

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-255/84-11(DE)

Docket No. 50-255

License No. DPR-20

Licensee: Consumers Power Company
212 West Michigan Avenue
Jackson, MI 49201

Facility Name: Palisades Nuclear Generating Plant

Inspection At: Palisades site, Covert, MI

Inspection Conducted: May 31 - June 1, 1984

Inspector: *D. H. Danielson*
W. J. Key

6/15/84
Date

Approved By: *D. H. Danielson*
D. H. Danielson, Chief
Materials & Processes Section

6/15/84
Date

Inspection Summary

Inspection on May 31, June 1, 1984 (Report No. 50-255/84-11(DE))

Areas Inspected: Special inspection of auxiliary feedwater nozzle modification activities, including purchase order documentation review; observation of installation activities; review of installation, welding and inspection procedures; welder qualification; and a review of installation documentation. This inspection involved a total of 14 inspector-hours onsite by one NRC inspector including 0 hours during off-shifts.

Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Consumers Power Company (CPCo)

- *J. S. Rang, Operations and Maintenance Superintendent
- *D. G. Malone, Licensing Engineer
- *C. H. Gilmor, Technical Superintendent
- *M. P. Niese, QA Engineer
- *D. W. Rogers, Technical Engineer
- D. Morse, Senior QC Inspector
- J. Pomeranski, Project Engineer
- P. Flenner, Welding Engineer
- D. Engle, Project Manager
- M. Axdorff, Maintenance Supervisor

*Denotes those attending the exit meeting.

2. Auxiliary Feedwater Nozzle Modification

a. Background

On March 12, 1984, the licensee informed the Region III office that damage had been discovered on the auxiliary feedwater (AFW) sparger piping in both the A and B steam generators. The weld between the thermal sleeve and an elbow was completely broken.

On April 30, 1984, the licensee informed the Region III office that cracking of the "A" steam generator auxiliary feedwater penetration nozzle had been discovered, that cracking was confined to the radius section of the nozzle just above and below the nozzle, and that further investigation was being performed and would include the "B" steam generator.

On May 23, 1984, a meeting between Consumers Power Company and the NRC was held in Bethesda, Maryland. This meeting was held in order for CPCo to present the following:

- . A description of the original combustion engineering auxiliary feedwater sparger design.
- . The as-found condition of the sparger, nozzle and thermal sleeve.
- . A failure analysis report.
- . A new nozzle liner design, pipe and nozzle repair program.

The topics discussed during this meeting included:

- . Nozzle face cracking, that was determined to be thermal cracks caused by cold AFW contacting the hot metal of the nozzle.
- . Liner reduced section cracking of A and B steam generator, believed to have been caused by vibration and water hammers.

- . Liner weld cracking in "B" steam generator believed caused by non-fusion of the weld.
- . Bracket failures on A and B AFW piping, believed to have been caused by fatigue.
- . Banging marks on sparger pipe A and B. Mechanical damage at 12 and 6 o'clock on reduced section failure on "A" steam generator piping.
- . Some erosion and cavitation indications on the OD of the thermal sleeves was noted during laboratory analysis.
- . The transition pieces had metal upset from vibration and there were signs of wet steam impingment.

The licensee has determined that repairs to the AFW piping can be accomplished under 10 CFR 50.59(a)(1) without prior approval of the Commission. These repairs will be reported in their annual safety evaluation of the plant.

The licensee further informed the Commission that they no longer intended to use the Combustion Engineering (CE) sparger design in the repaired system. They have contacted Westinghouse Electric who made a safety evaluation of their auxiliary nozzle thermal liner discharge system. The licensee intends to replace the installed system with the Westinghouse system.

The Commission members present had no objections to the licensee's intended modification, but requested that the licensee make the Westinghouse safety analysis report available for review.

The licensee developed facility change number 613 for modification of the AFW system that requires the removal of the existing auxiliary feedwater sparger ring and installing the Westinghouse thermal liner assembly with an inverted J-tube at the nozzle discharge. An evaluation of the new system was made by the licensee to determine that it would meet the ASME Section III Code requirements. A detailed evaluation of the system, taking into consideration pressure, seismic, thermal and fluid loadings is being performed by Westinghouse and will be provided to the licensee to demonstrate that the as installed system meets all ASME Section III Code requirements. This will be accomplished prior to declaring the steam generators operable.

b. Purchased Material Documentation Review

The below listed materials were supplied to the licensee by Westinghouse for replacement of the existing auxiliary feedwater sparger system on purchase order No. CP-12-469Q and Westinghouse drawing No. 1725E69, Revision 2.

- . Thermal Sleeves - S/N 5355-C78, 1 and 2, (W) Quality Release No. 6965-R0
- . Pipe Sections - H04 and H05, Heat No. T68030, (W) Quality Release No. 6898-R0
- . Reducing Elbows - SA-234-WPB, Heat Code JD6BA, (W) Quality Release No. 6967-R0
- . Weld Filler Material - E70S-3, Heat No. 412H8951

During the inspectors review of weld radiographs an indication was noted in the base material of the middle elbow on the discharge line of steam generator "B".

A visual examination of the elbow was performed, but failed to reveal the indication. The inspector suggested that a radiograph of the area be taken to determine the extent of the indication. The licensee is contacting Westinghouse for a disposition of this matter. This is considered an unresolved item (255/84-11-01) pending further review by the licensee and inspector.

c. Installation Activities (Site)

Installation of the new auxiliary feedwater system is being performed with site job order number 0066 for the "A" steam generator and 0067 for the "B" steam generator. The inspector examined the fit-up and tack welding of installed piping on both steam generators.

d. Welding Procedures

The following GTAW welding procedures, are being used for installation.

WPS-GT-1-1

WPS-GT-1-3

WPS-GT-3-3

e. Weld Filler and Liquid Penetrant Materials

The following weld filler and liquid penetrant materials are being used for installation.

Weld Filler

E70S-16, Heat No. 49984

E70S-2, Heat No. 065763

Liquid Penetrant

Magnaflux Cleaner - Batch No. SKC-83D021

Magnaflux Penetrant - Batch No. SKL-HF/S-83D038

Magnaflux Developer - Batch No. SKD-S-83E026

f. Radiographic Review

Radiography of welded joints is being performed by CPCo nondestructive examination personnel. The inspector reviewed radiographs of Weld No. 2 and 5 on both steam generators.

g. Welder Certification

The following Consumers Power Company welders certifications were examined:

<u>Name</u>	<u>Symbol</u>	<u>Process</u>
R. Dykman	54	GTAW/SMAW
N. Cady	82	GTAW/SMAW
K. Krentz	1P	GTAW/SMAW
J. Legard	1R	GTAW/SMAW
H. Wilson	2R	GTAW/SMAW
D. Metcalfe	3B	GTAW/SMAW
L. Britton	3Y	GTAW/SMAW
J. Hunter	4J	GTAW/SMAW
E. Smart	4H	GTAW/SMAW

No items of noncompliance or deviations were identified.

3. Unresolved Items

Unresolved Items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. An unresolved item disclosed during the inspection is discussed in paragraph 2.b.

4. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the close of the inspection on June 1, 1984. The scope and findings of the inspection were discussed the licensee acknowledged the unresolved item, and noted they would inform the resident inspector of further investigation results. In addition, they stated that they would forward a copy of the Westinghouse system evaluation through the resident inspector to the Region III office for review.