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 GL 89-10, "Safety-Related Motor-Operated Valve Testing &
 Surveillance."

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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 Request for Additional Information -
Closure of Generic Letter 89-10

On June 28, 1989, the NRC issued Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," recommending that licensees establish a program to provide for the testing, inspection, and maintenance of safety-related motor-operated valves (MOVs). Florida Power and Light Company (FPL) developed a comprehensive program for Turkey Point Units 3 and 4 for testing, inspection, and maintenance of safety-related MOVs to provide the necessary assurance that safety-related MOVs will function when subjected to the design-basis conditions during normal operation and abnormal events within the design-basis of the plant.

By letters L-94-196 dated August 15, 1994, and L-95-23 dated February 2, 1995, FPL notified the NRC of the completion of the GL 89-10 program implementation for Turkey Point Units 3 and 4, respectively. The NRC Staff has requested FPL to provide additional information needed for NRC closure of the GL. Attached is the closure package which summarizes the Turkey Point Units 3 and 4 MOV program and its implementation. The closure package has been prepared following NRC's "Guidance on Closure of Staff Review of Generic Letter 89-10 Programs," dated July 12, 1994, and Temporary Instruction 2515/109, "Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance."

Should there be any questions, please contact us.

Very truly yours,

Robert J. Hovey
Vice President
Turkey Point Plant

OIH

Attachment

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

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TURKEY POINT UNITS 3 AND 4
DOCKET NOS. 50-250, 50-251
LICENSE NOS. DPR-31, DPR-41
NRC GENERIC LETTER 89-10 CLOSURE

In accordance with NRC "Guidance on Closure of Staff Review of Generic Letter 89-10 Programs," dated July 12, 1994, and Temporary Instruction (TI) 2515/109, "Inspection Requirements for Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillance," the following information is provided to assist in the closure of Generic Letter 89-10 for Turkey Point Units 3 and 4. Since the NRC has inspected and determined that the Turkey Point program meets the intent of the NRC's recommendations, appropriate sections from NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25 are referenced where applicable.

SECTION A

The items in this section refer to the number designations provided in the NRC's July 12, 1994 guidance and TI 2515/109.

Item 04.04 Select a sample of MOVs for detailed review from the population of MOVs in the generic letter program.

In implementing its GL 89-10 program, the licensee is expected to have verified the design-basis capability of each MOV in its GL 89-10 program. As a result, the licensee should have available a specific status for each MOV in its GL 89-10 program. Although not necessarily in a single document, the licensee should have available the following status of each MOV in the GL 89-10 program:

- a. Valve number and system label name
- b. Safety function description (and probabilistic risk assessment priority, if applicable)
- c. Manufacturer, type, and size for valve, actuator, and motor for each MOV
- d. Control switch thrust vs. calculated minimum and maximum thrust
- e. Test status (static/dynamic/Design-Basis Differential-Pressure/Percent DBDP during test)
- f. Basis for closure
 - (1) Full d/p or extrapolated partial d/p test
 - (2) Static test only
 - (a) grouping with other valves
 - (b) prototype testing
 - (c) reliance on EPRI or industry test data
 - (d) large calculated margin
 - (e) other (PRA, etc.)
- g. Remaining activities with schedule for completion

FPL Response

There are a total of 111 MOVs in the Turkey Point Units 3 and 4 GL 89-10 MOV Program. The information requested for the program MOVs is contained in Tables A, B and C of this attachment. During the October 1993 inspection, the NRC inspection team selected a sample of MOVs for detailed review and concluded the following:

"Based on the review of the MOVs sampled, the inspectors determined that the licensee was implementing an effective MOV program. In response to GL 89-10, the review of the MOV documentation verified that the design-basis capabilities were being met. The inspectors concluded that the licensee's implementation of its MOV program addressed the GL 89-10 recommendations and the licensee's commitments to the generic letter." (Page 2 of NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25)

Sub-item g of Item 04.04 addresses the schedule of completion dates for remaining activities. Turkey Point has completed the GL 89-10 MOV Program activities with the exception of the implementation of the EPRI Performance Prediction Program (PPP) software for non-testable program MOVs. MOVs identified as non-testable have been evaluated to date with the best test data available. Those MOVs which are to be evaluated with the EPRI PPP software will be evaluated within 120 days of NRC acceptance of the EPRI methodology, currently expected in December 1995.

