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SUBJECT: Forwards response to GL 95-07, "Pressure Locking & Thermal Binding of Safety-Related Power-Operated Gate Valves."

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L-96-024
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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to Generic Letter 95-07,
Pressure Locking and Thermal Binding of
Safety-Related Power-Operated Gate Valves

By letter dated August 17, 1995, the NRC issued Generic Letter (GL) 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," requesting licensees to perform, or confirm that they performed, (1) evaluations of operational configurations of safety related, power operated gate valves for susceptibility to pressure locking and thermal binding and (2) further analyses, and any needed corrective actions, to ensure these valves are capable of performing their intended safety functions.

By letter L-95-275 dated October 11, 1995, Florida Power and Light Company (FPL) stated its intent to implement the actions requested in GL 95-07 to the schedule proposed by the Staff.

In accordance with GL 95-07, FPL has completed: (1) the evaluation of the operational configurations of safety related power operated gate valves to identify those valves which are susceptible to pressure locking or thermal binding, and (2) performed further analyses as appropriate, and taken needed corrective actions, to ensure that the susceptible valves identified in Item 1 are capable of performing their intended safety function(s) under all modes of plant operation, including test configurations.

In accordance with the reporting requirements of GL 95-07, the attachment to this letter provides a summary of the evaluation performed to demonstrate that power operated gate valves at Turkey Point will not be prevented from performing their active safety functions by the phenomena of pressure locking or thermal binding, and to identify the corrective actions implemented to assure the susceptible valves will remain capable of performing their intended safety related functions.

The information is provided pursuant to the requirements of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

Should there be any questions concerning this response, please contact us.

Very truly yours,

Robert J. Hovey
Vice President
Turkey Point Plant

OIH

cc: S. D. Ebneter, Regional Administrator, Region II, USNRC
T. P. Johnson, Senior Resident Inspector, USNRC, Turkey Point Plant

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STATE OF FLORIDA)
) ss.
COUNTY OF DADE)

Robert J. Hovey being first duly sworn, deposes and says:

That he is Vice President, Turkey Point Plant, of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

Robert J. Hovey

Subscribed and sworn to before me this 2nd day of February, 1996.

James E. Knorr
Name of Notary Public (Type or Print)
NOTARY PUBLIC, in and for the County of Dade, State of Florida

My Commission expires 1-22-99
Commission No. CC 434300

JAMES E. KNORR
MY COMMISSION # CC 434300
EXPIRES: January 22, 1999
Bonded Thru Notary Public Underwriters

Robert J. Hovey is personally known to me.

ATTACHMENT TO L-96-024

RESPONSE TO GENERIC LETTER 95-07
"PRESSURE LOCKING AND THERMAL BINDING OF
SAFETY-RELATED POWER-OPERATED GATE VALVES"

SUMMARY REPORT FOR TURKEY POINT UNITS 3 & 4
PRESSURE LOCKING AND THERMAL BINDING EVALUATION OF
SAFETY RELATED POWER OPERATED GATE VALVES

1.0 Introduction

The NRC issued Generic Letter (GL) 95-07, "Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," requesting licensees to perform, or confirm that they performed, (1) evaluations of operational configurations of safety related, power operated gate valves for susceptibility to pressure locking and thermal binding and (2) further analyses, and any needed corrective actions, to ensure these valves are capable of performing their intended safety functions.

The purpose of this document is to provide a summary of the evaluation performed to demonstrate that power operated gate valves at Turkey Point will not be prevented from performing their active safety functions by the phenomena of pressure locking or thermal binding, and to identify the corrective actions implemented to assure the susceptible valves will remain capable of performing their intended safety related functions.

A thorough evaluation of the power operated gate valves used in Turkey Point Units 3 and 4 safety related systems was conducted. The evaluation addressed the following actions requested within GL 95-07:

"90-Day Actions"

1. Perform a screening evaluation of the operational configurations of all safety related power operated gate valves to identify valves that are potentially susceptible to pressure locking or thermal binding.

