ENCLOSURE 2

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-298/95-16

License: DPR-46

Licensee: Nebraska Public Power District
1414 15th Street
Columbus, Nebraska

Facility Name: Cooper Nuclear Station

Inspection At: Brownville, Nebraska

Inspection Conducted: November 6-9, 1995

Inspector: Michael P. Shannon, Radiation Specialist
Plant Support Branch

Approved: J. Blaine Nicholas 12/7/95
for Blaine Murray, Chief, Plant Support Branch Date
Division of Reactor Safety

Inspection Summary

Areas Inspected: Routine, announced inspection of the licensee's radiation protection program during the 1995 refueling outage which included the following activities: audits and appraisals; program changes; planning and preparation; training and qualifications; external exposure control; internal exposure control; control of radioactive materials and contamination, surveys, and monitoring; and maintaining radiation exposures as low as is reasonably achievable (ALARA).

Results:

Plant Support

- Only one quality assurance surveillance had been performed in the radiation protection area. The rotational assignment of a senior radiation protection technician to the quality assurance department was a program strength (Section 2.1).

- The radiological controlled area access system was user friendly and clearly identified radiation protection requirements. The wireless remote exposure monitoring and audio system used with video communication was a good ALARA tool (Section 2.2).

- The ALARA section was effective in outage planning activities (Section 2.3).
- The training program for contractor radiation protection technicians did not include screening examinations. The rotational assignment of a senior radiation protection technician to the training department was a program strength (Section 2.4).
- A violation was identified involving the failure to follow training procedures for radiation protection technicians (Section 2.4).
- External exposure control program was well implemented and maintained. (Sections 2.5)
- Locked high radiation area controls were effective (Section 2.5.1).
- Housekeeping within the radiological controlled area was good (Section 2.5.3).
- Internal exposure controls were effectively maintained and implemented (Section 2.6).
- In general, contamination controls were properly maintained (Section 2.7.1).
- The radiation instrument program was effectively maintained (Section 2.7.2).
- A violation was identified involving a radiation protection technician and plant workers that failed to follow radiation protection procedures (Section 2.7.1).
- Overall, a good ALARA program was maintained. However, operations and outage supervision had not attended quarterly ALARA meetings, and the documentation and distribution of meeting minutes was not timely (Section 2.8).

Summary of Inspection Findings:

- Violation 298/9516-01 was opened (Sections 2.4 and 2.7.1).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 PLANT STATUS

During the inspection the plant was conducting its 16th scheduled refueling outage. At the beginning of the inspection, the reactor was defueled with all fuel off loaded into the spent fuel pool. During the inspection period, the licensee began reloading fuel assemblies into the reactor vessel.

2 OCCUPATIONAL EXPOSURE DURING EXTENDED OUTAGES (83729, 83750)

The licensee's program was inspected to determine compliance with Technical Specifications and the requirements of 10 CFR Part 20.

2.1 Audits and Appraisals

The inspector reviewed 1995 surveillances and quality assurance/quality control activities checklists (observations) performed by the quality assurance organization, and field observations performed by radiation protection management.

A surveillance schedule was not developed for 1995 until October; therefore, the licensee had performed only one radiation protection surveillance. This surveillance was a thorough look at the release of trash from the radiological controlled area and was performed by a qualified auditor with a number of years of radiation protection experience. Quality Assurance Surveillance Program Procedure NQP 2.6, Revision 0, Section 5.2.2, requires a surveillance schedule that shall identify surveillances for the month. This procedural issue was identified by the licensee during the performance of the joint utility management audit of the quality assurance organization in August 1995. A surveillance schedule was subsequently developed.

The inspector reviewed radiation protection-related quality assurance/quality control activities checklists performed during 1995 and determined that the last radiation protection based observation performed by the quality assurance/quality control organization was completed on July 12th. In discussions with the licensee's quality assurance/quality control management, the inspector was told that because of limited resources and the belief that the radiation protection department had a strong program, observation priorities were shifted to other departments. Of the documented observations available for review, the inspector determined that the observations found few radiation protection problems and focused on general field observations. Few task-related observations were performed.

The inspector reviewed the qualifications of selected quality assurance/ quality control auditors and determined that, although all the auditors had years of auditing experience, only one auditor had any extensive radiation protection practical and technical experience. This individual was assigned

to the quality assurance organization on a year rotational assignment from the radiation protection department. The inspector determined that the rotational assignment of an individual from the radiation protection department was a program strength.

