

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report No. 50-482/92-13

Operating License No. NPF-42

Licensee: Wolf Creek Nuclear Operating Corporation
P.O. Box 411
Burlington, Kansas 66839

Facility Name: Wolf Creek Generating Station (WCGS)

Inspection At: Burlington, Kansas

Inspection Conducted: July 6-9, 1992

Inspectors: Dr. D. Blair Spitzberg, Emergency Preparedness Analyst
(Lead Inspector)

Kriss M. Kennedy, License Examiner, Operating Licensing Section

Approved:

Blaine Murray
Blaine Murray, Chief, Facilities Inspection
Programs Section

7/16/92
Date

Inspection Summary

Inspection Conducted July 6-9, 1992 (Report No. 50-482/92-13):

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, the inspection included a regional initiative inspection of dose calculation and assessment.

Results: Within the areas inspected, no violations or deviations were identified. Three weaknesses were identified during walkthroughs conducted with operating crews and are discussed in paragraphs 6.2.1 - 6.2.3. The following is a summary of the inspection results:

- o Changes to the emergency plan and implementing procedures had been properly reviewed, approved, and submitted to NRC. No plan changes were determined to decrease the effectiveness of emergency planning.

- o The licensee had made functional improvements in emergency response facilities and had maintained emergency facilities, equipment, and supplies in an excellent state of operational readiness.
- o The licensee had maintained a trained emergency response organization with good depth at all key positions. Improvements had been made in the emergency planning organization by moving more of the supervision and planning activities onsite from the Wichita, Kansas, office.
- o The emergency response organization was determined to have received required training specific to assigned response duties. Lesson plans were found to be comprehensive. During walkthroughs conducted with operating crews, three weaknesses were identified. The weaknesses were in the areas of emergency classification, notifications and protective action recommendations made to offsite authorities, and dose assessment procedures.
- o Comprehensive annual internal audits of the functional area of emergency preparedness had been performed in accordance with requirements.
- o A computer-based method for assessing consequences of a radiological release had been established by the licensee, and licensee personnel demonstrated proficiency in its use. Procedures for implementing the program were weak in providing guidance on estimating integrated doses from the time a release begins.

DETAILS

1. PERSONS CONTACTED

WCNOC

B. D. Withers, President and Chairman of the Board
F. T. Rhodes, Vice President, Engineering and Technical Services
J. A. Bailey, Vice President, Operations
R. Hagan, Director, Nuclear Services
D. L. Fehr, Manager, Operations Training
K. J. Moles, Manager, Technical Services
W. M. Lindsay, Manager, Quality Assurance
J. Weeks, Manager, Operations
T. S. Morrill, Manager, Radiation Protection
R. L. Logsdon, Manager, Chemistry
B. T. McKinney, Manager, Training
*M. Schreiber, Supervisor, Emergency Planning
*S. Wideman, Supervisor, Licensing
*E. Peterson, Supervisor, Audits
*D. Moseby, Supervisor, Operations
*S. Henry, Supervisor, Chemistry
*D. Parks, Supervisor, Corporate Training
*D. Hooper, Licensing Engineer
*L. Herhold, Emergency Preparedness Specialist
*K. Craighead, Emergency Response Planner

NRC

*G. A. Pick, Senior Resident Inspector

*Denotes those present at the exit interview.

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

2. FOLLOWUP ON PREVIOUS INSPECTION FINDINGS (92701)

(Closed) Open Item (482/8906-03): This item involved a commitment to evaluate an NRC report containing observations for improvement of the licensee's Emergency Action Levels. The licensee revised the Emergency Action Level scheme in March 1989 to include additional events agreed upon during NRC Inspection 50-482/89-06. Subsequently, changes to the Emergency Action Level scheme were imposed as a plant specific backfit. This was described to the licensee in the NRC letter dated June 7, 1990, which also forwarded the regulatory analysis.

(Closed) Exercise Weakness (482/9116-02): Failure of the shift crews evaluated during walkthroughs to provide accurate offsite dose assessments. The operating crews evaluated during this inspection in walkthroughs performed dose assessments proficiently in accordance with procedures.

