cycle." Had the licensee administered cycle examinations typically every other cycle, approximately 6 cycle examinations would have been administered over the 2-year requalification period.

The inspectors reviewed the timing and content of the three cycle examinations against the topics that were trained on for that cycle examination. The first and second cycle examinations were given after completion of two training cycles, and tested on the topics conducted during each respective two training cycle period (a period of approximately 12 weeks.) The third cycle examination was given after completion of six training cycles (a period of approximately 36 weeks). The inspectors determined that several of the topics that were covered during training in that 36 week period were not evaluated during the third cycle examination. Examples of these topics included changes to the severe accident management guidelines and modifications to the reactor vessel level control system. The cycle examination contained 20 multiple choice questions, the majority of which asked emergency operating procedure and technical specification questions. The licensee's root cause investigation also concluded that "the three cycle examinations did not adequately assess the students abilities and weaknesses. . . ."

The inspectors concluded that failure to administer comprehensive cycle examinations on a regular, periodic basis that test on the topics covered in training, as described in Training Program Procedure 201, had a significant impact on the effectiveness of the LORT. First, not having an examination could reduce student motivation to learn the material being presented in the classroom. Second, the SAT process requires a mechanism whereby the students' mastery of the training content can be assessed. This assessment of mastery should be used to provide feedback into the training program to retrain on weak areas identified through periodic evaluations. This is particularly important when new equipment is installed in the plant or where existing equipment is modified. Third, without routine examinations, the training staff can neither detect generic knowledge weaknesses nor can they identify individuals with consistently marginal or unsatisfactory performance and effectively use remedial opportunities. The inspectors determined that the failure to routinely evaluate mastery of training topics was an important contributor to a declining fundamental knowledge and skill level among the licensed operators.

During interviews, several operators stated they needed additional training to improve test taking skills. Operators stated this written examination was challenging, fair, and a valid discriminator of operator knowledge. Challenges faced by the operators to display

that knowledge included examination references provided in more than one electronic format and an unfamiliar reference search software. Operators also stated that cycle examinations and quizzes should be in a format similar to that used for the biennial written examination.

During interviews with the inspectors, many of the licensed operators stated that basic operator knowledge had degraded over the 2-year biennial LORT cycle due, in part, to the loss of core topics in training and that this degradation was a contributing factor to the poor performance on the biennial written examination. The inspectors determined that the station did not have a process for identifying historical marginal performers. Marginal performers should be identified and reviewed in an effort to identify and remediate general knowledge and ability weaknesses in order to improve station performance. This was also identified in the licensee's root-cause investigation.

The inspectors concluded that the requalification program was inadequate in evaluation of the effectiveness of training. This deficiency led to the failure to identify marginal performers, as well as a failure to properly prepare the competent operators to successfully pass their examinations. The ability of the examinations to discriminate was also affected, as seen in the reduction of content validity in the reactor operator examinations, which tested knowledge outside of the job tasks of the reactor operator. The inspectors also concluded that although the evaluation element of a systems approach to training was implemented inadequately, the licensed operators on shift had maintained an adequate level of knowledge to safely operate the plant.

5. Element 5 - Program Evaluation and Revision

The inspectors assessed the effectiveness of the facility process for revising and maintaining its licensed operator continuing training program current, including the use of feedback from plant events and industry operating experience. Overall, the inspectors determined that Element 5 guidelines for program evaluation and revision were being met. The inspectors based this conclusion primarily on information obtained from interviews with operations and training staff, and plant management personnel. The inspectors also compared the implementation of the remedial training program to the guidance in Nuclear Training Procedure 5.3, "Remediation," Revision 15. The inspectors also evaluated the training to be presented during the current examination cycle to ensure that knowledge and performance weaknesses identified during previous training cycles are addressed.

Information from plant events and industry operating experience was typically incorporated into continuing training in a timely manner. Significant plant events were routinely duplicated in the control room simulator shortly after their occurrence. In many instances, training on events was conducted during the same training cycle in which the event occurred. Operators also indicated that information presented during continuing training appeared to be current. Operators further stated that they received responses from the training department shortly after submitting feedback concerning other aspects of the training program. The inspectors concluded that the facility process used for maintaining the licensed operator continuing training program current appeared to be effective.

Interviews with operators and senior operators indicated that remediation performed following the last examination was conducted in several formats. Remediation was primarily self-study of weak areas identified during the post-examination review, followed by the remedial examination. For the majority of the operators who failed their examinations, this level of remediation was adequate to pass the remedial examination. The inspectors determined that the most significant aspect of this remedial training was to remove certain examination stress factors associated with the electronic references and examination techniques in an open reference format examination. The inspectors further concluded that this observation supported the conclusion that operator knowledge level had been maintained adequately to support safe operation of the facility.

