

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-254/85030(DRS)

Docket No. 50-254

License No. DPR-29

Licensee: Commonwealth Edison Company
P.O. Box 767
Chicago, IL 60690

Facility Name: Quad Cities Station, Unit 1

Inspection At: Quad Cities Site, Cordova, IL

Inspection Conducted: December 19, 1985, and January 7, 13, 21, 23, 28, 30,
and February 3, 6, 11, 13-14, 1986

Inspector: *D. H. Danielson*
K. D. Ward

2/24/86
Date

Accompanied By: D. H. Danielson
(February 13-14, 1986)

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

2/24/86
Date

Inspection Summary

Inspection on December 19, 1985, and January 7, 13, 21, 23, 28, 30, and February 3, 6, 11, 13-14, 1986 (Report No. 50-254/85030(DRS))

Areas Inspected: Routine, unannounced inspection of inservice inspection (ISI) procedures, work activities, nondestructive examination (NDE) personnel certifications and data; Ultrasonic Examination (UT) of shroud head hold down bolting; UT of jet pump beam bolts. This inspection involved a total of 69 inspector-hours by one NRC inspector.

Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*N. Kalivianakis, Station Manager
*T. Tamlyn, Service Superintendent
*C. Smith, QC Supervisor
*D. Gibson, QA Superintendent
*H. Do, ISI/IST Group Leader
*K. Medulan, ISI Coordinator
*M. Kool, Compliance Engineer
D. Thayer, Maintenance Senior Staff Engineer
W. Witt, Level III, NDE
B. Wilson, Level III, NDE
J. Ford, QC Inspector

United States Nuclear Regulatory Commission (NRC)

*D. Danielson, Chief, Materials and Processes Section
*A. Madison, Senior Resident Inspector
A. Morrongiello, Resident Inspector

General Electric (GE)

R. Hooper, Manager, Inspection Services
E. Reczek, Level III, NDE
P. Nash, Level II, NDE

NUTECH Engineers, Incorporated (NUTECH)

D. Pitcairn, Engineer Director

Hartford Steam Boiler Inspection and Insurance Company (HSB)

F. Roosé, ANII

Personnel Present at Quad Cities Pre-ISI Meeting

D. VanPelt, Assistant Superintendent, Maintenance, CECo
W. Witt, Level III, NDE, CECo
C. Smith, QC Supervisor, CECo
D. Gibson, QA Supervisor, CECo
H. Do, ISI/IST Group Leader, CECo
J. Ford, QC Inspector, CECo
K. Medulan, ISI Coordinator, CECo
J. Kopacz, Assistant Technical Staff Supervisor, CECo
H. Lihou, Assistant Technical Staff Supervisor, CECo
B. Wilson, Level III, NDE, CECo

D. Thayer, Maintenance Senior Staff Engineer, CECo
R. Roose, ANII, Hartford Steam Boiler Inspection and Insurance Company
R. Hooper, Manager, Inspection Services, GE
K. Cherian, QC Superintendent, Level III, NDE, GE
C. Purseglove, Engineer, Illinois Department Nuclear Safety
J. Brittin, Engineer, Illinois Department Nuclear Safety
K. Ward, Reactor Inspector, NRC

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

*Denotes those present at the final exit interview on February 14, 1986.

2. Inservice Inspection (ISI)

a. General

This is the second outage of the second period of the second ten year plan.

A Pre-ISI meeting was held at the site December 19, 1985. (See attendance list Paragraph 1). The purpose of the meeting was to discuss with the NDE contractor (GE) any possible problem areas during the upcoming ISI of Unit 1.

The augmented inspection sample set forth in Generic Letter 84-11 consisted of 59 welds (see Attachment A for specific welds). Generic letter 84-11 does not give clear guidance for the inspection of mitigated welds, therefore guidance was taken from NUREG-1061, Volume 1. This unit has 77 welds which have been mitigated by Induction Heat Stress Improvement (IHSI) or Heat Sink Welding (HSW). Generic Letter 84-11 states that all overlays on welds where circumferential cracks longer than 10% of circumference will be examined. The Quad Cities sample included the inspection of three 12" pipe-to-elbow overlaid welds (No. 02K-S3, No. 02C-S4, No. 02J-S4, in the recirculation system.

