U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-266/88010(DRS)

Docket No. 50-266 License No. DPR-24

Licensee: Wisconsin Electric Power Company
231 West Michigan
Milwaukee, WI 53203

Facility Name: Point Beach Nuclear Plant, Unit 1

Inspection At: Point Beach Site, Two Creeks, Wisconsin

Inspection Conducted: April 12-14, 19-21, and May 10-12, 1988

Inspector: J. F. Schapker for 5/27/88
Date

Approved By: D. H. Danielson, Chief for 5/27/88
Materials and Processes Section Date

Inspection Summary

Inspection on April 12-14, 19-21, and May 10-12, 1988 (Report No. 50-266/88010(DRS))
Areas Inspected: Routine unannounced inspection of inservice inspection (ISI) activities including review of program (73051), procedures (73052), observation of work and work activities (73753), and data review and evaluation (73755); of unresolved items (92701); of fuel rod assembly examinations (73753); of the ultrasonic examination (UT) of the steam generator transition field weld and the reactor coolant loop piping (73052, 73753); of the eddy current examination of the steam generator tubes, (73052, 73753); and of the balance of plant piping examinations (73052, 73753).
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Wisconsin Electric Power Company (WEPCO)

J. Reisenbuechler, Superintendent
S. Pullins, ISI Engineer
*J. Kohlwey, Nuclear Engineer
K. Crowly, Nuclear Engineer
*J. Knorr, Regulatory Engineer
J. Schewitzer, Maintenance Mechanical Engineer
R. Winjet, Nuclear Engineer
*G. Sherwood, Nuclear Engineer
J. Kenefich, Quality Assurance, Level III

EBASCo Services, Inc. (EBASCo)

J. Sengenberger, Level III

Hartford Steam Boiler Engineering and Insurance Company

R. Motguin, ANII

Nuclear Regulatory Commission (NRC)

*R. Hague, Senior Resident Inspector
R. Leemon, Resident Inspector

*Denotes those attending the exit meeting.

2. Licensee Action on Previous Inspection Findings

a. (Open) Unresolved Item (266/87009-01(DRS)): The licensee previously discovered evidence which indicated certain portions of the reactor coolant piping were fabricated with welded long seams, which had not been previously examined in accordance with ASME Section XI Code requirements.

The licensee has confirmed the existence of the welded long seams and additional girth welds (4) not previously examined as required by Section XI. The exclusion of these welds resulted from inaccurate as-built drawing records where some shop welds were not recorded, thereby, being excluded from the Inservice Inspection (ISI) Plan. The licensee has implemented the following corrective action: 1) All welds not previously inspected have been examined in accordance with ASME Section XI Code requirements, 2) A nonconformance report has been issued to address the inaccuracy of the ISI plan due to the as-built drawing discrepancies, 3) A review of shop drawings and construction documentation to verify the accuracy of as-built is being performed to assure other systems ISI programs are accurate, and 4) Examination of the previously unidentified longitudinal

welds utilizing special ultrasonic equipment and procedure developed for cast stainless steel has been performed with no recordable indications. (Reference Paragraph 3 of this report)

This item remains unresolved pending further action by the licensee, and review by the NRC.

b. (Open) Unresolved Item (266/86015-01(DRP)): During a review of the technical manual for the Model 44F steam generators installed in Unit 1 during the six-month outage ending in March of 1984, it was noted that the testing section for primary and secondary side hydrostatic testing listed a minimum test temperature of 120°F. The technical manual for the steam generators that were removed from Unit 1 and for the steam generator presently being used in Unit 2 list a minimum temperature of 70°F. The actual acceptance hydros done by the licensee were performed at a temperature of 147°F. Technical Specifications 15.3.1.B.2 states: "The secondary side of the steam generator will not be pressurized above 200 psig if the temperature of the steam generator vessel shell is below 70°F." The licensee is checking with the vendor to determine what the Technical Specification temperature value should be.

The inspector reviewed the licensee's Technical Specification, Technical Manual for the Model 44 steam generators (SG), and secondary side leak and hydrostatic test procedures. The Point Beach Technical Specification 15.3.1.B.1 states: "The Reactor Coolant system temperature and pressures shall be limited in accordance with the limit lines shown in Figures 15.3.1-1 and 15.3.1-2." This includes the primary side of the steam generators. Therefore, the primary side temperature/pressure limitations is specified adequately within the Technical Specification. The secondary side as described above is not similarly prescribed and pressurization above 200 psig.

