ATTACHMENT A

Niagara Mohawk Power Corporation
License No. DPR-63
Docket No. 50-220

Proposed Changes to Technical Specifications and Bases

Replace existing page 117 with the attached revised page. This page has been retyped in its entirety with marginal markings to indicate changes.

TABLE 3.2.7.1

PRIMARY COOLANT SYSTEM PRESSURE ISOLATION VALVES

	System	Valve No.	Maximum[a] Allowable Leakage
1.	Core Spray System	40-03	≤5.0 gpm
		40-13	≤5.0 gpm
2.	Condensate Supply to Core Spray (Keep Fill System)	40-20	≤5.0 gpm
		40-21	≤5.0 gpm
		40-22	≤5.0 gpm
		40-23	≤5.0 gpm
3.	Core Spray Supply to Shutdown Cooling (Waterseal)	38-165	≤0.375 gpm
		38-166	≤0.375 gpm
		38-167	≤0.375 gpm
		38-168	≤0.375 gpm
		38-169	≤0.375 gpm
		38-170	≤0.375 gpm
		38-171	≤0.375 gpm
		38-172	≤0.375 gpm

Footnote:

(a) 1. Leakage rates shall be limited to 0.5 gpm per nominal inch of valve diameter up to a maximum of 5 gpm.

2. Test differential pressure shall not be less than 150 psid.

3. The observed leakage at test differential pressure shall be adjusted to the functional maximum pressure differential.

ATTACHMENT B

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Supporting Information and No Significant Hazards Consideration Analysis

BACKGROUND

The Shutdown Cooling System is designed to cool the reactor water below temperatures and pressures at which the main condenser can be used as a heat sink following reactor shutdown. Once the reactor water has been cooled to below 350°F by the main condenser, the Shutdown Cooling System is used to cool the water down to 125°F and maintain it at these temperatures. The Shutdown Cooling System is a closed loop system that takes suction from the suction line of reactor recirculation pump 14 and returns back through reactor recirculation pump 15 discharge. Isolation valves 38-01 (AC motor, inboard) and 38-02 (DC motor, outboard) are provided on the suction side of the system. Isolation valves 38-12 (check, outboard) and 38-13 (AC motor, inboard) are provided on the discharge side of the system. The portion of the system between the recirculation lines and the outboard isolation valves is safety related and designed for reactor temperature and pressure of 575°F and 1200 psig respectively. The remaining portion of the system is designed for 1200 psig and 350°F and is non-safety related. The Shutdown Cooling System does not perform any post-LOCA function except for the containment isolation valves. The original Nine Mile Point Unit 1 design basis considerd the Shutdown Cooling System to be an extension of containment under accident conditions and therefore the suction and discharge valves did not require testing in accordance with 10CFR50 Appendix J. A Safety Evaluation Report issued by the NRC dated May 6, 1988, determined that these valves are containment isolation valves and should be included in the Appendix J program, which would require Type C local leak rate testing.

Niagara Mohawk requested a schedular exemption from Appendix J in order to allow the replacement of the existing valves with valves capable of being Type C air tested. The schedular exemption was required since sufficient time would be required to procure and install testable valves. ALARA concerns associated with draining and decontaminating the reactor vessel and outage management philosophy also necessitated the request for exemption. A schedular exemption was granted which allowed the valves to be replaced during the 1995 refueling outage.

As discussed with the NRC at a meeting on February 22, 1994, it is Niagara Mohawk's intention to provide a seal water system that will meet Section III.C.3 of 10CFR50 Appendix J. This is in lieu of replacing the Shutdown Cooling System isolation valves with ones that are Type C air testable. The proposed changes to Table 3.2.7.1, "Primary Coolant System Pressure Isolation Valves," are required since check valves 38-165, 166, 167, 168, 169, 170, 171 and 172 are being added, such that the Core Spray System can

be used as a seal water system. These valves represent a high pressure/low pressure interface between the Reactor Coolant System and the Core Spray System. As requested by the Staff, a description of the seal water system is provided below.

The Core Spray System will provide the pressurized seal water. The water seal will be applied to the interspace between the inboard and outboard shutdown cooling isolation valves from either core spray loop 11 or 12. The seal water will be supplied to a common header connected to the existing test connections located on the inboard side of the outboard shutdown cooling isolation valves as shown on Figure 1. The check valves mentioned above are being added to provide the high pressure/low pressure isolation interface. They also prevent seal water from one loop entering the other. The water supply for the Core Spray System is from the torus. An adequate supply is available for 30 days, since leakage through the valves would be back to the containment or to the closed loop Shutdown Cooling System. Equipment leakage from the Shutdown Cooling System to the reactor building would be minor and would have an insignificant impact on control room habitability or post-accident offsite doses. Additionally, make-up to the torus is provided from the Containment Spray Raw Water System. The seal water supply lines have been sized to provide a flow of nominally 20 gpm at a pressure of 38.5 psig (1.1 P_a), based on a minimum pressure of approximately 150 psig at the discharge of the core spray topping pump. This corresponds to the theoretical minimum topping pump discharge pressure assumed in the Appendix K analysis at the run out flow of approximately 4540 gpm.

