

May 25, 2005

Mr. Christopher M. Crane, President
and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNIT 1 - SUMMARY OF CONFERENCE TELEPHONE
CALL REGARDING STEAM GENERATOR INSPECTIONS FROM THE SPRING
2005 OUTAGE (TAC NO. MC6415)

Dear Mr. Crane:

On March 16, and March 24, 2005, conference calls were held between representatives of Exelon Generation Company, LLC (Exelon) and the Nuclear Regulatory Commission (NRC) staffs to discuss the results of the steam generator tube inspections conducted during the spring 2005 refueling outage for Byron Station, Unit 1. The NRC follows the results of the industry's steam generator inspections in order to maintain an awareness of the condition of the steam generators and the types of tube degradation mechanisms that are active.

The enclosed documentation of the phone call is provided to Exelon for information. Also, included is a copy of the information provided by Exelon in support of the conference calls. If there are any questions, please contact me at (301) 415-3019.

Sincerely,

/RA/

George F. Dick, Sr. Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation.

Docket No. STN 50-454

Enclosure: Conference Call Summary

cc w/encl: See next page

May 25, 2005

Mr. Christopher M. Crane, President
and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BYRON STATION, UNIT 1 - SUMMARY OF CONFERENCE TELEPHONE
CALL REGARDING STEAM GENERATOR INSPECTIONS FROM THE SPRING
2005 OUTAGE (TAC NO. MC6415)

Dear Mr. Crane:

On March 16, and March 24, 2005, conference calls were held between representatives of Exelon Generation Company, LLC (Exelon) and the Nuclear Regulatory Commission (NRC) staffs to discuss the results of the steam generator tube inspections conducted during the spring 2005 refueling outage for Byron Station, Unit 1. The NRC follows the results of the industry's steam generator inspections in order to maintain an awareness of the condition of the steam generators and the types of tube degradation mechanisms that are active.

The enclosed documentation of the phone call is provided to Exelon for information. Also, included is a copy of the information provided by Exelon in support of the conference calls. If there are any questions, please contact me at (301) 415-3019.

Sincerely,

/RA/

George F. Dick, Sr. Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation.

Docket No. STN 50-454

Enclosure: Conference Call Summary

cc w/encl: See next page

DISTRIBUTION:

| | | |
|-------------|-----------------------------|------------------|
| PUBLIC | RidsNrrDlpm (TMarsh/JLyons) | RidsNrrLAPCoates |
| PDIII/2 r/f | RidsAcrsAcnwMail | RidsNrrPMGDick |
| RidsOgcRp | RidsNrrDlpmLpdiii (GSuh) | DPassehl, RIII |
| LLund | MMurphy | DHills |
| DLPM DPR | | |

ADAMS Accession Number: ML051400413 Nrr-001

| | | | |
|--------|------------|------------------------|----------|
| OFFICE | PM:PDIII-2 | LA:PDIII-2 | SC:PD3-2 |
| NAME | GDick | THarris for PCoates | GSuh |
| DATE | 05/24/05 | 05/23/05 | 05/25/05 |

OFFICIAL RECORD COPY

Byron/Braidwood Stations

cc:

Dwain W. Alexander, Project Manager
Westinghouse Electric Corporation
Energy Systems Business Unit
Post Office Box 355
Pittsburgh, PA 15230-0355

Joseph Gallo
Gallo & Ross
1025 Connecticut Ave., NW, Suite 1014
Washington, DC 20036

Howard A. Learner
Environmental Law and Policy
Center of the Midwest
35 East Wacker Dr., Suite 1300
Chicago, IL 60601-2110

U.S. Nuclear Regulatory Commission
Byron Resident Inspectors Office
4448 N. German Church Road
Byron, IL 61010-9750

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532-4351

Ms. Lorraine Creek
RR 1, Box 182
Manteno, IL 60950

Chairman, Ogle County Board
Post Office Box 357
Oregon, IL 61061

Mrs. Phillip B. Johnson
1907 Stratford Lane
Rockford, IL 61107

George L. Edgar
Morgan, Lewis and Bockius
1800 M Street, NW
Washington, DC 20036-5869

