



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

NINE MILE POINT NUCLEAR STATION, UNIT 1

CONTAINMENT SYSTEMS ASPECTS OF MPA B-24

Introduction

The staff evaluation of the Nine Mile Point, Unit 1, containment purge/vent system design and operation practices was transmitted to the licensee by letter dated December 9, 1981, from T. Ippolito, NRC, to D. Dise, Niagara Mohawk Power Corporation. The evaluation identified several areas where further information was needed before the staff could complete its review. These areas included:

- 1) The amount of air/steam released to the environment prior to purge valve closure following onset of a LOCA;
- 2) The provisions to protect structures and safety-related equipment located downstream of the purge/vent system isolation valves against a loss of function from the environment created by the escaping air and steam;
- 3) The provisions made to ensure that isolation valve closure will not be prevented by debris which could potentially become entrained in the escaping air and steam;
- 4) Licensee response to the staff recommendation that purge/vent system operation during operation modes 1, 2, and 3 be limited to safety-related needs since the plant is inherently safer with closed purge/vent valves than with open lines to the environment which require valve action to provide containment integrity;
- 5) Licensee response to the staff recommendation that leak testing of the purge/vent butterfly isolation valves be done at three-month intervals to provide for early detection of valve seat deterioration; and
- 6) Licensee response to the staff recommendation that the purge/vent valves be modified to achieve a closure time that would comply with the guidelines of BTP CSB 6-4.

Evaluation

The licensee responded to the open issues identified in the December 9, 1981 letter, by letters dated January 29, 1982 and November 14, 1983, from T. Lempges and C. Mangan, respectively, of Niagara Mohawk Power Corporation, to D. Vassallo, NRC. A discussion of the issues identified in our December 9, 1981 letter follows:

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- 1) Regarding the amount of air/steam released through the purge lines, no values were provided to the staff from use in the plant-unique radiological analysis for Nine Mile Point 1. To expedite this issue, the staff calculated the mass flow through the 24-inch purge valves for a maximum valve closure rate of 15 seconds, using conservative techniques. This mass flow, 10,020 pounds (mass) of steam, was provided to the Accident Evaluation Branch for evaluation of the radiological consequences of a LOCA concurrent with open purge valves.
- 2) The staff requested an analysis of the provisions made to protection structures and safety-related equipment located downstream of the purge isolation valves against loss of function due to the environment created by the escaping air and steam. In response, the licensee identified the standby gas treatment system (SGTS) filter housing as the only system for which assurance could not be given that it would remain intact and functional following onset of a LOCA, while purging. The licensee has installed a pressure control valve upstream of the filter housing that will limit the pressure to less than 1 psig. This modification satisfies the staff's concerns with regard to the MPA B-24 recommendation.
- 3) In response to the staff's request to provide measures to ensure that isolation valve closure will not be prevented by debris, the licensee has installed seismic Category I debris screens in the vent and purge lines. The staff finds this acceptable.
- 4) In response to the staff's request to limit purge/vent operations to safety-related needs, the licensee stated that system operation during plant conditions other than cold shutdown or refueling is typically less than 90 hours per year to inert and deinert the containment and for safety-related surveillance or maintenance. The staff finds this response acceptable for the following reasons:
 - a) The total time the valves will be open annually is very low, with the restrictions proposed by the licensee;
 - b) The reasons for purging/venting of the containment are necessary actions for the safe operation of the plant; and
 - c) The cost involved in purging nitrogen to the environment is an incentive for the licensee to restrict purging and venting operations.
- 5) In response to our recommendations that leak testing of the purge/vent isolation valves be done at three-month intervals, the licensee installed rubber seals without any justification as to why this material would not degrade with time, as observed on valves with other

types of resilient seals. The staff recommends that a three-month test interval be used for the Nine Mile Point 1 purge isolation valves. An acceptable alternative would be to test the purge valves within 72 hours of their use (for operating conditions above cold shutdown) with a maximum interval of six months between leak tests.

- 6) Currently, with the valves blocked to open no more than 50°, the valve closure time is 30 seconds. To assure that the purge/vent valves would be fully closed before onset of fuel failure following onset of a LOCA, the staff recommends that the purge/vent valves be modified to reduce the valve closure times following onset of a LOCA to 15 seconds, or less. Instrument delay times, along with the valve disc traveling time, should be factored into the overall response time.

Conclusion

Based on our review of the information contained in the above referenced letters and a telecon between the NRC staff and the licensee's staff on February 1, 1984, we conclude the Nine Mile Point Unit 1 purge system design and operating practices are acceptable pending the licensee's confirmation of limiting valve closure time to less than 15 seconds post LOCA and leak testing of the valves at the frequency stated above to ensure that any seal deterioration would be detected in a timely manner.

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Dated: March 19, 1984