In order to evaluate the effect of the reduction in core spray flow, it was assumed that a gross failure occurred in one of the shutdown cooling isolation valves. This results in a back pressure of zero psig corresponding to a complete failure of one of the shutdown cooling isolation valves to seat. This would cause a maximum flow diversion of 35 gpm. The Appendix K analysis assumes approximately 10% degradation in flow (i.e., ~450 gpm) due to pump degradation, therefore, the loss of 35 gpm is insignificant and has no adverse effect on the analysis.

The Core Spray System would be required to run continuously for 30 days in order to meet the 30 day requirement of Section III.C.3(b) of 10CFR50 Appendix J. In the event that the accident requires either partial or no core spray injection (i.e., small break LOCA), the core spray pumps would typically be secured and seal water would not be available. Therefore, in order to meet the 30 day requirement, throttling and extended recirculation modes of operation for the Core Spray System are being added to maintain an operable water seal system. Extended recirculation would require the test return valves to open. However, both test return valves are powered from power board 167, representing a potential single failure which could cause a loss of the water seal.

A probabilistic risk assessment was performed to determine the probability of the scenario that could affect the water seal. The scenario evaluated was a small break LOCA with loss of offsite power and bus failure of power board 167. This scenario is appropriate since the test return lines are only needed when break flow is less than minimum pump flow. When offsite power is available, high pressure coolant injection (HPCI) is used for reactor make-up. HPCI is non-safety related, however, it requires surveillance testing in accordance with Technical Specification 4.1.8. The small break LOCA frequency is

8×10^{-3} per year, loss of offsite power is 1.37×10^{-4} per year and failure of power board 167 is 3.49×10^{-5} per year. This results in an overall probability of 3.8×10^{-11} per year. In addition, loss of power board 167 could be detected in the control room as power board 167 supplies the indicating lights for the core spray test valves.

During plant operation the Shutdown Cooling System isolation valves are normally closed. The breakers for Shutdown Cooling System isolation valves 38-01, 02, and 13 will be racked out to prevent a spurious valve opening (single active failure) from defeating the water seal. Valve 38-12 is a check valve which is not subject to an active failure. However, the water seal is subject to a single active failure when the plant is in the process of cooldown and the breakers have been racked in such that the system can be activated to perform its function. This occurs when reactor coolant temperature is less than 350°F and reactor pressure is approximately 120 psig. Should a LOCA occur at this time, failure of an isolation valve to close upon receipt of an initiating signal could cause a loss of the water seal. Based on current operating experience, less than three startup/shutdown cycles are expected per year. This results in an average of 10 hours per year when the system could be in this configuration.

A probabilistic risk assessment was performed to determine the probability of a LOCA occurring during the time when the Shutdown Cooling System is in operation. The probability of any LOCA occurring with the RPV in a depressurized state is 1.2×10^{-3} per year. Assuming Shutdown Cooling System operation (reactor pressure less than 120 psig and temperature less than 350°F) of 10 hours per year, the probability of a LOCA is 1.3×10^{-6} per year. In addition, the probability of a single failure of a valve failing to close rendering the water seal inoperable is on the order of 0.1. This results in a probability of 1.3×10^{-7} per year. However, in order to produce any radiological consequences, a core damage event would need to occur. The probability of this occurring during the 10 hours per year in which the Shutdown Cooling System is in use is 1.1×10^{-8} per year. Multiplying by the estimated water seal failure probability results in a probability of a non-watersealed core damage event at 1.1×10^{-9} per year.

Both events described above are considered to be incredible and therefore are not required to be analyzed based on guidance in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," and Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities - 10CFR50.54." Section 2.2.3 of NUREG-0800 states that offsite hazards resulting in a greater than 1×10^{-7} per year probability of offsite release in excess of 10CFR100 guidelines should be considered design basis events. Thus, events with probabilities less than 1×10^{-7} per year need not be considered. Generic Letter 88-20 requires that important sequences and functional failures with probabilities greater than 1×10^{-6} per year be reported to the Commission. Consequently, given the probability of these events being significantly less than the referenced guidance, Niagara Mohawk believes no further evaluation is warranted.

DESCRIPTION OF PROPOSED CHANGE

The following Technical Specification changes are required to implement the use of a seal water system for Shutdown Cooling System isolation valves 38-01, 02, 12 and 13.

