

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

October 10, 1980

IE Information Notice No. 80-36: FAILURE OF STEAM GENERATOR SUPPORT BOLTING

Description of Circumstances:

On September 4, 1980, the NRC staff was informed by the Northern States Power Company that extensive cracking of the bolting for the supports attached to bottom of the steam generators on Prairie Island Unit 1 had occurred. The licensee initially discovered the bolting problem when two bolts failed during detensioning. The licensee was attempting to remove the pre-load on the bolting (specified at 1400 ft-lbs) to minimize the potential for stress corrosion cracking of the high strength 1-1/2 in. dia. 250 ksi maraging steel bolting (Vascomax 250).

Ultrasonic examination of the support bolting revealed cracks or breaks in 47 of 48 support bolts for the two steam generators at the Prairie Island Unit 1 facility. The licensee subsequently shut down the Prairie Island Unit 2 facility and performed ultrasonic examinations of the same steam generator support bolting, that failed on Unit 1. The results of the UT examinations revealed cracks in three of the 48 steam generator support bolts. The licensee attempted to remove the cracked bolts from the steam generator supports. Two cracked bolts were successfully removed while the third failed during removal. Two bolts that were judged as defect free by the ultrasonic examination were also removed. Magnetic particle examinations confirmed the results of the ultrasonic examinations on the bolts which were removed. As part of the short term corrective actions taken, the licensee has unloaded and retensioned the bolting at approximately 50 to 100 ft.-lbs.

Inservice ultrasonic examination of the affected bolting had been performed previously. In the case of Unit 1 a significant number of the bolts were examined at the last refueling outage 14 months ago. No cracks were found at that time.

The susceptibility for stress corrosion cracking was identified in NUREG-0577 (for comment). The NUREG identifies those facilities which have utilized maraging steels for reactor coolant pump and steam generator support bolting. Further the NUREG recommends augmented inspections for the facilities included in Group I.

Licensees are encouraged to review the bolting materials used at their respective facilities and consider inspection of maraging steel bolting that are either pre-loaded or significantly loaded during operation.

This Information Notice is provided as an early notification of a possible significant matter that is still under review by the NRC staff. It is expected that recipients will review the information for possible applicability to their facility. No specific action or response is requested at this time. If you have any questions regarding this matter, please contact the Director of the appropriate NRC Regional Office.

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Information Notice No.	Subject	Date of Issue	Issued to
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80-33	Determination of teletherapy timer accuracy	9/15/80	All teletherapy (G3) licensees
80-32	Clarification of certain requirements for Exclusive-use shipments of radioactive materials	8/12/80	All NRC and agreement state licensees
80-31	Maloperation of Gould-Brown Boveri Type 480 volt type K-600S and K-DON 600S circuit breakers	8/27/80	All light water reactor facilities holding OLs or CPs
80-30	Potential for unacceptable interaction between the control rod drive scram function and non-essential control air at certain GE BWR facilities	8/19/80	All boiling water reactor facilities holding power reactor OLs or CPs.
80-29	Broken studs on Terry turbine steam inlet flange	8/7/80	All light water reactor facilities holding power reactor OLs or CPs*
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80-28	Prompt reporting of required information to NRC	6/13/80	All applicants for and holders of nuclear power reactor CPs
80-27	Degradation of reactor coolant pump studs	6/11/80	All pressurized water reactor facilities holding power reactor OLs or CPs

\* Operating Licenses or Construction Permits