The licensee's hydrotest/leak test procedures for the secondary side specify the temperature/pressure requirements; however, these temperatures do not meet the requirement as stated in the Technical Manual for the 44F steam generators installed in Point Beach Unit 1. The licensee has inquired to the equipment manufacturer, a preliminary report was received and reviewed by the NRC inspector. Additional information has been requested. Pending the review and acceptance of this data this item remains unresolved.

3. Ultrasonic Examination of Primary Loop Reactor Coolant Piping

The licensee acquired ultrasonic procedures and special equipment to examine the primary loop cast stainless steel (CSS) piping.

Background

The metallurgical structure of cast stainless steel has historically presented a significant detriment to producing the optimum UT wave propagation mode needed to perform volumetric examinations. The manufacturing process of cast stainless steel results in a variation of

isotropic and anisotropic micro structures. Although the variation in velocity of wave propagation is small in isotropic grain structures, the anisotropic grain structures show a marked in impingement on the velocity of wave propagation, especially for the shorter shear wave velocities.

Conclusion

The licensee employed the services of a NDE contractor (EBASCo Services, Inc.) to develop a UT procedure adequate to meet the ASME Section XI criteria for volumetric examination of Primary Loop cast stainless steel piping welds. The NDE contractor developed a UT procedure utilizing special equipment, UT machine with special bandpass filters, and special transducers (focused dual, refracted longitudinal wave mode). With the modified UT equipment the NDE contractor demonstrated the detection of the axial and circumferential I.D. notches' with a signal to noise ratio of 4 to 1 (with system parameters optimized). The average signal to noise ratio during scanning of the reactor coolant piping was about 2 to 1. This is due to the variance of metallurgical structures and scanning at + 8 to 10 db. The NRC inspector concluded that the licensee's special UT equipment and procedure was adequate to resolve the calibration standard I.D. notch and provides adequate resolution to identify any significant defect in the area of interest.

The ultrasonic examination observed by the NRC inspector was effective with respect to meeting the safety objectives as required by the applicable Code requirements.

No violations or deviations were identified.

4. Inservice Inspection (ISI)

a. General

The NRC inspector reviewed the second ten year Inservice Inspection Plan for the third period, first outage. The ISI plan conforms to the American Society of Mechanical Engineers (ASME), Boiler and Pressure Vessel Code, Section XI, 1977 Edition, Summer 1979 Addenda.

The services of an Authorized Nuclear Inservice Inspector (ANII) were procured and the ISI procedures, examinations and personnel certifications have been reviewed by the ANII.

EBASCo and the WEPCo Quality Assurance departments performed the ISI in accordance with ASME Section XI, 1977 Edition, Summer 1979 Addenda. The majority of the ultrasonic examinations (UT) were performed by EBASCo, using pulse echo UT detection instruments and transducers utilizing straight beam and angle beam examinations. No intergranular stress corrosion cracking (IGSCC) was apparent. Westinghouse Electric Co. (WEC) performed eddy current examination (ET) of the steam generators tubing.

b. ISI Documentation Review

The NRC inspector reviewed documents relating to the following:

- Eddy current (ET) equipment calibration.
- Ultrasonic instruments, calibration blocks, transducers and UT couplant certifications.
- Liquid penetrant material certifications.
- Magnetic particle equipment certifications.
- NDE personnel certifications in accordance with SNT-TC-1A.
- NDE procedures utilized for ISI.
- NDE calibrations and examination reports.
- ET data reports.

c. Observation of Work Activities

The NRC inspector observed work and discussed examinations with NDE examiners. These activities included observation of calibrations and examination performance, and review of documentation of the following NDE:

- Liquid Penetrant examination of Residual Heat Removal (RHR) piping welds.
- Visual Examinations of Reactor Pressure Vessel to Head Hold Down Studs (RPVS).
- Ultrasonic examination of RPVS and Safety Injection System (SIS) piping welds.
- Eddy Current examination of Steam Generator tubes.
- Hydrostatic test of the Chemical and Volume Control System (CVCS).

No violations or deviations were identified.

5. Fuel Rod Assembly Examinations

The Brown Boveri (BBC) Failed Fuel Rod Detection System (FFRDS) was utilized to examine the fuel rods for defects in the fuel cladding. This system uses a remotely controlled automatic ultrasonic (UT) detection system. The licensee has purchased the UT system and is in the process of training personnel in its operation. The contractor (BBC) performed the examination and ultrasonic evaluation of the data. Licensee personnel in training assisted BBC in the examination as part of the on-the-job training program.

The NRC Inspector observed examinations in progress and recording of UT data and reports.

No violations or deviations were identified.

