APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-298/94-07

Operating License: DPR-46

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

Facility Name: Cooper Nuclear Station

Inspection At: Brownville, Nebraska

Inspection Conducted: February 28 through March 4, 1994

Inspector: A. D. Gaines, Radiation Specialist
Facilities Inspection Programs Branch

Approved: Blaine Murray 3/16/94
Blaine Murray, Chief, Facilities Inspection Programs Branch — Date

Inspection Summary

Areas Inspected: Routine, announced inspection of the liquid and gaseous radioactive waste management programs including organization and management controls, training and qualifications, quality assurance, radioactive liquid and gaseous effluent systems, reports of radioactive effluents, and air cleaning ventilation systems.

Results:

- The radioactive waste effluent management program was properly implemented (Section 1.1).
- An Inspection Followup Item was identified concerning the high range Kaman monitors (Section 1.1).
- A good training program had been implemented for personnel responsible for radioactive waste effluent management activities (Section 2.1).
- An appropriate number of personnel were trained and qualified to perform radioactive waste effluent activities (Section 2.2).

- Good quality assurance audits had been performed regarding the radioactive waste effluent program and Offsite Dose Assessment Manual (Section 3).

- An excellent liquid and gaseous radioactive waste effluent program was being implemented (Sections 4.1 and 5.1).

- A good testing and calibration program had been established for the radioactive waste effluent instrumentation and radiation monitors (Sections 4.1 and 5.1).

- Semiannual Radioactive Effluent Release Reports were submitted in a timely manner and contained all the required information in the proper format (Section 6.1).

- A good program had been established for testing the air cleaning systems (Section 7.1).

Summary of Inspection Findings:

- Inspection Followup Item 298/9407-01 was opened (Section 1.1).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting

- Attachment 2 - Summation of all Liquid Effluent Releases

- Attachment 3 - Summation of all Airborne Effluent Releases

- Attachment 4 - Maximum Doses to the Public Due to Radioactivity Released in Gaseous and Liquid Effluents

DETAILS

1 ORGANIZATION AND MANAGEMENT CONTROLS (84750)

The inspector reviewed the organization and staffing regarding the radioactive waste effluent program to determine agreement with commitments in Chapter 13 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specification 6.1.

1.1 Discussion

The inspector verified that the organizational structure of the chemistry department, which is responsible for the implementation of the radioactive waste effluent program, was as defined in the Updated Safety Analysis Report and Technical Specifications. Management control procedures were reviewed for the assignment of responsibilities for the management and implementation of the radioactive waste effluent program. The chemistry department was assigned the responsibility for preparing radioactive waste release permits, evaluating the radioactive waste effluent releases, calculating the radiation doses resulting from the releases to the environment, and maintaining radioactive waste effluent release data. The inspector determined that the duties and responsibilities of the chemistry department specified in the administrative procedures were being implemented. The inspector interviewed several of the chemistry technicians and determined that they were knowledgeable of the requirements of the radioactive waste effluent program.

The inspector reviewed the staffing of the chemistry department and noted that since the previous NRC inspection of the radioactive waste effluent program conducted in October 1992 there had been no changes. The Chemistry Supervisor indicated that they would be posting a permanent full-time chemistry technician position to replace a temporary part-time position. The chemistry department staffing was determined to be adequate and in accordance with licensee commitments.

The inspector reviewed Nonconformance Report 94-027 which was written on February 15, 1994. The report indicated that during training on the radwaste/augmented radwaste high range Kaman effluent ventilation monitor the technician being trained noted that the particulate/iodine assembly was loose and not sealed in the monitor. The technicians notified the control room and recommended that the monitor be declared inoperable because this condition would prevent the monitor from drawing a representative sample from the vent path. The monitor was declared inoperable. The licensee's subsequent review indicated that "O" rings were missing in the assembly. The licensee initiated a review of the other high range Kaman effluent monitors and found more missing "O" rings. All "O" rings were replaced and all of the monitors were declared operable on February 25, 1994. At the time of the inspection, the licensee had not finished their review of the incident. The Chemistry Supervisor indicated that the licensee would be sending the NRC a Licensee Event Report on the event by March 17, 1994. The inspector stated that a review of the incident would be classified as an Inspection Followup Item and would be reviewed during a future inspection (298/9407-01). The inspector

indicated to the licensee that the technician's inquisitive attitude that uncovered the missing "O" rings was commendable.

