

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-305/85003(DRSS)

Docket No. 50-305

License No. DPR-43

Licensee: Wisconsin Public Service Corporation  
P. O. Box 1200  
Green Bay, WI 54305

Facility Name: Kewaunee Nuclear Power Plant (KNPP)

Inspection At: Kewaunee Nuclear Power Plant, Unit 1, Kewaunee, WI

Inspection Conducted: March 5-8, and 12, 1985

*N.A. Nicholson*  
Inspector: N. A. Nicholson

4/4/85  
Date

*L.R. Greger*  
Approved By: L. R. Greger, Chief  
Facilities Radiation Protection Section

4/4/85  
Date

Inspection Summary:

Inspection on March 5-8, and 12, 1985 (Report No. 50-305/85003(DRSS))

Areas Inspected: Routine, unannounced inspection of the radiation protection program during refueling and maintenance activities including: internal and external exposure control; contamination control; organization; audits; training; the ALARA program; posting and labeling; an unplanned gaseous release; transportation/radwaste shipment; IE Notice 85-06; and selected open and TMI (NUREG-0737) items. The inspection involved 39 inspector-hours onsite by one NRC inspector.

Results: One violation was identified in each of two areas (a personal overexposure in excess of 10 CFR 20.101 limits - Section 6; failure to conduct a whole body count on a worker with facial contamination in accordance with Procedure RC-HP-104 - Section 7).

8504090077 850404  
PDR ADOCK 05000305  
Q PDR

## DETAILS

### 1. Persons Contacted

D. Finlaw, Acting Lead Radiation Technologist  
\*T. Kencklis, Nuclear Training Supervisor  
C. Long, Assistant Radiation Protection Supervisor  
\*M. Marchi, Plant Technical and Services Superintendent  
\*R. Pulec, Plant Technical Supervisor  
\*M. Reinhart, Radiation Protection Supervisor  
\*C. Steinhardt, Plant Manager

\*R. Nelson, NRC Senior Resident Inspector

The inspector also contacted other licensee employees and contractors including radiation protection technicians and members of the engineering staff.

\*Denotes those present at the March 8, 1985, exit meeting.

### 2. General

This inspection, which began at 8:00 a.m. on March 5, 1985, was conducted to review the radiation protection program during refueling and maintenance activities including organization, preparation and planning, internal and external exposure control, contamination control, ALARA, training, selected open items, transportation, and audits. Also reviewed were the health physics aspects of an unplanned gaseous release and licensee actions in response to IE Information Notice 85-06, Contaminated Breathing Air Systems. Readings taken with an NRC survey instrument (Xetex 305B) were in general agreement with licensee data. Good housekeeping practices were observed.

### 3. Licensee Actions on Previous Inspection Findings

(Closed) Open Item (305/84003-04): Review respiratory training program specified by ACD 6.10. The inspector viewed the most current respiratory training video tapes as part of the general radiation worker training shown to licensee employees and contractors. Topics specified by ACD 6.10 were addressed. No problems were noted.

(Open) Open Item (305/84003-05): Review ALARA modifications for radwaste. Licensee representatives indicated these modifications will be completed by the end of the outage (mid-April, 1985).

(Closed) Unresolved Item (305/84005-04): Failure to meet NUREG-0737 Item II.F.1.2 per March 14, 1983 Order. This matter was referred to NRR Radiological Assessment Branch (RAB) for review.<sup>1</sup> A January 2, 1985, safety evaluation report by RAB concluded the licensee's actions for this item and NUREG-0737 Item II.F.1.3 are acceptable.

(Closed) Open Item (305/84005-05): Proceduralize current diving practices.

<sup>1</sup>Inspection Report No. 50-305/84005

The licensee has completed and approved Procedure RC-HP-26, Radiological Precautions for Diving, which was reviewed by the inspector.

(Closed) Open Item (305/84018-01): Maintain a high radiation area barricade during DAW compaction. Procedure RC-RW-2, Hydraulic Baler Operations, Section 2.2, has been revised. A barricade to the drum storage area must remain in place during baler operations. During DAW compaction activities, the inspector observed that the referenced barricade was maintained.

#### 4. Organization and Management Controls

The inspector reviewed the licensee's organization and management controls for the radiation protection and radwaste programs including changes in the organizational structure and staffing, effectiveness of procedures and other management techniques used to implement these programs, experience concerning self-identification and correction of program implementation weaknesses, and effectiveness of audits of these programs.

Two staff changes were noted since the last inspection.<sup>2</sup> The chemistry supervisor was promoted to the plant analytical chemist position and the lead chemistry technologist was promoted to the chemistry supervisor position. Qualifications of these two individuals appear to meet the selection criteria of ANSI N18.1-1971 as specified by Technical Specification 6.3.1.