6. Ultrasonic Examination of Steam Generator (SG) "B" Transition Girth Weld

The licensee performed ultrasonic examination (UT) of the upper shell to transition cone girth weld on SG "B". This weld is a field weld that was performed when the SG was replaced in 1983.

Recent examinations performed at another site (Indian Point) of the SG girth weld revealed ultrasonic reflectors at the inside weld circumference. Visual examinations of the inside circumference revealed essentially horizontal intermittent linear indications around the weld length 360°. Ultrasonic and magnetic particle examinations were extended to 100% of the weld and removal of the indications was made by grinding.

Point Beach, Unit 1, replaced their steam generators in 1983. The replacement steam generators consist of the lower shell and tube bundle up to the Number 4 weld (transition weld). The upper SG shell above the Number 4 weld is removed and installed from the old steam generators. Consequently, the transition weld for the Unit 1 SG's have previously been ultrasonic examined and have seen minimal operational time. In addition the licensee has changed from copper (suspected contributor to the development of the cracks at Indian Point) tube condensers to stainless steel tube condensers.

The examination was performed utilizing pulse echo type UT detection instruments with A-Scan presentation. Piezoelectric transducers at nominal beam angles of 0° (longitudinal), 45° and 60° (transverse) were used. The UT procedure complied with the requirements specified in ASME Section XI, 1977 Edition, up to and including Summer 1979 Addenda. Qualification of the UT inspectors was verified to comply with SNT-TC-1A and ASME Section XI requirements.

Five indications matched or exceeded the 50% DAC reportability criteria as specified in ASME Section XI. All indications were spot reflectors with no measurable size. Four of the indications were determined to be geometric reflectors from the ID root. The remaining indication was determined to be a small inclusion within the weld. The indications were verified as recorded in the base line UT.

No violations or deviations were identified.

7. Eddy Current Examination of Steam Generators

The licensee employed Westinghouse Electric Corporation (WEC) to perform eddy current examination (ET) of steam generator tubes as required by Technical Specification. WEC utilized the MIZ 18 multi-frequency acquisition and analyser system to conduct the examinations.

The NRC inspector observed the ET of the steam generator tubes in progress, verified certifications of ET equipment and calibration standards, and reviewed the qualifications and certifications of the ET examiners.

No defective tubes were identified. Previously reportable distorted indications (DI) were reclassified as fabrication induced due to buffing to remove scratches induced during fabrication. The reclassification was predicated by research performed by WEC on other units in which removal of tubing was performed to verify the ET indications.

Subsequent to the ET examination two tubes were damaged in SG "A" during the wrapper seal plates modification. This modification was performed to enhance sludge lancing accessibility. In performing the modification a hole saw accidentally came into contact with two steam generator tubes. ET examination was performed on five tubes within the area of the penetration. The two damaged tubes were detected at Row 1, Column 1 (66%) and Row 2, Column 1 (22%). These two tubes were plugged.

In addition, all peripheral steam generator tubes in SG "B" were ET examined due to discovery of a metallic wedge found during visual examination of the annulus adjacent to the tube bundle after completion of the wrapper seal plate modification. The source of the wedge was not readily apparent, therefore, the licensee elected to ET the peripheral tubes to assure no damage was caused by the foreign object during operations. The wedge was resting on the tube sheet adjacent to the tubes. The NRC inspector observed the visual examination via remote VCR camera. The licensee performed adequate corrective action to assure the safe operation of the steam generators.

8. Secondary Side Piping Examinations

The licensee developed a piping inspection program to inspect balance of plant (BOP) piping that has a temperature greater than 140°F, diameter greater than or equal to two inches, and pressure greater than atmospheric. Previous to this outage over 700 inspection points were selected for ultrasonic, magnetic particle, liquid penetrant, and visual examinations. The inspection points included piping with single and dual phase flow. The licensee utilized EPRI guidelines to establish the criteria for these inspections. The licensee performed inspections on 75 inspection areas during this outage. The following systems were included in this inspection program:

- Feedwater piping
- Main Steam piping
- Condensate piping
- Steam Generator blowdown piping
- Turbine exhaust piping

- Low pressure trap headers
- Condenser steam dump lines
- Moisture Separator Reheaters feedwater drains

Examination of the condenser steam dump lines disclosed an area where 65% of the pipe wall thickness was eroded. The corrosion was contributed to low pressure trap header flow and not to steam dump flow. Repairs were made to this area to correct the discrepant condition. The NRC inspector observed inspections in progress and reviewed inspection results and data.

The licensee's inspection program for BOP piping is effective with respect to meeting the safety objectives as described in IE Information Notice 86-106.

9. Exit Meeting

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on May 12, 1988. The inspector summarized the scope and findings of the inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary.