

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION REGION IV

NRC Inspection Report: 50-285/92-34

Operating License: DPR 40

Licensee: Omaha Public Power District (OPPD)
444 South 16th Street Mall
Mail Stop 8E/EP4
Omaha, Nebraska 68102-2247

Facility Name: Fort Calhoun Station (FCS)

Inspection At: FCS site, Fort Calhoun, Nebraska

Inspection Conducted: December 7-11, 1992

Inspector: J. E. Whittemore, Reactor Inspector, Plant Support Section
Division of Reactor Safety

Approved:

T. F. Stetka
T. F. Stetka, Chief, Maintenance Section
Division of Reactor Safety

12-23-92
Date

Inspection Summary

Areas Inspected: Routinely, announced inspection of the facility licensed operator training (requalification) program including administrative controls, response to plant modifications, response to industry and plant events, response to changing administrative or license requirements, and training staff performance. The inspection also reviewed the program performance in identifying and responding to poor operator performance.

Results:

- o The licensee's program for assuring the continued competence of licensed operators was performing well. (paragraph 1.6)
- o The instructional staff was capable and experienced, with the majority holding a senior reactor operator license for FCS. (paragraph 1.1)
- o A cooperative relationship existed between the operations and training organizations, which resulted in a beneficial teamwork approach to resolving training issues. (paragraph 1.4)

Summary of Inspection Findings:

- The licensee intended to temporarily reduce the instructor staff for the initial and licensed operator training programs by a total of two personnel. The licensee indicated their intent to monitor this matter to assure that there was no impact on program effectiveness. (paragraph 1.1).
- A potential to compromise examinations was identified, in that the license's procedures for developing written examinations allowed excessive use of identical questions on back-to-back examinations. However, there was no indication that examination compromise had occurred and the licensee initiated action to revise the procedure. (paragraph 1.3).

Attachments:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 LICENSED OPERATOR TRAINING (41701)

This inspection involved a review of the performance of the FCS licensed operator (requalification) training program which is required by the regulations in 10 CFR Part 55. The review was conducted to determine if various processes within the program would respond correctly to industry and plant events, facility modifications, procedure revisions, and any changes to administrative and license requirements. The program processes reviewed included classroom training, trainee evaluation, examination failure remediation, and the integration of the training staff effort toward program implementation. The inspection was conducted during the seventh and final rotation for the 1992 scheduled licensed operator training.

The inspector reviewed the two documents that controlled the licensed operator training program. The Licensed Operator Training Program Master Plan (TPMP) defined the program and provided a program overview, organizational responsibilities, department interfacing instructions, qualification requirements, and the training program task list. The training program was conducted according to Training Administrative Procedure (TAP)-13, "Licensed Operator Requalification Training," Revision 21, which contained the detailed program implementing instructions.

The inspector concluded that the controlling procedures assured compliance with the licensee's administrative requirements, facility license requirements, and the regulations in 10 CFR Part 55.

1.1 Training Organization And Responsibilities

Within the training organization, the responsibility for the licensed operator and initial license training programs fell under the supervisor of operations training. A total of 11 personnel were assigned to the supervisor for administering the two programs. Two of the assigned personnel were contractors whose contract was scheduled to end on December 31, 1992. At this time, it appeared that the licensee did not intend to renew the contract. Of the remaining nine personnel, eight were currently, or had been, senior reactor operator licensed on the FCS facility. The remaining individual had been licensed on another Combustion Engineering plant. The training personnel were specifically assigned to one of the programs, but assigned duties would overlap into the other program. Most often, this overlap would occur in the simulator training and evaluation area.

