

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/86-35

License: DPR-46

Docket: 50-298

Licensee: Nebraska Public Power District (NPPD)
P. O. Box 499
Columbus, Nebraska 68601

Facility Name: Cooper Nuclear Station (CNS)

Inspection At: CNS Site, Brownville, Nebraska

Inspection Conducted: December 8-12, 1986

Inspector:

Blaine Murray
for J. Blair Nicholas, Senior Radiation Specialist
Facilities Radiation Protection Section

1/21/87
Date

Approved:

Blaine Murray
Blaine Murray, Chief, Facilities Radiological
Protection Section

1/21/87
Date

Inspection Summary

Inspection Conducted December 8-12, 1986 (Report 50-298/86-35)

Areas Inspected: Routine, unannounced inspection of the licensee's liquid and gaseous radioactive waste management programs including review of organization and management controls, training and qualifications, radioactive waste effluent releases, records and reports of radioactive effluents, radioactive waste effluent release procedures, effluent monitoring instrumentation, air cleaning systems, reactor coolant and secondary water quality, quality control of analytical measurements, quality assurance (QA) program, and Licensee Event Reports.

Results: Within the areas inspected, no violations or deviations were identified.

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DETAILS

1. Persons Contacted

NPPD

*G. R. Horn, Division Manager, Nuclear Operations
 *R. L. Beilke, Chemistry and Health Physics Supervisor
 J. W. Dutton, Training Manager
 *K. L. Fike, Chemist
 *C. R. Goings, Regulatory Compliance Specialist
 R. J. McDonald, Assistant Chemistry and Health Physics Supervisor
 *J. M. Meacham, Senior Manager, Technical Support
 J. L. Peaslee, Surveillance Coordinator
 D. R. Robinson, QA Specialist
 *J. V. Sayer, Radiological Manager
 *G. E. Smith, Acting QA Manager
 D. L. Snyder, Chemistry Training Coordinator
 J. R. Warren, Senior Chemistry and Health Physics Specialist
 T. A. Wilson, Mechanical Engineer

Others

*D. L. DuBois, NRC Senior Resident Inspector
 *E. A. Plettner, NRC Resident Inspector
 *J. P. Jaudon, Chief, Reactor Projects Section A, USNRC Region IV

*Denotes those present during the exit briefing on December 12, 1986.

2. Organization and Management Controls

The NRC inspector reviewed the licensee's organization and staffing regarding the radioactive waste effluent program (RWEF) to determine agreement with commitments in Section XIII-2 in the Updated Safety Analysis Report (USAR) and the requirements in Section 6.1 in the Technical Specifications (TS).

The NRC inspector verified that the organizational structures of the CNS radwaste operations section and chemistry/radiochemistry section (C/RS) were as defined in the USAR and TS. The CNS management control procedures and position descriptions were reviewed for the assignment of responsibilities for the management and implementation of the CNS RWEF. The NRC inspector verified that the administrative control responsibilities specified in CNS procedures were being implemented. Selected procedures and records listed in the attachment to this report were reviewed.

The NRC inspector reviewed the staffing of the radwaste operations section and the C/RS and determined that both sections were fully staffed. Since

the previous NRC radwaste inspection in October 1985, the licensee's C/RS which manages the RWEP had replaced two chemistry technicians and the radwaste operations section had experienced no personnel turnover.

No violations or deviations were identified.

3. Training and Qualifications

The NRC inspector reviewed the training and qualifications of the C/RS staff and non-licensed station operators responsible for the RWEP to determine agreement with commitments in Section XIII-3 of the USAR and the requirements in Section 6.1.4 of the TS.

The NRC inspector reviewed the qualifications of selected C/RS staff and station operators responsible for the implementation of the RWEP and verified that they met the required qualifications specified in the USAR and TS.

The NRC inspector reviewed training records and qualification cards for selected C/RS personnel and non-licensed radwaste station operators responsible for performing RWEP activities. The NRC inspector verified that the C/RS technicians and non-licensed station operators had completed the required training on radiological effluent technical specifications (RETS) and radwaste systems to perform their functional area assignments.

