APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No. 50-298/92-01

Operating License No. DPR-46

Licensee: Nebraska Public Power District
P.O. Box 499
Columbus, Nebraska 68602-0499

Facility Name: Cooper Nuclear Station

Inspection At: Brownville, Nemaha County, Nebraska

Inspection Conducted: January 6-10, 1992

Team Leader: Dr. D. Blair Spitzberg, NRC Region IV

Inspector: K. Kennedy, Operator License Examiner

Approved: Blaine Murray 1/22/92
Blaine Murray, Chief, Facilities Inspection Programs Section — Date

Inspection Summary

Inspection Conducted January 6-10, 1992 (Report No. 50-298/92-01):

Areas Inspected: Routine, announced inspection of the operational status of the emergency preparedness program, including changes to the emergency plan and implementing procedures; emergency facilities, equipment and supplies; organization and management control; training; and independent internal reviews and audits. In addition, regional initiatives performed included the inspection of knowledge and performance of duties, protective action decisionmaking, and emergency detection and classification.

Results: The functional area of emergency preparedness had been maintained in a state of operational readiness. Four exercise weaknesses were identified during operating crew walkthroughs which need prompt corrective action. The licensee committed during the exit interview to prompt interim corrective measures for the exercise weaknesses. The results of the inspection in the areas evaluated are summarized below:

- The licensee had properly reviewed and submitted to NRC changes in its emergency plan and implementing procedures.
- Emergency facilities, equipment, and supplies had been maintained in a state of operational readiness.

- The licensee had maintained good staffing levels of trained emergency response organization personnel. The emergency preparedness planning organization had maintained the emergency preparedness program in a state of operational readiness.

- Emergency response training had been completed by members of the emergency response organization. Training exercises and drills had been conducted as required.

- Annual internal audits of the emergency preparedness program had been performed in accordance with 10 CFR 50.54(t).

- In the evaluation of operating crews' abilities to implement properly the emergency plan and implementing procedures, four exercise weaknesses were identified. Exercise weaknesses were identified in the areas of emergency classification (298/9201-01), notification messages (298/9201-02), dose assessment (298/9201-03), and formulation of protective action recommendations (298/9201-04).

- The licensee's emergency plan and implementing procedures contained clear criteria, methodology, and responsibility for making protective action recommendations to protect the public and onsite workers.

- Proceduralized emergency action levels, definitions, and criteria for classifying emergency conditions had been established which are based primarily on indicators of plant status or offsite radiological conditions and are consistent with NRC guidance.

DETAILS

1. PERSONS CONTACTED

*J. M. Meacham, Division Manager of Nuclear Operations
*D. A. Whitman, Division Manager of Nuclear Support
*R. L. Gardner, Senior Manager of Operations
*G. E. Smith, Manager, Quality Assurance
*E. M. Mace, Senior Manager, Staff Support
*J. W. Dutton, Manager, Nuclear Training
*S. M. Peterson, Senior Manager, Technical Support
R. D. Creason, Supervisor, Operations Training
*K. M. Krumland, Supervisor, Emergency Preparedness
*M. A. Dean, Supervisor, Nuclear Licensing and Safety
*R. W. Hayden, Emergency Preparedness Coordinator
*L. E. Bray, Regulatory Compliance Specialist
D. A. Shallenberger, Lead Licensed Instructor
G. Ketner, Emergency Preparedness Instructor

The inspectors also held discussions with other station personnel during the course of the inspection.

*Denotes those present at the exit interview.

2. FOLLOWUP ON PREVIOUS INSPECTION FINDINGS (92701)

(Closed) Unresolved Item (298/9024-01): This item concerned questions of whether changes to emergency action levels contained in an emergency plan change submitted pursuant to 10 CFR 50.54(q) represented a decrease in the effectiveness of the emergency plan. This item was reviewed during a management meeting held in the Region IV office on July 20, 1990, and as a result, the licensee revised the subject emergency action levels. The revised emergency action levels were approved by NRC on April 1, 1991.

3. PROGRAM AREAS INSPECTED

Areas inspected included the operational status of the emergency preparedness program including changes to the emergency plan and implementing procedures; emergency facilities, equipment, instrumentation, and supplies; organization and management control; training; and independent and internal reviews and audits. The inspectors also reviewed three emergency preparedness areas as regional inspection initiatives including knowledge and performance of duties, protective action decisionmaking, and emergency detection and classification.