2. Document a basis for the operability of potentially susceptible valves or where operability can not be supported, take action in accordance with the Technical Specifications.

"180-Day Actions"

3. Evaluate the operational configurations of safety related power operated gate valves that are susceptible to pressure locking or thermal binding.

4. Perform further analyses as appropriate, and take needed corrective actions, to ensure that the susceptible valves identified in Item 1 above are capable of performing their intended safety function(s) under all modes of plant operation, including test configurations.

2.0 Background

In response to nuclear industry events associated with motor-operated valve performance, the NRC issued GL 89-10, which requested that operating and construction permit licensees provide additional assurance of the capability of safety related motor operated valves (MOVs) to perform their safety related functions. GL 89-10 requested that licensees review MOV designs, verify MOV switch settings, test MOVs under design-basis conditions where practicable, improve the evaluations and corrective actions of MOV failures, and trend MOV problems.

In Enclosure 1 to Supplement 6 of GL 89-10 (Reference 2), the NRC Staff described one acceptable approach for licensees to address pressure locking and thermal binding of motor-operated gate valves. GL 89-10, Supplement 6, confirmed that licensees are expected, under existing regulations, to take actions necessary to ensure that safety related power operated gate valves susceptible to pressure locking or thermal binding are capable of performing their required safety related functions.

In subsequent communications, NRC GL 95-07 confirmed the NRC Staff position on this issue and requested that licensees perform or confirm evaluations and actions previously performed to ensure that safety related power operated gate valves susceptible to pressure locking and thermal binding are capable of performing required safety related functions within the current licensed design bases of the facility.

In response to GL 95-07, Florida Power and Light (FPL) has performed the requested actions discussed within the GL. FPL has joined with other Westinghouse Owner's Group (WOG) utilities to develop the screening, evaluation, and acceptance criteria required to uniformly and comprehensively address the requirements of the GL 95-07.

FPL has previously evaluated the potential for pressure locking and thermal binding of power operated gate valves for Turkey Point as part of an ongoing effort to address issues identified in GL 89-10 and from the resolution of concerns identified in Institute of Nuclear Power Operations (INPO) Significant Operating Experience Reports (SOERs). The Turkey Point response to GL 95-07, as described below, incorporates the knowledge base and results of these previous evaluations of power operated gate valves.

3.0 Evaluation Process

FPL had previously evaluated the potential for pressure locking of power operated gate valves at Turkey Point in a response to INPO SOER 84-07 (Reference 3). This evaluation identified the potential for pressure locking in forty (40) valves and provided corrective action options. Sixteen (16) of these valves were modified with a bonnet equalization path. A subsequent engineering evaluation performed for Turkey Point in 1989

concluded that the remaining valves had no operability concerns relative to pressure locking.

An additional evaluation of the potential for pressure locking and thermal binding was performed considering the NRC concerns detailed in NUREG 1275 Volume 9 (Reference 4) and Supplement 6 to GL 89-10. The scope was limited to the motor-operated valves included in the GL 89-10 MOV Program scope.

This response provides a summary of the detailed engineering evaluation prepared to address the requirements of NRC GL 95-07. The detailed engineering evaluation reevaluated the GL 89-10 MOVs and other safety related power operated gate valves identified to be within the scope of NRC GL 95-07. Where applicable, the effects of reduced voltage have been considered, consistent with the requirements of GL 95-07. In addition, NRC Information Notice (IN) 95-14 (Reference 5) identifies a potential pressure locking scenario which may occur in a steamline valve, when differential pressure exists across the disc and the valve orientation permits condensate to collect and enter the bonnet. Potentially susceptible valves were also evaluated to determine if valve orientation could cause pressure locking.