- Mispositioning

FPL Response

The Turkey Point Units 3 and 4 GL 89-10 MOV program addressed "mispositioning" as required by the original GL. Design-basis reviews conducted for each MOV assumed mispositioning in the determination of the maximum expected differential pressure. Based on the later guidance provided by the NRC, the "mispositioning" criteria for selected MOVs were revised. The NRC staff has indicated that a Supplement to GL 89-10 is in preparation to address valve mispositioning for PWRs. The Turkey Point Units 3 and 4 GL 89-10 MOV Program will be reviewed when the additional guidance concerning valve mispositioning becomes available.

Item 04.05 Verify that the licensee has performed design-basis reviews of the sampled MOVs consistent with the generic letter or its commitments (where accepted under Part 1), as appropriate.

FPL Response

A design-basis review of each program MOV has been completed. During the October 1993 inspection, the NRC inspection team concluded the following;

"The inspectors identified no concerns with the performance of the design-basis review for the selected MOVs and concluded that the licensee has adequately addressed the design-basis review for the MOVs." (Page 5 of NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25)

- Pressure Locking and Thermal Binding

FPL Response

Florida Power and Light Company (FPL) reviewed the entire population of Turkey Point GL 89-10 MOVs for susceptibility to Pressure Locking and Thermal Binding (PL/TB) in accordance with the guidance provided in Supplement 6 of the GL. The review concluded that, based on the previous

evaluations performed in response to INPO SOER 84-7, "Pressure Locking and Thermal Binding of Gate Valves," and selected valve modifications, the motor-operated gate valves in the Turkey Point GL 89-10 program are not susceptible to PL/TB. The review will be included as part of FPL's response to Generic Letter 95-07 addressing PL/TB. The review referenced above was not complete during the October 1993 NRC inspection, (NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25). The inspection team reviewed the Turkey Point response to SOER 84-7 and was aware of on-going MOV PL/TB activities.

Item 04.06 Verify that the licensee has adequately sized the sampled MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate. Verify that switch settings are consistent with the expected design conditions for operation of the valve.

FPL Response

FPL performed calculations to determine the required thrust and actuator capability for each of the program MOVs. These calculations address minimum thrust requirements, valve and actuator structural limits, and actuator torque and thrust capability at degraded voltage conditions. A screening process identified MOVs with low margins, and modifications were implemented to provide additional capability. During the October 1993 inspection, (NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25), the NRC inspection team selected a sample of MOVs for review. No deficiencies were noted.

The NRC inspection team did note two areas of concern with regard to the Turkey Point GL 89-10 MOV sizing and switch setting process. The first concern was that the calculations did not include a specific margin for stem lubrication degradation. Stem lubrication is addressed within the analysis of the MOV static and dynamic test results. Based on the as-left test data, the assumptions for stem coefficients of friction were found to be conservative. Furthermore, the Turkey Point Maintenance Department has instituted a program whereby all GL 89-10 program MOV stems are lubricated approximately every 18 months. As-found testing has proven that the lubrication schedule is adequate. As-found testing will continue to be performed on selected program MOVs or if required for trending to quantify degradation.

The second concern was that margin had not been allocated for load sensitive behavior (rate-of-loading). FPL performed an evaluation which determined that a thrust margin of a minimum of 10% exists in the MOV field setup of high and medium priority MOVs to accommodate load sensitive behavior for each MOV that was DP tested.

Item 04.07 Verify that the licensee has demonstrated the design-basis capability of the sampled MOVs and the adequacy of the licensee's program applied to the sampled MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

FPL Response

Each GL 89-10 program MOV is independently evaluated to ensure it is capable of performing its intended design-basis function. The Turkey Point GL 89-10 MOV Program has taken an aggressive approach to dynamic testing of MOVs. Program strengths as noted in NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25 include the performance of multiple point differential pressure (DP) testing for individual MOVs and the use of upstream and downstream pressure transducers to capture time dependent pressure variation during dynamic testing. For those program MOVs not dynamically tested, the MOVs were evaluated based on the best available plant-specific and/or industry test data. The preferential source would be Turkey Point site specific test data or, if none were available, the EPRI test results for a comparable MOV. As noted above in response to Item 04.04, the NRC inspection team stated in NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25 that a review of the MOV documentation verified the design-basis capabilities are being met.