Attorney General
500 S. Second Street
Springfield, IL 62701

Illinois Emergency Management
Agency
Division of Disaster Assistance &
Preparedness
110 East Adams Street
Springfield, IL 62701-1109

Byron Station Plant Manager
Exelon Generation Company, LLC
4450 N. German Church Road
Byron, IL 61010-9794

Site Vice President - Byron
Exelon Generation Company, LLC
4450 N. German Church Road
Byron, IL 61010-9794

U.S. Nuclear Regulatory Commission
Braidwood Resident Inspectors Office
35100 S. Rt. 53, Suite 79
Braceville, IL 60407

County Executive
Will County Office Building
302 N. Chicago Street
Joliet, IL 60432

Braidwood Station Plant Manager
Exelon Generation Company, LLC
35100 S. Rt. 53, Suite 84
Braceville, IL 60407-9619

Ms. Bridget Little Rorem
Appleseed Coordinator
117 N. Linden Street
Essex, IL 60935

Document Control Desk - Licensing
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Site Vice President - Braidwood
Exelon Generation Company, LLC
35100 S. Rt. 53, Suite 84
Braceville, IL 60407-9619

Senior Vice President - Nuclear Services
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Vice President of Operations - Mid-West
Pressurized Water Reactors
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Director - Licensing and Regulatory
Affairs
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Regulatory Assurance Manager - Braidwood
Exelon Generation Company, LLC
35100 S. Rt. 53, Suite 84
Braceville, IL 60407-9619

Regulatory Assurance Manager - Byron
Exelon Generation Company, LLC
4450 N. German Church Road
Byron, IL 61010-9794

Associate General Counsel
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Vice President - Licensing and
Regulatory Affairs
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Manager Licensing - Braidwood, Byron
and LaSalle
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

Mr. Barry Quigley
3512 Louisiana
Rockford, IL 61108

CONFERENCE CALL SUMMARY

2005 STEAM GENERATOR TUBE INSPECTIONS

BYRON STATION, UNIT 1

DOCKET NO. STN 50-454

On March 16, 2005, the Nuclear Regulatory Commission (NRC) staff participated in a conference call with Exelon Generation Company, LLC (Exelon) representatives regarding the results of 2005 steam generator tube inspection activities at Byron, Unit 1 during the spring 2005 refueling outage. The telephone call also included a discussion of the disengaged collector bar in the U-bend region of steam generator B. A follow-up call was conducted between the NRC staff and Exelon representatives on March 24, 2005. A summary of the information provided during the conference calls is provided below.

BACKGROUND

Byron Station, Unit 1, has four recirculating steam generators designed and fabricated by Babcock and Wilcox. The model 7720 steam generators were put into service in 1997 during refueling outage B1R8. Each steam generator has 6,633 thermally-treated Alloy 690 tubes which have an outside diameter of 0.6875-inch and a nominal wall thickness of 0.040-inch. The tubes were manufactured by Sumitomo.

The licensee performed full length bobbin coil inspections of 100 percent of the tubes in all four steam generators during their 2005 outage B1R13. In addition, a rotating probe equipped with a +Point™ coil was used to inspect the hot-leg top of tubesheet area from 3 inches above to 3 inches below the secondary face of the tubesheet in 20 percent of the tubes. All dents or dings greater than 2 volts on the hot leg side were also inspected with a +Point™ coil. Sludge lancing and foreign object search and retrieval was conducted in all four steam generators. Visual inspections were performed on the upper bundle, steam drum, moisture separator, and feed ring of steam generator C.

RESULTS FROM SPRING 2005 INSPECTION

A total of nine foreign objects were identified in the four steam generators. Seven of these objects (4 machine turnings and 2 shavings in steam generator B, and 1 machine turning in steam generator D) were found in the annulus trough outside of the tube bundle and were removed. One shaving was identified and removed from within the tube bundle in steam generator A. One object could not be removed from within the tube bundle in steam generator D. Since the object could not be removed, an analysis was performed to ensure that tube integrity would be maintained until the next inspection, and the five tubes surrounding the object in steam generator D were stabilized and plugged. No tube wear was attributed to the foreign objects in any of the steam generators. Each steam generator had between 20 and 31 pounds of sludge removed during this outage.

