

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No.: 50-455/92005(DRS)

Docket No.: 50-455

License No. NPF-66

Licensee: Commonwealth Edison Company
Op. West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: Byron Station - Unit 2

Inspection At: Byron Site, Byron, IL

Inspection Conducted: February 24, March 13, 16, and
April 23, 1992

Inspector:

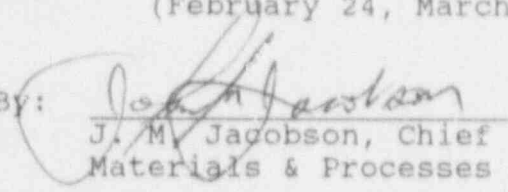

K. D. Ward

4-27-92
Date

Accompanied By: J. M. Jacobson
(March 16, 1992)

Accompanied By: B. Metrow, IDNS
(February 24, March 13, 16 and April 23, 1992)

Approved By:


J. M. Jacobson, Chief
Materials & Processes Section

4-27-92
Date

Inspection Summary

Inspection on February 24, March 13, 16, and April 23, 1992
(Report No. 50-455/92005(DRS))

Areas Inspected: Routine, unannounced safety inspection of inservice inspection (ISI) activities including review of programs (73051), data (73755), procedures (73052), observation of work activities (73753), and review of the erosion/corrosion (E/C) program (73051, 73052, 73753, and 73755).

Results: No violations or deviations were identified. Based on the results of the inspection, the NRC inspector noted the following:

- ° The licensee adequately demonstrated the ability to properly implement the ISI program, including the eddy current examinations of the steam generator tubes.

- ° Personnel involved in the ISI effort appeared knowledgeable, well trained, and competent.
- ° Management was involved in the ISI activities in an effective manner.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*R. Pleniewicz, Station Manager
*M. Bursess, Technical Superintendent
*D. Brindle, Regulatory Assurance Supervisor
*J. Smith, ISI Group Leader
*P. O'Neill, Assistant Technical Staff Supervisor
*D. Klink, Nuclear Quality Program Engineer
*D. Berg, Safety Assessment Engineer
*G. Hagemann, Technical Staff ISI Coordinator
*E. Zittle, NRC Coordinator
W. Grundman, Nuclear Quality Program Superintendent
J. Louigro, ISI/Steam General Engineer
K. Kim, ISI/Erosion/Corrosion Engineer

U.S. Nuclear Regulatory Commission (NRC)

*T. Reidinger, Senior Resident Inspector (Acting)
*V. Ordaz, Reactor Intern (NRR)
W. Kropp, Senior Resident Inspector
C. Brown, Resident Inspector

Illinois Department of Nuclear Safety (IDNS)

*B. Metrow, IDNS Engineer

Babcock and Wilcox Company (B&W)

H. Smith, Level III

Ebasco Services (EBASCO)

J. Sengenberger, Level III, Project Manager
R. McBride, Site Supervisor

Hartford Steam Boiler Inspection and Insurance Company (HSB)

J. Hendricks, ANII

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

*Denotes those present during the exit interview on April 23, 1992.

2. Inservice Inspection (ISI) Unit 2

a. Program Review (73051)

Personnel from B&W, EBASCO, and CECO performed the ISI in accordance with the licensee's program and ASME Section XI, 1983 Edition, Summer 1983 Addenda. The licensee did not make a request for relief from the ASME Code for this outage. The NRC inspector reviewed CECO Audit No. 06-92-04 and surveillances of ISI program activities. These audit efforts were found to be acceptable, and performed by qualified personnel. Organizational staffing for the ISI program was found to be acceptable and the services of an Authorized Nuclear Inservice Inspector (ANII) were procured from Hartford Steam Boiler Inspection and Insurance Company.

b. Procedure Review (73052)

All applicable ISI procedures were approved by the ANII and were reviewed by the NRC inspector. The ISI procedures were found to be acceptable and in accordance with ASME Section V, 1983 Edition, Summer 1983 Addenda.

c. Data Review (73755)

(1) General

The examination data was found to be in accordance with the applicable ISI procedures and ASME Code requirements. The NRC inspector reviewed documents related to nondestructive examination equipment, data, and evaluations.

(2) Eddy Current Examination (ET)

During this outage, 100% of all accessible tubes were examined full length. The examinations were conducted utilizing the Zetec MIZ-18 multifrequency digital test equipment with associated acquisition software and remote positioning devices. The Zetec DDA-4 Digital Data Analysis System was used for the data evaluation.

Motorized rotating pancake coil (MRPC) examinations were utilized to supplement the bobbin coil examinations. The MRPC was used to further characterize manufacturing burnish marks, and undefined indications.