Table 3.2.7.1, "Primary Coolant System Pressure Isolation Valves"

Add item 3 as follows:

	SYSTEM	VALVE NO.	MAXIMUM[a] ALLOWABLE LEAKAGE
3.	Core Spray Supply to Shutdown Cooling (Waterseal)	38-165	≤0.375 gpm
		38-166	≤0.375 gpm
		38-167	≤0.375 gpm
		38-168	≤0.375 gpm
		38-169	≤0.375 gpm
		38-170	≤0.375 gpm
		38-171	≤0.375 gpm
		38-172	≤0.375 gpm

EVALUATION

Reactor Safety Study, WASH-1400, identified an intersystem LOCA in a PWR which is a significant contributor to core damage accidents. The design examined in WASH-1400 contains in series check valves isolating the High Pressure Primary Coolant System from Low Pressure Injection System piping. This arrangement could lead to an overpressurization and rupture of the low pressure piping that results in a LOCA that bypasses primary containment. All licensees were requested to provide information to the Commission in order that an evaluation could be performed on all light water reactors. Niagara Mohawk responded on March 19, 1980 and subsequently by Order dated April 20, 1981, the NRC issued Technical Specification 3.2.7.1, "Primary Coolant System Pressure Isolation Valves," for Nine Mile Point Unit 1.

The Core Spray System was identified as having configurations in which isolation of the high pressure Reactor Coolant System from the low pressure Core Spray System is provided by check valves. The NRC stated in its Order that these valves should be tested periodically to ensure low probability of gross failure and as such reduce the risk of an intersystem LOCA. The testing is a hydrostatic pressure test. A leakage acceptance criteria was also contained in that Order, which was subsequently changed to 0.5 gpm per nominal inch of valve diameter up to a maximum of 5.0 gpm. These are currently reflected in Specification 3.2.7.1.

The proposed seal water system for Shutdown Cooling System isolation valves 38-01, 02, 12, and 13 utilizes the low pressure Core Spray System. In order to utilize this system, it is necessary to install check valves 38-165, 166, 167, 168, 169, 170, 171, and 172. The addition of these valves represents an additional high pressure/low pressure interface, thus creating the potential for an intersystem LOCA. Therefore, in accordance with the above, these valves are being added to Table 3.2.7.1 and will be tested in a manner similar to the valves already contained in the Table.

The portion of the seal water system from the interface with the Shutdown Cooling System isolation valves up to and including the check valves identified above is designed as safety related with a temperature and pressure rating equal to that of the Reactor Coolant System. This configuration is similar to that used in the Keep Fill System that was added to prevent water hammer in the Core Spray System (i.e., two check valves downstream of the motor operated core spray injection valves).

<u>CONCLUSION</u>

The addition of check valves 38-165, 166, 167, 168, 169, 170, 171, and 172 provides isolation between the high pressure Reactor Coolant System and the low pressure Core Spray System. The seal water system design up to the check valves meets the same design criteria as the Reactor Coolant System with respect to safety classification, temperature, and pressure. Leak testing for these check valves will be in accordance with Specification 3.2.7.1. Therefore, adequate assurance is provided such that the low pressure Core Spray System will not be damaged by overpressurization and result in potential loss of integrity with subsequent release of radioactivity.

Therefore, there is reasonable assurance that the operation of Nine Mile Point Unit 1 in the proposed manner will not endanger the public health and safety, and that issuance of the proposed amendment will not be inimical to the common defense and security.

<u>NO SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS</u>

10CFR50.91 requires that at the time a licensee requests an amendment, it must provide to the Commission its analysis using the standards in 10CFR50.92 concerning the issue of no significant hazards consideration. Therefore, in accordance with 10CFR50.91, the following analysis has been performed.

<u>The operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not involve a significant increase in the probability or consequences of an accident previously evaluated.</u>

The proposed change requires the addition of Primary Coolant System pressure isolation valves for the prevention of an intersystem LOCA. The proposed addition does not affect operation of either the Shutdown Cooling or Core Spray Systems. These changes do not alter any accident initiators or precursors and therefore does not affect the probability of a previously evaluated accident.

Testing these valves in accordance with Specification 3.2.7.1 provides assurance that the Core Spray System will not be damaged by an overpressurization event which could lead to potential loss of integrity of the system and subsequent release of radioactivity. Thus, the addition of the valves would not increase the consequences of any accident. Therefore, the operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed addition of Primary Coolant System pressure isolation valves, although a physical change, does not alter the initial conditions used for any design basis accident. The check valves provide the high pressure/low pressure isolation between the Reactor Coolant and Core Spray Systems. These valves will be subject to leak rate testing in accordance with Specification 3.2.7.1. This ensures that an intersystem LOCA is prevented. The proposed change has no effect on operation of either the Shutdown Cooling or Core Spray Systems. Therefore, the design capabilities of these systems are not challenged in a manner previously assessed so as to create the possibility of a new or different kind of accident. Accordingly, operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not create the possibility of a new or different kind of accident from any accident previously analyzed.