As additional examination failures occurred and more management attention was given to the requalification examination results, standard remediation escalated to include classroom presentations of general areas of weakness, practice examinations, and an audit examination, prior to administration of the retake examination.

For the few operators that did not pass their remedial examination, a more focused remedial program was developed, tailored to specific areas of weakness. One operator stated that without personal development of a course of study, he would have also failed his second remedial examination. The inspectors determined that remediation activities followed the guidance contained in the licensee's Nuclear Training Procedure 5.3, and were effective in preparing operators for a retake of the examination.

Analysis. The failure to adequately implement a licensed operator requalification training program based on a systems approach to training was associated with the White finding described in NRC Inspection Report 05000298/2004-009. The inspectors concluded that failure to implement a systems approach to training in licensed operator requalification resulted in the high failure rate observed during the comprehensive biennial written examinations. These factors are described in detail in Sections 2.01 and 2.02 of this report. The significance determination process analysis for the high failure rates is described in Section 1R11 of NRC Inspection Report 05000298/2004-009.

Enforcement. Section 10 CFR 55.59(c) provides, in part, that "The requalification program must meet the requirements of . . . a program developed using a systems approach to training." Section 10 CFR 55.4 defines a systems approach to training as "a training program that includes the following five elements: . . . ." Element 4 is "(4) Evaluation of trainee mastery of the objectives during training."

Contrary to the above, from February 25, 2002, through January 11, 2004, the licensee failed to implement a training program for licensed operators that consistently included Element 4 of a systems approach to training. Examples of Element 4 failures include lack of periodic examinations to evaluate student mastery of training topics, failure to identify and retrain marginal performers, and reactor operator examinations that tested senior operator objectives, which reduced the examination's content validity. The licensee took immediate corrective actions to remove from licensed duties, retrain and retest those operators who had failed their examinations. The licensee also took interim corrective actions to identify training program implementation weaknesses and marginal performing operators, as well as improve management training and focus management

oversight of the requalification program. The inspectors determined that the interim corrective actions taken were adequate and that based on these actions, the finding and violation is not an immediate safety concern. The licensee has entered this issue into its corrective action program as Notifications 10284833 and 10284648 (VIO 05000298/2004011-02). Since this violation is associated with the escalated enforcement action issued with the White finding in NRC letter dated March 24, 2004, this violation is not considered a separate escalated enforcement action.

03 MANAGEMENT MEETINGS

Exit Meeting Summary

On April 8, April 14, and May 5, 2004, the inspectors presented the preliminary observations from the supplemental inspection in progress. On May 12, 2004, the lead inspector presented the preliminary results of the inspection, conducted April 5 through May 5, 2004, to Mr. R. Edington, Vice President, and other members of his staff. Mr. Edington acknowledged the observations presented. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Ashbridge, Senior Operator
M. Barton, Instructor
W. Baruth, Senior Operator, Operations Support Group
R. Carlson, Licensed Operator Requalification Instructor
K. Chablis, Operations Manager
J. Christenson, Director, Nuclear Safety Assurance
J. Domino, Reactor Operator
T. Donovan, Instructional Technologist
T. Doray, Instructional Technologist
R. Edington, Vice President - Nuclear Energy and Chief Nuclear Officer
P. Flemming, Manager, Risk and Regulatory Affairs
B. Gilbert, Senior Operator, Operations Training Supervisor (Classroom)
S. Hoff, Reactor Operator, Operations Support Group/Auxiliary Operator mentor
M. Holmes, Shift Manager, Operations Training Liaison
R. Jacobs, Senior Operator, Work Control Supervisor
T. Knapp, Support Clerk, Operations Training
H. McDaniel, Instructor
S. Minahan, Acting Site Vice President
E. Murray, Reactor Operator
K. Nosbisch, Senior Operator, Work Control
T. Ratzlaff, Senior Operator, Work Control
J. Roberts, Regulatory Affairs
M. Schaible, Assistant Operations Manager
T. Slenker, Crew B Shift Manager
D. Tune, Superintendent, Operations Training
D. Van Der Kamp, Licensing Engineer
J. Waid, Manager, Training
D. Werner, Supervisor, Simulator Training

ITEMS OPENED AND CLOSED

Opened and Closed

50-298/2004011-01	NCV	Errors in written examination grading resulted in six operators passing who should have failed, three of which were returned to licensed duties. (Section 2.04)

Opened

50-298/2004011-02	VIO	Failure to maintain a systems approach to training led to high failure rates on the biennial requalification examinations. (Section 2.05)

DOCUMENTS REVIEWED

NRC Inspection Report 05000298/2004-009, "Cooper Nuclear Station - NRC Inspection Report 05000298/2004-009 Biennial Licensed Operator Requalification Inspection - Preliminary White Finding," dated February 11, 2004.