The inspection team made the following observations for follow-up during program completion;

- a) The Turkey Point GL 89-10 MOV Program was conducting multi-point dynamic testing to develop justification for the use of linear extrapolation. Until this justification is complete, the inspection team considers the extrapolation to be the first stage of a two stage approach. The inspection team expected the justification for this method of extrapolation to be complete in accordance with the scheduled commitment date for the program.

Justification for the use of linear extrapolation has been documented. As stated above, the NRC inspection team considered the multiple point testing and the use of upstream and downstream pressure transducers to be a Turkey Point MOV program strength. The evaluation, issued in January, 1994, concluded that the MOV DP test data obtained shows that MOVs exhibit reasonably linear characteristics and justifies the linear extrapolation methodology. The evaluation results are also in agreement with the test results from the EPRI PPP. As noted in NRC Information Notice 93-88, "Status of Motor-Operated Valve Performance Prediction Program by the Electric Power Research Institute;"

"EPRI reported that the valve sliding friction coefficient tends to decrease with increasing differential pressure which lends support for linear extrapolation of reduced differential pressure results when there is a low potential for valve damage (for example, under nominal flow velocity pumped flow conditions)."

- b) The inspection team noted that no guidance was provided within the program to provide additional margin to account for uncertainties, (e.g., torque switch repeatability) when comparing the extrapolated required thrust with the thrust measured at the control switch trip. No operability concerns were identified, however, additional guidance should be provided for future operability judgements.

Additional guidance has been provided in FPL Engineering Evaluation JPN-PTN-SEMP-93-032, Revision 4, "Engineering Evaluation for the NRC Generic Letter 89-10 MOV Static and Dynamic Test Results." The evaluation reviewed the test results for every valve within the GL 89-10 program and documents the basis for the acceptability of all test results. The

evaluation requires equipment uncertainties to be considered when evaluating dynamic test results.

- c) The inspection team discovered one instance where diagnostic equipment uncertainty was not correctly determined. Engineering incorrectly assumed that a stem mounted strain gauge had been calibrated with the MOVATS torque thrust cell (which would allow the use of a smaller uncertainty), when the strain gauge had not been calibrated. The inspection team reviewed the remaining sample MOVs and found this to be an isolated incident.

The affected engineering calculation was revised and re-issued in March 1994. A complete review of diagnostic equipment data was performed to ensure the error was an isolated incident. No other such errors were discovered. The Turkey Point Maintenance Department test procedures have been revised to include steps to record diagnostic equipment data in the procedure to preclude a similar occurrence.

Specific information on MOV testing is provided in Tables B and C of this attachment.

- GL 89-10, Supplement 5, Diagnostic Test Equipment Accuracy

FPL Response

Diagnostic equipment accuracy (DEA) is included in the setup range (minimum and maximum values) for program MOVs. Included in the DEA value are the vendor published values for the diagnostic system (including any additional sensors) in use at Turkey Point and the appropriate values for torque switch repeatability. These values are combined using the Square Root Sum of the Squares Methodology. As discussed previously, the test results have been reviewed and it has been demonstrated that adequate design margin exists to provide assurance that the program MOVs can perform their design-basis functions. As MOVs are retested, the test results are compared to the design-basis requirements. If the MOV does not satisfy the design-basis requirements, the test results are forwarded to Engineering for evaluation. As documented in FPL's response to Supplement 5 of Generic Letter 89-10, by FPL letter number L-93-230, dated September 30, 1993, issues pertaining to diagnostic equipment accuracy had already been resolved. No additional actions were required as a result of Supplement 5.

- GL 89-10, Supplement 6, Grouping

FPL Response

The Turkey Point GL 89-10 MOV program has developed a grouping methodology consistent with the guidance provide in Supplement 6 of the GL. In order to remove a testable MOV from the dynamic testing schedule, the MOV must meet the following criteria:

- a) The MOV must have "Low" Probabilistic Safety Assessment Impact.
- b) The MOV must not be required to perform in a severe service, (i.e., high temperature, high pressure, blowdown conditions, etc.).
- c) The MOV must possess a high design margin.



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Bounding valve factors for the grouped MOVs were determined by adding the mean valve factor of the test results plus two times the standard deviation. As additional testing was conducted, the bounding valve factors have been revised.

Item 04.08 Verify that the licensee has established a method for periodic verification of adequate capability of the sampled MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

FPL Response

The Turkey Point GL 89-10 MOV Program has established a maximum periodic verification frequency of every 3 refueling outages for all the MOVs within the program. The periodic verification consists of a static test. The program will continue to be reviewed to ensure the periodic verification intervals are adequate.