At the time of the inspection, the licensee was preparing to start the 1993 licensed operator program. Additional effort was being expended to complete the final training phase for an initial licensing class of nine, scheduled for NRC licensing exams in June 1993. Recognized training technology standards recommend that experienced instructors be allowed twice the time for

preparation as required for presentation of classroom material. Outside the classroom, additional time is needed to validate and review materials for dynamic training and evaluation sessions such as simulator guides and job performance measures (JPM). It was also conceivable that instructors could be tasked to develop additional training materials. Additionally, it normally required two instructors to operate the FCS control room simulator. The inspector conducted discussions with licensee representatives concerning the instructional staff and scheduled workload. The inspector asked if the nine remaining instructors would have adequate preparation time to prepare for their assigned instructional tasks with the planned reduction of qualified instructors. The licensee could not provide a definite affirmative answer to the question. Management indicated they were aware that instructional personnel availability would be reduced temporarily, but in their opinion, no significant problems would result from decreased staffing. In order to avoid any long-term problems, the licensee planned to limit the number of licenses held at the facility. In addition, there were plans to avoid conducting an initial license class for about 2 years. Further, when new operators were licensed in mid 1993, as many as three licensed personnel would be assigned to the licensed operator training staff.

The inspector concluded that the initial and licensed operator training programs would be at absolute minimum staffing until the latter part of 1993. Licensee management stated an intent to closely monitor program performance during this period.

1.2 Classroom Training

It was not possible to observe operational training during the inspection because the control room simulator was undergoing a modification outage. All scheduled classroom and operational training and evaluation for the 1992 program had been completed. However, the inspector observed three sessions of classroom training provided to licensed operators that had been requested by licensed personnel or the operations supervisor. The subjects of the three sessions were fire protection, operability determination, and NRC notification requirements.

The inspector observed two instructors during the administration of the three classroom lessons. The instructors observed were experienced licensed senior reactor operators and were well prepared for the training sessions. Both of the instructors had different but effective techniques for motivating the students and provided good presentations. Additionally, both of the instructors exhibited a superior questioning technique to initiate discussion of the subject matter. Interaction was encouraged and several points were addressed and cleared up by the dialogue between the instructor and students.

During two of the sessions, the students surfaced single issues that were not finalized or closed out during the classroom session. The student questions concerned interpretation of conditions and management policy. The instructors did not refer to the issues during the lesson summaries or commit to addressing the students' concerns later or through other methods. The

inspector debriefed with the instructors and the supervisor and determined there was an unwritten policy to address and answer all student questions which arose in the classroom. There were no formal requirements or methods specified for obtaining assistance on issues needing expertise from outside of training. A licensee representative stated the instructor evaluation program had identified the practice of failing to address issues not answered in the classroom as a generic problem in classroom training, and would be addressed in the future.

The inspector concluded that a potential existed for instructors to ignore student concerns brought up in the classroom. Aside from this single observation, the classroom training phase of the licensed operator training program was effective.

1.3 Licensed Operator Evaluation And Corrective Action

The inspector reviewed the annual examination results from 1990 to the present, and the remediation process for each failure. Individual licensed operator and crew performance on annual examinations indicated improvement since 1990. During the 1990 requalification year, 37 licensed individuals were examined. One crew and two individuals failed the simulator examination. There was one written examination failure. During the 1991 cycle, 44 individuals, including 12 co-examined by the NRC, were tested. The NRC did not fail any individuals or crews. OPPD failed one crew on the simulator, four individuals on the simulator, one on JPM walkthrough, and one on the written examination. For the 1992 requalification year, 42 individuals were examined. A total of 12 licensed individuals were declared exempt from the annual examination because of holding a license for less than 3 months or being enrolled in a Senior Reactor Operator upgrade training program. There were no failures of the 1992 examinations.

