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                  Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards "Interim Rept on Exam, Testing & Evaluation of Irradiated Pressure Vessel Surveillance Specimens from Monticello Nuclear Generating Plant."

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August 10, 1983

Director, Office of Nuclear Reactor Regulation  
Attention: Document Control Desk  
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Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT  
Docket No. 50-263 License No. DPR-22

Summary Technical Report of Analysis of Capsule  
from Reactor Vessel Radiation Surveillance Program

Submitted for NRC Staff review are 40 copies of the report, "Interim Report on Examination, Testing, and Evaluation of Irradiated Pressure Vessel Surveillance Specimens from the Monticello Nuclear Generating Plant", April 18, 1983. This report was prepared by Battelle Columbus Laboratories for Northern States Power Company and contains the results of the analysis of the first surveillance specimen capsule removed from the Monticello reactor vessel. This report is submitted in accordance with 10 CFR Part 50, Appendix H, Section III.

This report notes the following:

- a) The upper bound of the maximum end of life fast neutron fluence at the pressure vessel 1/4T position is  $3.6 \times 10^{18}$  n/cm<sup>2</sup>. This is 60 per cent higher than earlier predicted values, but still represents a relatively low fluence.
- b) Weld metal, heat affected zone, and base metal upper shelf energies were well above the minimum allowable upper shelf energy of 50 ft-lb after a fast neutron fluence of  $2.93 \times 10^{17}$  n/cm<sup>2</sup>.
- c) All tensile test specimens exhibited ductile failures.
- d) Weld metal chemistry was determined. Weld metal specimens contained a maximum of 0.1 weight per cent copper as expected.

As indicated in the report, there presently is not complete assurance as to the origin of the tested "J" specimens. For this reason, the report is labeled as an "interim" report. For this reason also, there was no comparison of nonirradiated and irradiated material properties. All evidence indicates that the "J" specimens were cut from plate 1-15 (heat number C2220) instead of plate 1-14 from this heat as reported earlier in NEDO-24197.

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Following completion of investigations into the origin of the "J" specimens, a final report will be submitted for NRC review. The following actions are currently being pursued to resolve this matter:

- 1) Some material will be removed from the piece of plate 1-15 which is now in storage at GE, and will be sent to Battelle.
- 2) One of the extra unirradiated "J" base metal tensile specimens will be removed from the Monticello storage vault and sent to Battelle.
- 3) Battelle will perform a detailed comparative chemical analysis of both materials. We fully expect that this will confirm that the "J" specimens did come from plate 1-15, as all documentation has implied.
- 4) Battelle will then update and correct their interim report, and issue a final report.

Also noted in the report is the fact that the Monticello surveillance capsules are positioned in the vessel such that they have a lead factor of less than unity. There is also no unirradiated "baseline" surveillance toughness data except for the results of the certified materials test reports required by the fabrication specifications and Code. This information is limited. The usefulness of removing additional capsules for analysis is questionable. This matter will be addressed in a future 10 CFR Part 50, Appendix H, exemption request which is required by recent changes to Appendix H.

Please contact us if you have any questions related to the attached interim report. The final report should be available for NRC review by January 1, 1984.

  
David Musolf  
Manager - Nuclear Support Services

DMM/dab

cc: Regional Administrator-III  
NRR Project Manager, NRC  
Resident Inspector, NRC  
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Attachment