Field observations performed by radiation protection management were thorough and comprehensive. Most of these field observations focused on process controls and general field conditions and were not task orientated. Management expectation was that, during nonoutage conditions, weekly field observations should be performed and documented by all managers and supervisors. A plant management decision was made that, due to the increased work schedule of the outage, weekly field observations would not have to be documented.

The licensee was not able to provide the inspector with any radiation protection outage-related quality assurance/quality control activities checklists, surveillances, or field observations to evaluate the licensee's self assessment of radiation protection activities during the outage.

2.2 Program Changes

The licensee recently installed a new radiological controlled area access system. The system consisted of a computerized touch screen in conjunction with electronic dosimetry. Electronic dosimeter alarms were automatically set corresponding to the dose rates as defined on the radiological controlled area work permit or special work permit. The inspector determined, by observation and interviews with plant workers, that the system was extremely user friendly and radiological control requirements were clearly identified.

A wireless remote exposure monitoring and audio system used with video communication for radiation protection job coverage of high exposure work in the drywell was a recent addition. Remote antennas located in various areas throughout the drywell were used to ensure that the communication signal was not lost. Radiation protection technicians providing job coverage using this system were very knowledgeable of the system and its independent alarm setting capabilities. This system was a good ALARA tool. The radiation protection manager stated that although he was confident that this equipment will save dose, he was not able to estimate the dose savings at this time.

2.3 Planning and Preparation

The inspector discussed planning and preparation activities with representatives in the radiation protection, outage, and training departments to review planning and preparation for the refueling outage. The inspector also reviewed two ALARA job packages for completeness and the inclusion of lessons learned from previous similar work.

Based on discussions and field observations, the inspector determined that the radiation protection department provided proper staff, equipment, and protective clothing to support outage work activities.

During the outage, the permanent radiation protection staff was supplemented with 44 senior radiation protection contractor technicians, 24 junior radiation protection contract technicians, and 14 radiation protection trainees. Radiation protection support functions were staffed for continuous outage support. The outage radiation protection organization was properly staffed to support the outage workload and minimize delays.

The inspector reviewed ALARA job packages for in-service inspection activities which were estimated to involve 65 person-rem and safety relief valve vacuum breaker upgrade activities which were estimated to involve 28 person-rem. The inspector determined that both ALARA job packages were complete and thorough. Past lessons learned from the industry and the site were evaluated in the development of the ALARA packages. However, the inspector found that lessons learned, although evaluated, were not documented in the latest ALARA job packages. Industry practice showed that documenting lessons learned in ALARA job packages maintained consistency. Radiation protection management stated that they will re-evaluate the benefits of maintaining lessons learned in the ALARA job packages.

In discussions with the ALARA coordinator, the inspector determined that for major outage-related activities the ALARA section was properly involved with enough up-front planning time to research and provide meaningful input into the work package to ensure good ALARA practices were implemented.

2.4 Training and Qualifications of New Personnel

The inspector reviewed the training and qualifications for contract radiation protection technicians brought on site to support outage activities. The inspector interviewed plant radiation protection personnel assigned to review contractor resumes and the training department radiation protection instructor. The inspector also reviewed contractor radiation protection training lesson plans, resumes, and station procedures to determine whether contract radiation protection personnel were appropriately qualified to perform their assigned responsibilities.

The inspector determined that the training department senior radiation protection instructor was well qualified for his position with a number of years of practical and operational radiation protection experience. The senior radiation protection instructor routinely worked with the plant radiation protection staff in an effort to assess the effectiveness of the training program.

The radiation protection department assigned a senior radiation protection technician on a yearly rotational assignment to the training department. This helped to ensure that the training department was involved and updated with the plant's radiological work practices. The inspector determined that this was a program strength.

The inspector reviewed the outage contractor training program and noted the following items: there was no screening examination for senior radiation protection technicians to assess their knowledge of the technical aspects of health physics; and, although, both senior and junior contractor radiation protection technicians were provided with site-specific and industry lessons learned, as well as site-specific procedures, only senior radiation protection technicians were tested on the material. The inspector concluded that the lack of a screening test for senior contractor radiation protection technicians and no site-specific test of radiation protection procedures for junior radiation protection technicians represented a weakness in the training program and was not consistent with industry standards. Licensee training personnel stated that they planned to evaluate the need to revise their outage contractor training program.

During the review of the outage contractor lesson plans, the inspector noted that course and test materials were recently updated to reflect the new 10 CFR Part 20 terminology and incorporated the latest procedure changes to the program. The inspector reviewed the course and test materials and found them appropriate for the duties to be performed by an outage senior radiation protection technician.

