

**ENCLOSURE**

U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Docket No.: 50-298  
License No.: DPR-46  
Report No.: 50-298/97-19  
Licensee: Nebraska Public Power District  
Facility: Cooper Nuclear Station  
Location: P.O. Box 98  
Brownville, Nebraska  
Dates: November 17-20, 1997  
Inspector: J. Blair Nicholas, Ph.D., Senior Radiation Specialist  
Plant Support Branch  
Approved By: Blaine Murray, Chief, Plant Support Branch  
Division of Reactor Safety  
Attachment: Supplemental Information

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## EXECUTIVE SUMMARY

Cooper Nuclear Station  
NRC Inspection Report 50-298/97-19

This routine, announced inspection reviewed the implementation of the radiological environmental monitoring and the meteorological monitoring programs. Training and qualifications, quality assurance oversight, facilities and equipment, and annual reports were also reviewed.

### Plant Support

- Overall, good radiological environmental and meteorological monitoring programs were implemented. Environmental sampling locations were properly established and met Offsite Dose Assessment Manual requirements. Environmental sampling equipment was properly calibrated and maintained. Appropriate changes were made to the environmental sample locations described in the Offsite Dose Assessment Manual as a result of the land use census. Good radiological environmental monitoring implementing procedures were maintained. The meteorological tower instrumentation was properly calibrated and maintained (Sections R1.1, R1.2, R2.1, R2.2, and R3.1).
- Good training and qualification programs were implemented. The knowledge and performance of the environmental management and technical staff were excellent (Sections R4 and R5).
- Good, comprehensive biennial audits of the radiological environmental monitoring and meteorological monitoring programs were performed. Timely corrective actions were implemented. Qualified auditors, who were assisted by experienced and knowledgeable technical specialists, performed the audits. An appropriate assessment was performed of the contractor environmental laboratory's performance (Section R7.1).

## Report Details

### Summary of Plant Status

Cooper Nuclear Station was at power operation during the inspection. There were no events during this inspection that adversely affected the results of the inspection.

## IV. Plant Support

### **R1 Radiological Protection and Chemistry Controls**

#### **R1.1 Radiological Environmental Monitoring Program**

##### **a. Inspection Scope (84750)**

The radiological environmental monitoring program was reviewed to determine compliance with the requirements in the Offsite Dose Assessment Manual. Selected environmental media sampling stations were inspected.

##### **b. Observations and Findings**

The inspector accompanied and observed an environmental technician collect air particulate filter and iodine charcoal cartridge samples for shipment and analyses. The inspector also observed the preparation of the samples for shipment to a contractor environmental laboratory for analyses. Good sampling techniques were observed.

The inspector determined that the collection, processing, and analyses of radiological environmental samples were performed in accordance with Technical Specifications, station procedures, and the Offsite Dose Assessment Manual. The inspector verified that the environmental sample locations met the Offsite Dose Assessment Manual requirements. The 1996 and 1997 annual land use censuses were conducted, and the results were documented in the appropriate annual radiological environmental operating report. Based on the annual land use censuses, appropriate changes were made to several environmental sample locations described in the Offsite Dose Assessment Manual. Licensee staffing was adequate, and management controls were appropriate. Environmental samples were analyzed by a contractor environmental laboratory. Annual radiological environmental operating reports were written and submitted to the NRC as required.

The inspector noted that the radiological environmental monitoring program was fully implemented in accordance with the requirements in the Technical Specifications and the Offsite Dose Assessment Manual. Summaries of the 1995 and 1996 environmental sample results showed that all sample analyses indicated no observed radiological impacts on the environment that could be attributed to the operation of the station. An assessment of the preoperational and operational environmental data showed no changes to the environmental radiation levels due to station operations.

c. Conclusions

Overall, a good radiological environmental monitoring program was implemented in accordance with the Technical Specifications and the Offsite Dose Assessment Manual. All required environmental sampling and analysis activities were performed. Environmental sampling locations were properly maintained and met Offsite Dose Assessment Manual requirements.

