

November 9, 1995



U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Clarification of Braidwood Unit 1 Inspection Data

Braidwood Nuclear Power Station Unit 1
NRC Docket Nos. 50-456

The purpose of this letter is to formally update the Nuclear Regulatory Commission (NRC) staff on the current results of the ongoing inspection of the steam generators at Byron Unit 1, and to discuss the implications of those results on the completed inspection of the steam generators at Braidwood Unit 1.

Commonwealth Edison Company (ComEd) is conducting a midcycle outage at Byron Unit 1. During the inspection of the Byron Unit 1 steam generators, inspection data became available which we believe needs to be evaluated against the already completed inspection of the steam generators at Braidwood Unit 1. To understand the reasons for this re-evaluation, it is necessary to review the results of the Braidwood inspection.

During the Braidwood Unit 1 refuel outage, 100% of the steam generators, hot leg, top-of-tube sheet region was inspected. This inspection utilized a three coil .080" mid range rotating pancake probe (RPC). The RPC probe, which is qualified per EPRI Appendix H, identified 22 circumferential, 5 axial, and 3 mixed mode indications (tubes with axial and circumferential indications). Each of these tubes were inspected with the Plus Point probe to gain additional data to be used in sizing these indications.

As part of the Braidwood Unit 1 inspection the following actions were implemented to assure that the eddy current data was properly evaluated:

- Expert review of all primary and/or secondary analysis calls indicating circumferential indications that were dispositioned as No Detectable Degradation (NDD) by the Resolution Analyst.
- Expert review of approximately 200 random NDD tubes.
- The tubes selected for tube support plate locking expansion received additional inspection using the Plus Point probe to confirm no top-of-tube sheet indications.

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Results of these actions demonstrate that:

- All Plus Point probe indications had previously been identified by RPC.
- The 85 "locked" tubes were confirmed by RPC and Plus Point to have no indications at the top-of-tube sheet after expert review.
- The expert review of the 200 random NDD tubes were confirmed as NDD.
- Two of the 25 RPC confirmed circumferential indications were not confirmed by the Plus Point probe, but were subsequently removed from service.

Therefore, Braidwood Station stabilized and plugged 25 circumferential indications (22 circumferential and 3 mixed mode indications).

ComEd believes that the Braidwood Unit 1 inspection program was in compliance with its licensing bases and no significant tube structural integrity concerns exists based upon the following:

- The inspections were performed using: a qualified vendor, EPRI Appendix H qualified probes, and Qualified Data Analysts (QDA).
- No significant change in the RPC identified circumferential or axial indications were noted during this inspection. (Last inspection, 0.5 Effective Full Power Years (EFPY) ago identified 15 circumferential indications, 2 axial indications, and 1 mixed mode indication using the same probe.)
- Additional actions as noted above, were taken to ensure confidence in the data.
- Sizing of as found circumferential cracks as discussed below shows limited depth.

Following the Braidwood inspection, Byron's midcycle inspection was initiated. The inspection scope was 100% of the steam generator tubes, hot leg, top-of-tube sheet region. Byron Station performed this inspection utilizing a probe with a Plus Point coil, a 0.080" mid range pancake coil and 0.115" pancake coil. This probe choice was made because:

- ComEd wanted to obtain data that could be used to compare Plus Point with the RPC (0.080" mid range) coil results.
- ComEd believes that the Plus Point data will be useful when sizing indications.
- Ability to compare RPC data collected this outage to data collected in the previous outage.

ComEd expected that the use of the Plus Point coil could reveal a different population of circumferential indications that were shallower in depth and size than identified by RPC. To date the Byron inspection is 99% complete and 2499 circumferential indications have been identified at the top-of-tube sheet using the Plus Point probe. Preliminary analysis of the indications shows that 888 indications were identified with the 0.080" pancake and Plus Point probe. The remainder of the indicators was identified using the Plus Point probe.

With regard to axial indications seen at Byron Unit 1, preliminary results show 120 have been identified at the top-of-tube sheet. All axial indications have been identified by both the 0.080" pancake coil and the Plus Point coil.

The results from the Byron inspection led to a re-assessment of the inspection that was conducted at Braidwood. The conclusions of that re-evaluation are:

- ComEd believes that the inspection satisfactory was conducted in compliance with our licensing bases using qualified probes, analysts and techniques.
- ComEd cannot conclude at this time that the inspection results at Byron Station can be directly applied to the Braidwood steam generators. This is based upon the following:
 - Braidwood Station has historically seen fewer circumferential cracks than Byron Station.
 - Based on the available eddy current circumferential crack sizing technique, historically, the largest indications seen at Braidwood have been significantly smaller than seen at Byron.
 - The Byron inspections is being performed at 7.8 EFPY. Braidwood inspection was performed at 5.5 EFPY. This "age" difference may contribute to the number of cracks identified.
- ComEd believes that if additional indications were detected, these indications would be structurally insignificant and have minimal safety significance. Based on the following:
 - Circumferential growth rates have been determined for 6 tubes for the 0.5 EFPY since the previous inspection. When compared to the previous inspection, three indications had no change. Two indications had length changes of 74° and 80° with no measurable depth change. One indication had a 30% throughwall increase in depth with little or no change in arc length.
 - Preliminary eddy current sizing of the indications found by the RPC (0.080" coil) during the Braidwood Unit 1 inspection. The smallest indication had a maximum depth of 10% throughwall and an average depth of 4% over 360°. This supports the belief that the eddy current technology used at Braidwood is capable of detecting very small circumferential indications.

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ComEd considers the possibility of undetected mixed mode indications as extremely small because the RPC performs well in detecting axial cracks.

Summary:

ComEd considers the Braidwood Unit 1 steam generators to be operable. The number of potential circumferential indications that may have not been detected is small and the structural integrity of the steam generators will be maintained through the operating cycle. Additionally, the recent Braidwood inspection did comply with the plant's current licensing bases.

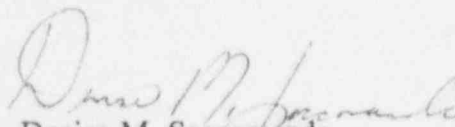
Interim Inspection Discussion:

During a recent meeting with the Staff, ComEd committed to perform an interim inspection of the steam generator top-of-tube sheet region during Braidwood Unit 1 Cycle 6. Based upon input from the Staff and this evaluation, Braidwood will perform an interim inspection within 0.5 Effective Full Power Years. This is comparable to the operating time from the previous midcycle inspection to the current refueling outage.

ComEd intends to continue to evaluate industry circumferential cracking data and the data obtained in the recent Byron and Braidwood outage with the intention of determining appropriate cycle length for Braidwood 1. It is anticipated that further discussions with the NRC will take place on this topic in the near future at an upcoming meeting.

If you have any questions concerning this correspondence, please contact this office.

Sincerely,


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