3.1 Gate Valve Identification

The starting point for the evaluation to address GL 95-07 concerns was a listing of all safety related power operated gate valves which perform safety related functions during design basis events. All safety related power operated gate valves or power operated gate valves with a licensing commitment were considered applicable to the GL 95-07 evaluation. The following search process was used to develop the list of all safety related power operated valves:

1. Using FPL's Total Equipment Database (TEDB - a computerized component level data base), a report was generated for Unit 3, Unit 4, and common safety related valves by actuator type (i.e., motor-operated, air-operated, hand control, etc). This report identified all safety related power operated valves at Turkey Point. The report also indicated valve type (gate, globe, ball, butterfly).

2. Plant Piping and Instrumentation Diagrams and valve drawings were reviewed to verify valve type as indicated in the TEDB report to determine the total gate valve population.

3. From this report a plant specific list of all the safety related power operated gate valves was developed.

4. This final list was compared with a generic WOG applicability list based on a WOG Task Team Survey of similar plants to ensure completeness. The final list was also compared to the list of MOVs generated during one of the earlier FPL reviews to address the requirements of GL 89-10.

The final safety related power operated gate valve identification list is contained in Table 1 of this document. Table 1 also provides a brief description of each valve.

3.2 Screening Evaluation

After all safety related power operated gate valves were identified, this population of valves was then screened based on valve type and active safety function to determine whether there was a potential for pressure locking or thermal binding that could prevent these valves from performing their intended safety related functions. FPL utilized the screening criteria recommended by the Westinghouse Owner's Group (WOG), which was selected for consistency with the criteria specified in the NRC GL 95-07. The WOG recommended screening criteria is provided in the following discussion.

The following screening criteria were applied to the listing of all safety related power operated gate valves (from Table 1) identified for Turkey Point:

1. Only gate valves are potentially susceptible to pressure locking or thermal binding. In accordance with GL 95-07, all other types of valves were removed during this part of the screening evaluation process.

2. Only valves having a safety related function, which requires the valve to change position from closed to open, can be prevented from performing their safety related function as a result of pressure locking or thermal binding. This screening was based on the design basis functions provided in the Turkey Point Updated Final Safety Analysis Report, the Design Basis Documents, plant Technical Specifications, and other design and licensing documentation.

3. Pressure locking can only occur in double disc or flexible wedge gate valves; therefore solid wedge designs were not evaluated for pressure locking. Valve types were based on a review of the valve drawings.

4. Double disc valves with parallel seat designs are not subject to thermal binding. Note that double disc gate valves without parallel seats (i.e. split wedge gate valves) were conservatively classified as flex wedge gate valves and were evaluated for thermal binding.

Application of the above screening criteria resulted in the selection of all safety related gate valves which were determined to be "potentially susceptible" to pressure locking or thermal binding. The final population of potentially susceptible gate valves is summarized below.

Valves Potentially Susceptible to Pressure Locking

MOV-3/4-350	MOV-3/4-535 & 536
MOV-3/4-744A/B	MOV-3/4-750 & 751
MOV-3/4-843A/B	MOV-3/4-860A/B
MOV-3/4-861A/B	MOV-3/4-863A/B
MOV-3/4-869	MOV-3/4-872
MOV-3/4-880A/B	

Valves Potentially Susceptible to Thermal Binding

MOV-3/4-350	MOV-3/4-535 & 536
MOV-3/4-744A/B	MOV-3/4-749A/B
MOV-3/4-863A/B	MOV-3/4-872

3.3 Individual Gate Valve Evaluations

After the valves were screened with the criteria listed above in Section 3.2, the valves requiring additional evaluation were examined individually to determine whether any corrective action was required to reduce the potential for pressure locking or thermal binding.

3.3.1 Individual Pressure Locking Evaluations

Based on previous evaluations, some performed for GL 89-10, a number of gate valves were previously identified as having the potential to experience pressure locking. Corrective actions were, therefore, implemented to provide an interdisc vent path as part of the permanent design for these valves.