R1.2 Meteorological Monitoring Program

a. Inspection Scope (84750)

The meteorological monitoring program was reviewed to determine agreement with the recommendations in NRC Regulatory Guide 1.23 and compliance with the commitments in the Updated Safety Analysis Report. The 100-meter and 10-meter meteorological towers and monitoring instrumentation were inspected. The meteorological instrument calibration results were reviewed.

b. Observations and Findings

The inspector toured the 10- and 100-meter meteorological towers with the environmental department's operations support supervisor and the nuclear environmental/industrial safety technician responsible for the meteorological towers and monitoring instrumentation. The 100-meter meteorological tower was equipped with instrumentation for wind speed, wind direction, and temperature measurement at the 10-, 60-, and 100-meter levels. The 10-meter meteorological tower provided backup monitoring instrument channels at the 10-meter level. Meteorological monitoring instrumentation, including sensing and data recording equipment, was operational, calibrated, and properly maintained. Daily channel checks, periodic physical inspections, and semiannual instrument calibrations were performed on the meteorological monitoring instruments.

Meteorological data was transmitted to the plant computer and displayed in the control room and the site's emergency facilities. The inspector verified that appropriate meteorological data was transmitted to the Control Room and Technical Support Center.

The inspector discussed the 1995 and 1996 meteorological data results with the licensee's meteorologist. During 1995 and 1996, the meteorological data recovery rate was greater than 90 percent for most of the instrument channels, which was an improvement over previous years. However, the inspector noted that several instrument channels still did not meet the recommended data recovery rate of better than 90 percent. The licensee was in the planning process to update the meteorological instrumentation and data transmitting equipment to improve the meteorological data recovery and reliability.

During an inspection of the 100-meter meteorological tower, it was discovered that the east guy anchor of the 100-meter meteorological tower could be stressed under severe

adverse weather conditions (ie., 70-mile per hour wind and 1/2-inch ice on the tower) and represented a safety concern. The Telecommunications Department declared that the 100-meter meteorological tower was not in a safe condition to climb and was working on a solution to this problem.

c. Conclusions

A good meteorological monitoring program was implemented. The meteorological monitoring program satisfied the commitments in the Updated Safety Analysis Report.

**R2 Status of Radiological Protection and Chemistry Facilities and Equipment**

R2.1 Environmental Monitoring Equipment

a. Inspection Scope (84750)

Selected environmental sampling stations were inspected to verify that the stations were maintained and that all sampling equipment was operable and properly calibrated. The on-site environmental facility, where environmental samples were stored and prepared for shipment to a contractor environmental laboratory for analysis, was inspected to verify that sufficient supplies and equipment were available.

b. Observations and Findings

The inspector visited selected environmental media sampling locations specified in the radiological environmental monitoring program. The following types of sampling sites were inspected: air, broadleaf vegetation, thermoluminescent dosimeter, milk, and surface water. The inspector noted that all air samplers in the field were operational and properly calibrated. A timing device was used with each air sampler to monitor its time of operation and to account for any power outages during the sampling period.

All environmental samples were shipped to an offsite contractor environmental laboratory for analyses. The licensee had used the same contractor environmental laboratory for environmental sample analyses since January 1, 1979. The contractor environmental laboratory participated in an interlaboratory comparison program as required by the Technical Specifications. The analytical results from the interlaboratory comparison program were reported in the Annual Environmental Operating Reports. The 1995 and 1996 analytical performance results were within three standard deviations of the known certified results.

The inspector visited the on-site environmental media sample storage and preparation facility, where environmental samples were stored and prepared for shipment to a contractor environmental laboratory for analysis. The facility was stocked with the necessary equipment and sufficient supplies to perform the required sampling activities and sample shipment preparation.

c. Conclusions

Sufficient supplies and spare environmental sampling equipment were available and properly maintained. Environmental monitoring stations were maintained, and the sampling equipment was operable and properly calibrated.

R2.2 Meteorological Monitoring Equipment

a. Inspection Scope (84750)

The meteorological instrumentation at the two meteorological towers was inspected, and the instrument calibration procedures and records were reviewed to ensure that the meteorological instrumentation on the towers was operable and properly calibrated and maintained in accordance with written procedures, the guidance in Regulatory Guide 1.23, and the Updated Safety Analysis Report.

b. Observations and Findings

The 10- and 100-meter meteorological towers and the monitoring instrumentation installed at the 10-, 60-, and 100-meter levels were as described in the Updated Safety Analysis Report. The meteorological towers were equipped with wind speed, wind direction, and temperature sensing instrumentation at 10-, 60-, and 100-meter levels. Daily charnel checks, physical inspections, and semiannual calibrations of the meteorological instrumentation were performed.

The inspector determined that the meteorological sensing and recording equipment was calibrated semiannually by the licensee's instrument and controls department. The calibrations were conducted in accordance with approved procedures. All records reviewed indicated that the meteorological monitoring instruments were being properly tested, calibrated and maintained.

c. Conclusions

The meteorological towers and monitoring instrumentation channels were operational, inspected, maintained, and properly calibrated.