FPL has evaluated the need to perform future MOV DP testing. The evaluation considered the need to perform dynamic testing based on two requirements. The first requirement is the need to monitor MOV degradation assumed to be internal to the MOV and the second requirement are those maintenance activities which could alter the internal characteristics of the MOV.

On the issue of internal degradation, the evaluation concluded that those MOVs which possessed sufficient DP test data demonstrated that sufficient design margin was available to preclude the need for future dynamic testing. Those MOVs for which sufficient DP test data was not available are included as Phase 2 MOVs (of a two stage approach) which will be evaluated in accordance with the EPRI PPP software. With regard to potential maintenance activities which could affect MOV performance, the evaluation concluded that the guidance provided in existing plant maintenance procedures contains the appropriate criteria to identify the need for dynamic testing following selected maintenance activities.

Item 04.09 Verify that (1) the licensee has analyzed MOV failures which have occurred and has an effective corrective action plan to prevent recurrence and (2) the licensee trends failures of MOVs in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

FPL Response

Trending of MOV data focuses on five areas; motor current, failure root causes, valve stem factors, grease inspections, and running loads/abnormalities in the MOV diagnostic traces. Motor current data is reviewed to establish preventive maintenance intervals and to identify potential incipient motor failure. MOV failure root causes are trended to identify generic and/or recurring failure modes. For selected MOVs, as found stem factors are trended to evaluate the condition of valve stems and stem nuts. As-found stem factor data is also used to evaluate the performance of the valve stem lubricant. Running loads are evaluated to determine packing drag. Grease inspections will be trended to determine if current overhaul schedules are adequate. Corrective actions will be taken as undesirable trends are identified. A feedback mechanism

for any trending data which could affect engineering assumptions is in place. Engineering evaluates the data and calculations are revised as required.

Item 04.10 Verify that the licensee is meeting the program schedule in accordance with the generic letter or its commitments (where accepted under Part 1), as appropriate.

FPL Response

The Turkey Point GL 89-10 MOV Program was implemented consistent with the schedular requirements of the GL. By letters L-94-196 dated August 15, 1994, and L-95-23 dated February 2, 1995, FPL notified the NRC of the completion of the GL 89-10 program implementation for Turkey Point Units 3 and 4, respectively.

Item 04.11 Verify quality assurance program implementation in the design control and testing of the sampled MOVs.

FPL Response

The Turkey Point GL 89-10 MOV program was developed in accordance with FPL's Quality Assurance Program as outlined in the plant procedures and the FPL Nuclear Engineering Quality Instructions. NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25 recommended procedural enhancements to the verification process for the as-found data collected, and the equipment used for the testing. Resolution of this issue is discussed in the response to Item 1 of Section B below.

SECTION B - INSPECTOR FOLLOWUP ITEMS

There were no Inspector Followup Items documented in NRC Inspection Report Nos. 50-250/93-25 and 50-251/93-25. Several concerns were identified as follows:

1. The procedures for the performance of MOV static testing need to be enhanced to define clearly acceptance criteria and record the as-found data. These procedures need to consider the 10 CFR 50, Appendix B criteria in the verification process for the data collected and equipment/programs used for the test.

FPL Response

The inspection team expressed a concern with regard to the performance of the static testing procedure. The NRC stated that the maintenance test procedures need to consider the 10 CFR 50, Appendix B criteria in the verification process for the data collected and equipment/programs used for the test. The plant procedures have been revised accordingly to provide adequate verification of the data collected. The equipment/programs used for the test were previously addressed by Maintenance Department procedures.

2. There was a lack of documentation to support the operation of MOV brake assemblies at less than 90 percent rated voltages. No margins were included in the stem friction coefficient calculation for the stem lubrication degradation. The licensee intends to conduct testing to evaluate the appropriate amount of margin required.

FPL Response

FPL performed an evaluation which concluded that sufficient voltage was available to those MOVs with motor brakes which must perform an active safety function. Subsequent to the evaluation, two plant change/modification packages, one per unit, were implemented to render the motor brakes non-functional. The issue of stem lubrication degradation has been addressed and can be found in the discussion for Item 04.06 above.

3. No margins were set aside for load sensitive behavior (rate of loading) in the licensee's calculations. The licensee was evaluating this margin for dynamically tested MOVs.

