



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE TESTING PUMP TEST RELIEF

NINE MILE POINT NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-220

INTRODUCTION

By letter dated July 8, 1987, Niagara Mohawk Power Corporation submitted a pump test relief request for the Inservice Testing Program for its Nine Mile Point Nuclear Station Unit 1 (NMP-1). The requested relief will permit NMP-1 to measure the reactor liquid poison pump vibration instead of bearing temperature once per year.

DISCUSSION

There are two high-pressure positive displacement liquid poison pumps in the NMP-1 plant. Their function is to inject a pre-determined amount of concentrated boron solution into the reactor core within the required time in the event of massive control rods failure. Each of the two pumps has the capacity to achieve the design objective by itself.

NMP-1 conducts monthly flow testing on these pumps at present. Each pump is used to circulate demineralized water through a test tank. The discharge pressure is controlled to 1275 psig by manually throttling a gate valve. Bearing temperatures are measured during the annual flow test as required by IWP-3500(b) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code Section XI. Since the volume of the test tank is relatively small, the heat up rate of the pump fluid exceeds the rate allowed for bearing temperatures to stabilize. The bearing temperatures thus increase with the fluid temperature and cause the pumps to run for the maximum test time of 2 hours. The high fluid temperature also jeopardizes the integrity of pump packings.

NMP-1 is proposing an alternative testing method by measuring bearing vibration instead of bearing temperatures. Vibration measurements will be taken in the outboard horizontal, vertical and axial directions as well as the inboard horizontal and vertical directions on a monthly basis. The inboard axial direction is inaccessible for measurement.

The purpose of measuring bearing temperature is to determine the degree of bearing deterioration and degradation caused by service. They usually are more detectable toward the end of the service life. By measuring vibration, however, more information can be revealed about the bearing condition. The American Society of Mechanical Engineers Operation & Maintenance Working Group 6 (O&M 6) Standard established a set of rules for the vibration measurement and its acceptance criteria. This set of rules should be used as guidance for the proposed alternative method.

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The alternative testing method proposed by NMP-1 would provide, under ideal conditions, comparable information about bearing deterioration and degradation caused by service. In this case, the alternative testing method will provide better results for pump testing and also protect pump packings for better service. The staff deems it acceptable when the O&M 6 acceptance criteria is used and recommends the requested relief be granted on that basis.

CONCLUSION

Based on the review summarized herein, we conclude that the relief may be granted and pursuant to 50.55a(3)(i), the proposed alternative will provide an acceptable level of quality and safety.

PRINCIPAL CONTRIBUTOR:

H. Shaw



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