U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No.: 50-304/90009(DRS)

Docket No.: 50-304 License No.: NPF-48

Licensee: Commonwealth Edison Company
Post Office Box 767
Chicago, IL 60690

Facility Name: Zion Station, Unit 2

Inspection At: Zion Site, Zion, IL 60099

Inspection Conducted: April 2-4, 26, 30; and May 2, 9-10, and 22, 1990

Inspector: K. D. Ward 5/29/90
K. D. Ward Date

Approved By: D. R. Danielson 5/30/90
D. R. Danielson, Chief Date
Materials and Processes Section

Inspection Summary

Inspection on April 2-4, 26, 30; and May 9-10, and 22, 1990 (Report No. 50-304/90009(DRS))
Areas Inspected: Routine, unannounced safety inspection of inservice inspection (ISI) activities including review of programs (73051), procedures (73052), observation of work activities (73753), and data review (73755); and of an independent measurements inspection.
Results: No violations or deviations were identified. Based on the results of the inspection, the NRC inspector noted the following:

- The licensee's ISI program, procedures, work activities, nondestructive examination results and interpretation were in compliance to the ASME Code, Section XI, 1980 Edition, Winter 1981 Addenda.
- The licensee demonstrated a positive commitment to assure the reliability of the steam generators.
- Steam generator transition girth weld indications, found by nondestructive examination (NDE) were dispositioned in accordance with the ASME Code, Section XI, 1980 Edition, Winter 1981 Addenda.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*T. Saksefski, Regulatory Assurance
*T. Rieck, Technical Superintendent
*R. Wolf, ISI Group Leader
*J. Vost, Quality Control
T. Joyce, Station Manager
R. Tolentino, ISI Engineer
R. Summers, Engineering Assistant

U. S. Nuclear Regulatory Commission (U. S. NRC)

*C. Patel, Project Manager, NRR
*R. Leemon, Resident Inspector
J. Smith, Senior Resident Inspector
A. Bongiovanni, Resident Inspector
H. Kerch, Reactor Inspector (Region I)
R. Harris, Reactor Inspector (Region I)
W. Mingus, NDE Technician (NRC Contractor)
D. Wiggins, NDE Technician (NRC Contractor)

Westinghouse Electric Corporation (W)

E. Jackson, Steam Generator Service Manager

Conam Inspection Service (CONAM)

M. Gortemiller, Level III Analyst, ET

Hartford Steam Boiler Inspection and Insurance Company (HSB)

P. Fisher, Supervisor, ANII

The NRC inspector also contacted and interviewed other licensee and contractor employees.

*Denotes those present at the exit interview on May 22, 1990.

2. Inservice Inspection (ISI), Unit 2

a. General

During the period of April 30 through May 11, 1990, an onsite independent measurements inspection was conducted on both Units 1 and 2. This inspection was conducted by NRC Region I inspectors and contracted nondestructive examination (NDE) personnel. The purpose of this inspection was to verify the adequacy of the licensee's NDE

program during plant modifications. This was accomplished by duplicating, as near as possible, those examinations required by Code and regulations, and evaluating the results. The examination results are documented in Region I Inspection Reports No. 50-295/90012 and No. 50-304/90012.

b. Review of Programs (73051)

Combustion Engineering (CE) personnel performed the eddy current examinations (ET), and Conam Inspection, Inc. (CONAM) performed the analysis of the data. An independent analysis was then performed by CE and Zetec. Westinghouse Electric Corporation (W) performed the remainder of the ISI program in accordance with ASME Section XI, 1980 Edition, Winter 1981 Addenda.

c. Review of Procedures (73052)

All ISI procedures were approved by the Authorized Nuclear Inservice Inspector (ANII) and were reviewed by the NRC inspector. The manual pulse echo detection instruments and transducers of various angles, sizes, and frequencies were used. The NDE was performed in accordance with ASME Section V, 1980 Edition, Winter 1981 Addenda.

d. Data Review and Evaluations (73755)

(1) General

The data for the following examinations was within the criteria as outlined in the applicable NDE procedures and ASME Code requirements. The NRC inspector's review included examination of documents relating to NDE equipment, data, and evaluations.