FPL Response

This issue has been addressed and can be found in the discussion for Item 04.06.

4. In cases where dynamic testing showed original thrust calculations were not conservative, the licensee changed the method of extrapolating the required thrust by directly measuring thrust at control switch trip. Although no operability concerns were noted, no guidelines were provided to account for torque switch repeatability and other uncertainties in the calculations.

FPL Response

This issue has been addressed and can be found in the discussion for Item 04.07.



TABLE A
Valve, Operator and Motor Data for
Turkey Point GL 89-10 Program

Tag Number	Description	Safety Function	Valve					Operator Type	Motor	
			Mfg.	Type	Size	Class	Mat'l		Start Tq.	Voltage
Unit 3										
MOV-3-115C	VCT Discharge to Charging Pump Section	None (15)	C/A	FWGate	4"	150 lb.	SS	SMB-000	5 ft-lb	480 VAC
MOV-3-350	Emergency Boreation Isolation	None (15)	C/A	FWGate	2"	150 lb.	SS	SMB-000	5 ft-lb	480 VAC
MOV-3-381	RCP Pump Seal Water Return Line Isolation	Close (1)	Aloyco	FWGate	3"	150 lb.	SS	SMB-000	5 ft-lb	480 VAC
MOV-3-535	PORV Block Valve	Op/Cl (2)	Velan	FWGate	3"	1500 lb.	SS	SMB-00	10 ft-lb	480 VAC
MOV-3-538	PORV Block Valve	Op/Cl (2)	Velan	FWGate	3"	1500 lb.	SS	SMB-00	10 ft-lb	480 VAC
MOV-3-828	RCP Thermal Barrier Outlet Header Isolation	Close(3)	Velan	FWGate	3"	1500 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-3-718A	RCP CCW Supply Isolation	Close(3)	A/D	DDGate	8"	150 lb.	CS	SMB-00	10 ft-lb	440 VAC
MOV-3-718B	RCP CCW Supply Isolation	Close(3)	A/D	DDGate	8"	150 lb.	CS	SMB-00	10 ft-lb	440 VAC
MOV-3-730	RCP Oil Cooler CCW Return Isolation	Close(3)	A/D	DDGate	8"	150 lb.	CS	SMB-00	10 ft-lb	440 VAC
MOV-3-744A	Low Head Safety Injection Isolation	Op/CK(4)	Velan	FWGate	8"	1500 lb.	SS	SMB-3	80 ft-lb	480 VAC
MOV-3-744B	Low Head Safety Injection Isolation	Op/CK(4)	Velan	FWGate	8"	1500 lb.	SS	SMB-3	80 ft-lb	480 VAC
MOV-3-748A	RHR Heat Exchanger CCW Supply Isolation	Open (5)	Crane	SWGate	18"	150 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-3-748B	RHR Heat Exchanger CCW Supply Isolation	Open (5)	Crane	SWGate	18"	150 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-3-750	RHR Suction from the RCS	None (15)	C/V	DDGate	14"	2500 lb.	SS	SMB-1	40 ft-lb	480 VAC
MOV-3-751	RHR Suction from the RCS	None (15)	C/V	DDGate	14"	2500 lb.	SS	SMB-1	40 ft-lb	480 VAC
MOV-3-832	Demin Water Supply Isolation	None (15)	Crane	Globe	3"	150 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-843A	Boron Injection to RCS Cold Leg	Op/Cl (4)	A/D	DDGate	4"	1500 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-3-843B	Boron Injection to RCS Cold Leg	Op/Cl (4)	A/D	DDGate	4"	1500 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-3-858A	SI Pump Minimum Recirc Isolation	Close (8)	C/V	Globe	2"	1500 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-858B	SI Pump Minimum Recirc Isolation	Close (8)	C/V	Globe	2"	1500 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-880A	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-880B	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-881A	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-881B	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-882A	RHR Pump RWST Suction Isolation	Close (8)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-882B	RHR Pump RWST Suction Isolation	Close (8)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-883A	SI/CS Pump Recirc Phase Suction Isolation	Open (5)	Aloyco	FWGate	8"	300 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-3-883B	SI/CS Pump Recirc Phase Suction Isolation	Open (5)	Aloyco	FWGate	8"	300 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-3-884A	RWST Isolation Stop Valve	Close (8)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-884B	RWST Isolation Stop Valve	Close (8)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-3-885A	Accumulator Discharge Isolation Valve	None (15)	A/D	DDGate	8"	1500 lb.	CS	SMB-2	80 ft-lb	480 VAC
MOV-3-885B	Accumulator Discharge Isolation Valve	None (15)	A/D	DDGate	8"	1500 lb.	CS	SMB-2	80 ft-lb	480 VAC
MOV-3-885C	Accumulator Discharge Isolation Valve	None (15)	A/D	DDGate	8"	1500 lb.	CS	SMB-2	80 ft-lb	480 VAC

