

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-454/88017(DRS)

Docket No. 50-454

License No. NPF-37

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

Facility Name: Byron Station, Unit 1

Inspection At: Byron Site, Byron, IL

Inspection Conducted: September 14, 20-22, 27-29, and October 17, 1988

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

10/19/88  
Date

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

10/19/88  
Date

Inspection Summary

Inspection on September 14, 20-22, 27-29, and October 17, 1988 (Report No. 50-454/88017(DRS))

Areas Inspected: Routine, unannounced safety inspection of inservice inspection (ISI) activities including review of program (73051), procedures (73052), observation of work activities (73753), and date review (73755); stress relieving steam generator tube U-bends (37701); and various modifications (37701).

Results: No violations or deviations were identified. The following are the general conclusions reached during the inspection:

- ° The inservice inspection program was properly implemented.
- ° Personnel performing nondestructive examinations, heat treating, and modification activities appeared to be knowledgeable and conscientious in their work.
- ° Management involvement in inservice inspection, heat treating, and the modification activities was evident.
- ° Activities examined were accomplished in accordance with established procedures by qualified personnel.

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## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

\*L. Sues, Assistant Superintendent, Technical Services  
\*D. Winchester, Station QA Superintendent  
\*R. Flahive, Technical Staff Supervisor  
\*D. Robinson, Nuclear Safety Group, Onsite Supervisor  
\*M. Snow, Regulatory Assurance Supervisor  
\*J. Harkness, Technical Staff, ISI  
\*M. Kennedy, Technical Staff, Engineer  
\*J. Smith, Technical Staff, Engineer  
\*E. Zittle, Regulatory Assurance Staff  
G. Sorensen, Construction Superintendent  
W. Wolber, QC Supervisor

#### Nuclear Regulatory Commission (NRC)

\*P. Brochman, Senior Resident Inspector  
\*N. Gilles, Resident Inspector

#### EBASCO Services (EBASCO)

J. Semgenberger, Supervisor  
N. Bollingmo, UT Level II  
S. Busby, PT Level II

#### Hunter Corporation (HC)

J. Smith, Quality Control Weld Inspector, Level II

#### Babcock & Wilcox Company (B&W)

R. Rawlings, QC Specialist  
R. Shope, QC Supervisor  
E. Mayhew, Quality Programs Specialist (Auditor)

#### Hartford Steam Boiler Inspection and Insurance Company (HSB)

J. Hendricks, ANII

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

\*Denotes those present at the exit interview conducted October 17, 1988.

### 2. Inservice Inspection (ISI) - Unit 1

#### a. General

This is the second outage of the first period of the first ten-year ISI plan. EBASCO personnel performed the ISI in the methods of

ultrasonics (UT), magnetic particle (MT), and liquid penetrant examinations (PT). B&W personnel performed the eddy current examinations (ET) on the tubes in steam generators (SG) A, B, C, and D. CECO personnel performed the visual examinations (VT). The examinations were all performed in accordance with ASME Section XI, 1983 Edition, Summer 1983 Addenda. The UT was performed by EBASCO using pulse-echo UT flaw detection instruments and various angles and MHZ transducers. There were several EBASCO personnel who had been trained and qualified by EPRI in detecting Intergranular Stress Corrosion Cracking (IGSCC).

b. Program (73051) and Procedures (73052)

The NRC inspector reviewed the ISI program and procedures and found them to be acceptable. Where these rules were determined to be impractical, specific relief was requested in writing. The NRC inspector reviewed the specific relief requests and related documentation.

c. Review of Data, Audits and Certifications of Material, Equipment and Personnel (73755)

The NRC inspector reviewed documents relating to the following:

- (1) Ultrasonic instruments, calibration block, transducers and couplant certifications.
- (2) Liquid penetrant, cleaner and developer material certifications.
- (3) Magnetic particle, materials and equipment certifications.
- (4) Eddy current equipment certifications.
- (5) NDE personnel certifications in accordance with SNT-TC-1A.
- (6) Audits/Surveillances.
- (7) ISI Data Reports, including 1977 radiographs of the "A" steam generator girth weld. There was an acceptable slag indication found by ultrasonic examination this outage that had not been found by ultrasonic examination during the preservice inspection. In reviewing the 1977 radiographs of the girth weld, the NRC inspector determined that the indication has always been in the weld. The slag indication was radiograph examined this outage, but because of a "T" type configuration of where the weld is located, the area could not be successfully radiographed. The indication will continue to be monitored.
- (8) Eddy Current Reports -
  - ° Steam Generator A - 3 tubes were plugged, a total of 39 tubes are now plugged.

