

June 8, 2000

Mr. Mark L. Marchi
Site Vice President
Kewaunee Plant
Wisconsin Public Service
Corporation
Post Office Box 19002
Green Bay, WI 54307-9002

SUBJECT: KEWAUNEE RADIATION SAFETY INSPECTION REPORT
50-305/2000009(DRS)

Dear Mr. Marchi:

On May 19, 2000, the NRC completed a routine inspection at your Kewaunee Nuclear Power Station. The results were discussed on May 19, 2000, with Mr. Hoops and other members of your staff. The enclosed report presents the results of that inspection.

The inspection was an examination of activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, this inspection focused on occupational radiation safety, the radiological controls implemented for access to radiologically significant areas, and the implementation of your ALARA program during the ongoing refueling outage.

Based on the results of this inspection, one issue was identified concerning the failure to adequately post a very high radiation area. This issue was evaluated under the risk significance determination process and was determined to be of very low safety significance (Green). The issue has been entered into your corrective action program and is discussed in the summary of findings and in the body of the attached inspection report. The issue was determined to be a violation of NRC requirements, but because of its very low safety significance, the violation is not cited. If you contest this Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Kewaunee facility.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room and will be available on the NRC Public Electronic Reading Room (PERR) link at the NRC home page, <http://www.nrc.gov/NRC/ADAMS/index.html>.

M. Marchi

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We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

Gary L. Shear, Chief
Plant Support Branch
Division of Reactor Safety

Docket No. 50-305
License No. DPR-43

Enclosure: Inspection Report 50-305/2000009(DRS)

cc w/encl: K. Weinhauer, Manager, Kewaunee Plant
B. Burks, P.E., Director, Bureau of Field Operations
Chairman, Wisconsin Public Service Commission
State Liaison Officer

M. Marchi

-2-

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Plant Support Branch
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Docket No. 50-305
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cc w/encl: K. Weinhauer, Manager, Kewaunee Plant
B. Burks, P.E., Director, Bureau of Field Operations
Chairman, Wisconsin Public Service Commission
State Liaison Officer

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-305
License No: DPR-43

Report No: 50-305/2000009(DRS)

Licensee: Wisconsin Public Service Corporation

Facility: Kewaunee Nuclear Power Station

Location: N 490 Highway 42
Kewaunee, WI 54216

Dates: May 8 -19, 2000

Inspectors: Steven K. Orth, Senior Radiation Specialist
Robert D. Jickling, Emergency Preparedness Analyst

Approved by: Gary L. Shear, Chief, Plant Support Branch
Division of Reactor Safety

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) recently revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting and assessing safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety

- Initiating Events
- Mitigating Systems
- Barrier Integrity
- Emergency Preparedness

Radiation Safety

- Occupational
- Public

Safeguards

- Physical Protection

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent very low safety significance. WHITE findings indicate issues that are of low to moderate safety significance. YELLOW findings are issues that are of substantial safety significance. RED findings represent issues that are of high safety significance with a significant reduction in safety margin.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing varying levels of performance and incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections. WHITE corresponds to performance that may result in increased NRC oversight. YELLOW represents performance that minimally reduces safety margin and requires even more NRC oversight. And RED indicates performance that represents a significant reduction in safety margin but still provides adequate protection to public health and safety.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, which can include shutting down a plant, as described in the Action Matrix.

More information can be found at: <http://www.nrc.gov/NRR/OVERSIGHT/index.html>.

SUMMARY OF FINDINGS

Kewaunee Nuclear Power Station NRC Inspection Report 50-305/2000009(DRS)

The report covers a seven-day period of announced inspection by a regional senior radiation specialist and a regional emergency preparedness analyst. This inspection focused on occupational radiation safety. In particular, the inspectors reviewed access controls to radiologically significant areas, which included a verification of radiological boundaries and postings, a review of radiation work permits, and the observation of radiation worker practices. The inspection also included a review of the licensee's As-Low-As-Is-Reasonably-Achievable (ALARA) planning and controls for the April-to-June 2000 refueling outage and a review of associated problem identification and resolution records. The significance of issues is determined by their color (green, white, yellow, red) and was determined by the Significance Determination Process in Inspection Manual Chapter 0609.

RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

- Green. The inspectors identified a noncited violation for the failure to post a very high radiation area in accordance with 10 CFR 20.1902(c). Although the area was not adequately posted, the licensee had provided physical controls and barriers that were consistent with its requirements for a very high radiation area. Based on the adequacy of these controls, the potential for an overexposure from the inadvertent entry of personnel into the area was low. Consequently, this finding was determined to be of very low safety significance (Section 20S1.1).

Report Details

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Controls for Radiologically Significant Areas

.1 Plant Walkdowns and Radiological Boundary Verifications

a. Inspection Scope

The inspectors performed walkdowns of the radiologically controlled area (RCA) to verify the adequacy of radiological boundaries and postings. Specifically, the inspectors performed confirmatory radiation measurements in the Containment and Auxiliary Buildings to verify that radiologically significant work areas (high radiation areas (HRAs), radiation areas, and airborne radioactivity areas) were properly posted and controlled in accordance with 10 CFR Part 20 and the licensee's procedures.

b. Observations and Findings

The licensee failed to properly post a very high radiation area (VHRA) within the reactor Containment Building. During plant walkdowns, the inspectors questioned a radiation protection technician (RPT) on the posting and barriers within the Containment Building. Although radiation protection management had previously indicated to the inspectors that two VHRAs existed, the RPT could only identify one area which was posted in that manner. Later, another RPT identified that the posting on the containment "C" sump had not been upgraded from an HRA to a VHRA when the incore instrument thimbles were withdrawn from the reactor vessel. Since the thimbles were withdrawn, the licensee stated that radiation levels in the area exceeded 500 rad per hour. Despite the inadequate radiological posting, the technician noted that the controls for the area were consistent with VHRA procedural requirements (i.e., a uniquely keyed lock controlled by the shift supervisor). In addition, the licensee had placed 55-gallon drums of water in front of the door to the area (i.e., serving as shielding), which would also have significantly impeded access into the area. Following the identification, the radiation protection staff changed the posting and entered the incident into its corrective action program (initiated a Kewaunee Assessment Process (KAP) form).

The failure to post a VHRA with a conspicuous sign or signs bearing the radiation symbol and the words "GRAVE DANGER, VERY HIGH RADIATION AREA" is a violation of 10 CFR 20.1902(c). However, this violation is considered a Non-Cited Violation (50-305/2000009-01), consistent with Section VI.A of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as KAP work request No. 00-001449-00. As a result of this noncompliance, the licensee and the inspectors also concluded that the incident constituted a VHRA occurrence, as measured by the occupational exposure control effectiveness performance indicator.

The inspectors evaluated the risk significance of this issue using the Occupational Radiation Safety Significance Determination Process (Appendix C to NRC Manual Chapter 0609, "Significance Determination Process"). Based on the information provided by the licensee, the inspectors concluded that the licensee's controls for the area would have limited the potential for an inadvertent entry that could have resulted in an overexposure. Specifically, the area was controlled with a chain and padlock. The padlock had a unique key maintained by only the shift supervisor, who was aware of the position of the thimbles and the resultant radiological conditions within the area. Although the area was not properly posted, these physical access controls would have limited the potential for an inadvertent entry. Therefore, the inadequate radiological posting was determined to be of very low safety significance (Green).

.2 Reviews of Radiation Work Permits

a. Inspection Scope

The inspectors reviewed radiation work permits (RWPs) and electronic dosimeter (ED) alarm setpoints for both a dose rate and accumulated dose to ensure that the controls were consistent with the licensee's Technical Specifications and to verify that adequate work controls were in place to maintain worker exposures ALARA (as-low-as-is-reasonably-achievable).

b. Observations and Findings

There were no findings identified and documented during this inspection.

.3 Reviews of Radiologically Significant Work

a. Inspection Scope

The inspectors observed work activities in the RCA that were performed in radiation areas or high radiation areas (< 1 rem per hour). Specifically, the inspectors verified the adequacy of radiological controls (e.g., RWPs and ALARA reviews), surveys, and RPT performance for the following work activities:

- Reactor Head Lift Associated with Reactor O-Ring Inspection;
- Steam Generator Repair Activities; and
- Miscellaneous Reactor Containment Work Activities.

b. Observations and Findings

There were no findings identified and documented during this inspection.

