UNITED STATES ATOMIC ENERGY COMMISSION

SAFETY EVALUATION BY THE DIRECTORATE OF LICENSING

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

INSERTION OF 8x8 FUEL ASSEMBLIES INTO MONTICELLO CORE

AND

TESTING AT REACTOR POWER LEVELS LESS THAN 1%

INTRODUCTION

Northern States Power Company (NSP) has requested approval(1) to insert 116 8x8 fuel assemblies into the core of the Monticello Nuclear Generating Plant. NSP previously submitted a proposed change to the Technical Specifications(2) to allow the use of 8x8 fuel assemblies in the Monticello core. The description and performance analysis of the 8x8 fuel assemblies had been submitted by NSP(3). Plant modifications to be completed during the March-April-May 1974 refueling outage were described by NSP(5,6,7) and approved by the Directorate of Licensing(8).

EVALUATION

The Regulatory staff has evaluated the General Electric Licensing Report NEDO-20103, "General Design Information for General Electric Boiling Water Reactor Reload Fuel Commencing in Spring 1974", and has determined(4) that the nuclear design parameters of the 8x8 fuel assemblies are similar to the 7x7 fuel assemblies previously loaded in the Monticello nuclear core and other boiling water reactors.

The calculational methods previously used to predict the nuclear characteristics of the 7x7 fuel assemblies currently in use have been applied to the 8x8 assemblies and are considered adequately conservative to provide assurance that the 8x8 fuel can be accurately described as neutronically similar to the 7x7 assemblies. The 8x8 fuel assemblies can therefore be loaded into the Monticello core.

Technical representatives of NSP and the Directorate of Licensing met(9) to review and clarify the modifications to be made during the spring 1974 refueling outage. Of particular interest was the effect of the new

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blowdown pipe connections to the existing steam lines. This concern was resolved(10) satisfactorily by calculations that had been made by Bechtel which show negligible stresses and steam line movement resulting from the new steam blowdown line connections. We have completed our evaluation of the nuclear steam supply system modifications(10) and have concluded that the proposed modifications are acceptable and that the integrity of the primary coolant pressure boundaries have not been compromised(8).

With respect to reactor operation at power levels below 1%, we note fuel temperatures are greater than water temperatures by about 1% of the difference between fuel temperatures at 100% power level and the saturated water temperature. Therefore, the fuel temperatures are sufficiently low that the stored energy is negligible and fuel clad temperatures following the DBA LOCA remain well below acceptable limits. In fact, the peak clad temperatures would not be greater than about 450°F which is sufficiently low in contrast with the 2300°F in the Interim Acceptance Criteria for Emergency Core Cooling Systems for Light Water Reactors to assure negligible fuel damage and provides large margins with respect to emergency core cooling capability. Accordingly, the request to test at power levels up to 1% does not present a safety problem.

CONCLUSIONS

Based upon the above considerations, we conclude that no significant hazards consideration is involved in loading of 8x8 fuel assemblies in the Monticello core and performing routine core measurements at power levels below 1% of rated. We also have concluded that the health and safety of the public will not be endangered by this action.

/s/

James J. Shea
Operating Reactors Branch #2
Directorate of Licensing

/s/

Dennis L. Ziemann, Chief
Operating Reactors Branch #2
Directorate of Licensing

Date: MAR 30 1974

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DATE ➤						

REFERENCES

1. NSP request for 8x8 Fuel Loading and Testing Authorization dated March 21, 1974.

2. NSP Technical Specification Change Request dated February 27, 1974.

3. NSP "Second Reload Submittal" dated November 19, 1973.

4. Directorate of Licensing "Technical Report on the General Electric Company 8x8 Fuel Assembly" dated February 5, 1974.

5. NSP submittal, "Permanent Plant Changes to Accommodate Equilibrium Core Scram Reactivity Characteristics", dated January 23, 1974.

6. NSP submittal, "Errata to January 23, 1974 Report . . . Permanent Plant Changes . . .", dated March 19, 1974.

7. NSP submittal, "Supplement 1 to January 23, 1974 Report", dated March 8, 1974.

8. Directorate of Licensing Approval of Plant Modifications for Fuel Cycle 3 dated March 14, 1974.

9. Minutes of meeting with NSP representatives on February 20 and 21, 1974.

10. Safety Evaluation by Directorate of Licensing - "Plant Modifications" dated March 14, 1974.

11. Minutes of meeting with NSP representatives on March 22, 1974.

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