**R3 Procedures and Documentation**

R3.1 Offsite Dose Assessment Manual and Radiological Environmental Monitoring Program Implementing Procedures

a. Inspection Scope (84750)

The inspector reviewed the Offsite Dose Assessment Manual regarding the radiological environmental monitoring program and radiological environmental monitoring program implementing procedures.

b. Observations and Findings

The inspector noted that the changes made to the radiological environmental monitoring program as described in the Offsite Dose Assessment Manual since the last inspection did not result in a decrease of the effectiveness of the program.

The radiological environmental monitoring program implementing procedures described the responsibilities and requirements for collection, analyses, documentation, and shipment of environmental media samples collected around the site. The procedures contained sufficient detail for personnel to implement the radiological environmental monitoring program. The inspector determined that the requirements in the Technical Specifications and the Offsite Dose Assessment Manual were appropriately described by this procedure.

c. Conclusions

Changes to the radiological environmental monitoring program were appropriately made in the Offsite Dose Assessment Manual and the radiological environmental monitoring program implementing procedures. Good radiological environmental monitoring implementing procedures were maintained.

R3.2 Annual Reports

a. Inspection Scope (84750)

The 1995 and 1996 annual radiological environmental operating reports were reviewed to determine compliance with Technical Specifications and Offsite Dose Assessment Manual requirements. The reports were reviewed relative to the radiological environmental monitoring program for data omissions, anomalous measurements, trends in the data, and interlaboratory analysis comparisons.

b. Observations and Findings

Sample data in the 1995 and 1996 Annual Radiological Environmental Operating Reports demonstrated that the required sampling, analyses, and reporting requirements were met. Program discrepancies and missed samples were properly reported. The results of the contractor environmental laboratory's participation in an interlaboratory comparison program were reported as required. The results of the annual land use censuses were documented. The reports were submitted in a timely manner and contained the required information.

c. Conclusions

Excellent annual radiological environmental operating reports were submitted in a timely manner and contained the required information.

**R4 Staff Knowledge and Performance**

a. Inspection Scope (84750)

Environmental policy department and nuclear environmental/industrial safety personnel were observed and interviewed to determine their knowledge of the radiological environmental monitoring program sampling and analyses' requirements and implementing procedures.

b. Observations and Findings

The inspector noted that good radiological sample handling practices were used by the environmental technician to maintain sample integrity. Sample collection and sample preparation for shipment activities observed were conducted in accordance with approved procedures. The inspector determined that environmental policy department and nuclear environmental/industrial safety personnel were familiar with the requirements of the radiological environmental monitoring program and maintained a high level of understanding and performance.

c. Conclusions

The knowledge and performance of personnel responsible for implementing the radiological environmental monitoring program were excellent.

**R5 Staff Training and Qualification**

a. Inspection Scope (84750)

The training and qualification programs for the technical staff responsible for implementing the radiological environmental monitoring program were reviewed.

b. Observations and Findings

The inspector determined that proper training and qualification programs had been implemented. The environmental technician met the qualifications for the independent environmental sampling activities performed. The two recently hired nuclear environmental/industrial safety technicians were in the process of completing their training and qualifications to independently perform environmental sampling activities and the annual land use census.

c. Conclusions

Good training and qualification programs were implemented.

**R6 Organization and Administration**

a. Inspection Scope (84750)

The organization, staffing, and assignment of the radiological environmental monitoring program responsibilities were reviewed.

b. Observations and Findings

The licensee's environmental policy department and the radiological department's nuclear environmental/industrial safety group were responsible for implementing the radiological environmental monitoring program. The inspector reviewed the current organizational charts that identified the positions and responsible staff.

Currently, one part-time environmental technician in the environmental policy department was performing the environmental sampling and shipment of samples for analyses. Environmental specialists were responsible for administering the radiological environmental program and tracking the implementation of the program. The nuclear environmental/industrial safety group was organized within the radiological department at the plant in January 1997 to assist in implementing the radiological environmental monitoring program. Since that time, two nuclear environmental/industrial safety technicians were hired to become trained and qualified to independently perform the required environmental sampling and meteorological tower surveillance activities.

c. Conclusions

The environmental policy department maintained a stable technical staff. The recently organized nuclear environmental/industrial safety group will provide better program ownership and coordination radiological environmental monitoring program activities between the plant and the General Office.