.4 Spent Fuel Pool Non-Fuel Materials Controls

a. Inspection Scope

The inspectors reviewed the licensee's programmatic controls for highly activated or contaminated materials (non-fuel) stored within the spent fuel or other storage pools. Discussions with the licensee and walkdowns of the area were conducted and to verify whether materials were being stored underwater on hangers or ropes along the spent fuel pool walls.

b. Observations and Findings

There were no findings identified and documented during this inspection.

2OS2 As-Low-As-Is-Reasonably-Achievable (ALARA) Planning and Controls

.1 Radiation Dose Controls and Trending

a. Inspection Scope

The inspectors reviewed the licensee's outage dose estimates and the associated dose trending.

b. Observations and Findings

The licensee established an exposure estimate of 85 person-rem for the ongoing refueling outage. At the conclusion of the onsite inspection (May 19, 2000), accumulated exposure was about 77 person-rem, which was on target with the licensee's initial exposure estimate. Based on the licensee's exposure data, the inspectors did not identify any actual job exposures which had exceeded the initial estimates by more than 50 percent and had exceeded 5 person-rem.

There were no findings identified and documented during this inspection.

.2 Source Term Reduction

a. Inspection Scope

The inspectors reviewed the status of the licensee's source term reduction program, which included hot spot identification and reduction, shut down chemistry controls, hydrolazing/flushing of the reactor cavity drain line, and a plant modification to relocate the cavity drain line filters. The inspectors also performed surveys within the radiologically controlled area to verify the accuracy of the licensee's records/surveys and to identify any other significant, unidentified sources of radiation exposure.

b. Observations and Findings

There were no findings identified and documented during this inspection.

.3 Declared Pregnant Workers

a. Inspection Scope

The inspectors reviewed the controls implemented by the licensee for the one individual who voluntarily declared her pregnancy within the last 12 months. Specifically, the inspectors reviewed the licensee's adherence to the requirements contained in 10 CFR 20.1208 and reviewed the licensee's evaluation of the dose to the individual's embryo/fetus.

b. Observations and Findings

In accordance with the licensee's program, the declared pregnant worker completed the procedural declaration form. The dose assigned to the embryo/fetus was 0 millirem for the gestation period.

There were no findings identified and documented during this inspection.

2OS4 Radiation Worker Performance

a. Inspection Scope

The inspectors observed radiation workers performing the activities described in Section 2OS1.3 and evaluated their awareness of radiological conditions and their implementation of applicable radiological controls.

b. Observations and Findings

There were no inspection findings identified and documented during this inspection.

4. OTHER ACTIVITIES (OA)

4OA1 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, dosimetry problem reports, and KAP forms concerning HRAs, radiation worker practices, and RPT performance errors. The inspectors' review spanned the period of time between April 1, 1999, and the time of this inspection.

b. Observations and Findings

The inspectors observed a number of dosimetry problem reports concerning ED usage problems. Since the licensee implemented EDs in January of 2000, the licensee documented seven incidents involving personnel entries into the RCA with an ED which had not been activated or without an ED. In at least two of the recorded incidents, the individuals had been in the RCA for several hours (4 to 6 hours) before noting a problem, which indicated that personnel were not actively monitoring their exposure. For each of the incidents, the licensee performed and documented an exposure evaluation; however, the corrective actions were limited to the individual involved.

During routine walkdowns within the RCA, the inspectors also identified a similar incident involving inadequate ED usage. In this case, the individual corrected the problem but failed to identify it to the radiation protection staff. Based on the data, the inspectors observed an ongoing problem within the site, which had not been adequately corrected. The radiation protection staff indicated that they planned to document the trend in a KAP form to evaluate the trend and to determine additional long-term corrective actions.

4OA5 Management Meetings

The inspectors presented the inspection results to Mr. Hoops and other members of licensee management at the conclusion of the inspection on May 19, 2000. Additional telephone discussions were held with Mr. M. Reinhart and members of the radiation protection staff on May 23 and 24, 2000. The licensee acknowledged the findings presented. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. Gauger, Plant Health Physicist
G. Harrington, Licensing Leader
R. Hartfield, Radiation Protection
K. Hoops, Plant Manager
B. Koehler, Manager, Quality Programs
D. Morgan, Radiation Protection
M. Reinhart, Superintendent, Plant Radiation Protection

NRC

P. Krohn, Resident Inspector
W. Slawinski, Acting Chief, Plant Support Branch

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

50-305/2000009-01	NCV	Failure to post a very high radiation area in accordance with 10 CFR Part 20 (2OS1.1).
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Closed

50-305/2000009-01	NCV	Failure to post a very high radiation area in accordance with 10 CFR Part 20 (2OS1.1).
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Discussed

None.

