June 13, 2000

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

SUBJECT: NRC INSPECTION REPORT 50-305/2000011(DRS)

Dear Mr. Marchi:

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

This inspection was an examination of activities conducted under your license as they relate to inservice inspection, safety, compliance with the Commission's rules and regulations and with the conditions of your license. Specifically, the inspector evaluated the implementation of your inservice inspection program for monitoring degradation of the reactor coolant system boundary, and risk significant piping system boundaries. Within these areas the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.

During this inspection, the NRC identified one issue of very low safety significance (green) that 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. This issue was determined to involve a violation of NRC requirements, but because of its 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 Nuclear Generating Plant.

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.

Sincerely,

***/RA/***

John M. Jacobson, Chief
Mechanical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-305/2000011(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

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

| | |
|---|---|
| Docket No: | 50-305 |
| License No: | DPR-43 |
| Report No: | 50-305/2000011(DRS) |
| Licensee: | Wisconsin Public Service Corporation |
| Facility: | Kewaunee Nuclear Power Plant |
| Location: | N 490 Highway 42<br>Kewaunee, WI 54216 |
| Dates: | May 8 - 19, 2000 |
| Inspector: | K. GreenBates, Engineering Specialist |
| Approved by: | John M. Jacobson, Chief<br>Mechanical Engineering Branch<br>Division of Reactor Safety |

## NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) 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 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 | Radiation Safety | Safeguards |
|---|---|---|
| ● Initiating Events | ● Occupational | ● Physical Protection |
| ● Mitigating Systems | ● Public | |
| ● Barrier Integrity | | |
| ● Emergency Preparedness | | |

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 little effect on safety. WHITE findings indicate issues with some increased importance to safety, which may require additional NRC inspections. YELLOW findings are more serious issues with an even higher potential to effect safety and would require the NRC to take additional actions. RED findings represent an unacceptable loss of safety margin and would result in the NRC taking significant actions that could include ordering the plant to shut down.

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 incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. The color for an indicator corresponds to levels of performance that may result in increased NRC oversight (WHITE), performance that results in definitive, required action by the NRC (YELLOW), and performance that is unacceptable but still provides adequate protection to public health and safety (RED). GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections.

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. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, as described in the matrix. 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.

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

SUMMARY OF FINDINGS

Kewaunee Nuclear Power Station
NRC Inspection Report 50-305/2000011(DRS)

The inspection assessed the effectiveness of the licensee's program for monitoring degradation of vital system boundaries. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance

**Cornerstone: Barrier Integrity**

- Green. During 1998 inservice inspection examinations, the licensee failed to properly implement the flaw acceptance criteria for laser welded sleeve inspection within two steam generator tubes. The safety significance was very low based on the absence of adverse consequences, and May 2000 in-situ pressure testing where both welds exhibited zero leakage at normal operating pressure, main steam line break pressure, and three times normal operating differential pressures. As such, this issue was characterized as a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion IX, "Control of Special Processes." To correct the error, the licensee plugged both tubes (Section 1RO8).

Report Details

## 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R08 Inservice Inspection Activities

a. Inspection Scope

The inspector reviewed the implementation of the licensee's inservice inspection program for monitoring degradation of vital system boundaries. This inspectable area verifies aspects of the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones for which there are no indicators to measure performance. Steam generator U-tube eddy current testing was reviewed including the planning, scope, and method employed, as well as portions of applicable test procedures and initial findings. The inspector observed in-progress repairs of damaged steam generator tubes, and supplemental visual examinations performed by Kewaunee following a lessons learned failure at another facility. Lastly, the inspector reviewed Kewaunee's activities associated with ISI problem identification and resolution, and evaluated the oversight of ISI program implementation by Kewaunee's quality assurance department. As part of this review, the inspector:

- Reviewed documents defining the scope of eddy current testing planned for steam generator examinations, including specific eddy current probes and acquisition equipment used in each area of the steam generator tube inspection (e.g., tube expansions, tube support plate intersections, U-bends).

- Observed a sample of in-progress inservice inspection (ISI) activities including, eddy current examinations, and ultrasonic tests on steam generator tube sleeves.

- Reviewed Kewaunee's evaluation process for indications discovered through ISI testing.

- Reviewed Kewaunee's conformity with industry standard Electric Power Research Institute steam generator examination guidelines, and primary-to-secondary leak guidelines.

- Reviewed the radiographs and radiographic documentation of two steam generator feedwater nozzles welds.

- Reviewed a sample of non-destructive examination procedures.

- Reviewed the status of the Kewaunee Third Ten Year Interval Inservice Inspection Program Plan.

- Reviewed four inservice inspection Quality Assurance audit reports.

- Reviewed a sample of refueling outage inservice inspection examination records.

- Reviewed a sample of condition reports/evaluation records issued for problems identified in the inservice inspection area during both the 1996, 1998 and 2000 refueling outages.