Four audits, conducted by inhouse and non-licensee auditors, of the radiation protection and radwaste programs during 1984 and 1985 were reviewed. No nonconformances or open items were identified. Licensee response to a minor finding regarding a check source was prompt and complete. No problems were noted.

The inspector reviewed the licensee's reporting system for minor violations of health physics practices and/or procedures. No formal tracking system of offenses is in effect. Health physics personnel confront either the offender directly or his immediate supervisor. Although the NRC advocates a formalized tracking system to identify repeat offenders and/or generic problems, the licensee's system is effective because of a low number of occurrences.

No violations or deviations were noted.

#### 5. Planning and Preparation

The inspector reviewed the outage planning and preparation performed by the licensee, including: additional staffing; special training; increased equipment supplies; and job related health physics considerations.

<sup>2</sup>Inspection Report No. 50-305/84018

The licensee completed the following outage preparations addressing radiological concerns.

- The Plant Operations Review Committee (PORC) reviews all procedures regarding outage work. The Radiation Protection Supervisor and Technical Services Superintendent are members of PORC and submit comments and/or changes to maintain doses ALARA.
- Pre-outage planning meetings were held for jobs not previously completed at KNPP. A radiation protection management representative attended these meetings.
- The licensee sent radiation protection and maintenance representatives to Prairie Island Nuclear Generating Station (PING) to observe core barrel internals removal and inspection, a major job scheduled at KNPP this outage. KNPP and PING have the same plant design. A dry run at KNPP was conducted for pulling the core barrel internals. The licensee reported no problems with the actual procedure.
- Additional supplies, such as dosimetry and protective clothing, were ordered; instruments were calibrated to meet outage demands.

The licensee has augmented the radiation protection staff with 27 contractor health physics technicians. The same contractor who worked the 1984 outage was procured; a licensee representative noted an approximate 60% return rate of individual contractor health physics technicians. These technicians completed the general radiation worker training and informal on-the-job training including procedural review and job coverage. Contractor technicians covering jobs report to the KNPP lead HP technician on duty in the controlled area; good liaison between contractor and inhouse personnel was noted and observed.

The plant manager has authorized an extension of working hours for HP technicians in accordance with ACD 2.15 Overtime Policy. Practices are in accordance with the above procedure. No problems were noted.

No violations or deviations were identified.

#### 6. External Exposure Control

The inspector reviewed the licensee's external exposure control and personal dosimetry programs, including: changes in program to meet outage needs; use of dosimetry; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

The licensee currently uses timekeeping methods to estimate neutron exposures. Four neutron portable survey instrument are available onsite. Neutron doses are forwarded to the vendor to be included in the individual's official record.

The inspector reviewed the licensee's dosimetry QA program conducted in accordance with Procedure RC-HP-40A and calibrations of self-reading dosimeters (SRD) in accordance with Procedure SP 80-061. No problems were noted.

In addition to the official vendor TLD, approximately 80% of all monitored individuals also wear an inhouse TLD for more expedited dose monitoring. During this outage, doses of individuals entering the controlled area are updated each shift; this report is reviewed at least daily to monitor dose status. The cumulative totals reflect available SRD, inhouse TLD, and/or vendor TLD results. The license compares SRD and TLD totals. Unfavorable comparisons are investigated.

The inspector reviewed selected dosimetry results for 1984 and 1985 to date. One whole body exposure in excess of 10 CFR 20.101 limits was identified. According to licensee records, a contracted boilermaker working on the steam generator from February 11 through 28, 1985, had a cumulative SRD exposure of 853 mrems versus the inhouse TLD of 1561 mrems read out March 1, 1985. Both types of dosimetry reportedly were worn during each controlled area entry. Licensee representatives were not alerted to a potential overexposure situation because the cumulative SRD total, the only available dosimetry result during this period, were below the limits. Both the inhouse and vendor TLD's were being processed at the routine monthly frequency. At the inspector's request, readout of the vendor badge was expedited; a result of 1561 mrems was reported by the vendor March 12, 1985. Based on licensee records, health physics representatives verified this individual had not received additional exposure during this quarter at KNPP or any other facility. An updated Form NRC-4 was not on file at the time of exposure. This is a violation of 10 CFR 20.101(a) which limits whole body quarterly exposures to 1.25 rems without a completed Form NRC-4. (50-305/85003-01)

The licensee conducted an extensive evaluation of this matter after the March 12, 1985 notification; no definitive cause of the overexposure was identified. The licensee will file a thirty-day report with the NRC in accordance with 10 CFR 20.405(a)(1)(i). To permit additional controlled area entries this quarter, the licensee completed the needed NRC Form-4 for this worker.

One violation was identified.