According to OPPD procedures and policy, the failure of any phase of the annual requalification examination required the affected individual to be removed from shift duties. A review of the remediation effort for each failure over the past 3 years indicated that an in-depth analysis was conducted to determine the reason for each examination failure. The analyses identified the specific weaknesses that had contributed to the failures, or identified problems with the examination. Once an operator's specific weaknesses had been identified, a specific upgrade program was designed to improve the individuals performance in the weak area(s). Some of these upgrade programs were simple and easy to complete while others were complex and lengthy. The upgrade programs had been approved by management in the operations and training departments. Prior to being returned to shift duties, the individuals were re-examined to determine if they had regained proficiency in the previously identified weak areas. Crew failures on the simulator had been handled in the same manner as individual failures. However, individuals who had performed well and had not contributed to the failure, had been exempted from the remediation process.

The remediation process was effectively implemented. The crew or individuals weaknesses were properly identified and the prescribed corrective action had been beneficial and timely. A review of the makeup examinations indicated that the affected operators had been tested on the individual simulator critical tasks (ISCT) and in the knowledge areas where they demonstrated weaknesses.

Written examinations were constructed from a computer-based examination bank according to Procedure TAP-8, "Examination Control And Administration," Revision 16. Most of the test items in the database were in the preferred objective (multiple choice) format. The majority of the questions were comprehensive or required conceptual knowledge, synthesis, and analysis by the examinee to obtain the correct answer. One person on the training staff was responsible for developing the six iterations of the annual exam that were administered over the 6-week crew rotation. All versions of the examination required peer review and management approval.

Examinations for the annual requalification examinations were developed by using a sampling plan. The plan was generated from a computer database that contained the exact amount of training time that had been expended for each subject. This time was then reflected as a percentage of the total training time. From this data, a plan could be generated to indicate the percentage of questions to be used in the broad areas of systems, procedures, and administration. The finished plan also showed the percentage of questions needed to address smaller areas such as emergency procedures or abnormal procedures.

The inspector reviewed the sampling plans that had been developed to support the 1991 and 1992 cycle examinations. A review of the examinations to support these cycles was also performed. The inspector determined that the quality of the test items used on the annual examinations was good. Questions that required memorized response from the examinee occurred infrequently. A rough estimate comparing two examinations to the sample plan indicated favorable comparisons to the sample plan. The examinations did not exactly agree with the plan percentages, but the proportions were close enough to confirm that the sample plan had been used as intended.

Procedure TAP-8 dealt with using identical questions on back-to-back written examinations. According to the procedure, only 30 percent of an examination had to be different from the previous version. This translated to allowing 70 percent of the questions used on the first weekly examination to be repeated on the second week of the examination. The inspector told the licensee that the amount of identical question overlap appeared to be excessive and could result in examination compromise. A licensee representative agreed with the inspector's conclusion and expressed an intent to immediately commence a procedure revision that would not allow an examination to be compromised. The licensee representative also stated that very little, if any, question overlap had been used in the past.

The inspector reviewed different versions of the last annual examination to see if any questions had been used more than once. Also, an interview was conducted with the individual who constructed the most recent set of six weekly examinations. This review and interview revealed that no test items had been used more than once on any of the six examinations.

The inspector concluded that the licensee's program for evaluating operators was strong. The prescribed followup corrective action to address identified weaknesses was imaginative, timely, and beneficial. While the potential existed for examination compromise within the licensee's procedures, no instance was identified where this had occurred and procedure revision was initiated prior to the end of the inspection.

1.4 Training Program Response

The inspector reviewed the process for changing the training program content in response to changes and modifications to the plant, procedures, administrative requirements, license conditions, and regulations. Changes to training programs content was conducted according to Procedure TAP-7, "Revision Of Training Program," Revision 21. Change was initiated within the training program configuration management (TPCM) system. This system was administered by a coordinator and committee members that represented each training program. The committee was notified of all changes and met weekly to decide what programs would be affected by a specific change. Once the affected programs were identified, program supervisors determined the required program content change, subject to management approval.