(Open) Exercise Weakness (482/9119-03): Failure to maintain habitability in the emergency response facilities. This weakness consisted of separate observations in the control room, operational support center, and technical support center. The walkthroughs conducted during this inspection contained an objective to evaluate the response of the control room shift crews to elevated radiation levels in the control room. The crews responded well to the simulated conditions and properly assessed control room habitability. This item will remain open pending reevaluation of the operational support center and technical support center habitability concerns.

(Closed) Violation (482/9116-01): This violation of 10 CFR 50.54(q) was identified for implementing changes to the licensee's Emergency Plan which decreased the effectiveness of the plan without receiving prior NRC approval. The inspectors reviewed the revision to Procedure EPP 02-1.1 and associated forms which govern the internal review process for emergency plan changes. The revised sections provided additional guidance on performing 50.54(q) reviews and appeared reasonable. Training in the revised procedure was documented. A review of emergency plan changes submitted since the previous inspection showed that the changes were properly reviewed and did not decrease the effectiveness of the plan.

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

The inspectors reviewed changes in the licensee's emergency plan and implementing procedures to verify that changes had been properly reviewed and approved and had not decreased the effectiveness of emergency planning. Since the previous inspection, during which problems were noted in this area, the licensee had revised and improved the review process for plan changes specified in Procedure EPP 02-1.1, "Emergency Planning Program". Four plan changes submitted since the previous inspection were found to have been reviewed in accordance with 10 CFR 50.54(q).

The inspectors also reviewed documentation of emergency plan procedure changes for proper review and submittal. Of the 45 emergency plan procedure changes implemented since July 1991, all had been submitted to NRC within 30 days of the effective date as required by 10 CFR Part 50, Appendix E.V. The inspectors verified that current letters of agreement with offsite emergency support organizations were on file.

Conclusion

Changes to the emergency plan and emergency plan implementing procedures had been properly reviewed, approved, and submitted to NRC. No plan changes were determined to decrease the effectiveness of emergency planning.

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

The inspectors toured emergency response facilities and reviewed inventories of emergency equipment and supplies to determine compliance with 10 CFR 50.47(b)(8) and the state of operational readiness for emergency

response. Emergency response facilities were found to be well maintained. Improvements were noted in the technical support center and emergency operations facility with the installation of several plant data computer terminals. These new terminals upgrade the facilities' capabilities for data transfer and operational awareness. Lockers containing dedicated emergency equipment were found to be as described in the procedures and were secured. The calibration of survey and monitoring equipment was noted to be current. Each facility contained current revisions of the emergency plan and implementing procedures.

The inspectors reviewed records of emergency equipment inventories, communication and callout tests, siren tests, and other recurring tests of emergency readiness. Such tests had been performed satisfactorily and in accordance with applicable procedures.

Conclusion

The licensee had made functional improvements in emergency response facilities and had maintained emergency facilities, equipment, and supplies in an excellent state of operational readiness.

5. ORGANIZATION AND MANAGEMENT CONTROLS (82701-02.03)

The inspectors reviewed the emergency response organization to determine conformance with the emergency plan. No significant changes had been made to the organizational positions or responsibilities since the previous inspection. Position staffing was reviewed, and it was noted that a good number of trained personnel had been assigned to each position. The inspectors discussed the process for making emergency response organization assignments and found that sufficient reviews had been performed to ensure that assigned members had received specified training.

The inspectors reviewed the emergency planning organization and found that since the previous inspection, technical planning staff positions had remained constant. A change had been made in the organization, with both onsite and offsite planning personnel reporting to an upgraded Emergency Planning Supervisor position based onsite. As an improvement from previous inspections, all onsite emergency planning and supervisory activities are currently performed from the WCGS site.

Conclusion

The licensee had maintained a trained emergency response organization with good depth at all key positions. Improvements had been made in the emergency planning organization by moving more of the supervision and planning activities onsite from the Wichita, Kansas, office.