4. EMERGENCY PLAN AND IMPLEMENTING PROCEDURES (82701-02.01)

The inspectors reviewed changes in the licensee's emergency plan and implementing procedures to verify that these changes had been properly reviewed and submitted to NRC. Since the previous inspection, there have been two emergency plan revisions submitted (Revisions 14 and 15) and 19 submittals of emergency plan implementing procedure changes.

Emergency plan changes had been reviewed and approved by the licensee in accordance with Emergency Preparedness Department Procedure 06, "Emergency Plan Revisions". The inspectors reviewed documentation of the plan changes and determined that since the previous inspection, changes had not decreased the effectiveness of the plan. Emergency plan and implementing procedure changes had been submitted to NRC in accordance with 10 CFR 50.54(q) and 10 CFR Part 50, Appendix E.V. The inspectors reviewed the document control process for plan and implementing procedure changes and determined that controlled copies were maintained for use in all emergency response facilities.

The inspectors verified that letters of agreement with offsite emergency support organizations were on file and that annual contacts with all support organizations had been made to ensure that the terms of the agreements remained current.

Conclusion

The licensee had properly reviewed and submitted to NRC changes in its emergency plan and implementing procedures.

5. EMERGENCY FACILITIES, EQUIPMENT, INSTRUMENTATION, AND SUPPLIES (82701-02.02)

The inspectors reviewed the licensee's emergency equipment and supplies inventories and provisions for maintaining emergency facilities, equipment, and supplies in a state of operational readiness.

Records of inventories of the emergency facilities and emergency lockers were found to be complete. Maintenance of the facilities and equipment had been conducted in accordance with Section 8.6 of the emergency plan and 10 CFR 50.47(b)(8). The inspectors observed the performance of a routine test of the operability of the offsite emergency warning sirens and verified corrective action on two sirens that failed to pass the operability test.

The inspectors toured onsite emergency response facilities and the alternate emergency operations facility located in Auburn, Nebraska, and found that they were as described in the emergency plan and were in a state of operational readiness. Documentation was reviewed to confirm the performance of routine surveillance tests of the emergency air filtration system for the emergency operations facility.

Conclusion

Emergency facilities, equipment, and supplies had been maintained in a state of operational readiness.

6. ORGANIZATION AND MANAGEMENT CONTROL (82701-02.03)

The inspectors reviewed the emergency response organization and management control of the emergency preparedness program to determine conformance with the emergency plan. The licensee's emergency response organization had remained

es. ntially unchanged since the previous inspection with respect to position titles and emergency responsibilities. The inspectors discussed with licensee representatives the process for ensuring sufficient depth at each emergency response organization position and the process by which the individuals would be notified and activated in the event of an emergency. The emergency response organization staffing roster in effect at the time of the inspection showed that a good depth of trained personnel was available for both the onsite and corporate response organization.

The inspectors reviewed the emergency planning and preparedness organization and determined that staffing levels and personnel were unchanged from the previous inspection. The organization consisted of a corporate emergency preparedness supervisor, an onsite emergency coordinator, and two emergency preparedness specialists (one corporate, one onsite). The emergency preparedness organization reports to the Division Manager of Nuclear Support. The organization had received good support from upper management and sufficient resources to maintain the program in a state of readiness.

Conclusion

The licensee had maintained good staffing levels of trained emergency response organization personnel. The emergency preparedness planning organization had maintained the emergency preparedness program in a state of operational readiness.

7. TRAINING (82701-02.04)

The inspectors met with training staff personnel and reviewed the licensee's program for emergency response training to determine compliance with the requirements of 10 CFR 50.47(b)(15); 10 CFR Part 50, Appendix E.IV.F; and the emergency plan.

Training for individuals assigned to the emergency response organization has been performed in accordance with a training program description document which specifies courses requiring completion for each emergency response organization job title. The inspectors reviewed copies of lesson plans for 17 emergency response training courses which have been established. The lesson plans use individual emergency implementing procedures as the framework for the courses. Training has consisted of initial and annual refresher training both of which have been completed by achieving a passing score on an exam or practical evaluation. The inspectors reviewed the training and qualifications of the emergency preparedness instructor and found that he had been certified in accordance with the nuclear training department Procedure 08,"Instructor Qualifications".