LIST OF ACRONYMS USED

ALARA	As-Low-As-Is-Reasonably-Achievable
DRS	Division of Reactor Safety
ED	Electronic Dosimeter
HRA	High Radiation Area
KAP	Kewaunee Assessment Process
OS	Occupational Radiation Safety
PERR	Public Electronic Reading Room
RCA	Radiologically Controlled Area
RPT	Radiation Protection Technician
RWP	Radiation Work Permit
VHRA	Very High Radiation Area

LIST OF DOCUMENTS REVIEWED

Audits and Assessments

Contractor Self-Assessment, "Summary Reviews of Radiation Protection and Chemistry at the Point Beach and Kewaunee Nuclear Plants," conducted February 7 -11, 2000.
KAP No. 3306, "Self-Assessment of Kewaunee's ALARA Program."
Quality Surveillance Report No. QSR 1919, "Radiography in Turbine Building."

Kewaunee Assessment Program (KAP) Forms Nos.

Work Order Nos. 99-002997-000, 99-003126-000, 99-300050-00, 99-300050-01, 00-000281-00, 00-000651-00, 00-001032-000, 00-001034-000, 00-001115-00, 00-001449-00, and 00-001588-00.

Miscellaneous

Dosimetry Problem Reports dated April 1, 1999, through May 19, 2000.

Procedures (CPS Nos.)

HP-01.003 (Revision F), "Administrative Exposure Control and Records;"
HP 01.016 (Revision A), "Radiation Work Permit -- Preparation and Issuance;"
NAD 08.03 (Revision E), "Radiation Work Permit;" and
NAD 11.08 (Revision D), "Kewaunee Assessment Process (KAP)."

Radiation Work Permits (RWPs)

RWP No. 4 (Revision 1), "For Access Into the Controlled Area for Inspection Only or Other Work of a Brief, Minor, or Temporary Nature Where Exposures Will Be Minimal;"

RWP No. 7 (Revision 2), "General Clean-up, Decontamination, and Operation of the Decon and Laundry;"

RWP No. 57 (Revision 0), "Steam Generator Eddy Current Tube Repair in Steam Generator 1A and 1B;"

RWP No. 58 (Revision 0), "Remove and Replace Reactor Vessel Head O-Ring on 606' Elevation of Containment By the Head Lay-down Area. Inspection and Cleaning of Reactor Vessel Flange Surface;"

RWP No. 60 (Revision 0), Reactor Coolant Pump 1B Break Coupling, Drop Shaft, Remove Spool Piece, Inspect, Replace, and Assemble Seals. Reactor Coolant Pump 1A Break Coupling and Drop Shaft;"

RWP No. 70 (Revision 4), "Reactor Head Disassembly/Assembly - To Include Head Ventilation, Missile Shield, Seismic Restraints, Control Rod Drive Mechanisms, Head Vent, Sandbox Covers, Studs, Seal Rings, Stud Hole Plugs, Guide Pins, Remove/Replace Reactor Head, Remove/Replace Insulation, Remove/Replace Blank Flange on Fuel Transfer Tube;" and

RWP No. 91 (Revision 0), "Reactor Cavity Drainline Hot Spot Removal."

ALARA Reviews

ALARA Review No. 00-001, "KNPP Refueling Operations;"

ALARA Review No. 00-002, "Steam/Generator Sludge Lance;"

ALARA Review No. 00-003, "Primary Steam Generator Eddy-Current;"

ALARA Review No. 00-006, "Reactor Coolant Pump "B" Seal Maintenance;"

ALARA Review No. 00-007, "Extended RWPs;"

ALARA Review No. 00-008, "Steam/Generator Nozzle Dams;"

ALARA Review No. 00-009, "Primary Steam Generator Manways;"

ALARA Review No. 00-011, "Cavity Drain Line Hot Spot Removal;" and

ALARA Review No. 00-016, "Decon and Laundry."