

July 13, 2000

Mr. Robert P. Powers, Senior Vice President  
Indiana Michigan Power Company  
Nuclear Generation Group  
500 Circle Drive  
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2 - CLOSEOUT OF THE RESPONSE TO THE REQUEST FOR ADDITIONAL INFORMATION TO GENERIC LETTER 92-01, REVISION 1, SUPPLEMENT 1, "REACTOR VESSEL STRUCTURAL INTEGRITY" (TAC NO. MA0539)

Dear Mr. Powers:

On May 19, 1995, the U.S. Nuclear Regulatory Commission (NRC) issued Generic Letter 92-01, Revision 1, Supplement 1 (GL 92-01, Rev. 1, Supp. 1), "Reactor Vessel Structural Integrity," to holders of nuclear operating licenses. In issuing the GL, the staff required addressees of the GL to:

- (1) identify, collect and report any new data pertinent to the analysis of structural integrity of the reactor pressure vessels (RPVs) at their nuclear plants, and
- (2) to assess the impact of that data on their RPV integrity analyses relative to the requirements of Sections 50.60 and 50.61 to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.60 and 10 CFR 50.61), and to the requirements of Appendices G and H to Part 50 of Title 10 of the *Code of Federal Regulations* (Appendices G and H to 10 CFR Part 50).

On August 16, 1995, you submitted your initial response to GL 92-01, Rev. 1, Supp. 1, and provided the requested information relative to the structural integrity assessments for the D.C. Cook Nuclear Plant, Units 1 and 2. The staff evaluated your response to GL 92-01, Rev. 1, Supp. 1, and provided its conclusion relative to your response on February 28, 1996. However, since the time of the staff's closeout letter, Combustion Engineering (CE) Owners Group and Babcock and Wilcox (B&W) Owners Group have each submitted additional data regarding the alloying chemistries of beltline welds in CE and B&W fabricated vessels. The additional alloying data were submitted in Topical Reports CE NPSD-1039, Revision 2, CE NPSD-1119, Revision 1 for CE fabricated RPV welds, and BAW-2325, Revision 1 for B&W fabricated RPV welds.

In addition, Chicago Bridge and Iron (CB&I) BWR data were submitted in Topical Report BWRVIP-46. As a result of the efforts by CE and B&W, the staff determined that additional information was necessary relative to the structural integrity assessments for the RPV at D. C. Cook Unit 1. On November 11, 1998, the staff issued a request for additional information (RAI) in regard to the alloying chemistries of RPV beltline welds at D. C. Cook Unit 1, and in regard to the assessment of RPV surveillance data, the pressure-temperature (P-T) limits, and

pressurized thermal shock (PTS) assessment for the Unit. In general, with respect to the contents of the RAI, the staff requested that you reassess the alloying chemistries for the beltline welds and RPV surveillance welds for the D. C. Cook Unit 1 relative to the best-estimate chemistries provided in Topical Report CE NPSD-1039, Revision 2, and CE NPSD-1119, Revision 1, and provide the impact of any changes to the best-estimate chemistries for the welds on the structural integrity assessments for D. C. Cook Unit 1 relative to the requirements of 10 CFR 50.60, 10 CFR 50.61, and Appendices G and H to 10 CFR Part 50, as applicable to the licensing bases for the plant.

D. C. Cook Unit 2 is a CB&I fabricated vessel. The staff did not issue an RAI in regard to the vessel integrity data for the D. C. Cook Unit 2 because the data in the Topical Report BWRVIP-46, which provided the best-estimate chemistries for welds in CB&I fabricated vessels, did not vary significantly from the data reported for the RPV at D. C. Cook Unit 2. However, the staff did review the RPV data for D. C. Cook Unit 2 based on an assessment of the data provided in your responses to GL 92-01, Rev. 1, Supp. 1, as well as your response to GL 92-01, Revision 1 (July 13, 1992).