TABLE A
Valve, Operator and Motor Data for
Turkey Point GL 89-10 Program

Tag Number	Description	Safety Function	Valve					Operator Type	Motor	
			Mfg.	Type	Size	Class	Mat'l		Start Tq.	Voltage
MOV-3-888A	Safety Injection to RCS Hot Leg Isolation	Op/Cl (7)	Velan	Globe	2"	1500 lb.	SS	SMB-00	15 ft-lb	480 VAC
MOV-3-888B	Safety Injection to RCS Hot Leg Isolation	Op/Cl (7)	Velan	Globe	2"	1500 lb.	SS	SMB-00	15 ft-lb	480 VAC
MOV-3-889	SI Hot Leg Injection Isolation	Op/Cl (7)	A/D	DDGate	3"	1500 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-3-872	Alternate Low Head SI to Cold Leg	Open (7)	Velan	FWGate	8"	1500 lb.	SS	SMB-0	15 ft-lb	440 VAC
MOV-3-880A	Containment Spray Pump Discharge Isolation	Open (9)	A/D	DDGate	6"	300 lb.	CS	SMB-0	15 ft-lb	440 VAC
MOV-3-880B	Containment Spray Pump Discharge Isolation	Open (9)	A/D	DDGate	6"	300 lb.	CS	SMB-0	15 ft-lb	440 VAC
MOV-3-1400	Main Steam Bypass Valve	Close (10)	Crane	Globe	2"	800 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-1401	Main Steam Bypass Valve	Close (10)	Crane	Globe	2"	800 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-1402	Main Steam Bypass Valve	Close (10)	Crane	Globe	2"	800 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-1403	Auxiliary Feedwater Pump Turbine Steam Supply	Op/Cl (11)	Velan	Globe	4"	900 lb.	CS	SMB-00	10 ft-lb	125 VDC
MOV-3-1404	Auxiliary Feedwater Pump Turbine Steam Supply	Op/Cl (11)	Velan	Globe	4"	900 lb.	CS	SMB-00	10 ft-lb	480 VAC
MOV-3-1405	Auxiliary Feedwater Pump Turbine Steam Supply	Op/Cl (11)	Velan	Globe	4"	900 lb.	CS	SMB-00	10 ft-lb	125 VDC
MOV-3-1417	NCC/CRDM Cooler Supply and Return Isolation	Close (1)	Walworth	FWGate	10"	150 lb.	CS	SMB-00	10 ft-lb	480 VAC
MOV-3-1418	NCC/CRDM Cooler Supply and Return Isolation	Close (1)	Walworth	FWGate	10"	150 lb.	CS	SMB-00	10 ft-lb	480 VAC
MOV-3-1420	Steam Generator Feedwater Pump A Discharge	Close (12)	Walworth	FWGate	18"	900 lb.	CS	SMB-2	80 ft-lb	480 VAC
MOV-3-1421	Steam Generator Feedwater Pump A Discharge	Close (12)	Walworth	FWGate	18"	900 lb.	CS	SMB-2	80 ft-lb	480 VAC
MOV-3-1425	Steam Generator Blowdown Sample Isolation	Close (13)	Pacific	SWGate	1"	1500 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-3-1426	Steam Generator Blowdown Sample Isolation	Close (13)	Pacific	SWGate	1"	1500 lb.	CS	SMB-000	2 ft-lb	480 VAC
MOV-3-1427	Steam Generator Blowdown Sample Isolation	Close (13)	Pacific	SWGate	1"	1500 lb.	CS	SMB-000	2 ft-lb	480 VAC
MOV-3-8388	RCP Pump Seal Water Return Line Isolation	Close (1)	A/D	FWGate	3"	150 lb.	SS	SMB-000	2 ft-lb	480 VAC
Unit 4										
MOV-4-115C	VCT Discharge to Charging Pump	None (15)	C/A	FWGate	4"	150 lb.	SS	SMB-000	5 ft-lb	480 VAC
MOV-4-350	Emergency Boration Isolation	None (15)	C/A	FWGate	2"	150 lb.	SS	SMB-000	5 ft-lb	480 VAC
MOV-4-381	RCP Pump Seal Water Return Line Isolation	Close (1)	Aloyco	FWGate	3"	150 lb.	SS	SMB-000	5 ft-lb	480 VAC
MOV-4-535	PORV Block Valve	Op/Cl (2)	Velan	FWGate	3"	1500 lb.	SS	SMB-00	10 ft-lb	480 VAC
MOV-4-538	PORV Block Valve	Op/Cl (2)	Velan	FWGate	3"	1500 lb.	SS	SMB-00	10 ft-lb	480 VAC
MOV-4-828	RCP Thermal Barrier Outlet Header Isolation	Close (3)	Velan	FWGate	3"	1500 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-4-718A	RCP CCW Supply Isolation	Close (3)	A/D	DDGate	8"	150 lb.	CS	SMB-00	10 ft-lb	440 VAC
MOV-4-718B	RCP CCW Supply Isolation	Close (3)	A/D	DDGate	8"	150 lb.	CS	SMB-00	10 ft-lb	440 VAC
MOV-4-730	RCP Oil Cooler CCW Return Isolation	Close (3)	A/D	DDGate	8"	150 lb.	CS	SMB-00	10 ft-lb	440 VAC
MOV-4-744A	Low Head Safety Injection Isolation	Op/Cl (4)	Velan	FWGate	8"	1500 lb.	SS	SMB-3	80 ft-lb	480 VAC
MOV-4-744B	Low Head Safety Injection Isolation	Op/Cl (4)	Velan	FWGate	8"	1500 lb.	SS	SMB-3	80 ft-lb	480 VAC