NRC letter dated March 24, 2004, "Cooper Nuclear Station - NRC Inspection Report 05000298/2004-009 Biennial Licensed Operator Requalification Inspection - Final Significance Determination for a White Finding."

02.01 Problem Identification (95001)

Administrative Procedure 0.5, “Conduct of the Problem Identification and Resolution Process,” Revision 46

Administrative Procedure 0.5.PIR, “Problem Identification, Review, and Classification,” Revision 16

Nuclear Training Procedure 1.1, “Processing Notifications/Training Work Orders,” Revision 7

02.02 Root Cause and Extent of Condition Evaluation (95001)

Administrative Procedure 0.5.Root-Cause, “Root Cause Analysis Procedure,” Revision 3

02.03 Corrective Actions (95001)

Notifications

10306525, “Failure to Initiate TWO results in Delay,” April 7, 2004
10306788, “Operator Knowledge Documentation,” April 8, 2004
10308445, “EPIC 5.7.1 Rev 31 - 50.54Q Evaluation,” April 15, 2004
10303733, “Revise N.T.P. 5.2 (Examination),” March 26, 2004
10305418, “Generic Procedure Non-compliance,” April 2, 2004
10306142, “LO Not Qualified to Stand Watch,” April 6, 2004
10306457, “SCR 2003-1966 RXT Missing an Evaluation,” April 7, 2004
10306458, “SCR and Notification Content Mismatch,” April 7, 2004
10306947, “Question Given Credit When Not Warranted,” April 8, 2004
10308379, “SRO Failed Biennial Exam,” April 15, 2004
10308382, “RO Failed His Biennial Exam For 2003,” April 15, 2004
10308453, “LORT 2003 Exam Answer Changes,” April 15, 2004

CAP Work orders

All work orders associated with Significant Condition Report 2003-1966, including: 4350089-91, 4350887, 4362326-35, 4362339-45, 4363892, 4368110.

4375028, “Revise O-CNS-47 to include the information in the job familiarization guides for the training and operations managers.”

2.04 Requalification Training Program (71111.11B)

Training Program Procedure 201, “CNS Licensed/SRO Certified Personnel Requalification Program,” Revision 25

Operation Training Procedure 805, “Licensed Operator Requalification Annual/Biennial Exam Development,” Revision 6

Operation Training Procedure 808, “Open Reference Examination Test Item Development,” Revision 0

2003 Licensed Operator Requalification Biennial Written Exam Questions 1243, 16516, 19227, 6017, 16569, 19353, 19330, 10629, 5929, 1684, 20060, 19935, and 8842

2.05 Evaluation of Systems Approach to Training Process (41500)

Nuclear Training Procedures

1.0, “Conduct of Training,” Revision 16
1.15, “Performance Analysis”, Revision 4
2.0, “Analysis,” Revision 4
2.3, “Task Analysis”, Revision 6
3.2, “Test Item Design,” Revision 14
4.2, “Examination Development”, Revision 15
5.0, Implementation, Revision 5
5.2, “Examination,” Revision 19
5.3, “Remediation,” Revision 15
6.1, “Feedback Process,” Revision 15

Procedure 0-CNS-47, “Performance Improvement Committee,” Revision 13
Administrative Procedure 0.10, “Operating Experience Program,” Revision 17
2002-2003 Licensed Operator Requalification Cycle Master Exams
2003 Licensed Operator Biennial Exams
2003 Licensed Operator Requalification Training Scenario Matrix dated 4/6/2004
2003 Licensed Operator Requalification Written Exam Master Sample Plan
2003 Training Department On-Going Self-Assessment Reports
2003 Biennial Exam Test Item Analysis
2004 Training Performance Indicators
Benchmarking Trip Reports (various)
Instructor Continuing Training Attendance Sheets

Lesson Plans

(various) for instructor continuing training
“Battery Explosion,” SKL051-51-59, Revision 9
“Safety Function Determination,” INT-007-06-05, Revision 5
“Feedwater and RVLC,” SKL012-42-32, Revision 21
“OPS Technical Specifications 3.4,” RCS INT007-05-05, Revision 6
“Reactor Recirc,” COR022202 R19-L-RR, Revision 19,
“CNS Abnormal Procedure RR,” INT032-01-24, Revision 3,
“Containment,” OTH 015-03-02, Revision 0
“Conditions Adverse to Quality,” ESP00010126, Revision 0
“Accredited Training Program Reviews,” ADM 0160103, Revision 1
“SAT for Managers and Supervisors,” BET 7276, Revision 0
“Tailgate Training - RRMG Exciter Brushes”
Licensed - STE Personnel Requalification Cycle 02-16 Training Package
Management Observations of Licensed Operator Requalification Training
Operations Department Improvement Plan
Performance Improvement Committee meeting minutes (2001-2003)