1.2 Conclusions

The chemistry department organizational structure and staffing met the Technical Specification requirements. The radioactive waste effluent management program was being implemented in accordance with station procedures. The chemistry department had no turnover of technical personnel. A technician's inquisitive attitude which uncovered a problem with high range Kaman monitors was commendable. An Inspection Followup Item was initiated to review the problem with the high range Kaman monitors.

2 TRAINING AND QUALIFICATIONS (84750)

The inspector reviewed the training and qualification programs for the chemistry technicians and nuclear station operators responsible for implementing the radioactive waste effluent program to determine agreement with commitments in Chapter 13 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 6.1.4.

2.1 Discussion

The inspector reviewed individual training records for selected chemistry technicians and nuclear station operators responsible for performing radioactive waste effluent program activities. Based on the review of selected individual chemistry technician and nuclear station operator staff training records, it was verified that the chemistry technicians and nuclear station operators responsible for performing radioactive waste effluent program activities had completed the required training to perform their assigned duties. The inspector also noted that the staffing levels of the chemistry and operations departments appeared adequate to perform the duties required by the radioactive effluents programs.

2.2 Conclusions

The licensee had implemented good training programs for chemistry technician and nuclear station operator personnel. The chemistry department and operations department had adequate, well qualified staffs to meet staffing requirements.

3 QUALITY ASSURANCE PROGRAM (84750)

The inspector reviewed the quality assurance audit and surveillance programs regarding the radioactive waste effluent program activities to determine agreement with commitments in Chapters 13 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 6.2.

3.1 Discussion

Audit and surveillance reports of quality assurance activities performed during 1992 and 1993 of the radiological effluent monitoring programs, the Offsite Dose Assessment Manual and implementing procedures, and the effluent radiation monitors were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. The audits were performed in accordance with quality assurance procedures and by qualified auditors and assisted by technical specialists. The inspector found the quality assurance audits to be comprehensive and satisfactory to evaluate the licensee's performance in implementing the radiological effluents programs.

The licensee used a contract laboratory to perform Technical Specification required radiochemistry analyses on radioactive waste effluent composite samples. The licensee also used a contractor to perform in-place filter testing and laboratory charcoal adsorber analyses on the station's air cleaning systems. The inspector noted that the licensee used audits for both contractors that had been performed by Nuclear Procurement Issues Committee to satisfy their audit requirements and frequency. The licensee reviewed the audits for adequacy toward their programs and followed up on findings generated by the audits to ensure closure.

3.2 Conclusions

Quality assurance audits of the radioactive waste effluent program and Offsite Dose Assessment Manual had been performed as required. These audits were comprehensive and satisfactory to evaluate the licensee's performance in implementing the radiological effluents programs. Audits of the contractors used to perform radioactive waste effluent program Technical Specification required surveillance analyses had been performed as required.

4 LIQUID RADIOACTIVE WASTE EFFLUENTS (84750)

The inspector reviewed the liquid radioactive waste effluent program including liquid waste processing, liquid waste sampling and analyses, procedures for control and release of radioactive liquid waste effluents, surveillance tests, and liquid effluent instrumentation and radiation monitor tests and calibrations to determine agreement with commitments in Chapters 7 and 9 of the Updated Safety Analysis Report and compliance with the requirements in Sections 3/4.2, 3/4.21, 6.3, 6.7, and 6.8 of the Technical Specifications and the Offsite Dose Assessment Manual.

4.1 Discussion

The inspector reviewed the licensee's implementation of the radioactive waste effluent program and Offsite Dose Assessment Manual to ensure compliance with sampling and analyses requirements, analyses sensitivities, analytical results, surveillance tests, radwaste operations procedures, offsite dose results from radioactive liquid effluents, and operational tests and calibrations of equipment and radiation monitors associated with the radioactive liquid waste processing systems.