TABLE A
Valve, Operator and Motor Data for
Turkey Point GL 89-10 Program

Tag Number	Description	Safety Function	Valve					Operator Type	Motor	
			Mfg.	Type	Size	Class	Mat'l		Start Tq.	Voltage
MOV-4-749A	RHR Heat Exchanger CCW Supply Isolation	Open (5)	Crane	SWGate	18"	150 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-4-749B	RHR Heat Exchanger CCW Supply Isolation	Open (5)	Crane	SWGate	18"	150 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-4-750	RHR Suction from the RCS	None (15)	C/V	DDGate	14"	2500 lb.	SS	SMB-1	40 ft-lb	480 VAC
MOV-4-751	RHR Suction from the RCS	None (15)	C/V	DDGate	14"	2500 lb.	SS	SMB-1	40 ft-lb	480 VAC
MOV-4-832	Demin Water Supply Isolation	None (15)	Crane	Globe	3"	150 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-843A	Boron Injection to RCS Cold Leg	Op/Cl (4)	A/D	DDGate	4"	1500 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-4-843B	Boron Injection to RCS Cold Leg	Op/Cl (4)	A/D	DDGate	4"	1500 lb.	CS	SMB-0	15 ft-lb	480 VAC
MOV-4-856A	SI Pump Minimum Recirc Isolation	Close (6)	C/V	Globe	2"	1500 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-856B	SI Pump Minimum Recirc Isolation	Close (6)	C/V	Globe	2"	1500 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-880A	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-880B	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-881A	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-881B	Containment Sump Isolation	Open (5)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-882A	RHR Pump RWST Suction Isolation	Close (6)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-882B	RHR Pump RWST Suction Isolation	Close (6)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-883A	SI/CS Pump Recirc Phase Suction Isolation	Open (5)	Alcyco	FWGate	8"	300 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-4-883B	SI/CS Pump Recirc Phase Suction Isolation	Open (5)	Alcyco	FWGate	8"	300 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-4-884A	RWST Isolation Stop Valve	Close (6)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-884B	RWST Isolation Stop Valve	Close (6)	A/D	DDGate	14"	300 lb.	CS	SMB-0	40 ft-lb	480 VAC
MOV-4-885A	Accumulator Discharge Isolation Valve	None (15)	A/D	DDGate	8"	1500 lb.	CS	SMB-2	60 ft-lb	480 VAC
MOV-4-885B	Accumulator Discharge Isolation Valve	None (15)	A/D	DDGate	8"	1500 lb.	CS	SMB-2	60 ft-lb	480 VAC
MOV-4-885C	Accumulator Discharge Isolation Valve	None (15)	A/D	DDGate	8"	1500 lb.	CS	SMB-2	60 ft-lb	480 VAC
MOV-4-886A	Safety Injection to RCS Hot Leg Isolation	Op/Cl (7)	Valen	Globe	2"	1500 lb.	SS	SMB-00	15 ft-lb	480 VAC
MOV-4-886B	Safety Injection to RCS Hot Leg Isolation	Op/Cl (7)	Valen	Globe	2"	1500 lb.	SS	SMB-00	15 ft-lb	480 VAC
MOV-4-889	SI Hot Leg Injection Isolation	Op/Cl (7)	A/D	DDGate	3"	300 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-4-872	Alternate Low Head SI to Cold Leg	Open (7)	Valen	FWGate	8"	1500 lb.	SS	SMB-0	15 ft-lb	440 VAC
MOV-4-880A	Containment Spray Pump Discharge Isolation	Open (9)	A/D	DDGate	8"	300 lb.	CS	SMB-0	15 ft-lb	440 VAC
MOV-4-880B	Containment Spray Pump Discharge Isolation	Open (9)	A/D	DDGate	8"	300 lb.	CS	SMB-0	15 ft-lb	440 VAC
MOV-4-1400	Main Steam Bypass Valve	Close (10)	Crane	Globe	2"	800 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-1401	Main Steam Bypass Valve	Close (10)	Crane	Globe	2"	800 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-1402	Main Steam Bypass Valve	Close (10)	Crane	Globe	2"	800 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-1403	Auxiliary Feedwater Pump Turbine Steam Supply	Op/Cl (11)	Valen	Globe	4"	900 lb.	CS	SMB-00	10 ft-lb	125 VDC
MOV-4-1404	Auxiliary Feedwater Pump Turbine Steam Supply	Op/Cl (11)	Valen	Globe	4"	900 lb.	CS	SMB-00	10 ft-lb	480 VAC
MOV-4-1405	Auxiliary Feedwater Pump Turbine Steam Supply	Op/Cl (11)	Valen	Globe	4"	900 lb.	CS	SMB-00	10 ft-lb	125 VDC