You submitted your response to the staff's RAI on GL 92-01, Rev. 1, Supp. 1, for D. C. Cook Unit 1 on June 28, 1999. The staff has reviewed your response. In this response, you submitted surveillance data for weld heat 1P3571 as obtained from fracture toughness tests on coupons of the material that were removed from the Kewaunee and Maine Yankee RPVs. You also proposed using this data as the basis for evaluating intermediate to lower shell circumferential weld 9-442, which was fabricated from heat 1P3571. You indicated that the surveillance data for the material is credible after performing necessary adjustments to normalize the data for evaluation. These adjustments include adjustments to account for differences between the operating temperatures of the reactors and in the neutron irradiation levels for the test coupons. The average operating temperature of the D. C. Cook Unit 1 reactor vessel, as determined from temperatures reported for the D. C. Cook Unit 1 surveillance capsules, is approximately 540°F. This operating temperature is greater than the mean irradiation temperature (532.3°F) reported for the Kewaunee and Maine Yankee surveillance capsules, and higher irradiation temperatures have been shown to result in a lower rate of irradiation damage. You chose to conservatively apply the Kewaunee and Maine Yankee surveillance data directly to the D. C. Cook Unit 1 RPV assessment without accounting for this temperature differential. As this does result in a conservative assessment, it is acceptable to the staff.

The staff has verified that the submitted surveillance data and your method for adjusting the data are acceptable. The staff therefore concludes it is acceptable to use the data as the basis for calculating the  $RT_{PTS}$  value and adjusted reference temperature (ART) values for the circumferential weld 9-442. Your letter indicates that circumferential weld 9-442 is the new limiting material for the beltline region of the D. C. Cook Unit 1 RPV, and that the changes to the data for the material would necessitate a change to the current approved P-T limit curves for the Unit. The current curves are based on a 1/4T ART of 171°F at 32 EFPY (e.g., the 32 EFPY ART for intermediate shell plate B4406-3, Heat C3506). You stated that you would submit a license amendment request with the necessary changes by December 22, 2000. The staff has verified that December 2000 is approximately the time when the new curves should be

submitted, as based on the changes to your vessel data for D. C. Cook Unit 1. Therefore, December 22, 2000, is an acceptable time frame for submittal of the new curves.

The staff has revised the RPV integrity information in the Reactor Vessel Integrity Database (RVID) based upon review of your letter of June 28, 1999, as well as your responses to GL 92-01, Revision 1; GL 92-01, Rev. 1, Supp. 1; and the best-estimate chemistry data in the topical reports that are applicable to the evaluations of the D. C. Cook RPVs (e.g., Topical Reports CE NPSD-1039, Revision 2, and CE NPSD-1119, Revision 1, for the RPV at D. C. Cook Unit 1, and Topical Report BWRVIP-46 for the RPV at D. C. Cook Unit 2). The staff has released the new version of the database as RVID Version 2. It should be noted that, with respect to the vessel integrity data for D. C. Cook Units 1 and 2, there may be some variations in the data inputted by the staff, and the corresponding values reported by you in your responses to GL 92-01, Rev. 1; and to GL 92-01, Rev. 1, Supp. 1. Any deviations in the data are explained in the reference sections for each unit, or the individual component screen notes (i.e. each forging, plate, and weld has a specific area for notes which is a new feature of the database).

The new database diskettes for the RVID are posted on the world-wide-web at a location which is linked to the NRC home page (<http://www.nrc.gov/NRR/RVID/index.html> ). We recommend that you review this information. If the staff does not receive comments within 30 days of the date of this letter, we will assume that the data entered into the RVID are acceptable for your plant. Future submittals on P-T limits, PTS, or upper shelf energy (USE) should reference the most current information.

This closes the staff's efforts for TAC number MA0539. The staff appreciates your efforts with regard to this matter.

Sincerely,

**/RA/**

John F. Stang, Senior Project Manager, Section 1  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-315 and 50-316

cc: See next page

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John F. Stang, Senior Project Manager, Section 1  
Project Directorate III  
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