The operation of Nine Mile Point Unit 1, in accordance with the proposed amendment, will not involve a significant reduction in a margin of safety.

The proposed change which requires the addition of Primary Coolant System pressure isolation valves, ensures proper isolation of a high pressure/low pressure interface between the Reactor Coolant and Core Spray Systems. The pressure isolation valves will be leak tested in accordance with Specification 3.2.7.1. This provides assurance that the Core Spray System will not be damaged by an overpressurization event and will not result in loss of integrity of the system. Thus, the results of any event previously analyzed remains unchanged. Therefore, the operation of Nine Mile Point Unit 1, in accordance with the proposed amendment will not involve a significant reduction in a margin of safety.

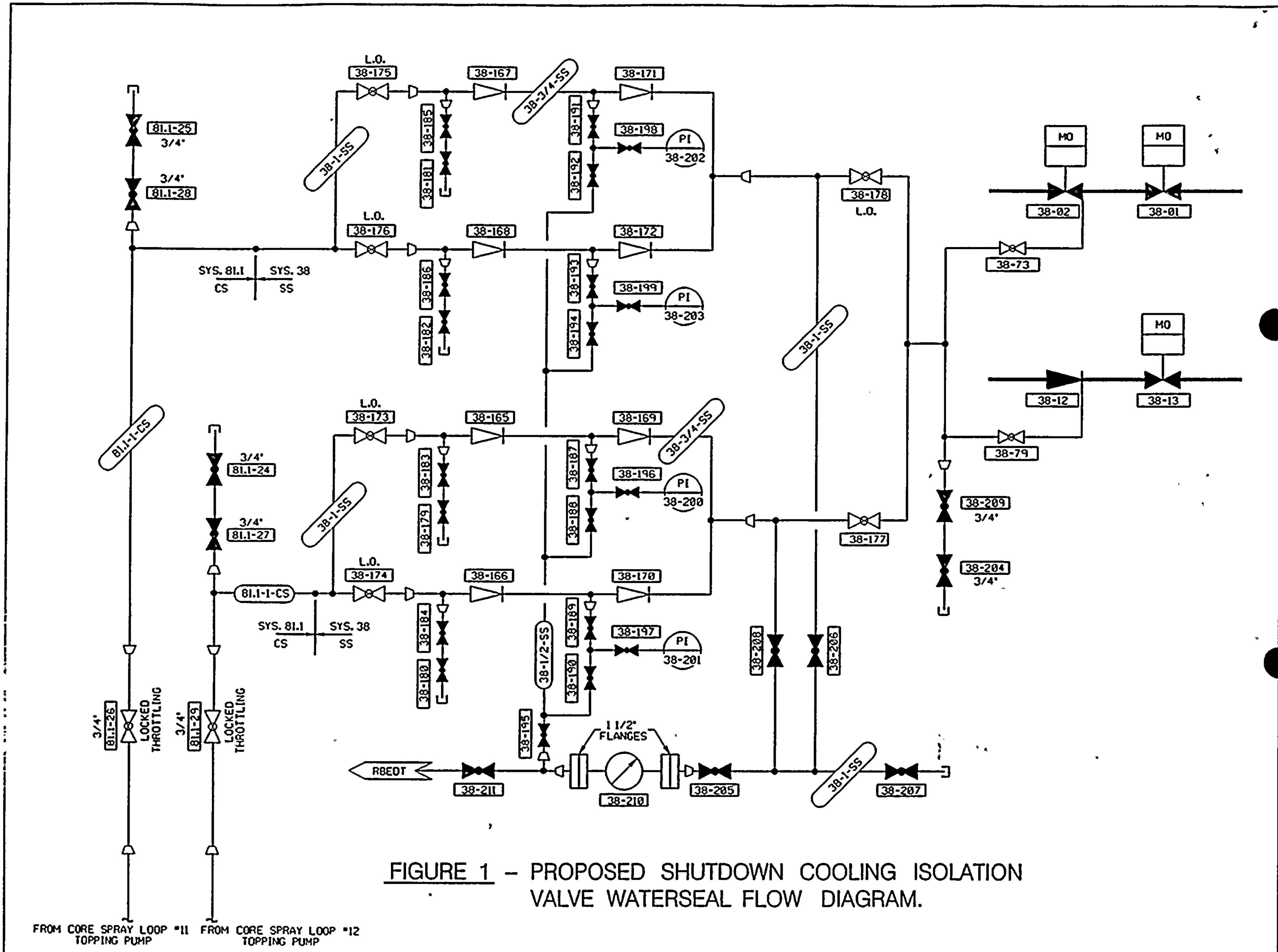

FIGURE 1 – PROPOSED SHUTDOWN COOLING ISOLATION VALVE WATERSEAL FLOW DIAGRAM.