The licensee was not able to provide the inspector with an approved outage contractor radiation protection technician lesson plan. The inspector determined that lesson plans and the site-specific examination were changed by the rotational senior radiation protection technician assigned to the training department. The senior instructor and training department supervisor were not aware of or had they approved the changes to the materials. Procedure NTI 03, "Revision to Training Materials," Revision 16, states that, "Revisions shall be documented on the Revision/Change summary form and shall identify revised items and the basis for revision of each item." It also states, "submit the revision to the appropriate lead instructor for review and then forward the revision package to the nuclear training supervisor for review and approval." The approved revision package would then be forwarded to training services for processing. Criterion V of Appendix B to 10 CFR Part 50 states, in part, that activities affecting quality shall be prescribed by documented procedures, of a type appropriate to the circumstances, and shall be accomplished in accordance with these procedures. The failures to process the required revision/change summary form, obtain the review of the senior instructor, and obtain the review and approval of the nuclear training supervisor were violations of Training Procedure NTI 03. As a result, inappropriate training material could be presented to radiation protection contractor technicians. This was a first example of a violation involving the failure to follow plant procedures (298/9516-01).

The inspector reviewed several contractor senior radiation protection technicians' resumes. All resumes reviewed met and/or exceeded the requirements of ANSI/ANS 18.1, and a large number of technicians exceeded the requirements of ANSI/ANS 3.1. The inspector noted that approximately 50 percent of the contractor senior radiation protection technicians onsite had previously worked at the station.

2.5 External Exposure Control

The inspector reviewed the external exposure control program, which included: personnel dosimetry program, posting and labeling, radiation work practices and procedures, licensee supervisory oversight of radiological work activities, access control, and control of high radiation areas. The inspector conducted several tours of the radiological controlled area, including the drywell to observe work in progress. Additionally, the inspector conducted several independent radiation surveys within the radiological controlled area and protected areas to verify that these areas had been properly surveyed, posted, and controlled.

2.5.1 High Radiation Area and Dosimetry Controls

Access control to high radiation areas greater than 1000 millirem per hour was appropriate. All barricades and postings were found to be in place. Locked high radiation control was effective, and all doors challenged by the inspector were found to be secured.

The inspector verified that individuals entering the radiological controlled area wore the required personnel monitoring devices. Electronic dosimetry was worn by all workers observed in the radiological controlled area. All workers questioned by the inspector were knowledgeable of the proper response to the electronic dosimeter alarms.

The licensee used the services of a vendor, who was certified in all eight National Voluntary Laboratory Accreditation Program processing categories, to process the station's thermoluminescent dosimeters. The inspector reviewed the results of the licensee s thermoluminescent dosimetry blind spiking program and noted no problems.

2.5.2 Access Controls and Shift Turnover Briefings

An improved radiological controlled area access system was recently installed, which used a computerized touch screen in conjunction with electronic dosimetry. The system was controlled by the radiation protection staff. The inspector noted little or no congestion at the access control point during some of the busiest times, such as shift turnovers. In addition to the normal access and check point, other control points were established to support outage activities.

Briefings and shift turnovers of the radiation protection staff observed by the inspector were clear, concise, and attentive. Thorough discussions pertaining to work in progress and changes in radiological conditions were highlighted.

2.5.3 Postings and Housekeeping

Independent radiation area surveys were performed, and postings were reviewed by the inspector. All areas were found to be appropriately surveyed, controlled, and posted in accordance with regulatory requirements.

During the tours of the drywell, the inspector noted that no radiological informational postings were in place to aid workers in identifying areas of higher dose, such as the areas near the shielded feed water nozzles. Without informational posting, the shielding could give the false impression to workers that doses were lower in the area. In discussions with radiation protection management, it was stated that they were aware of this and were in the process of purchasing and installing green flashing lights, which would indicate areas of lower dose.

Tours of the radiological controlled area by the inspector indicated that housekeeping controls were acceptable.

2.6 Internal Exposure Control

At the time of this inspection, the licensee had not identified any elevated whole-body counts as a result of outage-related work. Twenty full-faced negative pressure respirators had been issued for outage radiological protection purposes. Of the 20 issued, 12 were issued for clean-up work in the sand blast tent area located on the turbine deck. This area had dose rates of less than 2 millirem per hour, thus, no additional exposure was accrued by wearing a respirator.

During tours of the radiological controlled area, the inspector observed that the licensee had established appropriate air sampling equipment and air filtration units in the work place. In addition to job-specific air samplers, the licensee also had appropriately positioned continuous air monitors throughout the radiological controlled area. The inspector observed that all air sampling equipment examined in the work place had current calibration dates and had documented operational checks. Air filtration units were placed in some areas to provide better breathing air in potentially high contaminated areas.