A problem had occurred recently when the training organization had not been notified that planned modifications to the facility had been completed. This resulted in failure to implement training program content changes until after the facility had recovered from an outage and was back on line. This issue was resolved by changing the distribution methodology for design packages. The current practice was to provide training with the initial modification package, significant revisions, and the final completed package, which provided a signal to implement the training changes. Also the supervisor of licensed operator training had developed and implemented a special plant modification status tracking system to prevent recurrence of the problem. The TPCM system appeared to be effective in providing the necessary changes to program content.

There was a variety of methods for dispensing information about a change to the licensed operators. Generally, existing training material such as lesson plans or simulator guides would be revised. Sometimes completely new material would be developed. For matters of relatively low importance, a licensed operator required reading file was administered from the training department. In the past, immediate training had been administered by the training organization to licensed crews, prior to the assumption of shift duties. This had become necessary when plant modifications had not been completed until just before a crew assumed the shift. The most frequently used approach was to develop and administer a special topics classroom session for each

rotation. There were typically seven rotations during a requalification program year. For each rotation a handbook was developed for the operators to follow the classroom presentation. One instructor within the licensed operator training program was responsible for developing and administering this training. The session content was jointly agreed to by operations management.

The inspector reviewed training material that had been developed for three recent special topics sessions. The material for a session consisted of a handbook and a generic lesson plan. The generic lesson plan contained learning objectives specific to the lesson material and the instructor had highlighted the handbook to use as a presentation guide. From discussions with instructors, supervisors, and operators, the inspector determined that this method of instructing operators about plant and program revisions and modifications had been very effective. However, the inspector noted that the material development and presentation appeared to lack formal control. In the past, session content had been determined in telephone conversations between operations management and an instructor. It was not clear that training supervision and management were systematically included in the concurrence of the session content. The inspector informed licensee representatives of the apparent lack of formal control for this otherwise effective effort and the potential for excluding training management and supervision from the control process.

The inspector tracked seven Licensee Event Reports (LER) through the TPCM to assess how the licensed operator training program had responded. It was possible to determine how the training issues had been addressed and what basic changes had been made. However it was not possible to determine the details of revisions that had been made to existing classroom lesson plans. A record hard copy of the revision request form was available, but this did not provide the detail. During the approval process, the detailed markup of the change would have been attached to the revision request, but was not retained after the change was final. The previous versions of the lesson plans were not vaulted or retained, and there was no requirement to do so. The program supervisor was able to point out most of the changes to the lesson plans, and it appeared that the required changes had been made in all cases. The only issue was that the licensee's methodology did not provide for a historical change record, and this was not considered to be significant.

The inspector reviewed in detail the event that occurred on July 3, 1993 at FCS. This event consisted of a loss of coolant accident (LOCA) caused by a pressurizer safety valve opening prematurely and failing to close after a turbine valve closure at power. The entire event was precipitated by an interruption of the power supply to the turbine control system which caused the turbine valves to close without a turbine trip signal which would have caused a reactor trip.

The training response to this event had been minimal as the licensed crew's performance during the event was considered to be good. A crew communication problem had been identified, but the corrective action had been to revise the

Emergency Operating Procedures. Another issue had arisen regarding which reactor coolant system (RCS) subcooling instrumentation was the most viable during the event. The training department's response had been to initiate an extensive review of the event in the rotational special topics training. Another training action was to fine tune a simulator scenario to duplicate the event as precisely as possible. This effort was undertaken mainly to validate the performance of RCS subcooling that was observed during the event. However there were plans to use this information to develop training that would encourage operators to consider long term effects of stopping and throttling safety injection system flow during LOCA conditions. A final effort of the training organization was to draft the detailed event report that would be distributed to the industry.

The inspector interviewed three of the licensed operators that had been on shift during the event of July 3, 1993. Each individual was candid and expressed general satisfaction with their own performance during the event. All three thought that the training they had received on responding to a LOCA had been more than adequate. Another common area was the high regard for the training they have received on the simulator. One individual expressed a desire to receive more than the 12 hours of simulator training and evaluation given during each rotation. An operator also stated that he now understood why the training scenarios usually consisted of multiple complex events with difficult circumstances.