The inspectors reviewed the methods used to track the status and completion of emergency response training to insure that training is kept current for all individuals assigned to the emergency response organization. Training has been scheduled on a demand basis, and notifications of training needs has been routed through appropriate employee supervision. The inspectors performed a review of documentation of training completion for a random sampling of

personnel. This review confirmed that members of the emergency response organization have received the required training specified to fill their assigned positions. While the required training specified for emergency response personnel had been completed in accordance with a defined program, the performance of control room shift crews during walkthrough evaluations raised questions related to the retention of certain training materials, and the overall effectiveness of the training in imparting the necessary proficiency for carrying out certain key emergency response tasks. The walkthrough results are discussed in detail in paragraph 9.

The inspectors reviewed documentation of emergency exercises and drills conducted routinely as specified in Section 8 of the emergency plan. The exercises and drills appeared to be challenging and involved formal critiques as required by 10 CFR Part 50, Appendix E.IV.F.5.

Conclusion

Emergency response training had been completed by members of the emergency response organization. Training exercises and drills had been conducted as required.

8. INDEPENDENT AND INTERNAL REVIEWS AND AUDITS (82701-02.05)

The inspectors examined independent and internal audits of the emergency preparedness program performed since the last inspection to determine compliance with the requirements of 10 CFR 50.54(t). The inspectors also met with quality assurance personnel to determine whether the licensee's audit program had a corrective action system that would ensure timely followup on weak or deficient areas.

The last annual audit of the emergency preparedness program was QAP-1900, Audit 91-04 which was performed February 20 through May 8, 1991. The audit was conducted by two individuals, an audit team leader and an emergency preparedness specialist from another nuclear utility. The inspectors reviewed the qualifications of the lead auditor and found that he had been certified to meet the criteria for audit team leader as specified in the licensee's quality assurance division training and qualification program and American National Standards Institute N45.2.23. The audit identified no findings corresponding to violations of regulatory requirements. Two observations requiring responses were cited. The audit captured the results of 9 surveillances performed in the emergency preparedness functional area. The inspectors reviewed audit checklists and other audit related documentation and determined that the annual audit had been conducted in accordance with Quality Assurance Plan QAP-1900. The scope and content of the audit was found to meet the requirements of 10 CFR 50.54(t).

Conclusion

Annual internal audits of the emergency preparedness program had been performed in accordance with 10 CFR 50.54(t).

9. KNOWLEDGE AND PERFORMANCE OF DUTIES (82206)

The inspectors conducted a series of emergency response walkthroughs with operating crews to evaluate the adequacy and retention of skills obtained from the emergency response training program. A single walkthrough scenario was developed by the inspectors and administered to the crews to determine whether control room personnel were proficient in their duties and responsibilities during a simulated accident scenario.

The inspectors observed three crews during the walkthroughs using the control room simulator in the dynamic mode. The scenario consisted of a sequence of events requiring an escalation of emergency classifications, culminating in a general emergency. Each walkthrough lasted approximately 90 minutes. During the walkthroughs, the inspectors were able to observe the interaction of the response crews to verify that authorities and responsibilities were clearly defined and understood. The walkthroughs also allowed the evaluation of the crews' abilities to assess and classify accident conditions, perform dose assessments, develop protective action recommendations, and make timely and complete notifications to offsite authorities.

The inspectors identified four areas of concern during the course of the walkthroughs. Each of these identified areas of concern has been characterized as an exercise weakness according to 10 CFR Part 50, Appendix E.IV.F.5, and are described in the following sections.

9.1 Emergency Classification

The inspectors observed and evaluated the ability of each crew to detect, assess, and classify abnormal and accident conditions. Two out of three crews were slow to recognize that emergency action level initiating conditions had been met for several scenario events. These crews, who verbalized their awareness of the conditions as they were occurring, failed to assess the conditions with reference to corresponding emergency action levels. As a consequence, emergency classifications were not made in a timely manner. Examples of weak emergency classification were identified as follows:

- One shift supervisor did not recognize that a loss of both onsite emergency diesel generators satisfied the emergency action level for a notification of unusual event classification. Fourteen minutes after the second emergency diesel generator was declared inoperable by the shift supervisor, the shift technical advisor discovered that a notice of unusual event should be declared and informed the shift supervisor. During the walkthrough with another crew, the shift supervisor did not declare a notice of unusual event under the same circumstances until 13 minutes after he declared the second diesel generator inoperable.