The inspector reviewed selected procedures governing the release of liquid radioactive waste effluents. These procedures provided for the following: recirculation and sampling of the radioactive liquid waste; chemical and radionuclide analyses prior to release; calculation of effluent release rate, effluent radiation monitor setpoints, projected offsite radionuclide concentrations, and offsite doses prior to release; recording of dilution parameters during the release; and verifying effluent discharge flow rates and effluent volume discharged.

The inspector reviewed a representative number of batch radioactive waste liquid release permits for the period January 1, 1993, through January 31, 1994. It was determined that the processing, sampling, and analyses of liquid radioactive waste effluent and the approval and performance of batch liquid radioactive waste discharges were conducted in accordance with Technical Specification and Offsite Dose Assessment Manual requirements. Quantities of radionuclides released in the liquid effluents were within the limits specified in the Offsite Dose Assessment Manual. Offsite doses were calculated according to the Offsite Dose Assessment Manual and were within Technical Specification limits. The inspector verified that the licensee was performing the Offsite Dose Assessment Manual requirements for gross alpha analysis, strontium-89 and strontium-90 analyses, and iron-55 analysis on composite samples of batch liquid radioactive releases. The licensee had not made any major equipment or design modifications to the radioactive liquid waste management systems since the last NRC inspection of this area in October 1992.

The inspector reviewed liquid radioactive waste process and effluent radiation monitor source check, channel check, functional test, and calibration records. All records reviewed indicated that the radioactive liquid effluent monitoring instrumentation was being properly maintained, tested, and calibrated in compliance with Offsite Dose Assessment Manual requirements.

4.2 Conclusions

The licensee was implementing a liquid radioactive waste effluent program in accordance with the Technical Specifications and Offsite Dose Assessment Manual. The quantities of radionuclides released in the liquid radioactive waste effluents were within the Offsite Dose Assessment Manual limits. Offsite doses to the environment from the liquid radioactive waste effluents had been calculated using Offsite Dose Assessment Manual methodologies, and the dose results were within Offsite Dose Assessment Manual limits. The licensee had not made any major equipment or design modifications to the radioactive liquid waste management systems. Liquid radioactive waste effluent instrumentation and radiation monitors were being tested and calibrated in compliance with Offsite Dose Assessment Manual requirements.

5 GASEOUS RADIOACTIVE WASTE EFFLUENTS (84750)

The inspector reviewed the licensee's gaseous radioactive waste effluent program including gaseous waste processing, gaseous waste sampling and analyses, procedures for the control and release of gaseous waste effluents,

and gaseous effluent radiation monitors to determine agreement with commitments in Chapters 7 and 9 of the Updated Safety Analysis Report and compliance with the requirements in Sections 3/4.2, 3/4.7, 3/4.12, 3/4.21, 6.3, 6.7, and 6.8 of the Technical Specifications and the Offsite Dose Assessment Manual.

The inspector reviewed the licensee's implementation of the radioactive waste effluent program and Offsite Dose Assessment Manual to ensure compliance with sampling and analyses requirements, analyses sensitivities, analytical results, surveillance tests, radwaste operations procedures, offsite dose results from radioactive gaseous effluents, and operational tests and calibrations of equipment and radiation monitors associated with the radioactive gaseous waste processing systems.

The inspector reviewed selected procedures governing the release of gaseous radioactive waste effluents. These procedures provided for the sampling and analysis of the radioactive gaseous waste effluents, calculation of effluent release rate, calculation of projected offsite radionuclide concentrations and doses, and calculation and verification of gaseous effluent radiation monitor setpoints prior to release; recording of dilution parameters during the release; and verification of effluent discharge flow rates and effluent volume discharged.