The valves listed below have an interdisc vent path design feature to eliminate any potential for pressure locking. To ensure that each of these valves retains this crucial design feature, various administrative controls, plant maintenance procedures, and drawings have been established to ensure that this design feature will be properly maintained.

1. MOV-3/4-350

   These valves have a 3/16-inch hole drilled in the upstream disc to provide an interdisc vent path.

2. MOV-3/4-750 & 751

   MOV-3/4-750 has a 3/16-inch hole in the upstream (RCS side) disc. The bonnet of MOV-3/4-751 is vented through the packing leakoff.

3. MOV-3/4-843A/B

   These valves have a vent pipe welded to the valve body which provides an inter-disc vent path.

4. MOV-3/4-860A/B

   These valves have a vent pipe welded to the valve body which provides an inter-disc vent path.

5. MOV-3/4-861A/B

   These valves have a 3/16-inch hole drilled in the downstream disc to provide a inter-disc vent path.

6. MOV-3/4-869

   These valves have a 1/8-inch hole drilled in the downstream (RCS side) disc to provide an inter-disc vent path.

7. MOV-3/4-872

   These valves have a 1/8-inch hole drilled in downstream disc to provide an inter-disc vent path.

After eliminating the above valves from further consideration, only the following listed valves required an additional evaluation for potential pressure locking:

MOV-3/4-744A/B	MOV-3/4-535 & 536
MOV-3/4-880A/B	MOV-3/4-863A/B

The above listed valves identified in the screening as requiring additional evaluation for pressure locking were evaluated using the WOG System Level Screening Criteria where applicable. Potential pressure locking due to both hydraulic and thermally induced effects was considered.

1. MOV-3/4-535 & 536, PORV Block Valves

   MOV-3/4-535 and 536 are the pressurizer PORV block valves. A detailed review of the design basis and licensing requirements has concluded that the valves do not perform an active safety related function to open during power operation. They are required to be in the open position to provide overpressure protection to the RCS during low temperature operation, but are not required to change position to perform this function (i.e. the valves are pre-staged open). However, for completeness, these valves have been evaluated for pressure locking.

   Hydraulic Effects - The valve manufacturer's design experience and testing results have determined that these valves have a

rigid disc design which responds to bonnet cavity pressurization in a manner similar to a solid wedge gate valve. The manufacturer's methodology is based on testing and concluded that any pressure locking forces are limited to the vertical component of the seating area. These forces were determined to be small and well within the actuator capability for these MOVs. Therefore, the PORV block valves are not susceptible to hydraulic pressure locking.

Thermally Induced - MOV-3/4-535 & 536 could be closed at normal operating pressurizer temperature to isolate a leaking pressurizer PORV. After closing, the valves would not be exposed to temperatures higher than the normal pressurizer operating temperature. Therefore, thermally induced pressure locking is not a concern for these valves.

2. MOV 3/4-744 A/B, Low Head Safety Injection Isolation Valves

MOV-3/4-744A/B serve as the discharge isolation valves for the residual heat removal (RHR) pumps. The valves are required to open automatically in response to a safety injection (SI) signal to establish a low head safety injection flow path to the RCS.

Hydraulic Effects - The valve manufacturer's design experience and testing results have determined that these valves have a rigid disc design which responds to bonnet cavity pressurization in a manner similar to a solid wedge gate valve. The manufacturer's methodology is based on testing and concluded that any pressure locking forces are limited to the vertical component of the seating area. These forces were determined to be small and well within the actuator capability for these MOVs. Therefore, MOV-3/4-744A/B are not susceptible to hydraulic pressure locking.

Thermally Induced - The detailed evaluation determined that these valves could experience heating from a post-Loss of Coolant Accident (LOCA) containment environment. Therefore, the valves were evaluated for thermally induced pressure locking. Calculations were performed to determine the stem thrust required to open the valve if the bonnet cavity was conservatively assumed to be at normal RCS pressure and subsequently heated by elevated post-LOCA containment temperatures. The resulting stem thrust is considerably less than the thrust required to open the valve under design basis conditions confirming that these valves are not susceptible to thermally induced pressure locking.