The NRC inspector observed some of the weld overlay build-ups on three weld mock-ups. The mock-ups were designed to assist in technique development and training in weld build-up and surface conditioning of weld overlays for ultrasonic examinations using the recently developed EPRI techniques. Weld overlay build-up and surface conditioning were performed in accordance with ASME Section XI, 1980 Edition, Winter 1980 Addenda.

CECo, CONAM and GE performed the ISI in accordance with ASME Section XI, 1980 Edition, Winter 1980 Addenda. CECo performed visual (VT) examinations, CONAM performed liquid penetrant (PT) examinations and GE performed magnetic particle (MT) and ultrasonic (UT) examinations. The Level II and III UT personnel performing evaluations on crack indications were qualified at the EPRI NDE Center by successfully performing the practical detection examination. Level I personnel not qualified at EPRI performing UT scanning duties were trained by EPRI qualified personnel onsite, CECo's Level III UT personnel who reviewed GE's results were also EPRI qualified.

London Nuclear, who performed the decontamination for the last outage, performed the decontamination of the recirculation suction and discharge of the pumping ring heads, cross ties and risers to thermal sleeves. The NRC inspector observed the operation of the decontamination equipment and reviewed the PO, the work request, and flow diagrams of the equipment.

Weld 02BS-S9 is a 28-inch pipe-to-elbow weld in the loop-B pump suction piping of the recirculation system. This weld was ultrasonically examined during the 1984 refueling outage by the CECO UT contractor (LMT), the CECO - SMAD UT Level IIIs and the third party UT contractor (UTL). The examination revealed two circumferential cracks on the pipe side (1/2 inch by 15% and 1-1/2 inches by 18%). A 4 inch long slag or fusion indication was evaluated on the elbow side. ID geometry was noted on the pipe side of the weld intermittently for 360 degrees of the circumference. Four discrete locations of ID geometry were identified on the elbow side. The weld was examined during the current refueling outage by the CECO UT contractor (GE) and CECO - SMAD UT Level III personnel. The evaluations of the data were as follows:

- The flaw indications on the pipe side compare well with those reported in 1984. No significant crack growth was observed during the previous fuel cycle.
- Minor circumferential cracking was observed on the elbow side. Two of the crack indications were evaluated as ID geometry and slag or fusion during the 1984 examinations.
- A shallow, short, circumferential crack indication was evaluated on the elbow side which was not reported in 1984. It is believed this flaw was present in 1984. It is felt that this flaw was observed in 1986 due to the use of enhanced transducers and additional examiner training.

The 1984 and 1986 UT examination results of weld 02BS-S9 were transmitted to NRR. The NRC inspector participated in a conference call held between CECO and NRR to discuss the results. The 1984 and 1986 flaw indications were evaluated in accordance with the guidance of NUREG-1061, Volume 1. Weld 02BS-S9 was analyzed by NUTECH to "leave-as-is" and this was concurred in by NRR.

b. Programs, Procedures and Drawings

The NRC inspector reviewed the following:

- CECO, Inservice Inspection and Testing Program. The program was developed in compliance with the rules and regulations of 10 CFR 50.55a and ASME Section XI, 1980 Edition, Winter 1980 Addenda. Where these rules were determined to be impractical, specific relief was requested in writing. The NRC inspector reviewed the specific relief requests to the NRC, including the related correspondence between the licensee and the NRC.