The inspector reviewed selected analyses 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 January 1, 1993, through January 31, 1994. It was determined that the sampling and analyses of the gaseous effluents were conducted in accordance with procedures. Quantities of gaseous and particulate radionuclides released were within the limits specified in the Offsite Dose Assessment Manual. Offsite doses had been calculated according to Offsite Dose Assessment Manual methodologies and were within required limits. Particulate effluent composite sample analyses for gross alpha, strontium-89, and strontium-90 had been performed and met Offsite Dose Assessment Manual requirements. The inspector reviewed selected daily readings taken from the noble gas monitor and recorded on the Operations-Daily Surveillance Log and determined that the Technical Specification requirement was met. Selected Operations-Daily Surveillance Logs were reviewed and the continuous monitoring of the hydrogen concentration in the augmented off gas treatment system was verified.

The inspector noted that minor modifications had been made to the standby gas treatment system in 1993 under Design Change 93-064. The design changes were to ensure solenoid operated valves had adequate over-pressure protection and to eliminate potential single failure vulnerability. The design changes had been reviewed in accordance with the licensee's procedures and included a 10 CFR 50.59 review.

The inspector reviewed gaseous radioactive waste process and effluent instrumentation and radiation monitor source check, channel check, functional test, and calibration records. All records reviewed indicated that the instrumentation and effluent radiation monitors were being properly

maintained, tested, and calibrated in compliance with approved procedures and the Offsite Dose Assessment Manual requirements.

5.2 Conclusions

The licensee was implementing a gaseous radioactive waste effluent program in accordance with the Technical Specifications and Offsite Dose Assessment Manual. The quantities of radionuclides released in the gaseous radioactive waste effluents were within the Offsite Dose Assessment Manual limits. Offsite doses to the environment from the gaseous radioactive waste effluents had been calculated using Offsite Dose Assessment Manual methodologies, and the dose results were within Offsite Dose Assessment Manual limits. The licensee had made minor design modifications to the standby gas treatment system in 1993. Gaseous radioactive waste effluent instrumentation and radiation monitors were being tested and calibrated in compliance with Offsite Dose Assessment Manual requirements.

6 REPORT OF RADIOACTIVE EFFLUENTS (84750)

The inspector reviewed the licensee's reports concerning radioactive waste systems and effluent releases to determine compliance with the requirements of 10 CFR 50.36(a)(2), Technical Specification 6.5.1, and the Offsite Dose Assessment Manual.

6.1 Discussion

The inspector reviewed the licensee's semiannual effluent release reports for the periods July 1 through December 31, 1992, January 1 through June 30, 1993, and July 1 through December 31, 1993. These reports were written in the format described in NRC Regulatory Guide 1.21, Revision 1, June 1974, and contained the information required by the Technical Specifications and the Offsite Dose Assessment Manual. During the time period July 1, 1992, through December 31, 1993, the licensee had performed 164 liquid batch releases. The licensee reported that there had been no unplanned releases during the time period reviewed. Effluent monitoring instrumentation had not been out of service in excess of Technical Specifications during the time period reviewed. The inspector reviewed the licensee's changes to the Offsite Dose Assessment Manual made during the time period reviewed and found the changes well documented in the appropriate Semiannual Radioactive Effluent Release Reports as required by the Technical Specifications. The changes to the Offsite Dose Assessment Manual had received Plant Safety Review Committee approval prior to their implementation. A summary of the radioactive liquid and gaseous effluent releases and associated doses for the third and fourth quarters of 1992 and all of 1993 is presented in Attachments 2 through 3 to this inspection report.

6.2 Conclusions

The licensee had submitted their Semiannual Radioactive Effluent Release Reports in a timely manner, and these reports contained all the required information presented in the format described in NRC Regulatory Guide 1.21. There were no unplanned radioactive releases. Changes to the Offsite Dose Assessment Manual had received appropriate approval prior to implementation and were properly documented.

7 AIR CLEANING SYSTEMS (84750)

The inspector reviewed the air cleaning ventilation system testing program to determine agreement with the commitments in Chapter 10 of the Updated Safety Analysis Report and compliance with the requirements in Technical Specifications 4.2 and 4.12.

