

May 6, 1997

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

**ComEd**

Attention: Document Control Desk

Subject: Byron Nuclear Power Station Unit 1 & 2  
NRC Docket Numbers: 50-454 and 50-455

Braidwood Nuclear Power Station Unit 1 & 2  
NRC Docket Numbers: 50-456 and 50-457

"Reactor Vessel Integrated Surveillance Program 10 CFR 50, Appendix H,  
Section III. C"

In order to remain consistent in the application of surveillance data to Reference Temperature, pressurized thermal shock (RT<sub>PTS</sub>) values, and Adjusted Reference Temperatures as inputs to P-T limits and Low Temperature Overpressure Protection System (LTOPS) setpoints, it is necessary to have integrated Surveillance Programs. Byron Unit 1 and Unit 2 share beltline and surveillance weld metal heat number 442002; Braidwood Unit 1 and Unit 2 share beltline and surveillance weld metal heat number 442011.

Pursuant to the regulatory requirements of Title 10 to the Code of Federal Regulations, part 50 (10 CFR 50), Appendix H, Section III. C, Commonwealth Edison Company (ComEd) requests permission to integrate the weld metal surveillance programs of Byron Unit 1 and Unit 2 (containing weld wire heat number 442002). ComEd also requests permission to integrate the weld metal surveillance programs of Braidwood Unit 1 and Unit 2 (containing weld wire heat number 442011). In accordance with Section III. C of 10 CFR 50, Appendix H, an integrated surveillance program must be approved by the Director, Office of Nuclear Reactor Regulation, on a case-by-case basis, and the criteria for approval includes the following considerations:

- The reactor in which the materials will be irradiated and the reactor for which the materials are being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.
- Each reactor must have an adequate dosimetry program.
- There must be adequate arrangement for data sharing between plants.
- There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.

9705140315 970506  
PDR ADOCK 05000434  
P P/R



- There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the test.
- No reduction in the requirements for number of materials to irradiated, specimen types, or number of specimens per reactor is permitted.

Attachment A addresses how Byron and Braidwood meet these criteria, as applicable. Detailed information is provided in Attachment B, WCAP -14824, Revision 1, April 1997 "Byron Unit 1 Heat Up and Cool Down Limit Curves for Normal Operating and Surveillance Weld Metal Integration for Byron and Braidwood" (Appendix A for Byron Units 1 and 2, and Appendix B for Braidwood Units 1 and 2).

In addition to the Appendix H requirements, the following criteria for credibility for surveillance data in 10 CFR 50.61 were addressed:

- Materials in the capsules must be those which are controlling materials with regard to radiation embrittlement.
- Scatter in the plots of Charpy energy versus temperature for the irradiated and unirradiated conditions must be small enough to permit the determination of the 30 ft-lb temperature and upper shelf energy unambiguously.
- When there are two or more sets of surveillance data from one reactor, the scatter of  $\Delta RT_{NDT}$  values must be less than  $28^{\circ}F$  for welds and  $17^{\circ}F$  for base metal. Even if the fluence range is large (two or more orders of magnitude), the scatter may not exceed twice those values.
- The irradiation temperature of the Charpy specimens in the capsule must equal the vessel wall temperature at the cladding/base metal interface within  $\pm 25^{\circ}F$ .
- The surveillance data for the correlation monitor material in the capsule, if present, must fall within the scatter band of the data base for that material.

WCAP-14824, Revision 1 addresses how Braidwood and Byron satisfy the credibility criteria in 10 CFR 50.61.

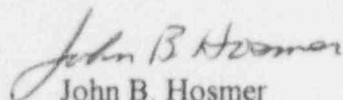
May 6, 1997

ComEd requests that the Staff approve this request for the integration of the surveillance weld metal by July 15, 1997. Approval by date is necessary to facilitate the restart of Braidwood Unit 2 restart from its Fall 1997 refuel outage.

ComEd would also like to note that the NRC Reactor Vessel Integrity Database entry for Braidwood Unit 2 for weld wire heat 442011 indicates an incorrect weld flux lot. Rather than lot number 0344, the lot number should be 8061. The correct weld flux lot was initially transmitted to the NRC via BAW-2261, "Response to Generic Letter 92-01, Revision 1, Supplement 1 for Commonwealth Edison Company's Braidwood Units 1 and 2, and Byron Units 1 and 2," docketed by ComEd on November 17, 1995.