No violations or deviations were identified.

4. Radioactive Waste Effluent Releases

The NRC inspector reviewed the licensee's liquid and gaseous radwaste processing systems, procedures, and records associated with liquid and gaseous releases to determine agreement with commitments in Sections IX-2, IX-4, IX-5, and IX-6 in the USAR and requirements in Sections 3.21, 6.3, 6.7, and 6.8 in the TS, offsite dose assessment manual (ODAM), and the design objectives of 10 CFR Part 50, Appendix I.

The NRC inspector determined that the licensee had implemented the new RETS program and ODAM in July 1986. The NRC inspector reviewed the implementation of the RETS and ODAM to ensure agreement with revised analysis sensitivities, reporting limits, analytical results, sampling requirements, surveillance tests, program operating procedures, offsite dose results from liquid and gaseous effluents, and calibration of equipment. Selected documents and records listed in the attachment to this report were reviewed.

a. Liquid

The NRC inspector reviewed a representative number of liquid release permits for the period July 1985 through November 1986. It was determined that processing, sampling and analysis, approval, and

performance of the releases were conducted in accordance with CNS procedures. Quantities of radioactive nuclides released in the liquid effluents were within the limits specified in the RETS. Offsite doses had been calculated according to the ODAM and were within the TS limits. The NRC inspector determined that no design changes had been made to the liquid waste management system since the previous NRC inspection conducted in October 1985.

b. Gaseous

The NRC inspector reviewed selected analysis of samples taken from the elevated release point, reactor building ventilation, augmented radwaste building ventilation, and turbine building ventilation continuous release paths for the period July 1985 through November 1986. It was determined that the continuous gaseous waste releases were being performed according to procedure and the quantities of gaseous radioactive nuclides released were within the limits specified in the RETS. Offsite doses had been calculated according to the ODAM, updated biweekly, and were within the TS limits. The NRC inspector reviewed daily readings taken from the noble gas monitor and recorded on the appropriate data form and determined that the TS requirement was being met. The NRC inspector reviewed selected operations daily surveillance log sheets for the period January 1986 through November 1986 and verified continuous monitoring of the hydrogen concentration in the augmented offgas treatment system downstream of the recombiners. The NRC inspector determined that no design changes had been made to the gaseous radwaste management system since the previous NRC inspection in October 1985.

No violations or deviations were identified.

5. Records and Reports of Radioactive Effluents

The NRC inspector reviewed the licensee's records and reports concerning radwaste systems and effluent releases for compliance with the requirements of 10 CFR Part 50.36 (a)(2) and Section 6.5.1.F in the TS.

The NRC inspector reviewed the semiannual effluent release reports for the periods July 1 through December 31, 1985 and January 11 through June 30, 1986. These reports were written in the format described in NRC Regulatory Guide 1.21 and contained the TS required information.

The NRC inspector reviewed the implementation of RETS for the period July 1 through December 11, 1986. It was determined that all required information and data were available; however, it was noted that not all RETS requirements were being addressed in specific surveillance procedures. The NRC inspector noted that the licensee is presently undergoing major procedure revisions which will provide surveillance

procedures to perform and track completion of requirements at specified frequencies and provide a concise method for reporting surveillance data.

No violations or deviations were identified.

6. Radioactive Waste Effluent Release Procedures

The NRC inspector reviewed the licensee's effluent release procedures to determine compliance with Sections 3.21 and 6.3 in the TS.

The NRC inspector reviewed current approved revisions of CNS procedures governing the release of liquid radioactive waste. The NRC inspector determined that the effluent release procedures included the following features:

- ° sampling of liquid radioactive waste
- ° chemical and radiochemical analyses prior to release
- ° calculation of effluent release rates and projected offsite radionuclide concentration prior to release
- ° verification of effluent radiation monitor setpoints
- ° testing of effluent isolation valves prior to release
- ° recording of effluent dilution during release
- ° verifying of discharge flow rates and effluent volume discharged
- ° using checklists for the operation of the liquid waste effluent discharge system including shift supervisor's approval signature

Selected documents and records listed in the attachment to this report were reviewed.