3. MOV 3/4-863 A/B, SI/CS Recirculation Phase Suction Valves

MOV-3/4-863A/B normally provide isolation between the RHR pump discharge headers and the recirculation suction headers of the high head SI (HHSI) pumps and containment spray (CS) pumps. The valves are required to open during the post-LOCA

recirculation phase to provide a "piggyback" operation flow path for containment sump water to the HHSI and CS pump suction headers.

Hydraulic Effect - During normal RHR system operation, these locked closed valves could be exposed to RCS pressure plus RHR pump discharge pressure during plant cooldown or heatup. Therefore, these valves were evaluated for pressure locking.

During plant cooldown, the potential for bonnet pressurization is not a concern, since sufficient bonnet pressure decay time would exist prior to the plant entering Mode 3. However, during plant heatup, the valve bonnets could potentially be pressurized while the unit is heating up and the RHR system is in service. Therefore, an evaluation using plant heatup rate, the Westinghouse Owner's Group recommended bonnet depressurization rate of 1.0 psi/minute, and the time when MOV-3/4-863A/B would be required for recirculation operation after a LOCA, was performed. The evaluation showed that potential pressure locking was not a concern, since sufficient bonnet pressure decay time would exist prior to the time the valves would be required to perform their intended safety related function.

Thermally Induced

The detailed evaluation determined that these valves could be closed at ambient temperature. Prior to initiating the post-LOCA recirculation phase, all system piping would contain refueling water storage tank (RWST) fluid at ambient temperature. Therefore, the valves would also be opened under ambient conditions to perform their safety related function. Since only normal ambient temperature changes would occur, conditions associated with pressure locking from bonnet cavity heating will not be present. Therefore, thermally induced pressure locking is not a concern for these valves.

4. MOV 3/4-880A/B, CS Pump Discharge Valves

MOV-3/4-880A/B are the containment spray (CS) pump discharge MOVs. During accident conditions, the valves are required to automatically open to initiate containment spray.

Hydraulic Effect - The detailed evaluation concluded that these normally closed valves are subjected to containment spray pump discharge pressure during pump in-service testing. Therefore, the valves could be exposed to pressure conditions that could lead to pressure locking immediately following the containment spray pump test. To evaluate these conditions, calculations were performed which concluded that the torque required to open these valves is within the capability of the valve and actuator. Therefore, the valves remain operable during and after the containment spray pump test. However, as an added conservatism, FPL will revise the pump testing

procedure to stroke the valve after each pump run to preclude the potential for pressure locking.

Thermally Induced - These valves are normally closed under ambient conditions after containment spray pump testing. To perform their safety function the valves would also be opened under ambient conditions. Since only normal ambient temperature changes will occur, conditions associated with pressure locking from bonnet cavity heating will not be present. Therefore, thermally induced pressure locking is not a concern for these valves.

3.3.2 Individual Thermal Binding Evaluations

Valves requiring additional evaluation were examined individually to determine whether any corrective action was required to reduce the potential for thermal binding. The valves requiring additional evaluation are listed below.

Valves Potentially Susceptible to Thermal Binding

MOV-3/4-350	MOV-3/4-535 & 536
MOV-3/4-744A/B	MOV-3/4-749A/B
MOV-3/4-863A/B	MOV-3/4-872

No screening criteria at the component level was available to remove valves from further consideration to address issues associated with thermal binding. Therefore, each valve identified in the screening as requiring additional evaluation for thermal binding is addressed below:

1. MOV 3/4-350 Emergency Boration Valves

MOV-3/4-350 are normally closed and provide a flow path for concentrated boric acid from the boric acid tanks to the suction of the charging pumps. Consistent with the design and licensing bases for Turkey Point, the opening function for these valves is not considered to be safety related. However, the valves have been included in this evaluation for completeness.