The following tubes were plugged as a result of this examination:

<u>Steam Generator</u>	<u>Tubes Plugged</u>	<u>Tubes Plugged Previously</u>
2A	9	7
2B	9	25
2C	5	8
2D	6	3

All of the new steam generator tube plugs were Inconel 690 alloy. No tubes were sleeved this outage.

- (3) During the Byron Unit 2 preservice inspection, (1983 through 1988) a request was submitted to NRR for relief from the ultrasonic examination requirements for the residual heat removal heat exchanger nozzle inner radii and nozzle to vessel welds. This was due to the inherent geometric constraints limiting the ability to perform a meaningful ultrasonic examination.

A similar relief request was submitted to NRR in December 1988. This relief asked for the same Code exemptions which had been granted during preservice inspection. NRR granted relief for the nozzle inner radii examination but requested a best effort ultrasonic examination be conducted on the nozzle to vessel welds. These nozzles are welded to the tube side (ASME Class 2 portion) of the heat exchanger vessels.

The original inspection schedule for this outage included ultrasonic inspection of the nozzle to vessel welds on the 2 "B" heat exchanger. Ultrasonic reflectors found during these examinations were evaluated in accordance with ASME Section XI 1983 Edition, Summer 1983 Addenda, Subarticle IWB-3500. The indications did not meet IWB-3500 acceptable criteria. At this point the inspection was expanded to include the nozzle to vessel welds on the 2 "A" heat exchanger. The examinations of this heat exchanger also revealed indications which exceed Code allowable limits. Those reflectors shown not to meet the acceptance standards of IWB-3500 were subjected to further evaluation in accordance with ASME Section XI Subarticle IWB-3600 (Fracture Mechanics Analysis) and found to be acceptable for continued service.

The indications are believed to be caused by slag and/or lack of fusion in the inside bevel weld which is a result of the fabrication process and not service induced. All indications fall within ASME Section XI acceptance standards set forth in either Subarticle IWB-3500 or IWB-3600. Those indications found acceptable analytically by a fracture mechanics analysis will be monitored by inspections during future Byron Unit 2 outages as required by ASME Section XI, IWC-2420.

NRC has evaluated the results of these examinations and concluded that the RHR heat exchangers are acceptable for continued service.

d. Observations 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) EBASCO personnel performing ultrasonic examinations on pipe weld No. 2CS23AA-14"-C26. This weld was in the containment spray system. Ultrasonic examinations were also observed on pipe welds No. 2SI03DA-6"-J15 and No. 2SI03DA-6"-J16 in the safety injection system.
- (2) EBASCO personnel performing liquid penetrant examinations on pipe weld No. 2RH01CA-16"-C18L. This weld was in the residual heat removal system. Liquid penetrant examinations were also observed on pipe welds No. 2SI09BA-10"-J2 and No. 2SI09BA-10" -J3 in the safety injection system.
- (3) CECo personnel performing visual examinations (VT) of the inside of the reactor pressure vessel head using a TV camera.
- (4) CECo QA personnel performing a surveillance inspection of pipe weld No. 2RH01CA-16"-C18L. This effort included observing a liquid penetrant examination and review of related records.
- (5) B&W personnel performing eddy current examinations of the tubes in steam generators "A", "B", "C", and "D".
- (6) B&W personnel evaluating eddy current examination data obtained from the steam generator tubes.

- (7) ANII performing a surveillance inspection on pipe welds No. 2SI03DA-6"-J15 and No. 2SI03DA-6"-J16. This effort included observing ultrasonic examinations and review of related records.

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

No violations or deviations were identified.

3. Erosion/Corrosion Activities (73051, 73052, 73753, 73755)

Commonwealth Edison Company began their erosion/corrosion (E/C) program at Byron in 1983. In 1987 a formalized procedure and administrative controls were established to ensure continued long-term implementation of an E/C monitoring program for piping and components. This program was applicable to both safety related and non-safety related systems with respect to E/C. Various references were used to establish the program, including NRC Bulletin No. 87-01, "Pipe Wall Thinning" and EPRI-NP-3944, "Erosion/Corrosion in Nuclear Plant Steam Piping."

An inspection sample is selected prior to every refueling outage utilizing the EPRI Chec, Checmate computer program. This program considers such variables as the effects created by poor geometry, high fluid velocities, moisture content, temperature conditions, historical chemistry data and piping/component material. When a piping component is found that has exhibited wall thinning due to E/C, an engineering analysis is performed. This analysis determines if the degraded component is acceptable for continued use or if repair/replacement is required. To date, there have been many component repairs and replacements, such as valve bodies, cross-under/over piping and elbows. The NRC inspector reviewed the program, procedures, data, and observed ultrasonic thickness examinations on a pipe No. 2FW05AB-18"-65 and pipe No. 2SXH05.

No violations or deviations were identified.

4. Exit Interview (30703)

The NRC inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection and 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 inspector during the inspection. The licensee did not identify any such documents/processes as proprietary.