6. TRAINING (82701-02.04)

6.1 Emergency Response Training

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.

The inspectors examined 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. The inspectors reviewed a sample of training records consisting of records of persons who participated in the walkthroughs and others in the emergency response organization. This review confirmed that members of the emergency response organization had received the required training to fill their assigned positions. The inspectors also reviewed copies of a sample of lesson plans for emergency response training courses and found them to be comprehensive.

6.2 Operating Crew Walkthroughs

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 observed that, in general, the crews understood their responsibilities in the emergency response organization and assumed these duties rapidly and efficiently. Improvements were noted from previous inspections in the response activities of the health physics and chemistry technicians in the control room environment under emergency conditions. Problems were noted, however, with the actions of the crews in performing certain key emergency response activities. These observations resulted in the identification of three weaknesses which are discussed in the following paragraphs.

6.2.1 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 failed to recognize that emergency action level initiating conditions had been met for a scenario event. Consequently, the two shift supervisors did not declare a Site Area Emergency when they became aware of plant conditions indicating a breach of, or challenge to the integrity of two fission product barriers. Specifically, fuel cladding was challenged as the result of an anticipated transient without trip, and containment was breached because of a steam generator atmospheric relief valve that was stuck open and unisolable. These conditions met the emergency action level for a Site Area Emergency contained in EPP 01-2.1, "Emergency Classification."

The emergency classification of accident conditions was identified as a weakness (482/9213-01).

6.2.2 Notifications and Protective Action Recommendations Made to Offsite Authorities

Errors and omissions in notification messages and in the formulation and issuance of protective action recommendations were identified during the walkthroughs as evidenced by the following observations:

- o In the initial notification message of a General Emergency, one crew failed to make any protective action recommendations as required. While protective action recommendations were made in a followup notification a few minutes later, EPP 01-10.1, Attachment 1.0 requires that protective action recommendations be made for all General Emergency classifications.
- o In a general emergency followup notification message, one crew informed offsite authorities that a release was in progress but failed to indicate the estimated release duration as required by the message form. Prior to that time, no information had been provided to offsite authorities regarding estimated release duration.
- o In the second notification message of the general emergency, one crew transcribed the wind direction of 90 degrees into the windspeed blank on the message form, which would have provided offsite authorities an erroneous windspeed of 90 mph. Scenario windspeed indicated at the time was about 6 mph.
- o In the initial notification to offsite authorities of the General Emergency, two crews communicated as the "type of accident," fuel cladding damage and loss of coolant. Both crews failed, however, to indicate the known condition of loss of containment.

- o In a General Emergency followup message, one crew entered data for plume travel distance but failed to indicate a time or the affected sectors for the plume travel as required by the form.

Notifications and protective action recommendations made to offsite authorities was identified as a weakness (482/9213-02).

6.2.3 Dose Assessment Procedure

One crew was unable to obtain an accurate estimate of the offsite radiological consequences of the release, because the dose assessment procedure did not provide guidance for initiating a dose projection after initial release conditions had changed significantly. In this case, the chemistry technician had been dispatched from the control room by the emergency director prior to the release to obtain steam generator samples. When he returned, the release had been in progress for approximately 20 minutes. The chemistry technician then promptly calculated the initial post-release dose projections in accordance with EPP 01-7.2 but used real time flow data from the release source. At the time, however, the flow had decreased about 70 percent since the onset of the release because of depressurization. Therefore, this dose projection did not provide an accurate assessment of the consequences of the release from the time it began.

Failure of the dose assessment procedure to provide guidance on obtaining accurate integrated dose projections based on prior release conditions was identified as a weakness (482/9213-03).

Conclusion

The emergency response organization was determined to have received required training specific to assigned response duties. Lesson plans were found to be comprehensive. During walkthroughs conducted with operating crews, three weaknesses were identified. The weaknesses were in the areas of emergency classification, notifications and protective action recommendations made to offsite authorities, and dose assessment procedures.