Observations and Findings

Kewaunee performed examinations of the structural integrity of the in-service tubes in both steam generators and conducted additional activities to evaluate the steam generators. The evaluations on the secondary side included pressure tests, flow slot examinations and visual foreign material examinations. The evaluations and repairs on the primary side included eddy current examinations using bobbin and rotating pancake probes; low, medium and high frequency plus point examinations; tube plugging and repair; ultrasonic testing; and in-situ testing.

Observed inservice inspection activities were adequate to monitor degradation of the reactor coolant system boundary. All of the 2000 refueling outage inservice inspection weld examinations reviewed were performed in accordance with procedure instructions and evaluated in accordance with procedural acceptance criteria.

There were no significant findings identified during this inspection. However, one issue was identified from an examination which took place during a past outage. On November 1, 1998, the licensee failed to properly implement the flaw acceptance criteria for Kewaunee procedure WPS-LWS-0197, "Steam Generator Eddy Current Analysis Guidelines for Laser Welded Sleeve Inspection," during steam generator inservice inspection examinations. The laser welded junction of the tube sleeve and steam generator tube in two steam generator B tubes (R 27C48 and R29C48) had recorded flaws which exceeded procedural limits for allowable flaw sizes. The procedural flaw criteria exceeded was more than an administrative limit, and as the licensee failed to implement the criteria for two tubes, this problem was not considered to be an isolated occurrence. Therefore, because of the potential degradation of a reactor coolant boundary part, this issue was considered to be more than of minor significance.

The actual safety significance of this violation issue was considered very low based on the absence of adverse consequences and May 2000 in-situ pressure testing where both welds exhibited zero leakage at normal operating pressure, main steam line break pressure, and three times normal operating differential pressures. No functional problems were identified by the re-inspection; therefore, the issue did not meet the initial SDP screening and is considered to be green. To correct the error, the licensee placed the issue within their corrective action program and plugged both tubes. As such, this issue will not be cited in accordance with section V1.A.1 of the NRC Enforcement Policy and is characterized as a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion IX (NCV 50-305/2000011-01(DRS)).

## 4. OTHER ACTIVITIES

4OA1 Identification and Resolution of Problems

a. Inspection Scope

The inspector reviewed ISI evaluation monitoring condition reports to verify the identification of ISI problems at an appropriate threshold. The inspector also verified that the corrective actions were appropriate.

b. Observations and Findings

There were no significant findings identified.

4OA5 Management Meetings

.1 Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on May 19, 2000. The licensee acknowledged the results presented.

The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

## PARTIAL LIST OF PERSONS CONTACTED

Licensee

P. Bukes, ISI Process Owner
W. Flint Jr., Chemistry Process Owner
G. Harrington, Plant Licensing Supervisor
K. Hoops, Plant Manager
T. Olsen, SG Program Owner
C. Schrock, Senior VP Energy Supply
M. Marchi, VP Nuclear
T. Webb, Nuclear Licencing Director
K. Weinhauer, General Manager

Nondestructive Examination (NDE) Contract Personnel

D. Darst, Zetec, Level III NDE
E. Kurkowski, Framatome Technologies, Level III NDE
J. Raschiatore, Westinghouse NDE Level III Independent Qualified Data Analyst

NRC

M. Kurth, Resident Inspector, RIII

## ITEMS OPENED AND CLOSED

Open and Closed During This Inspection

| | | |
|---|---|---|
| 50-305/2000011-01(DRS) | NCV | Failure to follow procedure for inservice inspection flaw evaluation. (Section 1R08) |

## LIST OF ACRONYMS USED

| | |
|---|---|
| CFR | Code of Federal Regulations |
| ISI | Inservice Inspection |
| NCV | Non-Cited Violation |
| NRC | Nuclear Regulatory Commission |

PARTIAL LIST OF DOCUMENTS REVIEWED

Procedures

- Kewaunee Nuclear Power Plant Procedure No. WPS-LWS-0197, “Steam Generator Eddy Current Analysis Guidelines For Laser Welded Sleeve Inspection,” dated January 25, 1997.

- Professional Welding Associates Procedure No. RT-1N, “Radiographic Examination Procedure for Wisconsin Public Service Corporation’s Kewaunee Nuclear Power Plant - Project Specific,” Revision 3.

- Kewaunee Radiographic Examination Report WO# 99-217006-000, “Feedwater Nozzle,” dated May 5, 2000.

- Wisconsin Public Service Corporation Nuclear Administrative Directive No. NAD 1.5, “Inservice Inspection Program Implementation,” Revision C.

- Wisconsin Public Service Corporation Nuclear Administrative Directive No. NAD 5.11, “Revision and Control of the Inservice Inspection Plan,” Revision A.

- Wisconsin Public Service Corporation Kewaunee Nuclear Engineering Procedure No. NEP 15.43, “Ultrasonic Limitation Documentation for Inservice Inspection,” Revision O.

- Wisconsin Public Service Corporation Kewaunee Nuclear Engineering Procedure No. NEP 15.6, “Liquid Penetrant Examination for Inservice Inspection,” Revision O.