MOV-3/4-350 are normally closed when the boric acid makeup system is at ambient conditions. To perform their quality related function, the valves would also be opened under ambient conditions. Since only normal ambient temperature changes will occur, conditions associated with thermal binding will not exist. Therefore, these valves are not susceptible to thermal binding.

2. MOV 3/4-535 & 536, PORV Block Valves

A description of MOV-3/4-535 and 536 has been provided above in Section 3.3.1. As stated above, the detailed evaluation concluded that MOV-3/4-535 & 536 do not perform an active safety related function to open. However, these valves were

evaluated for thermal binding for completeness. Following the closure of a PORV block valve to isolate a leaking PORV, the evaluation determined that significant cooling of the PORV block valve would not occur due to the close proximity of the PORV block valves to the pressurizer. Therefore, thermal binding of the PORV block valves was not considered credible.

3. MOV 3/4-744 A/B, Low Head Safety Injection Isolation Valves

A description of MOV-3/4-744A/B has been provided above in Section 3.3.1. The detailed thermal binding evaluation concluded that MOV-3/4-744A/B could be closed at temperatures up to 350°F during RHR system operation and subsequently be required to open at ambient containment temperature. Therefore, these valves were determined to be potentially susceptible to thermal binding. Normal operation of these valves since initial plant startup has demonstrated that thermal binding has not prevented these valves from opening. In addition, to address concerns associated with NRC GL 89-10, an actuator gear replacement was performed in 1991 which approximately doubled the actuator torque capability. Since thermal binding was not experienced with these valves prior to the 1991 actuator gear replacement, thermal binding would not be expected to be a concern with an actuator with increased capacity. Therefore, FPL has concluded that potential thermal binding for the MOV-3/4-744A/B valves is not a concern.

4. MOV 3/4-749A/B CCW, Outlet from RHR Heat Exchangers

MOV-3/4-749A/B are required to open prior to switchover from the accident injection phase to the recirculation phase. Opening the valves initiates shell side RHR heat exchanger cooling of the containment sump water.

These valves are closed prior to unit heatup with the component cooling water (CCW) system near ambient temperature. When the valves are required to perform their safety related opening function, during initiation of the recirculation mode after a LOCA, the CCW system will be at a similar or slightly higher temperature. Since only normal ambient temperature changes will occur, the potential for thermal binding does not exist. In addition, operating history supports this conclusion since these valves are stroked open, then closed, during performance of the quarterly inservice test of the RHR system. The CCW system is at or near ambient temperature during the test. Therefore, these valves are not susceptible to thermal binding.

5. MOV 3/4-863 A/B, SI/CS Recirculation Phase Suction Valves

A description of MOV-3/4-863A/B has been provided above in Section 3.3.1. The detailed evaluation determined that these valves could be susceptible to thermal binding during infrequent operating configurations if they were closed at elevated temperatures while utilizing the alternate RHR lineup

through MOV-3/4-863A/B. Since the plant does not normally cool down or heat up using this alternate RHR lineup and has not performed this procedure in recent history, the valves remain operable. However, the RHR system operating procedure, infrequent operations section, allows for this alignment. Therefore, FPL will revise the applicable operating procedure(s) to ensure that these valves will not be closed at elevated temperatures.

6. MOV 3/4-872, Alternate Low Head Safety Injection Isolation Valves

MOV-3/4-872 provide an alternate low head safety injection flow path during the LOCA recirculation phase. The detailed evaluation determined that these valves could be susceptible to thermal binding during infrequent operating configurations if they were closed at elevated temperatures while utilizing the alternate RHR lineup through MOV-3/4-872. Since the plant does not normally cool down or heat up using this alternate RHR lineup and has not performed this procedure in recent history, the valves remain operable. However, the RHR system operating procedure, infrequent operations section, allows for this alignment. Therefore, FPL will revise the applicable operating procedure(s) to ensure that these valves will not be closed at elevated temperatures.