#### 7. Internal Exposure Control

The inspector reviewed the licensee's internal exposure control and assessment programs, including: changes to procedures affecting internal exposure control and personal exposure assessment; determination whether

engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

Whole body count results of incoming refueling and maintenance contractors, inhouse personnel, and selected outgoing contractors were reviewed. No abnormal intakes or results approaching the 40 MPC-hour control measure were noted.

Contamination reports filed during the outage were reviewed. Primarily hand and some neck and facial contaminations occurred. With one exception, facial contamination instances were followed-up with a whole body count in accordance with RC-HP-104 Personnel Contamination Form. An individual working on the pressurizer February 19, 1985, was found to have 14,000 dpm/100 cm<sup>2</sup> around the nose and mouth area as noted on the personal contamination report. According to the lead health physics technician on duty at the time of the incident, nasal smears were taken and were negative; however, the nasal smear results were not recorded on the report nor documented elsewhere. The whole body count was waived, presumably because of the negative smear results; however, this justification was not indicated on the report. Absence of an immediate whole body count is a violation of RC-HP-104(c)(2) which states a whole body count is required if facial contamination is present. The individual involved was whole body counted March 8, 1985, at the inspector's request; no indications of an intake were noted. (50-305/85003-02)

One violation was identified.

#### 8. Maintaining Occupational Exposures ALARA

The inspector reviewed the licensee's program for maintaining occupational exposures ALARA, including: ALARA considerations for maintenance and refueling outage; worker involvement in the ALARA program; establishment of goals and objectives, and effectiveness in meeting them.

The following ALARA measures were noted:

- A temporary shield of water-filled 55-gallon drums was positioned around Sump C of the reactor basement where the incore thimbles have been retracted. Dose levels of 60-70 mR/hr on drum contact and 30-40 mR/hr ten feet from the drums were reported. Dose estimates for this area without shielding ranged up to 500 mR/hr.
- The primary radwaste operator, traditionally with the highest annual exposure, has been officially limited to 750 mrem per quarter.
- The computerized ALARA dose tracking system has been completed. Doses can be tracked by RWP, job, work crew, and individual.

The inspector reviewed the impact of staff stability on the ALARA program. In general, the following findings have a positive effect on ALARA considerations. Historically, health physics staff stability has been good, HP staff turnover is very low. Extended work experience at KNPP promotes familiarity with procedures and plant design which benefit ALARA. Staffing at management and technical levels appears adequate; staff qualifications and experience meet industry standards. Contractor reliance is minimal; health physics contractors are utilized only during refueling outages. Few changes in the organizational structure have occurred in the past three years; no significant impact on the radiation protection or ALARA program has been observed because of the changes that have occurred.

No violations or deviations were identified.

9. Control of Radioactive Materials and Contamination

The inspector reviewed the licensee's program for control of radioactive materials and contamination, including: adequacy of supply, maintenance, and calibration of contamination survey and monitoring equipment; effectiveness of survey methods, practices, equipment, and procedures; adequacy of review and dissemination of survey data; and effectiveness of methods of control of radioactive and contaminated materials.

The licensee's contamination control program was reviewed. Survey data indicated general area smears of the auxiliary building and containment were less than 100 dpm/100cm<sup>2</sup>. Some isolated work areas of containment were 300 dpm/100cm<sup>2</sup>. In general, a threshold level of 100 dpm/100cm<sup>2</sup> is used for decontamination. This low threshold represents extremely good contamination control efforts. Survey results above this value are highlighted and referred to the radiation helpers/decontainers for decontamination. Timely decontamination was noted and has been a long standing practice at KNPP as health physics management considers decontamination a priority. Although no trending of contaminated square footage is conducted, the Radiation Protection Supervisor estimates 5-10% of the plant is above the 100 dpm/100cm<sup>2</sup> level. KNPP doses are among the lowest in the industry; the low contamination levels contribute to the low doses by promoting better worker efficiency.

An adequate supply of survey instruments was observed. Calibration methods and records of selected instruments were reviewed. Calibrations of neutron meters (PNR-4 and PNC), and teletectors and ion chambers (used for high range gamma measurements) were conducted on all scales in accordance with applicable procedures. No problems were noted.

Good housekeeping techniques and contamination control were observed during tours of the controlled area. Contaminated areas and higher dose areas were appropriately roped off and posted. Independent readings with an NRC survey instrument (Xetex 305B) were in good agreement with licensee data.

Disposal of old ventilation filter housings was reviewed. Ventilation filter housings are dismantled to reduce radwaste volume. The filter paper is compacted; the frames are surveyed and released to an unrestricted sanitary landfill. According to licensee representatives, no activity is found on the majority of these frames. The lack of release survey records for these frames was discussed at the exit meeting. (305/85003-03)

No violations or deviations were identified.

#### 10. Training

The inspector reviewed the training aspects of the licensee's radiation protection, radwaste, and transportation programs, including provision for appropriate training of health physics personnel. Also reviewed were management techniques used to implement these programs and experience concerning self-identification and correction of program implementation weaknesses.