2.7 Control of Radioactive Materials and Contamination, Surveys, and Monitoring

Areas reviewed by the inspector included: adequacy of the surveys necessary to assess personnel exposure; proper use of personnel contamination monitors and friskers; supply, maintenance, calibration, and performance testing of portable radiation detection instrumentation; and the control of contaminated areas.

2.7.1 Contamination Control

The licensee provided good controls to prevent the spread of radioactive contamination. Contaminated areas were posted and marked with tape or rope. Step-off pads were placed at the entrances/exits to these areas to alert workers to a change from a contaminated area to a non-contaminated area. Receptacles provided for the collection of potentially contaminated protective clothing were periodically emptied, and the undressing areas were neatly kept to prevent inadvertent spread of contamination. After leaving a contaminated area and removing potentially contaminated protective clothing, calibrated and performance checked radiological frisking instruments were provided to workers for checking their hands and feet for contamination. Personnel contamination monitors were used to detect radiological contamination or potential intakes when personnel exited the radiological controlled area. Monitoring equipment was calibrated and had current calibration stickers.

On November 6, 1995, at approximately 6:30 p.m., while touring the radiological controlled area turbine deck, elevation 932 ft, the inspector witnessed two contract laborers decontaminating the soles of their shoes at the supplementary radiological controlled area access control point. The inspector noted that the individuals were using a wire brush in an effort to remove the contamination, and that no radiation protection personnel were monitoring the process. The workers repeated the process of alarming the monitor and decontaminating their shoes two additional times prior to a radiation protection technician coming on station.

The inspector questioned the workers as to what they where doing and why a radiation protection individual was not present. The workers informed the inspector that it was the end of their 12-hour shift and that they were trying to decontaminate their shoes so they could clear the personnel contamination monitor and go home. They also stated that every time they tried to leave the area their shoes alarmed the monitor.

Section 8.1.4 of Station Procedure 9.3.4.8, "Eberline Personnel Contamination Monitor Model PCM-1B," states, "If the monitor alarms after recount, contact Radiological Protection for further evaluation." Additionally, the inspector noted that page 32 of the Radiation Worker Training Student Text, GEN001-01-03, Revision 13, states that, when using a personnel contamination monitor, "If the alarm sounds, remain in the area and contact RP." The inspector determined that the failure to contact radiation protection after alarming the personnel contamination was a violation of Procedure 9.3.4.8. This was a second example of a violation involving the failure to follow plant procedures (298/9516-01).

While the workers were attempting to decontaminate their shoes, a third worker came to exit the area. This worker removed his shoes prior to stepping into the monitor and placed them under the work station desk located inside the radiological controlled area. The inspector noted that there were three other pairs of shoes already under the desk. The worker then proceeded into the

personnel contamination monitor and cleared the monitor. When asked by the inspector why he removed his shoes prior to stepping into the monitor, he stated, "those shoes alarm the monitor every time I try to leave, and I want to go home." The worker then left the area.

Prior to the first two workers clearing the radiologically controlled area, a night shift senior radiation protection technician had to help the workers successfully decontaminate their shoes. The workers cleared the monitor and left the area. The technician surveyed the floor where the workers were decontaminating their shoes to ensure that the area was radiologically clean. The inspector noted that the radiation protection technician did not counsel the workers about decontaminating themselves prior to contacting radiation protection.

The inspector questioned the radiation protection technician pertaining to what actions, if any, were required to be accomplished concerning personnel contamination events. The technician stated that she was required to fill out the personnel contamination monitor alarm log. The inspector noted that the log requires, in addition to other items, the name of the individual, initial contamination levels, work location, and date and time of the occurrence.

The workers had left the area prior to the radiation protection technician obtaining the needed information and, thus, the log was not completed as required by procedure. Procedure 9.1.6, "Personnel Contamination," Revision 20.2, Section 6.1 states, in part, "An entry on CNS RP-8, PCM Alarm Log, is required when two consecutive PCM-1 alarms occur. CNS RP-8, PCM Alarm Log requires such items to be recorded as: Date and Time of the contamination, Name of the individual and location of the work area, and initial and final contamination levels." The inspector reviewed the turbine deck supplementary access control personnel contamination monitor alarm log and noted that the last entry in the log was on November 4, 1995, at 10:45 a.m. In discussions with licensee radiation protection personnel, the inspector determined that the alarm log was not being properly maintained. Not maintaining the log and obtaining such information as, initial contamination levels and length of time an individual was contaminated could make it difficult to determine a skin dose exposure. The failure to obtain and record personnel contamination information was a third example of a violation involving the failure to follow plant procedures (298/9516-01).