No violations or deviations were identified.

7. Effluent Monitoring Instrumentation

The NRC inspector reviewed the licensee's calibration and function check program for the effluent radiation monitors to determine agreement with the commitments in Section VII-12 in the USAR and the requirements in Sections 3.2.D and 3.21.A in the TS.

The NRC inspector reviewed functional checks, calibrations, and alarm/trip setpoint procedures and records for all effluent radiation monitors and determined that the frequency of calibration and functional channel checks met TS requirements. The NRC inspector verified that the monitor primary calibrations were performed using radioactive standards in the same media

and configuration as the actual samples being measured in the effluent streams. The radioactive standards used were traceable to the National Bureau of Standards and were of various activity levels to cover the full range of each monitor. The calibrations and setpoint determinations were verified to have been performed according to approved procedures. The NRC inspector visually inspected the location and operation of the liquid and gaseous effluent radiation monitors and determined that the radwaste effluent radiation monitors were operating at the time of the inspection and met TS requirements.

Selected documents and procedures listed in the attachment to this report were reviewed.

No violations or deviations were identified.

8. Air Cleaning Systems

The NRC inspector reviewed the licensee's procedures and surveillance test results for maintenance and testing of air cleaning systems which contain high efficiency particulate air (HEPA) filters and activated charcoal absorbers to determine agreement with commitments in Section VII-17 and IX-10 in the USAR and the requirements in Sections 3.7 and 3.12 in the TS.

The NRC inspector verified that the licensee's surveillance test results for the period January 1 through December 10, 1986 were within TS limits. Selected documents and surveillance tests listed in the attachment to this report were reviewed.

No violations or deviations were identified.

9. Reactor Water Quality

The NRC inspector reviewed the licensee's program for monitoring and controlling the reactor water quality to determine compliance with the requirements in Section 3.6.B in the TS.

The NRC inspector reviewed procedures and selected reactor water chemistry analyses records for the period October 1985 through November 1986. The records reviewed indicated that all required sampling and analyses were performed at the frequencies required by the TS and the analyses results met TS requirements. Selected documents and records listed in the attachment to this report were reviewed.

No violations or deviations were identified.

10. Quality Control of Analytical Measurements

The NRC inspector reviewed the licensee's program for calibration and quality control of chemical and radiochemical analytical measurements to determine compliance with the requirements in Section 6.3 in the TS.

The NRC inspector inspected the licensee's chemistry/radiochemistry laboratory and counting room instrument calibration and quality control procedures, instrument calibration data, performance check data, and other documentation of instrument performance during the NRC inspection of chemistry/radiochemistry activities conducted March 3-7, 1986. The results of that inspection were reported in NRC Inspection Report 50-298/8609.

No violations or deviations were identified.

11. QA Program

The NRC inspector reviewed the licensee's QA audit and surveillance program regarding radwaste activities associated with liquid and gaseous effluent releases to determine agreement with commitments in Section XIII-9 in the USAR and requirements in Section 6.2 in the TS.

The NRC inspector reviewed the CNS QA organization, selected QA audit and surveillance procedures, audit and surveillance schedules for 1985 and 1986, and the qualifications of auditors. Selected QA surveillance and audit reports concerning QA activities performed during 1985 and 1986 in the areas of chemistry, liquid radwaste processing, implementation of RETS, and ODAM were reviewed for scope to ensure thoroughness of program evaluation and timely followup of identified findings. The NRC inspector found the audit plans, checklists, and surveillances to be comprehensive.

The NRC inspector determined that the licensee was using a contractor laboratory to perform the ^{55}Fe analysis on radioactive liquid waste effluent required by TS. The licensee was also using a contractor to perform in-place filter testing and laboratory charcoal adsorber analyses on the station ventilation systems as required by TS. The licensee had performed QA audits on both of these contractors and had placed them on the CNS approved supplier list. The NRC inspector reviewed the audits performed by the licensee on the two contractors and found the audits to be adequate.