**R7 Quality Assurance Program**

R7.1 Radiological Environmental Monitoring Quality Assurance Program

a. Inspection Scope (84750)

Quality assurance audit reports concerning the radiological environmental monitoring and meteorological programs were reviewed.

b. Observations and Findings

Biennial quality assurance audits of the radiological environmental monitoring and meteorological programs were comprehensive and provided management with good oversight. The audits adequately evaluated the radiological environmental monitoring program and meteorological monitoring program activities and were effective in identifying items for program improvement.

The audit teams consisted of licensee personnel and technical specialists from other nuclear power plants. The inspector determined that the nuclear assurance auditors and technical specialists who performed the audits had appropriate knowledge and experience, which enabled them to properly assess performance and implementation of the radiological environmental monitoring program.

The licensee used a contractor environmental laboratory to perform required radiochemistry analyses of environmental media samples. The licensee had obtained a nuclear procurement issues committee audit of the contractor environmental laboratory. The audit was satisfactory to evaluate the performance of the laboratory in performing the environmental sample analyses and retain its current status on the licensee's qualified suppliers list.

c. Conclusions

Good, comprehensive audits were performed that effectively evaluated the performance and implementation of the radiological environmental monitoring and meteorological monitoring programs. Qualified auditors, who were assisted by experienced and knowledgeable technical specialists, performed the audits. There was appropriate evaluation of the performance of the contractor environmental laboratory.

R7.2 Problem Identification Reports and Corrective Actions

a. Inspection Scope (84750)

Selected problem identification reports to evaluate the effectiveness of the licensee's controls in identifying, resolving, and preventing problems in the radiological environmental monitoring program and the meteorological monitoring program were reviewed.

b. Observations and Findings

Problem identification reports issued in 1996 and 1997 in the areas of the radiological environmental monitoring and meteorological monitoring programs revealed that licensee personnel used this reporting system as needed and had a proper threshold for identifying problems. Problem identification reports were initiated for problems identified during quality assurance audits and the routine implementation of the radiological environmental monitoring and meteorological monitoring programs and were effectively used to track and trend identified problems. Responses to the reviewed problem identification reports were timely and included proper corrective actions.

c. Conclusion

Good performance was noted in identifying problems, performing evaluations, and implementing corrective actions in a timely manner.

**R8 Miscellaneous Radiological Protection and Chemistry Issues**

**R8.1 (Closed) Deviation 298/9621-01: Updated Safety Analysis Report Commitment**

This deviation was discussed in NRC Inspection Report 50-298/96-21 and involved the electrical system design for the meteorological monitoring system as described in Volume I, Section II-3, "Meteorology," in the Updated Safety Analysis Report. The 100-meter meteorological tower is normally powered locally from the 12.5 kV ring bus, but in the event of a loss of off-site power condition the tower is powered locally from the MCC "L" bus. Between September 18, 1995, and April 29, 1996, the transfer switch between the two power supplies for the 100-meter meteorological tower was out of service which prevented the tower from being powered locally in the event of a loss of off-site power. The work order to repair the inoperable transfer switch was assigned a priority 3, and the work order was not being worked and completed in a timely manner. Also, there was no department ownership for the meteorological tower to ensure timely completion of the work order to repair the out-of-service transfer switch.

The inspector reviewed the licensee's response and corrective action to the Notice of Deviation stated in a letter dated November 12, 1996. The corrective action was to assign ownership of the meteorological tower reliability to the radiological department. In January 1997, the radiological department was reorganized and the nuclear environmental/industrial safety group was formed and assigned the responsibility for the meteorological tower performance and reliability. The licensee also revised Nuclear Production Group Directive 4.12, "Work Prioritization," to allow management to assign a higher priority level for a work activity depending on the specific circumstances involved, such as activities needed to maintain plant availability and radiological or personal safety. The inspector verified that work resulting from problem identification reports issued on the meteorological tower instrumentation by the nuclear environmental/industrial safety group during the time period August through November 1997 were assigned a priority 2 and completed in a timely manner. The inspector determined that the meteorological tower instrumentation was being monitored daily by the nuclear environmental/industrial safety technical staff, and identified problems were repaired in a timely manner.