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

The inspectors examined independent and internal audits of the emergency preparedness program to determine compliance with the requirements of 10 CFR 50.54(t). In connection with this review, the inspectors met with quality assurance personnel who were involved in the audit activities in order to determine whether the audit and surveillances had been conducted in accordance with the governing procedures.

The last annual audit performed to meet the requirements of 10 CFR 50.54(t) was conducted in June 1991 (QA 91-0332). This report was noted to be predominantly a summary compilation of prior audits, reviews, and exercise and drill reports. The report did address each of the evaluation categories identified in 10 CFR 50.54(t). A more comprehensive audit of the emergency

preparedness program was performed from July 1 through August 2, 1991 (QA 91-0373). This audit was performed to meet the requirements of Technical Specification 6.5.2.8(K). The audit was conducted by a four person team which included a functional area expert from another licensee. In neither of the audits discussed above were significant findings identified in the emergency preparedness area. Together, the depth and scope of these audits were found to be consistent with the requirements of 10 CFR 50.54(t).

The inspectors also reviewed licensee performance of surveillances in the emergency preparedness area. The surveillances had been targeted to exercise activities and areas of prior licensee or NRC concern. The inspectors found that audit and surveillance activities had been planned and conducted in accordance with applicable quality assurance procedures. The inspectors found that audit team leaders had been certified to meet the qualification requirements of American National Standards Institute Standard N45.2.23.

Conclusion

Annual internal audits of the functional area of emergency preparedness had been performed in accordance with requirements.

8. DOSE CALCULATION AND ASSESSMENT (82207)

The inspectors reviewed procedures for offsite dose calculation and assessment and tested the capabilities of licensee personnel to use the procedures to accurately perform offsite dose assessments. The licensee's computer based dose assessment program, referred to as "Emergency Dose Calculation Program (EDCP)," was approved and implemented in August 1991. The new method uses the same straight-line Gaussian atmospheric dispersion model as the previous method which was employed using a programmable calculator. The inspectors found that the computer model had been installed on dedicated Emergency Dose Calculation Program computers in the control room, technical support center, and emergency operations facility.

Several test calculations were performed using the Emergency Dose Calculation Program Computers to evaluate capabilities and the adequacy of EPP 01-7.2, "Computer Dose Calculation." The program was menu driven, and the inspectors found it to be easy to use. The program featured several accident release models including release rate, design basis accident, interfacing systems loss-of-coolant accident, and releases calculated from radiation monitoring system readings or containment conditions. The model was also capable of back calculating releases from field monitoring team data. A problem noted with the procedure was previously identified as a weakness in paragraph 6.2.3 of this report. The concern involved the lack of guidance specified in EPP 01-7.2 for determining integrated dose projections from the time a release begins. As demonstrated from the walkthroughs conducted, this weakness could result in significant underestimation of the offsite consequences of a radiological release unless appropriate historical release information and dose integration methods are applied. As noted in paragraph 6.2.3, EPP 01-7.2 does not contain such guidance.

The inspectors determined that procedures exist for incorporating the results of dose assessments into offsite protective action recommendations. It was noted, however, that the Emergency Dose Calculation Program protective action recommendations review screen, while not intended to be a protective action recommendation issuance guideline, was not consistent with licensee baseline protective action recommendations for a General Emergency in that it did not reference evacuation of the center nor John Redmond reservoir sectors.

On July 9, 1992, the inspectors contacted the Chief, Environmental Radiation and Emergency Preparedness Section of the Kansas State Department of Health, to discuss consistency between licensee and state dose assessment methods. The representative stated that the program in use by the state is the Emergency Dose Calculation Program developed and provided by the licensee. He stated that the licensee had provided state personnel with training in the method and that good agreement of results had been achieved during exercises.

Conclusion

A computer-based method for assessing consequences of a radiological release had been established by the licensee, and licensee personnel demonstrated proficiency in its use. Procedures for implementing the program were weak in providing guidance on estimating integrated doses from the time a release begins.

9. EXIT INTERVIEW

The lead inspector met with the licensee representatives denoted in paragraph 1 on July 9, 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.