



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20585

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 24 TO PROVISIONAL OPERATING LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

INTRODUCTION

By letter dated January 26, 1976, with supplemental information dated July 2, 1976, Northern States Power Company (NSP) requested a change to the Technical Specifications appended to Provisional Operating License DPR-22 for the Monticello Nuclear Generating Plant. The proposed change involved revising the frequency for exercising all control rod drives from weekly to monthly. After discussions with the licensee's staff, the proposal was modified by the NRC to apply the monthly exercise interval to one rod out of any two-by-two array, thus allowing a maximum of 25% of the rods to be tested monthly.

EVALUATION

The proposed changes to the Technical Specifications would modify the control rod drive exercise interval from weekly to monthly to minimize the rapid local changes in power, and subsequent fuel damage, resulting from rod exercising. In previous Monticello fuel cycles NSP had observed a trend in which radioactive offgas emissions, indicative of failed fuel, increased linearly with the integrated number of control rod notches moved. Although new 8x8 and improved 7x7 fuel assemblies are believed to be more resistant to the harmful effects of thermal cycling imposed by control rod drive exercising, General Electric and NSP feel that extending the interval between drive exercises will result in a reduction of fuel thermal cycling. The NRC staff concurs with this opinion and feels that reduction of fuel failures and subsequent reduction of offgas emissions provide sufficient impetus to consider changes in the frequency of control rod exercises.

Weekly exercising is presently deemed important to identify a rod which is inoperable due to the complete failure of a collet retainer tube (CRT). However, (1) inspections of CRTs at Monticello have revealed no cracks to date; (2) observed cracks at other plants have not resulted in a single inoperable drive; and (3) in simulated environmental tests, control rods with cracked CRTs have undergone more scrams from operating temperature (by a factor of 9.7) than anticipated in the life of a reactor, with no failures to operate. Therefore we have concluded that the proposed reduced frequency of control rod exercising will not significantly increase the likelihood of a cracked CRT remaining undetected.

The possibility of crevice corrosion of the piston tubes and/or index tubes of the control rod drives as the result of less frequent rod exercising is also a consideration. Crevice corrosion of the index and/or piston tubes could result in seal deterioration and subsequent higher stall flows and longer control rod insertion times but would not be expected to make the rod inoperable. Although the crevice corrosion has not been positively related to the frequency of control rod drive exercising, the licensee has agreed to examine a representative sample of monthly-exercised rods at the end of each cycle to determine if crevice corrosion is taking place. Abnormal degradation of the piston tube or guide tube would require the exercising of all rods on a weekly frequency during future cycles. This requirement would be specified in the Technical Specifications.

It has been determined that, during the present fuel cycle, even in the unlikely event that all the control rods selected for monthly testing (1 in any 2x2 array, 25% of total rods) were to fail, the reactor would still be safely shut down by the remaining, weekly-exercised, rods. Such a restriction would be added to the technical specifications for the current and future cycles.

Based on the above we have concluded that the proposed change to the Monticello Technical Specifications, as modified, to permit monthly testing of 25% of control rod drives, is acceptable.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: October 15, 1976