- CECo, Inservice Inspection Summary Report for activities conducted during the seventh refueling outage of Unit 2.
 - CECo, Quad Cities Unit 1 Augmented Inservice Inspection Program (Generic Letter 84-11).
 - Drawings ISI-103, sheets 1, 2, 3, and 4, and ISI-105, sheets 2 and 3. These were the drawings that were used in establishing the welds to be examined during this outage. The NRC inspector reviewed the drawings and walked down some of pipe spools selected from these drawings.
 - Welding Procedure Specifications and Qualification Records, including the General Welding Procedure.
 - Nondestructive Examination Procedure changes.
- c. Observation of Personnel, Material and Equipment Certifications, Data Reports and Audits

The NRC inspector observed the work and had discussions with personnel during his review of the ISI activities. These observations included calibration, performance of the ultrasonic examinations, and a review of the following documents:

- Ultrasonic instruments, calibration blocks, transducers and UT couplant certifications.
- NDE personnel certifications in accordance with SNT-TC-1A.
- Audits by CECo QA.
- Certified material test reports for the filler material.
- Nondestructive examination reports.
- Records of welder and welding operator qualifications.

No violations or deviations were identified.

3. Shroud Head Hold Down Bolting

Peach Bottom Unit 3 found four of forty-eight shroud head bolts (SHB) broken. The fracture was in a creviced area on the Inconel Alloy 600 portion of the bolt. The cause of failure was confirmed by Philadelphia Electric Company as being intergranular stress corrosion cracking (IGSCC). General Electric (GE) developed a remote ultrasonic examination capability (UT Procedure for Remote Examination of Shroud Head Hold Down Bolting, No. TP508-1236, Revision 2) for examining SHB installed on the shroud head and separator assembly, with the assembly in the equipment pool. The NRC inspector observed the calibration and examination on some bolts. Forty-seven out of forty-eight bolts were found to be acceptable, one bolt was inaccessible. The NRC inspector reviewed the procedure, the work request, and personnel and equipment certifications.

No violations or deviations were identified.

4. Ultrasonic Examination of Unit 1 Jet Pump Beam Bolts (IE Bulletin 80-07)

Pursuant to the requirements of IE Bulletin 80-07, all twenty jet pump beams were examined by CECO on January 10, 1986. Nineteen beams were acceptable and one beam, No. 13, was found to be cracked. The cracked beam was replaced during this outage. The NRC inspector observed part of the replacement activities. It is CECO's intent to continue to ultrasonically examine (UT) the jet pump beams during each refueling outage. Any cracked beams will be replaced prior to unit startup. The NRC inspector reviewed the procedure utilized to UT the jet pump beams and other associated documentation and determined that the actions implemented by the licensee meet the intent of the Bulletin.

No violations or deviations were identified.

5. Exit Interview

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

ATTACHMENT A

<u>SYSTEM</u>	<u>SIZE</u>	<u>WELD ID</u>		
Recirculation	28"	02 AS-S4	02 BS-S9	
		02 BD-S2	02 BS-F1 (NOZ-SE)	
		02 AS-S3	02 AS-F5	
		02 BD-S6	02 AD-S6	
	22"	02 A- S4	02 A- S6	02 B-S3
		02 A- S7	02 A- S8	02 A-S3
		02 B- S4		
	12"	02 L-F6	02 H- F6	02 C-S4*
		02 K-S3*	02 J- S4*	
		02 J-F1 (SE-NOZ)		02 K-F1 (SE-NOZ)
Shutdown Cooling	20"	10 S-S3	10 S-S4	10 S-F6
		10 S-S7	10 S-F8	10 S-S9
		10 S-S11		
Low Pressure Core Injection	16"	10 BD-F1	10 AD-S7	10 AD-S8
		10 BD-S7	10 BD-F6	10 BD-S17
		10 AD-S15		
Head Spray	6"	10 HS-S1B N6B-S1	N6A-S2	N6B-S2
	4"	10 HS-F10A 10HS-S2	10HS-S1A	10HS-S5
Core Spray	10"	14 A-F2	14 A-F3R	14 A-F7
		14 A-S8	14 B-F7	14 B-S8
		14 B-S9		
Reactor Water Clean Up	6"	12 S-F28	12 S-S26	
Head Vent	4"	N7-S2		
Control Rod Drive	3"	03-S3		
	4"	03-F8	03-F7	
Jet Pump Inst.	4"	N8A-F1	N8A-F2	

*Over Lay Welds Total welds ultrasonically examined = 59 welds