- ° Steam Generator B - 4 tubes were plugged, a total of 16 tubes are now plugged.
- ° Steam Generator C - 4 tubes were plugged, a total of 9 tubes are now plugged.
- ° Steam Generator D - 3 tubes were plugged, a total of 11 tubes now plugged.

d. Observation of Work Activities (73753)

The NRC inspector observed work and had discussions with personnel during the following ISI activities. The related documentation was also included as part of this review.

- (1) B&W personnel using the following equipment evaluating eddy current data from the steam generator tubes:
  - (a) The ZETEC Model DDA-4 analysis equipment.
  - (b) Automated data screening equipment.
  - (c) Data management software system.

The B&W personnel described in detail the purpose and the accuracy of the equipment in discriminating between the important and the irrelevant data.

- (2) B&W personnel performing eddy current examinations on many steam generator tubes.
- (3) An ultrasonic instrument being decontaminated by radiation chemistry personnel.
- (4) An EBASCO PT Level II individual performing a liquid penetrant examination on Line #1RH01BA-12", Weld #C7, long seam.
- (5) EBASCO UT Level II individuals performing calibrations and ultrasonic examinations on Line #1FW81AC-6", Weld #C5 FW331, and on Line #1MS01CC-32 & 3/4", Weld #C2, long seam.
- (6) The authorized nuclear inservice inspector performing his duties.
- (7) The B&W auditor performing her duties.

No violations or deviations were identified.

3. Stress Relieving the Steam Generator (SG) Tube U-Bends (37701)

Primary side Intergranular Stress Corrosion Cracking (IGSCC) has been noted by B&W in the U-bend region of the first and second row of the

Alloy 600 tubes in PWR recirculating steam generators. Destruction examinations have shown the cracks to be primarily at the apex and near the tangents of the bends on the extrados (outside bend radius) and in the sides near the small radius of the curvature portion of the oval corners.

Heat treating was performed to reduce tube residual stresses and to minimize primary and secondary side stress corrosion cracks. This was accomplished by heating the tubes to a predetermined temperature and time range. The heat treating was performed by B&W on the 3/4" OD tubes, Rows 1 and 2 U-bends in Steam Generators A, B, C, and D.

Individuals involved in stress relieving were trained on a mock-up prior to the actual stress relieving of the steam generator's tube U-bends. Tests were given to the individuals prior to performing the heat treating.

B&W personnel walked the NRC inspector through the heat treating process in detail which included the equipment and how it operated in the tube U-bends. The NRC inspector also observed, by video, the heat treating process in operation on the steam generators. The NRC inspector reviewed procedures, drawings, reports, and other related documentation.

After heat treating, the U-bends were eddy current examined using the B&W Eddy-360 system and found to be acceptable.

No violations or deviations were identified.

#### 4. Modifications (37701)

##### a. Easier Access Through Penetrations

Modifications were implemented to allow easier access to the containment during outages by replacing welded closure plates with blind flanges. The removal of closure plates on penetration sleeves #P-63, #P-64 and #P-74 easily allowed outage related eddy current examining power cables and sludge lancing hoses to pass into the containment.

All work for this modification was performed in accordance with ASME Section III, 1974 Edition, Summer 1975 Addenda, and ASME Section XI, 1983 Edition, Summer 1983 Addenda. The NRC inspector reviewed drawings, travelers, 10 CFR 50.59 safety evaluation, and NDE and welding related documentation. The NRC inspector also observed a part of the installation and a fit up.

No violations or deviations were identified.

##### b. Snubber Reduction

This modification altered the support arrangement of piping systems and other areas by removing the snubbers or replacing the snubbers

with rigid struts. The snubber reduction modifications reduced the overall snubber population and therefore, reduced the scope of the surveillance and testing program. The main intent of this modification was the removal of snubbers and/or replacement of snubbers with rigid struts, minimizing hardware changes.

All work for this modification was performed in accordance with ASME Section XI, 1983 Edition, Summer 1983 Addenda. The NRC inspector reviewed drawings, field changes, work requests, and other NDE and welding related documentation. The NRC inspector also observed fitups and visually examined the final welding and installation of many rigid struts.

No violations or deviations were identified.

5. Exit Interview (30703)

The inspector met with site representatives (denoted in Paragraph 1) 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.