- One shift supervisor did not declare a general emergency when he became aware of plant conditions indicating a loss of two fission product barriers and the potential for a loss of the third. Specifically, control room operators had initiated a Group 1 isolation in response to indications of a steam leak in the turbine building. Both main steam

isolation valves in main steam line A failed to close, resulting in the loss of two fission product barriers. At the same time, the control room operators had indications of increasing radiation readings on the A main steam line, off-gas, and drywell radiation monitors. An initial report made by a control room operator was that the containment radiation reading was 700 R/h, followed 2 minutes later by a report of 2000 R/h. In addition, the shift supervisor had indications that the turbine building effluent monitor was reading 1.0E+7 microcuries per second (i.e. 10 Curies per second) and increasing. Given these indications, the shift supervisor declared a site area emergency based on a loss of two fission product barriers with a release in the turbine building.

Emergency action level 2.4.1 states that a potential loss of a fission product barrier may be determined by monitoring the same parameters used to determine loss of a barrier. A degrading trend on one of these parameters indicates that the potential exists for the loss of a barrier. The shift supervisor had indications early in the event that the parameters used for determining a loss of fuel cladding exhibited a degrading trend, thus establishing the potential for the loss of the third fission product barrier.

The shift supervisor declared a general emergency only after the criteria found in Emergency Implementing Procedure 5.7.1, "Emergency Classification," for fuel cladding loss was exceeded, that is, when it was reported that the drywell radiation monitor exceeded 10,000 R/h.

- Although one shift supervisor declared a general emergency in a timely manner, he did not recognize that all three fission product barriers had been lost. He stated that the fuel cladding and primary containment boundaries had been lost, and there was a potential loss of the primary coolant barrier. He did not recognize that two main steam isolation valves stuck open in the same main steam line constituted a loss of both the primary coolant and containment barrier.

The emergency classification of accident conditions was identified as an exercise weakness (298/9201-01).

9.2 Notification Messages

The inspectors observed and evaluated the ability of each crew to make accurate and timely notifications to offsite authorities. Two out of three crews made multiple errors in completing the Nuclear Power Plant Incident Initial Report notification form. As a result, incomplete or erroneous information was communicated to offsite authorities during notifications. Examples of errors or omissions were identified as follows:

- Information was omitted from the forms including the event classification, the type of radioactive release in progress (airborne or liquid), and the emergency director's signature.

- Several instances were observed where incorrect information was communicated to offsite authorities because of errors on the notification forms. On one occasion, an estimated duration of release of 24 hours was indicated on the same form which also indicated that no release of radioactive material had occurred. On another occasion, a recommendation to the states to issue a message "stay tuned to the Emergency Broadcast System" was made on the same form which indicated that no public notification was recommended.

Failure to make complete and accurate notifications was identified as an exercise weakness (298/9201-02).

9.3 Dose Assessment

The inspectors observed and evaluated the ability of each crew to perform dose projections and assessments using the CNS-DOSE computer program. Two out of three crews were unable to perform an accurate dose assessment, resulting in incorrect and nonconservative protective action recommendations being made to the states.

One shift supervisor, while performing dose assessment using the CNS dose assessment program, erroneously entered "no" in the "core degraded?" field. This entry was used despite the shift supervisor being aware of plant conditions which indicated that the core was degraded as defined in Emergency Implementing Procedure 5.7.17, "Dose Assessment". As a result, the dose assessment underestimated offsite consequences of the release and the shift supervisor incorrectly recommended to the states a protective action recommendation of shelter out to 5 miles downwind. Had the correct information been used on the degraded core status, the protective action recommendation would have been to evacuate out to ten miles downwind.

Another shift supervisor entered 1 hour as the anticipated length of the release when performing a dose assessment. The protective action recommendations which were transmitted to the states were based on the same dose assessment assuming the 1 hour release. The states were also informed, however, in the same notification message, that the estimated duration of release was 5 hours. Such inconsistency could have caused significant confusion among dose assessors and decisionmakers with the states. In addition, at the time the dose assessment was made, general plant conditions were still degrading, and the shift supervisor had no realistic expectation that the release could be terminated within 1 hour. Therefore, the default or baseline release duration of 4 hours would have been more conservative for dose assessment purposes.

The performance of dose assessments was identified as an exercise weakness (298/9201-03).

9.4 Protective Action Recommendations

The inspectors observed and evaluated the ability of each crew to make protective action recommendations to offsite authorities. Two instances were

cited in paragraph 9.3 where inappropriate protective action recommendations were made as a result of errors in dose assessment. In addition to these instances, two out of three crews made incorrect protective action recommendations because of errors in selecting the proper protective action.