4.0 Conclusions

The safety related power operated gate valves evaluated to document the response for GL 95-07 have been reviewed for potential susceptibility to pressure locking and thermal binding. Note that the MOVs have been evaluated for pressure locking and thermal binding previously and that several valves have been modified with an interdisc vent path to prevent pressure locking. In the current configuration, the safety related power operated gate valves at Turkey Point are not susceptible to pressure locking or thermal binding which would prevent the valves from performing their safety related functions. To provide additional assurance of proper valve operation, specific actions will be taken for selected valves to ensure they will remain capable of performing their intended design basis functions. The specific recommended actions are detailed below.

5.0 Required Actions

1. MOV-3/4-350 : No further actions are required for these valves.

2. MOV-3/4-535 & 536 : No further actions are required for these valves.

3. MOV-3/4-744A/B : No further actions are required for these valves.

4. MOV-3/4-749A/B : No further actions are required for these valves.

5. MOV-3/4-863A/B : To preclude the potential for thermal binding, the applicable operating procedures will be revised to ensure that these valves will not be closed at elevated temperatures. Procedure revisions will be completed by February 13, 1996.

6. MOV-3/4-872 : To preclude the potential for thermal binding, the applicable operating procedures will be revised to ensure that these valves will not be closed at elevated temperatures. Procedure revisions will be completed by February 13, 1996.

7. MOV-3/4-880A/B : To preclude the potential for pressure locking, procedure changes will be implemented to require the plant to stroke MOV-3/4-880A/B immediately following operation and/or in-service testing of its associated containment spray pump. Procedure revisions will be completed by February 13, 1996.

6.0 References

1. NRC Generic Letter 95-07,"Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves," dated August 17, 1995.

2. Supplement 6 to NRC Generic Letter 89-10,"Information on Schedule and Grouping, and Staff Responses to Additional Public Questions," dated March 8, 1994.

3. INPO SOER 84-07,"Pressure Locking and Thermal Binding of Gate Valves," dated December 14, 1984.

4. NUREG-1275, Volume 9,"Pressure Locking And Thermal Binding of Gate Valves," dated March, 1993.

5. NRC Information Notice 95-14,"Susceptibility of Containment Sump Recirculation Gate Valves to Pressure Locking," dated February 28, 1995.

