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

ENCLOSURE-1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
MSIV CHANGE TO WYE-PATTERN GLOBE VALVES
SUPPORTING AMENDMENT NO-----TO FACILITY OPERATING LICENSE NO.-----
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT-UNIT 2
DOCKET NO:50-410

1.0 INTRODUCTION

By letter dated March 11, 1987, The Niagara Mohawk Power Corporation (NMPC, licensee) requested changes to the Technical Specifications for Nine Mile Point Unit #2. These changes are required due to the changing of the Main Steam Isolation Valves (MSIVs) from hydraulic actuated ball valve to air-operated Wye-pattern globe valves. By letters dated March 16, April 2, and April 28, 1987, NMPC provided additional information as requested by the staff. Changes to the MSIV-closure trip setpoints in the Technical Specifications are required due to the valve change.

2.0 EVALUATION

The MSIV Wye-pattern globe valves function in a similar manner as the MSIV ball valves. The new valves will close in 3 to 5 seconds in accordance with existing technical specifications. The new valves will also be actuated on the same safety related signals as presently used. NMPC has reviewed the effect on overpressurization protection analysis, LOCA analyses and transient and accident analyses due to the MSIV change to Wye-pattern globe valves. The results of the NMPC review are evaluated below.

2.1 Overpressurization Protection

The worst case overpressurization transient, MSIV closure with flux scram, was not affected since failure of direct position scram was assumed in the analysis. Therefore, the proposed MSIV closure trip setpoint change in the Technical Specifications from " <6% closed" to " <8% closed" and allowable value change from " <7% closed" to "<12% closed" in RPS instrumentation setpoints have no impact on the overpressurization protection analysis.

2.2 Loss of Coolant Accident (LOCA)

The change in MSIV closure characteristics, resulting from the installation of the Wye pattern glove valves, has a negligible effect on the ECCS performance analyses as shown in Table 1. The change to Wye pattern globe valves would cause less than .5 degree F increase in the peak clad temperature (PCT) for the most limiting large break and less than 2 degrees F increase for small breaks. Therefore, the acceptance criteria for emergency core cooling systems for light water nuclear power reactors as contained in 10CFR50.46 are satisfied with the globe valves in operation. The modeling of steam flow during MSIV closure remains unchanged from that is described in NEDO-10329, page B-9, and has been previously found to be acceptable by the staff.

In addition to reanalyzing the worst case breaks, the licensee assessed the impact of the change on other postulated breaks. For a recirculation line, feedwater line, or ECCS line break, MSIV closure is conservatively assumed to occur on Low-Low-Low water level (Level 1). A scram would be expected to have already occurred on Low water level (Level 3). Thus, changing the MSIV position scram setpoint has no effect on the ECCS performance analyses for these breaks since it was not utilized in these analyses.

For a steamline break inside the containment, the scram will occur on high drywell pressure before MSIV closure occurs. The MSIV position scram setpoint is not used for the ECCS system response. For steamline break outside the containment, the analysis conservatively starts with the water level at the scram trigger point, Low water level (Level 3). Realistically, a scram is likely to occur earlier due to MSIV closure on high steam line flow, but this input has been conservatively omitted in the analysis. Thus, the analysis is unaffected by the MSIV position scram setpoint change.

2.3 ANTICIPATED OPERATION OCCURRENCES

The proposed change to the MSIV closure setpoint necessitated by the valve change has been evaluated with respect to the transient and accident analyses contained in the FSAR. Loss of air or nitrogen, manual closure of all MSIVs, pressure regulator controller failure, and other transients and accidents were considered for any significant effect on the margin of safety.

The impact of a delayed scram signal due to the new MSIV closure-trip switch setpoint on transients has been evaluated. The new setpoint corresponds to an analytical limit of "85% MSIV open" instead of the previous "90% MSIV open." Two transients which take credit for this scram function are the manual closure of all main steam isolation valves (direct scram event) and the pressure regulator controller failure (open event). Of the two events, the manual closure is more limiting. The transient results are more sensitive (limiting) to differences in the allowable range of the Technical Specifications (3 to 5 sec.) speed of MSIV closure (which isn't being changed by this Technical Specification change) than due to a small scram delay resulting from the setpoint change. The proposed change to the Main Steam Isolation Valve-Closure setpoint was evaluated by reanalyzing the manual closure of all main steam isolation valves transient and there was no change in the critical power ratio (CPR) operating limit.

Another event affected by the setpoint change is load rejection without turbine bypass. This event was also reanalyzed. The change in MCPR, as shown in Table 1, is insignificant (much less than 0.01).

The remaining existing FSAR transient analyses are based upon an analytical model that bounds the closure characteristics (flow area versus time) of either the ball or globe valves. The Wye pattern globe valves have a 10 psi higher pressure differential when full open, than the ball valves, due to frictional flow losses. Sensitivity studies performed by GE based upon information from a number of plants have shown that the larger ΔP across the steamline volume produces milder transient response. Larger steam line ΔP has a dampening effect on the pressure wave following a closure of turbine stop or control valves. Thus, since the previous analyses are based upon a model which conservatively simulates the Wye pattern valve characteristics, there is no significant impact on the other pressurization transients due to the MSIV change.

3.0 CONCLUSION

The proposed change to the MSIV-closure setpoint in Technical Specification Table 2.2.1-1 necessitated by the MSIV change was evaluated against affected transient and accident analyses and the proposed change has been shown not to involve a significant increase in the probability or consequences of an accident previously evaluated. Table 3.6.1.2-1 has been changed to alter the valve designation to provide consistent notation for the type of valve installed, e.g., an air-operated (AOV) valve. Table 3.6.3-1 has also been changed to alter the valve designation to provide consistent notation. These changes are administrative only. For the reasons discussed in the evaluation, we find the proposed changes in Technical Specification Tables 2.2.1-1, 3.6.1.2-1, and 3.6.3-1 are acceptable.

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

TABLE 1

COMPARISON OF LOCA ANALYSIS

	BALL	WYE
Operating Limit[1] CPR	1.28	1.28
Limiting Transient[1] Δ CPR	0.22	<0.22[2]
Safety Limit MCPR	1.06	1.06
Peak-Vessel Pressure (psi)	1268	1268
Allowable Pressure (psi)	1375	1375
Large Break PCT (°F)	1921	1922
Small Break PCT (°F)	1522	1524
Allowable PCT (°F)	2200	2200

(1) Load rejection without bypass Section 15.2.2
(2) Slightly less due to 10 psi higher Δ P across Y valves

COMPARISON OF TRANSIENT ANALYSIS

	BALL	WYE
Operating Limit CPR	1.28	1.28
MSIV Closure Event [1, 4]		
(15.2.4)[3] Δ CPR	0.01	<0.01
Safety Limit MCPR	1.06	1.06
Peak Vessel Pressure (psi)	1268	1271
Allowable Pressure (psi)	1375	1375

(1) Only event affected by setpoint change
(2) Load rejection without bypass Section 15.2 using ODYN Option A
(3) Slightly less due to 10 psi higher Δ P across Wye type valves
(4) No change in Limiting Transient

ENCLOSURE 2

SALP EVALUATION - NMPC

Functional Areas

1. Management Involvement

   The submittal required additional information to permit approval

   Rating: Category 2

2. Resolution of Technical Issues

   The initial submittal showed insufficient understanding of the technical issues involved.

   Rating: Category 2

3. Responsiveness to NRC Initiatives

   Responses to questions were fully acceptable.

   Rating: Category 2