After declaring a general emergency, one shift supervisor failed to make the minimum automatic protective action recommendation of evacuation of the 2-mile radius surrounding the plant and 5 miles downwind and shelter of the remainder of the emergency planning zone. He instead recommended shelter for a 2-mile radius and 5 miles downwind.

Another shift supervisor following declaration of a general emergency incorrectly recommended evacuating three upwind sectors and failed to recommend evacuating the downwind sectors.

The formulation of protective action recommendations was identified as an exercise weakness (298/9201-04).

Conclusion

In the evaluation of operating crews' abilities to properly implement the emergency plan and implementing procedures, four exercise weaknesses were identified. Exercise weaknesses were identified in the areas of emergency classification, notification messages, dose assessment, and formulation of protective action recommendations.

10. PROTECTIVE ACTION DECISIONMAKING (82202)

The inspectors reviewed the emergency plan and implementing procedures, and discussed with licensee representatives the criteria and methodology for making protective action recommendations. The emergency plan and implementing procedures were consistent in the criteria established for determining protective actions both onsite and those to be recommended to offsite authorities. Clearly defined responsibility and authority for making protective action recommendations were specified for the emergency director.

The inspectors determined that procedural methodology for selecting the proper level of protective actions to recommend was contained in emergency plan implementing procedures and that these procedures had been reviewed by the offsite authorities. The inspectors reviewed the protective action implementing procedures contained in the emergency plans of Atchison, Nemaha, Richardson, and Otoe counties and the states of Missouri, Iowa, and Nebraska. Based on this review, the inspectors determined that procedures were in place for these agencies to act on the recommendations provided by the licensee. It was noted, however, that the latest baseline automatic protective action recommendation specified in the licensee's emergency plan for a general emergency were different than those contained in the plans for the states of Missouri and Nebraska and the counties of Atchison and Nemaha. In July 1991, the licensee changed the baseline protective action recommendations for a general emergency from shelter to evacuation of a 2-mile radius and 5 miles downwind. This change had been communicated to offsite agencies but had not,

as yet, been incorporated into the plans of the states and counties mentioned. The licensee representatives stated that it is their understanding that the state and county plans are in the process of being changed to become consistent with the licensee's baseline general emergency protective action recommendations.

Conclusion

The licensee's emergency plan and implementing procedures contained clear criteria, methodology, and responsibility for making protective action recommendations to protect the public and onsite workers.

11. EMERGENCY DETECTION AND CLASSIFICATION (82201)

The inspectors reviewed Emergency Operating, Alarm, and Abnormal Condition procedures to determine the extent that they incorporated emergency action levels and to determine whether they direct the operators to classify emergencies. The inspectors also reviewed certain instrumentation that is used to indicate accident conditions to determine whether measurement units are consistent between the instruments, procedures, and emergency action levels.

References to Emergency Plan Implementing Procedure 5.7.1, "Emergency Classification," were found in various Alarm and Abnormal Condition procedures. The Emergency Operating Procedures did not incorporate emergency action levels or direct operators to classify emergencies. The inspectors determined that the emergency plan and implementing procedures clearly assign the responsibility and authority for making emergency classifications to the emergency director.

Conclusion

Proceduralized emergency action levels, definitions, and criteria for classifying emergency conditions had been established which are based primarily on indicators of plant status or offsite radiological conditions and are consistent with NRC guidance.

12. EXIT INTERVIEW

The inspectors met with the licensee representatives denoted in paragraph 1 on January 10, 1992, and summarized the scope and findings of the inspection as presented in this report. The licensee did not identify as proprietary any of the materials provided to, or reviewed by, the inspectors during the inspection.

During the exit interview, the Division Manager of Nuclear Operations and other senior management representatives expressed concern over the exercise weaknesses identified during the operator walkthroughs. In consideration of the need for prompt corrective action concerning the weaknesses, licensee management committed to take the following interim measures:

- Provide remedial training and reevaluation testing of the three crews which were evaluated during the NRC walkthroughs. These crews were on active watch at the time of the inspection and were scheduled for active watch the following week. The licensee committed to complete the remedial training over the weekend of January 11-12, 1992.

- For the remaining three crews which were not evaluated by NRC and were not on active watch, the licensee committed to put them through walkthroughs similar to those conducted by the NRC during the week of January 13-17, 1992, in order to evaluate their emergency response proficiency.

- Provide direct senior management involvement in the remediation training and evaluation.

JAN 27 1992

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