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AUG 19 1975

Karl R. Goller, Assistant Director  
for Operating Reactors  
Division of Reactor Licensing

MONTICELLO NUCLEAR GENERATING PLANT - RESPONSE TO TECHNICAL ASSISTANCE  
REQUEST - REVIEW PROPOSED CHANGE IN MONTICELLO'S PRESSURE-TEMPERATURE  
LIMITATIONS FOR OPERATION, (TAR-1760)

Plant Name: Monticello  
Docket Number: 50-263  
Responsible Branch and Project Manager: ORB-2; B. Buckley  
Requested Completion Date: August 20, 1975  
Technical Review Branch Involved: Materials Engineering Branch  
Description of Request: Review Proposed Change in Monticello's  
Pressure-Temperature Limitation for Operation  
Review Status: Complete

In response to your Technical Assistance Request, the Materials Performance Section of the Materials Engineering Branch has reviewed the change to the pressure-temperature limitations for inservice testing, heatup, cooldown and core operation proposed by Northern States Power Company in License Amendment Request dated July 1, 1975.

The current pressure-temperature limitations for operation of Monticello are based on NDT temperature plus 60°F and do not comply with all the requirements of Appendix G, 10 CFR Part 50, "Fracture Toughness Requirements." The proposed pressure-temperature operating limits are based on the requirements of Appendix G, 10 CFR Part 50 and Appendix G to ASME Code Section III. In calculations to determine these limits the reference temperature,  $RT_{NDT}$ , of the vessel material was estimated from impact test data taken in accordance with requirements of the Code to which this vessel was designed and manufactured (1965 Edition including Summer 1966 Addenda). Where the dropweight NDT temperature was known, the reference temperature used was the NDT temperature. Where the dropweight NDT temperature was not known, the reference temperature used was the temperature at which 30 ft-lb of energy was expected to occur on the basis of reported Charpy V notch test data. For areas of the vessel shell remote from the core beltline region, the highest NDT temperature permitted by the vessel purchase specification for any vessel pressure boundary material is +40°F and this value is used for the  $RT_{NDT}$  in lieu of certified test results.

Predicted changes in NDT temperature as a function of neutron fluence are given in Figure 3.6.1. This curve is based on 35 data points from

tests on SA 302B and SA 533B steel. It agrees with our prediction for SA 533B steel with 0.15% copper. The percent of copper in the Monticello reactor vessel plate material from the beltline region has not been determined.

Calculations indicate that the maximum neutron fluence on the vessel wall is presently about  $2 \times 10^{17}$  n/cm<sup>2</sup> and will be approximately  $2.2 \times 10^{18}$  n/cm<sup>2</sup> at end of life.

The material surveillance program for Monticello consists of three sets of specimens representing the vessel base, weld and HAZ material and conforms to ASTM E 185-66. Northern States Power Company proposes to change the withdrawal schedule to withdraw samples at 1/4 and 3/4 of service life.

We conclude that the proposed temperature-pressure limits for operation of Monticello comply with the requirements of Appendix G, 10 CFR Part 50 and are acceptable until data from the first material surveillance capsule are obtained and reported to the NRC. We recommend that the phosphorus and copper content of vessel plate and weld material in the vessel core region be determined at that time, and the results included in the report. We also conclude that the proposed changes in surveillance requirements, specifications 4.5.A and B, are acceptable.

Details of our evaluation including calculations for operating limits are available in MTEB Branch files.

*Original signed by*  
*R. R. Maccary*

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