SAFETY EVALUATION OF THE

PROPOSED ACTIONS

REGARDING BWR FEEDWATER

PUMP TRIP ON REACTOR HIGH WATER LEVEL

Introduction

An NRC letter dated February 1, 1978, regarding a concern of flooding of main steam lines or lines to other safety related equipment on BWRs, was transmitted to the licensees of the following six BWR units: Big Rock Point - 1, Dresden - 1, Oyster Creek, Nine Mile Point - 1, Millstone - 1, and Pilgrim - 1. The letter referenced a report entitled, "Evaluation of Incidents of Primary Coolant Release from Operating Boiling Water Reactors" issued by the U. S. Atomic Energy Commission on October 30, 1972 in which the regulatory staff reported the results of a study of eight incidents involving the unintentional discharge of primary coolant through safety and relief valves during reactor operation. One of the staff recommendations resulting from this study was that the BWR feedwater control system should be designed to automatically control reactor vessel water level during anticipated transients without flooding of the main steam line or the lines to safety-related equipment. The installation of an automatic feedwater pump trip function on reactor vessel high water level for most operating BWR-3 and BWR-4 facilities has satisfied the intent of the staff's recommendation in this regard.

The February 1, 1978 letter requested that the licensees for the above six sited facilities transmit their plans for addition of the automatic feedwater pump trip. Niagara Mohawk responded to our request by a letter dated April 13, 1978. In their response Niagara Mohawk indicated that they plan to install a feedwater pump trip on the feedwater pump connected to the turbine.

Discussion

At Nine Mile Point Unit No. 1, there are no safety or safety relief valves located on the main steam lines which could be damaged by high water level conditions. Safety valves are located on the reactor vessel head: therefore, their safety function will not be affected. Relief valves are located on the main steam lines. The discharge from these valves is routed directly to the suppression pool. No damage would result to any equipment located inside of the primary containment should these valves actuate during a high water level condition.

The feedwater system consists of three (3) trains. One (1) train utilizes a shaft-driven pump off the main turbine whereas the other two (2) trains use electric motor-driven pumps. The existing feedwater control system is designed to automatically control reactor

vessel water level during normal operation and anticipated transients. The motor-driven pumps are also used in the high pressure coolant injection mode. A high reactor vessel level trip of the motor-driven feedwater pumps would disable this function.

For operational reasons, it may be advantageous to trip the shaft-driven pump on high water level to reduce the possibility of damage to the relief valves on the main steam lines. By letter dated April 13, 1978 the licensee indicated that they would install this trip before March 1979 by disengagement of the clutch between the turbine and pump in the event of high water level.

Based on our review we find the actions proposed by the licensee acceptable.

Conclusion

In the report entitled, "Evaluation of Incidents of Primary Coolant Release from Operating Boiling Water Reactors" issued by the U. S. Atomic Energy Commission on October 30, 1972, the following suggested performance objectives for the feedwater control system were identified by the staff:

1. The maximum water level attained should not initiate isolation of any safety feature, such as the high pressure coolant injection system, or disable any system or component required for the orderly shutdown of the reactor and

2. The minimum level attained should not require the activation of any safety system.

For Nine Mile Point, the following items are relevant:

1. The feedwater pumps are available as a source of high pressure make up to the core;

2. If the high reactor water level trip is installed to trip the feedwater pumps, then manual action by the control room operators will be required to restore the pump in order to conform to performance objective (2) above; and

3. There are no HPCI systems that could be damaged by steam line flooding.

Therefore, we conclude that the proposed plans and schedules in this area are acceptable.