The inspector concluded that the licensed operator training was responding properly to changes or events. The rotational special topics training was very effective but appeared to lack formal control.

1.5 Training Performance Indicators

The training department had initiated its own trending program in the form of training performance indicators. Only one of the indicators was specific to licensed operator training, but numerous indicators addressed all programs. The program tracked 19 different indicators and issued a report every other month. The reports received wide distribution, including corporate management. Below is a sample of indicators tracked that related to licensed operator training:

- o Training Personnel Budgeted versus Actual Hours
- o Student Contact Hours by Program
- o Requests for Training
- o Instructor Hours In Plant, Development, Continuing Training
- o Trainee Progress
- o Instructors With Licenses
- o Number of Critique Reports
- o Test Item Development
- o Number of Observations
- o Examination Pass/Fail
- o Attendance Percentage for Licensed Operator Training

The inspector reviewed performance indicators dating back to August 1991. The reports indicated that when the data was reduced and a trend was identified, corrective action was initiated. For example, the trend report for September/October 1991 indicated that attendance at licensed operator training sessions was low for some individuals. In subsequent bi-monthly reports, the attendance of the identified individuals, had increased significantly. Several other examples of this type of identified trend and ensuing corrective action caused the inspector to conclude that the performance indicator program was effective.

1.C CONCLUSIONS

The inspector concluded that the licensee's training program for maintaining the skill and knowledge of the licensed operators was effective. One of the indicators that supported this conclusion was the performance of the licensed crew during the LOCA event of July 3, 1993. A similar but less severe event occurred on August 22, 1993, and a different crew responded well. Another indicator of success was the 100 percent pass results of the last annual licensed operator requalification examination. The licensee acknowledged the inspector's finding concerning potential examination compromise and appeared enthusiastic about correcting the problem. Management also understood the concern about staffing and indicated that this situation would be closely watched.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Omaha Public Power District Personnel

- *R. Andrews, Division Manager, Nuclear Services
- J. Braun, Licensed Reactor Operator
- *G. Cook, Supervisor, Station Licensing
- D. Daily, Licensed Operator Training Instructor
- C. Darrow, Licensed Operator Training Instructor
- *S. Gambhir, Division Manager, Production Engineering
- *J. Gasper, Manager, Training
- *G. Guliani, Supervisor, Operations Training
- *R. Jaworski, Manager, Station Engineering
- *L. Kusek, Manager, Nuclear Safety Review
- R. Lewis, Principle Engineer, Design Engineering
- *D. Lippy, Licensing Engineer
- *R. Mehaffey, Principal Engineer, Electrical Engineering
- *S. Miller, System Engineer
- *R. Mueller, Supervisor, Electrical Engineering
- *J. O'Connor, Manager, Design Engineering - Electrical
- *W. Orr, Manager, Quality Assurance and Quality Control
- *T. Patterson, Manager, Fort Calhoun Station
- *R. Phelps, Manager, Design Engineering
- T. Reisdorff, Shift Supervisor
- C. Rennerfeldt, Licensed Operator Training Instructor
- R. Schreurs, Licensed Senior Reactor Operator
- *R. Short, Manager, Nuclear Licensing and Industry Affairs
- *C. Simmons, Station Licensing Engineer
- J. Tesarek, Supervisor Operations and Technical Training (Acting)
- *J. Tills, Assistant Manager, Fort Calhoun Station
- R. Ward, Licensed Operator Training Instructor

1.2 NRC Personnel

- *P. Goldberg, Reactor Inspector
- *D. Kelly, Reactor Inspector
- *P. Wagner, Team Leader

* Denotes personnel that attended the exit meeting conducted on December 11, 1992.

2 EXIT MEETING

An exit meeting was conducted with licensee management personnel on December 11, 1992. During this meeting, the inspector reviewed the scope and findings of the inspection. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspector during the inspection.