**R8.2 (Closed) Inspection Followup Item 298/9621-02: Meteorological Tower Maintenance**

This item was discussed in NRC Inspection Report 50-298/96-21 and involved the inspectors' concern with the less than 90 percent meteorological data recovery rate during 1995. Work orders for the meteorological tower instrumentation showed that the average length of time for instrument inoperability was about 120 days. This corresponded to work orders assigned a priority 3. The inspector verified that work orders resulting from problem identification reports issued on the meteorological tower instrumentation by the nuclear environmental/industrial safety group were assigned a priority 2 and completed in a timely manner. The inspector determined that the meteorological tower instrumentation was being monitored daily by the nuclear environmental/industrial safety technical staff, and identified problems were repaired in a timely manner. The inspector determined that during 1995 and 1996, the meteorological

data recovery rate was greater than 90 percent for most of the instrument channels, which was an improvement over previous years. However, the inspector noted that several instrument channels still did not meet the recommended data recovery rate of better than 90 percent. The licensee was in the planning process to update the meteorological instrumentation and data transmitting equipment to improve the meteorological data recovery and reliability.

#### V. Management Meetings

##### **X1 Exit Meeting Summary**

The inspector presented the inspection results to members of licensee management at an exit meeting conducted on November 20, 1997. The licensee acknowledged the findings presented. No proprietary information was identified.

ATTACHMENT

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

J. Citta, Environmental Protection Supervisor, Environmental Policy Department  
H. Hasenkamp-Gibbs, Environmental Specialist, Environmental Policy Department  
K. Walden, Manager, Environmental Policy Department  
R. Nyffeler, Environmental Compliance Coordinator, Environmental Policy Department  
M. Krumland, Environmental Operations Supervisor, Environmental Policy Department  
R. Bauer, Environmental Specialist, Environmental Policy Department  
R. McDonald, Staff Health Physicist, Radiological Department  
M. Hale, Manager, Radiological Department  
D. Robinson, Manager, Quality Assessment  
B. Houston, Manager, Licensing  
T. Chinn, Environmental Technician, Environmental Policy Department  
K. DeBuhr, Nuclear Environmental/Industrial Safety Clerk, Radiological Department  
L. Newman, Manager, Operations  
T. Klein, Nuclear Environmental/Industrial Safety Technician, Radiological Department  
N. Thoms, Nuclear Environmental/Industrial Safety Supervisor, Radiological Department  
D. Madson, Licensing Engineer, Licensing  
L. Lockard, Chemistry Supervisor, Radiological Department  
T. Chard, Assistant Radiological Manager, Radiological Department  
G. Smith, Manager, Quality Assurance Operations

NRC

M. Miller, Senior Resident Inspector  
C. Skinner, Resident Inspector  
B. Murray, Chief, Plant Support Branch

INSPECTION PROCEDURE USED

IP 84750                      Radioactive Waste Treatment and Effluent and Environmental Monitoring

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

50-298/9621-01            NOD    Updated Safety Analysis Report Commitment  
50-298/9621-02            IFI     Meteorological Tower Maintenance

LIST OF DOCUMENTS REVIEWED

ORGANIZATION CHARTS

Environmental Policy Department

Radiological Department

QUALITY ASSURANCE AUDITS

Quality Assurance Audit Report 96-17, "Radiological Control and Monitoring,"  
November 15 - December 12, 1996

Quality Assurance Audit Report 97-002, "Chemistry," July 31 - August 14, 1997

VENDCR AUDIT

NUPIC Audit 9601047, Teledyne Brown Engineering Environmental Services,  
August 26-30, 1996

ENVIRONMENTAL POLICY DEPARTMENT PROCEDURES

1.0, "CNS Radiological Environmental Monitoring Program," Revision 14

1.1, "CNS Environmental Air Pump Calibration and Maintenance," Revision 2

1.2, "Annual Review of Broadleaf Vegetation Sample Stations," Revision 3

1.3, "Annual CNS Land Use Census," Revision 2

SURVEILLANCE TESTS

Instrument and Control Procedure 14.3.3, "Meteorological Maintenance Procedure,"  
Revision 4

Instrument and Control Procedure 14.3.4, "Translator Module Calibration," Revision 3

Instrument and Control Procedure 14.3.8, "Wind Speed and Wind Direction Transmitter  
Maintenance," Revision 3

Instrument and Control Procedure 14.11.9, "Esterline-Angus Model MS424C Recorder  
Calibration and Maintenance," Revision 4

REPORTS

Annual Radiological Environmental Operating Reports - 1995 and 1996

Annual Radioactive Effluent Release Reports - 1995 and 1996

MISCELLANEOUS DOCUMENTS

Environmental technician training records

Annual Land Use Census - 1995 and 1996