- Wisconsin Public Service Corporation Kewaunee Nuclear Engineering Procedure No. NEP 15.9, “Ultrasonic Examination of Reactor Vessel Closure Head, Pressurizer, and Steam Generators for Inservice Inspection,” Revision O.

- ABB Combustion Engineering Nuclear Power Procedure Qualification Sleeving Test Record No. GTAA-43.43-Q2020, “Gas Tungsten Arc,” dated July 6, 1998.

- ABB Combustion Engineering Nuclear Power Weld Procedure Specification (WPS-Sleeving) No. GTAA-43.43-703, “Automatic Gas Tungsten Arc,” Revision 9.

- Wisconsin Public Service Corporation Procedure Qualification Record No. GMP-102-311-TGS-PQR, “Gas Tungsten Arc (GTAW) & Shielded Metal Arc (SMAW),” dated June 6, 1987.

- Wisconsin Public Service Corporation Procedure Qualification Record No. GMP-102-388-TGS-PQR, “Gas Tungsten Arc (GTAW) & Shielded Metal Arc (SMAW),” dated June 24, 1987.

- Wisconsin Public Service Corporation Welding Procedure Specification No. GMP-102-388-TGS, “Welding of P8 to P8 Materials per ANSI/ASME B31.1 and ASME Boiler and Pressure Vessel Code Sections I & VIII,” dated December 28, 1987.

Condition Reports/ISI Evaluation Reports

- Kewaunee Assessment Process Corrective Action No. 97-001323-000, “IWE Requirements for Class MC & Metallic Linners of Class CC Components of Light Water Cooled Power Plants,” dated September 16, 1997.

- Kewaunee Assessment Process Corrective Action No. 97-001322-001, “New Calibration Blocks Required for Improved UT Methods,” dated November 12, 1997.

- Kewaunee Assessment Process Corrective Action No. 00-000797, “Steam Generator Leakage,” dated March 29, 2000.

- Kewaunee Assessment Process Corrective Action No. 00-000797-001, “Steam Generator Primary-to-Secondary Step Increases,” dated May 11, 2000.

- Kewaunee Assessment Process Corrective Action No. 00-001224-000, “Steam Generator B Tube Flaws,” dated May 2, 2000.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F100 (1996), “3-inch RC to Pressurizer,” dated October 5, 1996.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F101 (1996), “SI-From Containment Penetration to Accumulators & Coldleg Loops ,” dated October 4, 1996.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F102 (1996), “RC - RTD Line for RC Loop A,” dated October 5, 1996.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F104 (1996), “Steam Generator SG-1B,” dated January 6, 1997.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F107 (1996), “Safety Injection Pumps Suction Piping,” dated October 10, 1996.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F109 (1996), “Pressurizer,” dated November 7, 1996.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F100 (1998), “From AFW Pumps 1A/1B and Turbine Driven Pump Discharge to Penetration 46E,” dated November 12, 1998.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F100 (1998), “Service Water Pump Strainer ASSW-1B1,” dated November 12, 1998.

- Kewaunee Nuclear Power Plant Inservice Inspection Indication Record F103 (1998), “Steam Generator SG-1A,” dated November 12, 1998.

QA Audits

- Kewaunee Nuclear Power Plant QA Audit 96-012 “ISI - Steam Generator Tubes/ Technical Specifications Section No. 4.2.b Audit,” dated March 7, 1997.

- Kewaunee Nuclear Power Plant QA Audit 97-015 “ISI General Audit,” dated November 20, 1997.

- Kewaunee Nuclear Power Plant QA Audit 98-004, “Forth Quarter 1998 Audit Report,” dated February 18, 1999.

- Kewaunee Nuclear Power Plant QA Audit 2Q00, “Second Quarter Audit Report - ISI,” Revision 0.

Miscellaneous

- Qualified Data Analyst Report Steam Generator Tubing - Eddy Current Inspection Kewaunee Nuclear Power Plant, Spring 2000,” dated May 8, 2000.

- Kewaunee Nuclear Power Plant Letter No. NRC-93-177, “Inservice Inspection Program For The Third Inspection Interval,” dated December 16, 1993.

- Kewaunee Nuclear Power Plant Letter No. NRC-94-109, “Additional Information on Third Ten-year Interval Inservice Inspection Plan,” dated October 31, 1994.

- Kewaunee Nuclear Power Plant Letter No. NRC-99-008, “1998 Inservice Inspection Summary Report,” dated February 12, 1999.

- Electric Power Research Institute Report No. EPRI TR-104788-R2, “PWR Primary-To-Secondary Leak Guidelines-Revision 2,” dated February 2000.

- Electric Power Research Institute Report No. EPRI TR-107569-V1R5, “PWR Steam Generator Examination Guidelines,” Revision 5.

- Ultrasonic Examination Record FW-W29, “Feedwater Nozzle From Anchored Elbow to SG 1A Ultrasonic Examination,” dated May 11, 2000.

- Ultrasonic Examination Record FW-W57, “Feedwater Nozzle From Anchored Elbow to SG 1B Ultrasonic Examination,” dated May 11, 2000.