7.1 Discussion

The inspector reviewed the licensee's procedures, surveillance tests, and selected records and test results for maintenance and testing of the air cleaning ventilation systems which contain high efficiency particulate air filters and activated charcoal adsorbers. The inspector verified that the licensee's procedures and surveillance tests provided for the required periodic functional checking of the ventilation systems' components, evaluation of the high efficiency particulate air filters and activated charcoal adsorbers, and the replacement and in-place filter testing of the filter systems. Selected records and test results for the period January 1993 through January 1994 for the main control room emergency ventilation and the standby gas treatment systems were reviewed. The in-place filter testing and activated charcoal laboratory tests had been performed in accordance with approved procedures by a contract laboratory, and all test results were verified to be within Technical Specification limits. The inspector noted that the Technical Specification requirement for testing the various ventilation systems' activated charcoal adsorber material prior to 720 hours of operation following previous laboratory testing was being tracked.

7.2 Conclusions

The air cleaning and filter ventilation systems conformed to the commitments in the Updated Safety Analysis Report and Technical Specification requirements. The licensee's safety related ventilation systems had been tested in accordance with Technical Specification requirements, and all test results were within Technical Specification limits.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

*R. L. Beilke, Acting Radiological Manager
M. L. Cade, Chemistry Technician
*M. A. Dean, Nuclear Licensing and Safety Supervisor
*J. W. Dutton, Acting Senior Manager Site Support
*R. L. Gibson, Quality Assurance Programs Supervisor
*M. Gillan, Training Supervisor
*R. Heywood, Procedures Clerk
*G. R. Horn, Vice President Nuclear
*J. E. Lynch, Engineering Manager
*R. J. McDonald, Chemistry Supervisor
J. L. Peaslee, Surveillance Coordinator
*J. V. Sayer, Technical Assistant to the Plant Manager
D. L. Snyder, Chemistry Training Instructor
J. A. Teten, Lead Chemistry Technician
*P. Thurman, Nuclear Support
*V. L. Wolstenholm, Division Manager Quality Assurance

1.2 NRC Personnel

*R. A. Kopriva, Senior Resident Inspector

*Indicates those present at the exit meeting on March 4, 1994. In addition to the personnel listed above, the inspector contacted other personnel during this inspection period.

2 EXIT MEETING

An exit meeting was conducted on March 4, 1994. During this meeting, the inspector reviewed the scope and findings of the inspection. The licensee did not identify as proprietary, any of the materials provided to, or reviewed by the inspector during the inspection.

ATTACHMENT 2

SUMMATION OF ALL LIQUID EFFLUENT RELEASES

	1992		1993			
	QUARTER 3	QUARTER 4	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Number of batch releases	53		66		45	
2. Fission & Activation Products (Curies)	8.64 E-01	4.38 E-01	1.09 E+00	8.66 E-01	1.79 E-01	1.81 E-01
3. Tritium (Curies)	2.18 E+00	3.24 E+00	6.01 E+00	2.58 E+00	1.23 E+00	9.66 E-01
4. Dissolved & Entrained Noble Gases (Curies)	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00
5. Waste Volume Released (liters)	1.91 E+06	1.62 E+06	2.36 E+06	2.13 E+06	1.97 E+06	1.07 E+06

ATTACHMENT 3

SUMMATION OF ALL AIRBORNE EFFLUENT RELEASES

	1992		1993			
	QUARTER 3	QUARTER 4	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
1. Fission & Activation Products (Curies)	5.85 E+00	9.21 E-01	0.00 E+00	0.00 E+00	3.72 E+00	2.70 E+00
2. Total Iodine-131 (Curies)	3.70 E-05	3.71 E-06	3.97 E-06	0.00 E+00	1.32 E-05	1.05 E-05
3. Particulates with Half-lives > 8 days (Curies)	0.00 E+00	0.00 E+00	1.48 E-04	0.00 E+00	3.23 E-03	3.47 E-05
4. Tritium (Curies)	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00	0.00 E+00