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ComEd

April 26, 2000
BW000051

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Subject: Reactor Vessel Material Surveillance Capsule W Test Results and Information Related to Assessments of Reactor Vessel Materials Data

References:

(1) Letter from H. G. Stanley (ComEd) to U.S. NRC, "Supplemental Information Pertaining to Technical Specification Amendment Regarding Pressure-temperature Curves Byron and Braidwood Nuclear Power Stations," dated January 8, 1998.

(2) Letter from R. A. Capra (U.S. NRC) to O. D. Kingsley (ComEd), "Integration of Reactor Pressure Vessel Surveillance Program for Byron and Braidwood, Units 1 and 2," dated January 16, 1998.

(3) Letter from T. J. Tulon (ComEd) to U.S. NRC, "Reactor Vessel Material Surveillance Capsule W Test Results and Schedule for Completing Assessment of Reactor Vessel Materials Data," dated October 22, 1999.

Pursuant to Appendix H to 10 CFR 50, "Reactor Vessel Material Surveillance Program Requirements," reactor vessel material surveillance capsule W was withdrawn from the Braidwood Unit 2 reactor vessel on May 1, 1999, and tested in accordance with ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." Appendix H requires a summary technical report of the capsule test results to be submitted within one year of the date of capsule withdrawal. Therefore, this letter is being submitted by May 1, 2000. Attachment 1 to this letter contains the summary technical report, documented in Westinghouse Topical Report WCAP-15369, Revision 0, "Analysis of Capsule W from Commonwealth Edison Company Braidwood Unit 2 Reactor Vessel Radiation Surveillance Program," March 2000.

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Commonwealth Edison (ComEd) Company proposes to submit an integrated assessment of the impact of testing both the Braidwood Station Unit 1 capsule W and the Braidwood Station Unit 2 capsule W in September 2000. Since Braidwood Station, Units 1 and 2, share a beltline weld wire heat and have an integrated surveillance program, which was accepted by the NRC in Reference 2, it is appropriate to perform an assessment of the impact of both of the capsules on material properties following completion of the Braidwood Station Unit 2 capsule W testing.

In Reference 1, ComEd committed to re-evaluate all applicable previous surveillance capsules and reactor vessel fluence values utilizing ENDF/B-VI neutron cross-section libraries in accordance with WCAP-14040-NP-A, "Methodology Used To Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," dated January 1996, at the next scheduled capsule withdrawal for each Braidwood Station unit. This has been completed for Braidwood Station, Units 1 and 2, as documented in Reference 3 and Attachment 1, respectively.

In addition, ComEd committed to re-evaluate all Adjusted Reference Temperature (ART) values resulting from the new reactor vessel fluence values and their impact on pressure-temperature limits at the next scheduled capsule withdrawal for each Braidwood Station unit. This re-evaluation will be provided in the integrated assessment submittal referenced above. The following provides an evaluation of the existing Braidwood Station pressure-temperature limits based on the new reactor vessel fluence values. For Braidwood Station Unit 2, as determined in Attachment 1, the reactor vessel calculated peak surface fluence value at 12 Effective Full Power Years (EFPY) is 7.43 E+18 neutrons/square centimeter (cm^2) (E>1.0 MeV). This reactor vessel fluence value is lower than the 8.24 E+18 neutrons/cm^2 peak surface fluence value used previously in the evaluation of reactor vessel materials and in the calculation of the 12 EFPY pressure-temperature limits for the current Unit 2 PTLR. In accordance with the ART calculation methodology of Regulatory Guide 1.99 , "Radiation Embrittlement of Reactor Vessel Material," Revision 2, the new lower reactor vessel fluence values would result in lower fluence factors, lower predicted shifts, lower margin terms, and lower ART values. Therefore, the ART values used previously in the calculation of the 12 EFPY pressure-temperature limits for the current Unit 2 PTLR are conservative based on a re-evaluation of reactor vessel fluences utilizing ENDF/B-VI neutron cross-section libraries. For Braidwood Station Unit 1 (Ref. 3), it was demonstrated that the reactor vessel fluence values and the ART values used previously in the calculation of the 16 EFPY pressure-temperature limits for the current Unit 1 PTLR were similarly conservative based on a re-evaluation of reactor vessel fluences utilizing ENDF/B-VI neutron cross-section libraries. Braidwood Station Unit 2 is expected to reach 12 EFPY in the summer of 2002, and Braidwood Station Unit 1 is expected to reach 16 EFPY in the summer of 2006.

Included as Attachment 2 to this letter is Westinghouse Topical Report WCAP-15316, Revision 1, "Analysis of Capsule W from Commonwealth Edison Company Braidwood Unit 1 Reactor Vessel Radiation Surveillance Program," December 1999. WCAP-15316, Revision 0, was transmitted by Reference 3. Due to a misinterpretation of a drawing, the fast neutron exposure of the weld seams listed in Table 6-14, "Neutron Fluence Projections On The Reactor Vessel Clad/Base Metal Interface For Selected Circumferential Weld Locations Along The 45° Azimuth," of WCAP 15316, Revision 0, indicated higher values than were actually experienced by the welds. This conservative error has been corrected in WCAP-15316, Revision 1.

Should you have any questions concerning this letter, please contact Mr. T. W. Simpkin at (815) 458-2801, extension 2980.

Respectfully,

Timothy J. Tulon
Site Vice President
Braidwood Station

Attachments: (1) Westinghouse Topical Report WCAP-15369, Revision 0, "Analysis of Capsule W from Commonwealth Edison Company Braidwood Unit 2 Reactor Vessel Radiation Surveillance Program," March 2000.

(2) Westinghouse Topical Report WCAP-15316, Revision 1, "Analysis of Capsule W from Commonwealth Edison Company Braidwood Unit 1 Reactor Vessel Radiation Surveillance Program," December 1999.

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - Braidwood Station

ATTACHMENT 1

**Westinghouse Topical Report WCAP-15369, Revision 0,
"Analysis of Capsule W from ComEd Braidwood Unit 2
Reactor Vessel Radiation Surveillance Program"**

ATTACHMENT 2

Westinghouse Topical Report WCAP-15316, Revision 1,
"Analysis of Capsule W from ComEd Braidwood Unit 1
Reactor Vessel Radiation Surveillance Program"