UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

March 31, 1976

Northern States Power Company Docket No. 50-263
ATTN: Mr. Leo Wachter, Vice President
Power Production and System
Operation
414 Nicollet Mall
Minneapolis, Minnesota 55401

Gentlemen:

Enclosed is IE Bulletin No. 76-04 which requires action by you with regard to your power reactor facility with an operating license.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely yours,

James G. Keppler
Regional Director

Enclosure:
IE Bulletin No. 76-04

cc w/encl:
C. E. Larson
Plant Manager

bcc w/encl:
IE Central Files
IE Files
PDR
Local PDR
OGC, Beth, P-506A
Anthony Roisman, Esq., Attorney

March 31, 1976
IE Bulletin No. 76-04

CRACKS IN COLD WORKED PIPING AT BWR'S

DESCRIPTION OF CIRCUMSTANCES:

On March 22, 1976, at the Nine Mile Point 1 facility, a leak was found in a reactor water clean-up system six-inch stainless steel pipe located outside of the drywell. The leak resulted from a throughwall crack in the base material at a pipe bend. Similar leaks had been experienced in this system on November 28, 1975 and March 19, 1976. The cracks do not appear to have any preferred orientation. The facility was shutdown on March 22 to permit nondestructive examination of the base material at similar pipe bends.

The piping involved is schedule 80, ASTM A-376, Type 304 stainless steel which had undergone cold bending during fabrication without subsequent solution annealing. Examination of the pipe section which leaked on November 28, 1975, revealed that the crack initiated in the transgranular mode at the inside surface and changed to the intergranular mode after it had propagated through the cold worked surface. Significant carbide precipitation around grain boundaries was observed although the reason for this precipitation is not known at this time. The cracking mechanism was categorized as stress corrosion. The stress field is believed to be caused by cold forming.

ACTION TO BE TAKEN BY LICENSEES:

All licensees of BWR power reactor facilities are to take the following action:

1. Develop the following information for those systems located within, or connected to, the reactor coolant pressure boundary and which are exposed to reactor coolant system pressure during operation:

    a. A specific listing of installed austenitic stainless steel piping or fittings made from pipe, greater than two inches nominal size, which may have been cold worked without solution annealing following forming. (Verification that cold worked material received full solution annealing following the forming operation must be based on acceptable time-temperature heat treating records, metallurgical analyses, or equivalent and may be on a sampling basis for each lot number.)

b. A description of the program and procedures, including inspection criteria and schedules, for the nondestructive volumetric examination of the items identified in (a) above.

2. A report of the above applications, descriptions, plans and schedules should be submitted within 60 days after receipt of this Bulletin.

3. The NRC Regional Office should be promptly informed, within 24 hours, of any adverse findings resulting during nondestructive evaluation of identified piping or fittings.

4. A report of the performance, the results, and the evaluation of any nondestructive evaluation conducted on cold worked stainless steel piping or fittings should be submitted within 60 days following completion of the examination.

Reports should be submitted to the Director of the NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Inspection Programs, Washington, D. C. 20555.

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U.S.C. 3152 from the U. S. General Accounting Office. (GAO Approval B-180255(R0072), expires 7/31/77).