No violations or deviations were identified.

12. Licensee Event Reports (LER)

The NRC inspector determined that the licensee had not written any LERs since the previous NRC inspection of this area in October 1985 that involved radioactive effluent release activities.

No violations or deviations were identified.

13. Exit Briefing

The NRC inspector met with the NRC and licensee representatives identified in paragraph 1 at the conclusion of the inspection on December 12, 1986. The NRC inspector summarized the scope and findings of the inspection.

ATTACHMENT
TO NRC INSPECTION REPORT
50-298/86-35

Documents Reviewed

Administrative Procedures

- 0.1, "Station Organization and Responsibility," Revision 2, dated July 31, 1986
- 0.17, "Selection and Training of Station Personnel," Revision 4, dated September 18, 1986
- 0.26, "Surveillance Program," Revision 1, dated May 22, 1986

Operating Procedures

- 2.2.62, "Radioactive Waste System - Gaseous," Revision 13, dated September 19, 1985
- 2.2.73, "Standby Gas Treatment System," Revision 14, dated August 8, 1985
- 2.5.2.3, "Radwaste High Conductivity Liquid Waste Floor Drain Sample Tank Fluid Transfer," Revision 28, dated October 30, 1986

Surveillance Procedures

- 6.2.6.1, "Off Gas System Auto Isolation Functional Test," Revision 12, dated October 30, 1986
- 6.2.6.2, "Augmented Off Gas Hydrogen Monitors Calibration," Revision 1, dated August 21, 1986
- 6.2.6.4, "Off Gas Flow Monitor Calibration," Revision 6, dated June 5, 1986
- 6.2.6.7, "Steam Jet Air Ejector Flow Monitor Calibration," Revision 1, dated September 4, 1986
- 6.2.6.8, "Augmented Off Gas Hydrogen Monitors Functional Test," Revision 1, dated August 21, 1986
- 6.3.7.1, "ERP Radiation Monitor (G.E.) Calibration and Functional/Functional Test," Revision 15, dated July 6, 1984
- 6.3.7.2, "Off Gas Radiation Monitor Calibration and Functional/Functional Test," Revision 18, dated October 23, 1986
- 6.3.7.3, "Liquid Radwaste Effluent Flow Monitor Calibration," Revision 0, dated June 26, 1986
- 6.3.7.4, "SW and REC Radiation Monitor Calibration Check and Instrument Channel/Instrument Channel Test," Revision 12, dated September 18, 1986

- 6.3.7.5, "Reactor Building Ventilation Radiation Monitor Calibration and Functional/Functional Test," Revision 9, dated January 2, 1986
- 6.3.7.6, "Liquid Radwaste Effluent Flow Monitor Functional Test," Revision 0, dated June 25, 1986
- 6.3.7.7, "Liquid Radwaste Effluent System Calibration and Functional/Functional and Logic Tests," Revision 13, dated February 20, 1984
- 6.3.7.8, "ERP Radiation Monitor (Kaman) Known Source Calibration Check/Functional Test," Revision 22, dated June 30, 1986
- 6.3.17.4, "Control Room Emergency Fan HEPA Filter Leak Test," Revision 7, dated March 20, 1985
- 6.3.17.5, "Control Room Emergency Fan Charcoal Leak, Charcoal Sampling, and Fan Capacity Testing," Revision 9, dated February 15, 1984
- 6.3.17.6, "HVAC Radwaste Building HEPA Filters Leak Test," Revision 3, dated February 6, 1986
- 6.3.17.7, "HVAC Reactor Building HEPA Filters Leak Test," Revision 3, dated June 26, 1986
- 6.3.17.8, "HVAC Augmented Radwaste Building HEPA Filters Leak Test," Revision 3, dated June 26, 1986
- 6.3.17.10, "EOF/TSC Emergency Air Filter In-Place HEPA Leak Test," Revision 1, dated December 26, 1985
- 6.3.17.11, "EOF/TSC Emergency Air Filter In-Place Charcoal Leak Test and Laboratory Analysis," Revision 1, dated September 5, 1985
- 6.3.17.13, "MPF HEPA Filter Leak Test," Revision 0, dated July 24, 1985
- 6.3.19.3, "SGT HEPA Filters Leak and Housing Door Seal Leak Test," Revision 9, dated May 1, 1986
- 6.3.19.4, "SGT Charcoal Filter Leak and Fan Capacity Test," Revision 13, dated May 1, 1986
- 6.3.19.5, "SGT Charcoal Filter Carbon Analysis - Methyl Iodide," Revision 9, dated May 1, 1986
- 6.4.6.1, "Reactor Building Air Sampling System (Kaman) Functional Test and Known Source Calibration Check," Revision 25, dated August 21, 1986
- 6.4.6.3, "Control Room Vent Monitors Calibration and Functional/Functional and Logic Tests," Revision 23, dated January 30, 1986