TABLE 1

SAFETY RELATED POWER-OPERATED GATE VALVE
INDENTIFICATION LISTING

VALVE TAG NUMBER	DESCRIPTION	SAFETY FUNCTION	VALVE MFG.	TYPE
	UNITS 3 and 4			
MOV-3/4-115C	VCT Discharge to Charging Pump Suction	None	C/A	FWGate
MOV-3/4-350	Emergency Boration Isolation	None	C/A	FWGate
MOV-3/4-381	RCP Pump Seal Water Return Line Isolation	Close	Aloyco	FWGate
MOV-3/4-535	PORV Block Valve	Open/Close	Velan	FWGate
MOV-3/4-536	PORV Block Valve	Open/Close	Velan	FWGate
MOV-3/4-626	RCP Thermal Barrier Outlet Header Isolation	Close	Velan	FWGate
MOV-3/4-716A	RCP CCW Supply Isolation	Close	A/D	DDGate
MOV-3/4-716B	RCP CCW Supply Isolation	Close	A/D	DDGate
MOV-3/4-730	RCP Oil Cooler CCW Return Isolation	Close	A/D	DDGate
MOV-3/4-744A	Low Head Safety Injection Isolation	Open/Close	Velan	FWGate
MOV-3/4-744B	Low Head Safety Injection Isolation	Open/Close	Velan	FWGate
MOV-3/4-749A	RHR Heat Exchanger CCW Supply Isolation	Open	Crane	SWGate
MOV-3/4-749B	RHR Heat Exchanger CCW Supply Isolation	Open	Crane	SWGate
MOV-3/4-750	RHR Suction from the RCS	None	C/V	DDGate
MOV-3/4-751	RHR Suction from the RCS	None	C/V	DDGate
MOV-3/4-843A	Boron Injection to RCS Cold Leg	Open/Close	A/D	DDGate
MOV-3/4-843B	Boron Injection to RCS Cold Leg	Open/Close	A/D	DDGate
MOV-3/4-860A	Containment Sump Isolation	Open	A/D	DDGate
MOV-3/4-860B	Containment Sump Isolation	Open	A/D	DDGate
MOV-3/4-861A	Containment Sump Isolation	Open	A/D	DDGate
MOV-3/4-861B	Containment Sump Isolation	Open	A/D	DDGate
MOV-3/4-862A	RHR Pump RWST Suction Isolation	Close	A/D	DDGate
MOV-3/4-862B	RHR Pump RWST Suction Isolation	Close	A/D	DDGate
MOV-3/4-863A	SI/CS Pump Recirc Phase Suction Isolation	Open	Aloyco	FWGate
MOV-3/4-863B	SI/CS Pump Recirc Phase Suction Isolation	Open	Aloyco	FWGate
MOV-3/4-864A	RWST Isolation Stop Valve	Close	A/D	DDGate
MOV-3/4-864B	RWST Isolation Stop Valve	Close	A/D	DDGate
MOV-3/4-865A	Accumulator Discharge Isolation Valve	None	A/D	DDGate
MOV-3/4-865B	Accumulator Discharge Isolation Valve	None	A/D	DDGate
MOV-3/4-865C	Accumulator Discharge Isolation Valve	None	A/D	DDGate
MOV-3/4-869	SI Hot Leg Injection Isolation	Open/Close	A/D	DDGate
MOV-3/4-872	Alternate Low Head SI to Cold Leg	Open	Velan	FWGate
MOV-3/4-880A	Containment Spray Pump Discharge Isolation	Open	A/D	DDGate

TABLE 1

SAFETY RELATED POWER-OPERATED GATE VALVE
INDENTIFICATION LISTING

VALVE TAG NUMBER	DESCRIPTION	SAFETY FUNCTION	VALVE MFG.	TYPE
	UNITS 3 and 4 (Cont'd)			
MOV-3/4-880B	Containment Spray Pump Discharge Isolation	Open	A/D	DDGate
MOV-3/4-1417	NCC/CRDM Cooler Supply and Return Isolation	Close	Walworth	FWGate
MOV-3/4-1418	NCC/CRDM Cooler Supply and Return Isolation	Close	Walworth	FWGate
MOV-3/4-1420	Steam Generator Feedwater Pump A Discharge	Close	Walworth	FWGate
MOV-3/4-1421	Steam Generator Feedwater Pump A Discharge	Close	Walworth	FWGate
MOV-3/4-1425	Steam Generator Blowdown Sample Isolation	Close	Pacific	SWGate
MOV-3/4-1426	Steam Generator Blowdown Sample Isolation	Close	Pacific	SWGate
MOV-3/4-1427	Steam Generator Blowdown Sample Isolation	Close	Pacific	SWGate
MOV-3/4-6386	RCP Pump Seal Water Return Line Isolation	Close	A/D	FWGate
CV-3/4-6165	Breathing Air Supply (Penetration 30)	Close	A/D	FWGate
CV-3/4-6275 A/B/C	SG Blowdown & Wet Layup (Penetration 28)	Close	A/D	FWGate
	COMMON			
MOV-878A	Safety Injection Pump Crosstie	Close	A/D	DDGate
MOV-878B	Safety Injection Pump Crosstie	Close	A/D	DDGate

ABBREVIATION KEY:

1. The following "valve manufacturer" abbreviations have been used -
   - A/D - Anchor Darling
   - C/A - Crane Alloyco
   - C/V - Copes Vulcan
2. The following "valve type" abbreviations have been used -
   - DD - Double Disc
   - FW - Flexible Wedge
   - SW - Solid Wedge