On November 8, 1995, the inspector noted another worker, in modesty clothing, alarm the personnel contamination monitor located at the main access control point. This access control point was staffed by radiation protection personnel. The inspector noted that the worker alarmed the monitor, stepped out of the monitor, and then attempted to return unchallenged by radiation protection personnel to the radiological controlled area. The inspector stopped the individual and contacted the lead radiation protection technician at the access control point. The worker stated that in the past radiation protection technicians told him the alarm was due to radon gas, and he should put on a clean set of modesty clothing and frisk out. The worker then stated

that he was not aware of any past log entries. The inspector determined that failure to remain in the area and contact radiation protection after alarming the personnel contamination monitor was not in accordance with the training guidelines written on Page 32 of Radiation Worker Training Student Text, GEN001-01-03, Revision 13.

2.7.2 Instrument Program and Surveys

The inspector reviewed the station's radiological survey instrumentation program. The inspector determined that the licensee maintained an adequate supply of calibrated survey instruments for outage support. All instrumentation observed was performance checked according to the licensee's procedures and industry standards.

The inspector reviewed selected radiological surveys and found that in general, the information provided on the surveys was written clearly and was easy to understand.

2.8 Maintaining Occupational Exposure ALARA

The inspector reviewed the licensee's ALARA program including: worker awareness and involvement, ALARA goals and objectives, and ALARA committee activities.

During plant tours, the inspector noted an aggressive temporary shielding program was in place to reduce the general radiation levels throughout the drywell.

The inspector determined that the ALARA coordinator was involved in up-front planning of outage-related high exposure jobs. The inspector noted that the ALARA coordinator had many years of both practical and technical health physics experience and was very knowledgeable of industry ALARA accomplishments.

The 1995 outage goal was 273 person-rem. The inspector noted that approximately 27 days into the scheduled 55-day refueling outage, the licensee was about 30 percent under the outage person-rem goal. The inspector noted that outage collective dose trending was updated twice daily and distributed throughout the plant. Outage collective dose was listed by organization, depicting daily exposure, exposure to date, and percent of goal used. In addition, the cumulative dose budget was graphed, showing the difference between exposure goals and actual exposure. This information was also updated twice daily.

A review of ALARA meeting minutes indicated that operations and outage supervision had not attended the first two quarterly ALARA meetings. The third quarter ALARA committee meeting was held on September 27, 1995. The inspector was not able to review the attendance or content of this meeting

because the meeting minutes were not typed or distributed at the time of this inspection. The inspector noted that the ALARA committee meeting minutes were normally typed and distributed just prior to the next quarterly meeting, even though the meetings were held approximately 90 days earlier. This made open items difficult to complete prior to the next meeting. The inspector determined that the lack of timely distribution of the ALARA meeting minutes was a weakness in the plant ALARA program.

In discussions with the plant manager, the inspector was told that after the completion of the outage, the ALARA committee membership would be changed. The site manager would be designated as chairman, the plant manager would be designated as the co-chairman, and general membership would consist of department managers.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

*J. Mueller, Site Manager
*J. Herron, Plant Manager
S. Bednar, Lead Radiation Protection Technician
R. Beilke, Radiological Support Supervisor
*T. Brown, Radiation Advisor
*T. Chard, Assistant Radiation Protection Manager
*P. Graham, Senior Engineering Manager
*R. Godley, Licensing Manager
*M. Hale, Radiation Protection Manager
*C. Jones, Senior Manager Safety Assessment
D. Jones, Lead Radiation Protection Technician
D. Kimball, Lead Radiation Protection Technician
*E. Kincheloe, Technician Training Supervisor
D. Oshlo, ALARA Coordinator
C. Putnam, Senior Quality Assurance Specialist
E. Rotkvic, Senior Instructor
*R. Sessoms, Quality Assurance Division Manager
*G. Smith, Quality Operations Manager
C. Stulte, Senior Radiation Protection Technician
*C. Taylor, Licensing and Compliance Specialist
*W. Turnbell, Senior Nuclear Engineer

1.2 NRC Personnel

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

In addition to the personnel listed, the inspector contacted other personnel during this inspection period.

*Denotes personnel that attended the exit meeting.

2 EXIT MEETING

An exit meeting was conducted on November 9, 1995. During this meeting, the inspector reviewed the scope and findings of the report. The licensee did not express a position on the inspection findings documented in this report. The licensee did not identify as proprietary, any information provided to, or reviewed by the inspector.