Approximately two-thirds of the health physics staff has attended the reactor systems overview course. A new training program, the Radiation Protection Technician Proficiency Training initiated in October 1984, was established as a formal technician qualification program to satisfy initial INPO accreditation standards. This lecture course addresses health physics practices, procedures, and regulations. Approximately 50% of the health physics staff has completed this course.

No violations or deviations were noted.

#### 11. Radiation Protection Procedures

The inspector selectively reviewed the following radiation protection procedures generated or revised since the third quarter 1984. These procedures are compatible with regulatory requirements.

RC-HP-26	Radiological Precautions for Diving
RC-HP-32K	Operation of Cascade System
RC-HP-40I/Revision E	Condenser R-Meter and R-Chamber Calibration
RC-HP-40J/Revision B	Multi-Source Gamma Calibrator Geometry Calibration
RC-HP-42/Revision F	Instrument Calibration Procedures-Dosimeters
RC-HP-42E	Instrument Calibration Procedure-RO-2
RC-HP-45/Revision D	Multiple Source Calibration Operating Procedure
RC-HP-53/Revision G	Containment Building Discharge Permit
RC-HP-57/Revision D	First Aid Equipment
RC-HP-58/Revision A	Auxiliary Radiation Monitoring System Description
RC-HP-58B/Revision C	SPING-4 Filter Change-Post Accident
RC-HP-61/Revision D	ND6700 System

Based on this review, the inspector made two observations: (1) the decay equation of RC-HP-40J/Revision B was incomplete; and (2) Section 2.8 of RC-HP-26 indicates crud may be dispersed to avoid buildup; this practice may precipitate a higher general radiation field. This matter was discussed at the exit meeting; licensee representatives agreed to review and correct these procedures. (Open Item 305/85003-04)

No violations or deviations were identified.

## 12. Unplanned Release

On February 14, 1985, a minor unplanned gaseous release occurred over a four-hour period because of a valving error on the 1A Gas Decay Tank, very similar to a release that occurred during the 1984 outage.<sup>3</sup> The activity involved was less than that of the 1984 occurrence. The release path was from the 1A Gas Decay Tank to a reactor coolant pump in containment and out the containment vent stack.

The inspector reviewed the licensee's evaluation of the incident, which concluded: (1) the three individuals working in close proximity to the release point in containment received 20 mrems whole body exposure, most of which was unrelated to the gaseous release; (2) no technical specifications or 10 CFR 20 limits were exceeded; and (3) less than one curie (0.0232 Ci) was released. In response to the inspector's comments regarding the 1984 release, the containment vent monitor (SPING-4) setpoints were significantly reduced for this outage. This monitor did not alarm because the lower concentrations, combined with the dilution of the recirculation fan, were at normal levels. Grab samples taken on the 606' level of containment during the release indicated concentrations were below unrestricted values. This matter was discussed at the exit meeting. The senior resident inspector is reviewing operational aspects of this matter.

No violations or deviation were identified.

## 13. Transportation/Radwaste Shipments

The inspector reviewed the licensee's methods used to assure packages are in an unimpaired physical condition before shipment.<sup>4</sup> According to the radwaste staff, radwaste operators visually inspect drums for any abnormal appearances including deformation, breaches and seam ruptures before and after compaction. The radwaste supervisor also inspects the drums for defects before shipment. Drums are stored inside the auxiliary building, out of the elements. LSA boxes are also inspected; all clips are welded and the drain outlet plugged.

No violations or deviations were identified.

<sup>3</sup>Inspection Report No. 50-305/84003.

<sup>4</sup>Inspection Report No. 50-409/84014

14. IE Information Notice No. 85-06

In response to IE Notice 85-06, Contamination of Breathing Air Systems, licensee representatives noted the following preventative measures currently in place: (1) waste gas sources are not connected to the plant breathing air supply; (2) the breathing air respirator filtration cart, connected to the supply air system, is fitted with three filters to remove particulates and iodines; and (3) no check valves are on the breathing air supply line. No problems were noted.

No violations or deviations were noted.

15. NUREG-0737 Item II.F.1

The inspector reviewed licensee procedures written to complete actions on this TMI Item (noble gas monitoring). No problems were noted. This item is closed.

No violations or deviations were identified.

16. Exit Meeting

The inspector met with licensee representatives noted in Section 1 on March 8, 1985. The scope and findings of the inspection were discussed. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any such documents or processes as proprietary. In response to the inspector's comments, the licensee:

- a. Acknowledged the two violations. (Sections 6 and 7)
- b. Stated surveys of material released offsite would be documented. (Section 9)
- c. Stated the discrepancies found in Procedures RC-HP-27 and RC-HP-40I would be corrected. (Section 11)