(2) Eddy Current Examinations (ET)

The Zetec MIZ-18A data acquisition and the Zetec DDA-14 Analysis System was used to conduct the ET. The ET included 100% of all steam generator tubes from the hot leg tube end to the seventh support plate in the cold leg. The results were as follows:

Steam Generator	Total This Outage		Total All Outages	
	Plugged	Sleeved	Plugged	Sleeved
A	13	82	225	82
B	15	0	69	0
C	17	0	57	0
D	2	0	42	0

All of the new steam generator tube plugs were type (W) Inconel #690 and the installed welded sleeves were fabricated by CE.

The eddy current examination (100%) program exceeded Technical Specification requirements, which requires sampling in accordance with Technical Specification Table 4.3.B.1.

(3) Examination of Steam Generator Girth Welds (Unit 2)

Westinghouse (W) performed the ultrasonic examinations (UT) on the steam generator upper shell to transition cone girth weld #6 on all four steam generators. The unacceptable indications found by (W) were verified by a CECo Level III UT individual.

The following are the steam generator results:

(a) 2A Steam Generator

1 Six indications were found by external UT.

2 One of these indications was verified as a surface indication by internal MT and was removed as a boat sample. The results of the boat sample analyses will be submitted with the Zion Unit 2 report to NRR at a later date.

3 None of the subsurface indications exceeded 50% DAC, hence no fracture mechanics work was required. (Over 50% DAC is unacceptable by UT.)

(b) 2B Steam Generator

1 Twenty indications were found by external UT.

2 Fourteen of these indications were verified as surface indications by internal MT and were removed by grinding and blending.

3 Two of the subsurface indications exceeded 50% DAC and were satisfactorily dispositioned by fracture mechanics.

(c) 2C Steam Generator

1 Eight indications were found by external UT.

2 Seven of these indications were verified as surface indications by internal MT and were removed by grinding and blending.

3 None of the subsurface indications exceeded 50% DAC, hence, no fracture mechanics work was required.

(d) 2D Steam Generator

1 Twenty-two indications were found by external UT.

2 Nine of these indications were verified as surface indications by internal MT and were removed by grinding and blending.

3 Eight of the subsurface indications exceeded 50% DAC and were satisfactorily dispositioned by fracture mechanics.

CECo extended the above recording beyond the ASME Code requirements. CECo informed NRR that the indications were, in most cases, approximately ¼" deep and 1" long. In an effort to obtain additional information that may help identify the root cause of the indications, hardness tests were performed on the girth welds and the surrounding area. The results will be submitted to NRR also.

e. Observation of Work Activities (73753)

The NRC inspector observed work activities and had discussions with personnel during the ISI activities. These observations included the following:

(1) NRC NDE van personnel performing various ISI activities.

(2) CE personnel utilizing the MIZ-18A multi-frequency and the DDA-4 analyzer system.

(3) CE personnel performing eddy current examinations on the tubes of the 4 steam generators.

(4) CECo Level III personnel performing ultrasonic examinations with the "P SCAN" instrument to size and verify the indications found in the girth welds.

(5) CONAM personnel performing a second independent evaluation on the eddy current examinations.

(6) Westinghouse personnel performing visual examinations on the internals of the reactor vessel using a mini-submarine.

(7) Westinghouse personnel performing ultrasonic examinations on the steam generator upper shell to transition cone girth welds #3-6 steam generator "A"; #4-6 steam generator "B"; and #2-6 steam generator "C".

The NRC inspector reviewed the qualifications and certifications of all inspection personnel on site to ensure conformance with SNT-TC-1A.

No violations or deviations were identified.

3. Exit Interview

The NRC inspector met with site representatives (denoted in Paragraph 1) at the conclusion of the inspection on May 22, 1990. The NRC inspector summarized the scope and findings of the inspection noted in this report. The NRC inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the NRC inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.