ENCLOSURE

Steam generator tube wear indications identified by the licensee include 46 fan bar wear indications (ranging from 4 to 21 percent throughwall), one lattice grid wear indication (measuring 3 percent throughwall), and 2 volumetric indications at lattice grid support structures

- 2 -

(measuring 14 percent and 23 percent throughwall). The two indications at lattice grid locations are not typical of lattice grid wear since they are not at the point of contact between the tube and the lattice grid. The most probable cause for these indications was loose parts; however, no evidence of loose parts was found. As a result, these two tubes were plugged.

A total of seven tubes were plugged during this outage. Five tubes were plugged as a result of a loose part in steam generator D, and 2 tubes were plugged because of lattice grid wear (1 in steam generator A and 1 in steam generator B). Tube integrity was met for all four steam generators.

In steam generator B, 57 of the 67 row 1 tubes on the hot-leg side of the bundle were found to be disengaged from the collector bar (see attached figure). The ten row 1 tubes on the hot-leg side that remained engaged with the collector bar were in close proximity to one another and were located near the edge of the tube bundle. The collector bar remained engaged for all row 1 tubes on the cold-leg side. There were no indications of tube wear in the affected row 1 tubes. All other steam generators had fully engaged collector bars, as confirmed by eddy current.

The absence of the collector bar from the row 1 hot-leg tubes was identified by eddy current analysis software that was designed to look for support structures as landmarks. When the software identified the absence of the collector bar the licensee looked at past inspection data and confirmed that this condition has existed since the preservice inspection. The condition was not noticed in past inspections since the analysts only looked for changes in landmarks.

Since the "as found" condition was different than what was analyzed during the design of the steam generator, the licensee verified that the row 1 tubes will remain stable despite the absence of the collector bar (i.e., the tubes will remain fluid elastically stable and there is no risk of high cycle fatigue). This is based on the fact that the steam generator has operated under this condition for five cycles with no indication of wear in the affected tubes at this location. The licensee stated that the greatest increase in unsupported tube length is in the row 1 tubes that are no longer in contact with the collector bar. Babcock and Wilcox analysis showed that the greatest movement of the fan bars from their normal position is equal to one-half of a tube pitch (0.456 inches). A change of this magnitude does not significantly change the distance between supports for tubes in rows 2 and higher. For this reason, the licensee states that the vibration analysis performed for the row 1 tubes bounds all other tubes.

Since the movement of the collector bar in the 57 disengaged tubes could have affected the positioning of the collector bars and fan bars, the licensee confirmed the location of the collector bar in rows 116-119 on the cold-leg side of the steam generator. These locations (i.e. rows 116-119) are the most susceptible locations for flow induced vibration fatigue.

The condition of the disengaged collector bar is believed to have originated during fabrication of the steam generator. In order to correct the potential for tubes to come into contact (or close proximity) with each other, the fan bar support mechanisms (J-tabs) were repositioned during the fabrication process. The curvature of the tube bundle is believed to have interacted with the J-tabs in a way that caused the collector bar to shift out of contact with the row 1 tubes on the hot-leg side. The ten row 1 tubes that remain in contact with the collector bar are located at the end of the tube bundle where the outermost tubes have a smaller U-bend radius. The licensee believes that the smaller radius tubes caused less rotation of the fan bar assembly during the J-tab repositioning process, and therefore, allowed the collector bar to remain engaged at those locations. The licensee's analysis predicts no additional stress has been added to the fan bar assemblies as a result of the shift in position. The assembly rotated approximately one half of a degree. The fan bar assembly can tolerate movements of this magnitude without adding strain to fan bars or the tubes.

Babcock and Wilcox stated that the J-tab repositioning procedure has not been performed at any other plant. This procedure was performed for all four steam generators at Byron 1; however, shifting of the collector bar was only observed in steam generator B.

The licensee plans to communicate their findings regarding the disengaged collector bar to the industry.

Fan Bar Configuration

NOTE: Not to Scale

Dashed Lines Shows Position when collector bar engaged in Row 1

