ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

June 15, 1970

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON MONTICELLO NUCLEAR GENERATING PLANT UNIT 1

Dear Dr. Seaborg:

At its 121st meeting, May 7-9, 1970, and its 122nd meeting, June 11-13, 1970, the Advisory Committee on Reactor Safeguards met with Northern States Power Company to review proposed changes to the reactor vessel nozzle "safe ends" (stainless steel extensions of the nozzles) of the Monticello Nuclear Generating Plant Unit 1. During its review of the changes, the Committee had the benefit of discussions with the applicant, the General Electric Company, the AEC Regulatory Staff, and their consultants. The Committee also had the benefit of the documents listed. The Committee reported to you on operation of the Monticello Plant on January 10, 1970.

Normal procedures for most reactor pressure vessels have been to join the austenitic stainless steel safe ends to the nozzles prior to the stress relieving heat treatment. This heat treatment sensitizes the safe ends, which makes the steel less resistant to certain types of corrosion. Sensitized austenitic stainless steels in this condition have given reasonably satisfactory service over many reactor years of operation.

Recently, leaks developed in sensitized safe ends of two operating reactors. The causes of the leaks have been studied exhaustively, and it is concluded by the licensees that they were caused by unusual circumstances that need not have existed. In view of this experience, however, Northern States Power Company is making modifications to Unit 1.

In the Monticello vessel, eight safe ends were sensitized. The modifications consist of replacing six sensitized safe ends with unsensitized material and overlaying the other two with weld metal cladding of a composition that is resistant to stress corrosion. Some other components and attachments in the vessel are also being overlaid or replaced.

The Committee agrees with the applicant that these changes, properly executed, should increase assurance of trouble-free operation. The Committee wishes to call attention to other factors that would further

tend to diminish the probability of a failure in a safe end or other piping component. The Committee believes an independent check should be made of stresses in the as-built piping of the primary system, and that displacements should be observed in the hot condition. A review should be made of high points in non-flowing parts of the system and means should be provided, where necessary, to vent or otherwise remove gases that could become trapped at such points.

The Committee also believes that the Regulatory Staff should assure itself that the biological shield surrounding the reactor vessel can withstand the pressure that could be developed by loss of integrity of a safe end or nozzle, or that failure of the shield would have no intolerable consequences.

The Committee has on several occasions stressed the importance of in-service inspection and leak detection. It recommends that the Regulatory Staff develop a schedule of inspections for safe ends. The operation of the leak detection and location systems should be reviewed and modified as appropriate to obtain the maximum speed and sensitivity for detection of leads. In addition, the applicant should study other techniques of detecting leaks.

Subject to these comments, and if due attention is paid to the items discussed in the Committee report of January 10, 1970, the Committee reaffirms its belief that there is reasonable assurance that the Monticello Nuclear Generating Plant Unit 1 can be operated at power levels up to 1670 MW(t) without undue risk to the health and safety of the public.

Mr. Hill did not participate in the review of this project.

Sincerely yours,

/s/ Joseph M. Hendrie

Joseph M. Hendrie
Chairman

References:

1. Amendment 26 to the License Application, dated 5/7/70 -- Proposed modifications to the furnace sensitized stainless steel components attached to the reactor pressure vessel.

2. Amendment 27 to the License Application, dated 5/19/70