- 6.4.6.4, "Turbine Building Air Sampling System (Kaman) Functional Test and Known Source Calibration Check," Revision 26, dated August 21, 1986
- 6.4.6.5, "Radwaste Building Air Sampling System (Kaman) Functional Test and Known Source Calibration Check," Revision 17, dated August 21, 1986
- 6.4.6.9, "Turbine Building Air Sampling System (Kaman) Electronic Calibration Test," Revision 1, dated March 6, 1986
- 6.4.6.10, "EPR Radiation Monitor System (Kaman) Electronic Calibration Test," Revision 1, dated March 6, 1986
- 6.4.6.11, "Radwaste Building Air Sampling System (Kaman) Electronic Calibration Test," Revision 1, dated February 13, 1986
- 6.4.6.12, "Reactor Building Air Sampling System (Kaman) Electronic Calibration Test," Revision 2, dated July 17, 1986
- 6.4.6.13, "Turbine Building Ventilation Flow Monitor Calibration Test," Revision 1, dated May 15, 1986
- 6.4.6.14, "Reactor Building Ventilation Flow Monitor Calibration Test," Revision 1, dated October 9, 1986
- 6.4.6.15, "Radwaste Building Ventilation Flow Monitor Calibration Test," Revision 0, dated April 24, 1986
- 6.4.6.16, "Steam Jet Air Ejector Flow Monitor Functional Test," Revision 1, dated September 4, 1986
- 6.4.6.17, "Reactor Building Ventilation Flow Monitor Functional Test," Revision 0, dated June 26, 1986
- 6.4.6.18, "Radwaste Building Ventilation Flow Monitor Functional Test," Revision 0, dated June 26, 1986
- 6.4.6.19, "Turbine Building Ventilation Flow Monitor Functional Test," Revision 0, dated June 26, 1986

Chemistry Procedures

- 8.2.1, "Chemistry Analysis and Instrument Calibration Schedule," Revision 14, dated July 1, 1986
- 8.4, "Routine Sampling Procedure and Liquid/Gas Sample Points," Revision 3, dated June 24, 1986
- 8.6.1, "Air Ejector Off Gas Radiation Monitor Calibration," Revision 8, dated July 10, 1986
- 8.6.2, "ERP and Vent Monitor Calibrations," Revision 12, dated April 24, 1986