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

Sincerely,



John B. Hosmer  
Engineering Vice President

Attachments

cc: G. Dick, Byron/Braidwood Project Manager-NRR  
C. Phillips, Senior Resident Inspector-Braidwood  
S. Burgess, Senior Resident Inspector-Byron  
A.B. Beach, Regional Administrator-RIII  
Office of Nuclear Safety-IDNS

## Attachment A

### 10 CFR 50 Appendix H Integrated Surveillance Program Criteria

**a. The reactor in which the materials will be irradiated and the reactor for which the materials are being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.**

An assessment of the similarity in reactor vessel design and operating features and materials is provided in WCAP-14824, Revision 1 "Byron Unit 1 Heat Up and Cool Down Limit Curves for Normal Operating and Surveillance Weld Metal Integration for Byron and Braidwood." The WCAP addresses the:

- Weld wire number
- Weld flux
- Flux Lot Number
- Vessel Fabricator
- Fabrication Period
- Heat Treatment
- Initial  $RT_{NDT}$
- Initial Upper Shelf Energy
- Type of Fuel
- Fuel Loading Pattern
- Fluence at 32 EFPY at Inside Surface Azimuthal Angles
- Capsule Locations and Lead Factors
- Vessel Inlet Temperature
- Vessel Dimension and Geometry
- 10 CFR 50.61 Credibility Criteria

ComEd concludes that the reactors and their irradiation environments for Byron Unit 1 and Byron Unit 2 are essentially identical; for the surrogate weld metals, irradiation in either of the reactors will provide accurate comparison of the predicted amounts of radiation damage. The same relationship applies between Braidwood Unit 1 and Braidwood Unit 2.

**b. Each reactor must have an adequate dosimetry program.**

The capsule dosimetry programs of the Byron Unit 1 and Unit 2, and Braidwood Unit 1 and 2 are identical, and as documented in the following WCAPs:

- WCAP-13880, "Analysis of Capsule X From the Commonwealth Edison Company Byron Unit 1 Reactor Vessel Radiation Surveillance Program" submitted February 23, 1994,
- WCAP-14064, "Analysis of Capsule W From the Commonwealth Edison Company Byron Unit 2 Reactor Vessel Radiation Surveillance Program" submitted September 21, 1994,
- WCAP-14241, "Analysis of Capsule X From the Commonwealth Edison Company Braidwood Unit 1 Reactor Vessel Radiation Surveillance Program" submitted March 21, 1995, and
- WCAP-14228, "Analysis of Capsule X From the Commonwealth Edison Company Braidwood Unit 2 Reactor Vessel Radiation Surveillance Program" submitted March 21, 1995.

Byron and Braidwood's dosimetry program is consistent with the requirements of Draft Regulatory Guide DG-1053, "Calculation and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence." Neutron transport cross-section libraries will be updated at the time of the next scheduled capsule withdrawal for each of the units. Based on the evaluation of WCAP-14824, Revision 1 Appendix C, considering the minimal expected impact of updating the neutron fluence evaluations from those previously reported along with the impact of low leakage fuel management of the low sensitivity to irradiation damage exhibited by the limiting materials of the Byron Units 1 and 2 and Braidwood Units 1 and 2 reactor vessels, the use of the previously documented fluence values is justified until the update to the ENDF/B-VI methodology is completed for each unit.

**c. There must be adequate arrangement for data sharing between plants.**

Since Byron Unit 1 and Unit 2 are owned by the Commonwealth Edison Company, there will be complete data sharing between the units.

Since Braidwood Unit 1 and Unit 2 are owned by the Commonwealth Edison Company, there will be complete data sharing between the units.

**d. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.**

Since surveillance material for the limiting base materials of the Byron Units 1 and 2 and Braidwood Units 1 and 2 reactor vessels is unique to each reactor vessel, all originally planned surveillance capsules will still be tested. Therefore, each reactor vessel will retain a completely independent surveillance program and will not depend on the other for data. For the same reason, no reduction in the number of materials to be irradiated, specimen types, or number of specimens per reactor will be requested. Therefore, the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which the data will be integrated.

**e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the test.**

ComEd is not requesting a reduction in the number of surveillance capsules in each reactor.

**2. No reduction in the requirements for number of materials to irradiated, specimen types, or number of specimens per reactor is permitted**

ComEd is not requesting a reduction in the number of materials to be irradiated, specimen types, or number of specimens per reactor.



**Attachment B**

**WCAP-14824, Revision 1**

**Byron Unit 1 Heat Up and Cool Down Limit Curves for Normal Operation and  
Surveillance Weld Metal Integration for Byron and Braidwood**