

50-454



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

See Tech Specs

November 9, 1995

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: ISSUANCE OF AMENDMENTS (TAC NOS. M91671, M91672, M91673 AND M91674)

Dear Mr. Farrar:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 77 to Facility Operating License No. NPF-37 and Amendment No. 77 to Facility Operating License No. NPF-66 for the Byron Station, Units 1 and 2, respectively. The Commission has also issued Amendment No. 69 to Facility Operating License No. NPF-72 and Amendment No. 69 to Facility Operating License No. NPF-77 for the Braidwood Station, Units 1 and 2, respectively. The amendments consist of revisions to the Technical Specification (TSs) for Byron, Unit 1, and Braidwood, Unit 1 and are in response to your application dated September 1, 1995. While there are no revisions to the TSs for Byron, Unit 2, and Braidwood, Unit 2, the licenses for both stations are also being amended to maintain the continuity of the amendment numbers.

Your first submittal of this request for the enclosed license amendments was made on February 13, 1995. This request was revised and superseded in its entirety by your request dated July 7, 1995, for license amendments on the same matter. In turn, that request for license amendments was revised and superseded in its entirety by your request dated September 1, 1995, as supplemented on September 1 (two letters), September 2, September 4, September 8, September 15, September 19, September 20, September 22, October 3, October 7, October 11 (two letters), October 13 (three letters), October 23 and October 26, 1995.

The purpose of the subject revisions is to modify, in part, the lower voltage limit of the voltage-based repair criteria in the current TSs for both Byron, Unit 1 and Braidwood, Unit 1. These voltage-based criteria are applicable only to a specific type of steam generator (SG) tube degradation mechanism identified as primarily axially oriented outside diameter stress corrosion cracking (ODSCC). Additionally, the implementation of these voltage-based criteria is also applicable only when this particular form of SG tube degradation is confined within the thickness of the SG tube support plates (TSPs). However, not only is the lower voltage limit being revised upward, this revision also reflects a significant modification in the methodology previously accepted by the staff for addressing the disposition of ODSCC flaws

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on the hot-leg side of the SGs. All other forms of SG tube degradation are subject to the inspection and repair requirements for SG tubes which are presently in the TSs of the Byron and Braidwood Stations.

Voltage-based repair criteria were added to the Byron 1 TSs by Amendment No. 66 issued on October 24, 1994, and their applicability was limited to the fuel cycle starting at that time (i.e., the seventh operating cycle) which is scheduled to end in March 1996. In a similar fashion, the voltage-based repair criteria used in instances of ODSCC as described above, were added to the Braidwood 1 TSs by License Amendment No. 54 issued on August 18, 1994. They were also only applicable for one Braidwood 1 operating cycle which ended on September 30, 1995 (i.e., the fifth operating cycle).

The voltage-based repair criteria cited above were consistent, for the most part, with those in the draft generic letter, "Voltage Based Repair Criteria for the Repair of Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking," that was published in the Federal Register on August 12, 1994. Subsequently, the staff issued its final version of this document as Generic Letter (GL) 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking," dated August 3, 1995.

Your request for license amendments differs from GL 95-05, cited above, in that you proposed in your submittal dated September 1, 1995, to raise the lower voltage limit from 1.0 volt to 3.0 volts and to remove the upper voltage repair limit entirely. This revision is applicable only on the hot-leg side of the SGs. The net effect is that all eddy current bobbin indications above 3.0 volts on the hot-leg side, except as noted below, will be either repaired or removed from service by plugging. Whereas bobbin indications between 1.0 volt and the upper voltage repair limit (i.e., about 2.7 volts) confirmed by a motorized rotating pancake coil (MRPC, RPC) would have been either plugged or repaired under the prior versions of the voltage-based repair criteria incorporated into the Byron 1 and Braidwood 1 TSs, all bobbin voltage indications below 3.0 volts will now be left in service. In addition, a sample of bobbin voltage indications between 1.0 and 3.0 volts will be inspected with an RPC to verify that these indications are ODSCC flaws.

For the cold-leg side of the SGs, the voltage-based repair criteria will be consistent with that in GL 95-05. The criteria in this generic letter will also be applied to SG tubes on the hot-leg side which have indications of a significant amount of denting as discussed in the enclosed Safety Evaluation (SE).

The basis for your proposal to raise the lower voltage limit from 1.0 volt to 3.0 volts is that you will implement certain structural modifications inside the SGs so as to limit the vertical movement of the TSPs under postulated accident conditions to a relatively small value, thereby restricting the potential exposure of an ODSCC flaw to this same small deflection (i.e., less than 0.10 inches). Based on prior industry experience with small ODSCC type flaws as well as a series of experiments you conducted on laboratory-induced

ODSCC type flaws, the conditional probability of SG burst on the hot-leg side for axially oriented ODSCC flaws, will be reduced to a negligible value well below the threshold screening criteria of 1×10^{-2} contained in GL 95-05 in the event of a main steamline break (MSLB) at the end of an operating cycle. This reduction reflects the change in the methodology associated with the locked TSP model discussed in the enclosed SE. The methodology for evaluating the probability of SG tube burst on the cold-leg side is described in GL 95-05.

An experimental program was also used to establish an upper bound value for the potential leakage from an ODSCC flaw which might attempt to burst, but is precluded from doing so when it is partially restrained by a TSP. The exposure of the ODSCC type flaw in this series of experiments was typically limited to about 0.10 inches to simulate the exposure of an ODSCC flaw under postulated accident conditions. This experimental program to measure leakage from indications restricted from burst (IRB) was an important factor in your proposal.

To provide further assurance that the TSP displacements remain small under blowdown loads from a postulated MSLB, a number of other measures have been implemented in the present refueling outage of Braidwood 1 and similar measures will also be implemented in the present Byron 1 mid-cycle SG inspection. These measures include a visual inspection of selected SG internal components which are relied upon in your structural analysis so as to provide assurance of their structural integrity. Further, you have performed additional eddy current inspections of the TSPs in the SGs to provide assurance of their structural integrity.

Whereas the NRC required you to conduct mid-cycle inspections and repairs of ODSCC flaws in all four SGs at Byron 1 and at Braidwood 1 in the letters transmitting their respective license amendments cited above, this requirement is not imposed for ODSCC flaws in the license amendments which we are now issuing. However, the implementation of this revised lower voltage repair limit is still limited to only one full operating cycle for both Byron 1 and Braidwood 1. Because Byron 1 will conduct a SG inspection in its present mid-cycle outage in November 1995 and again in March 1996 at the end of the seventh operating cycle, the revised lower voltage repair limit is applicable until the end of the eighth operating cycle.

D. Farrar

- 4 -

The Notice of Issuance will be included in the Commission's biweekly notice.

Sincerely,

Original signed by:

M. D. Lynch, Senior Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455,
STN 50-456 and STN 50-457

- Enclosures:
1. Amendment No. 77 to NPF-37
 2. Amendment No. 77 to NPF-66
 3. Amendment No. 69 to NPF-72
 4. Amendment No. 69 to NPF-77
 5. Safety Evaluation

cc w/encl: See next page

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DISTRIBUTION: ISSUANCE OF AMENDMENTS (TAC NOS. M91671, M91672, M91673 AND M91674)

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