- 8.6.3, "Liquid Process Radiation Monitors SW and REC," Revision 9, dated June 30, 1986
- 8.6.4, "Radwaste Liquid Process Radiation Monitor," Revision 11, dated July 17, 1986
- 8.6.5, "Control Room and Drywell Air Monitors," Revision 2, dated July 15, 1986
- 8.8.1.13, "Radiochemical Gross Activity Analysis," Revision 7, dated December 22, 1984
- 8.8.1.14, "Radiochemical Analysis Iodines," Revision 8, dated September 28, 1984
- 8.8.1.17, "Radiochemical Noble Gas Sampling," Revision 0, dated June 22, 1983
- 8.8.1.25, "Radiochemical Strontium and Yttrium Analysis," Revision 7, dated September 26, 1986
- 8.8.1.30, "Radiochemical Analysis of Tritium," Revision 1, dated June 26, 1986
- 8.8.4, "Off Gas Grab Samples Isotopic Analysis," Revision 8, dated July 17, 1986
- 8.8.5, "Determination of Off-Gas Flow Rate," Revision 2, dated July 13, 1982
- 8.8.6, "Determination of Off-Gas Hold-Up Time," Revision 2, dated August 12, 1986
- 8.8.7, "Liquid Waste Discharge Preparation and Analysis," Revision 9, dated June 26, 1986
- 8.8.8, "Particulate Filters, Iodine Cartridges, and Noble Gas ERP Vent Monitors Sample Collection," Revision 9, dated August 18, 1985
- 8.8.11, "Liquid Radioactive Waste Discharge Authorization," Revision 10, dated June 25, 1986
- 8.11.1, "Effects Program," Revision 1, dated September 11, 1986

Data Forms

8.2.12.0.1, 8.4.1.1.1, 8.4.5.1.6-C, 8.4.5.3.4-A, 8.4.5.3.4-B, 8.4.5.3.5-B, 8.4.7.2.2, 8.4.8.2.2, 8.4.11.1.2-A, 8.4.11.2.2-A, 8.4.11.9.2, 8.4.12.2.5-A, 8.4.12.2.5-B, 8.4.12.3.2-A, 8.5.5.3.5, 8.5.8.2.5, 8.5.11.10-A, 8.5.12.1.5

Other Documents

Cooper Nuclear Station Semiannual Effluent Release Reports
 July through December 1985
 January through June 1986

- 8.6.3, "Liquid Process Radiation Monitors SW and REC," Revision 9, dated June 30, 1986
- 8.6.4, "Radwaste Liquid Process Radiation Monitor," Revision 11, dated July 17, 1986
- 8.6.5, "Control Room and Drywell Air Monitors," Revision 2, dated July 15, 1986
- 8.8.1.13, "Radiochemical Gross Activity Analysis," Revision 7, dated December 22, 1984
- 8.8.1.14, "Radiochemical Analysis Iodines," Revision 8, dated September 28, 1984
- 8.8.1.17, "Radiochemical Noble Gas Sampling," Revision 0, dated June 22, 1983
- 8.8.1.25, "Radiochemical Strontium and Yttrium Analysis," Revision 7, dated September 26, 1986
- 8.8.1.30, "Radiochemical Analysis of Tritium," Revision 1, dated June 26, 1986
- 8.8.4, "Off Gas Grab Samples Isotopic Analysis," Revision 8, dated July 17, 1986
- 8.8.5, "Determination of Off-Gas Flow Rate," Revision 2, dated July 13, 1982
- 8.8.6, "Determination of Off-Gas Hold-Up Time," Revision 2, dated August 12, 1986
- 8.8.7, "Liquid Waste Discharge Preparation and Analysis," Revision 9, dated June 26, 1986
- 8.8.8, "Particulate Filters, Iodine Cartridges, and Noble Gas ERP Vent Monitors Sample Collection," Revision 9, dated August 18, 1985
- 8.8.11, "Liquid Radioactive Waste Discharge Authorization," Revision 10, dated June 25, 1986
- 8.11.1, "Effects Program," Revision 1, dated September 11, 1986

Data Forms

8.2.12.0.1, 8.4.1.1.1, 8.4.5.1.6-C, 8.4.5.3.4-A, 8.4.5.3.4-B, 8.4.5.3.5-B, 8.4.7.2.2, 8.4.8.2.2, 8.4.11.1.2-A, 8.4.11.2.2-A, 8.4.11.9.2, 8.4.12.2.5-A, 8.4.12.2.5-B, 8.4.12.3.2-A, 8.5.5.3.5, 8.5.8.2.5, 8.5.11.10-A, 8.5.12.1.5

Other Documents

Cooper Nuclear Station Semiannual Effluent Release Reports
 July through December 1985
 January through June 1986