TABLE A
Valve, Operator and Motor Data for
Turkey Point GL 89-10 Program

Tag Number	Description	Safety Function	Valve					Operator Type	Motor	
			Mfg.	Type	Size	Class	Mat'l		Start Tq.	Voltage
MOV-4-1417	NCC/CRDM Cooler Supply and Return Isolation	Close (1)	Walworth	FWGate	10"	150 lb.	CS	SMB-00	10 ft-lb	480 VAC
MOV-4-1418	NCC/CRDM Cooler Supply and Return Isolation	Close (1)	Walworth	FWGate	10"	150 lb.	CS	SMB-00	10 ft-lb	480 VAC
MOV-4-1420	Steam Generator Feedwater Pump A Discharge	Close (12)	Walworth	FWGate	18"	800 lb.	CS	SMB-2	80 ft-lb	480 VAC
MOV-4-1421	Steam Generator Feedwater Pump A Discharge	Close (12)	Walworth	FWGate	18"	800 lb.	CS	SMB-2	80 ft-lb	480 VAC
MOV-4-1425	Steam Generator Blowdown Sample Isolation	Close (13)	Pacific	SWGate	1"	1500 lb.	CS	SMB-000	5 ft-lb	480 VAC
MOV-4-1426	Steam Generator Blowdown Sample Isolation	Close (13)	Pacific	SWGate	1"	1500 lb.	CS	SMB-000	2 ft-lb	480 VAC
MOV-4-1427	Steam Generator Blowdown Sample Isolation	Close (13)	Pacific	SWGate	1"	1500 lb.	CS	SMB-000	2 ft-lb	480 VAC
MOV-4-8388	RCP Pump Seal Water Return Line Isolation	Close (1)	A/D	FWGate	3"	150 lb.	CS	SMB-000	2 ft-lb	480 VAC
Common										
MOV-878A	Safety Injection Pump Cross-tie	Close (8)	A/D	DDGate	4"	800 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-878B	Safety Injection Pump Cross-tie	Close (8)	A/D	DDGate	4"	800 lb.	CS	SMB-00	15 ft-lb	480 VAC
MOV-8459A	AFW Turbine Trip and Throttle Valve	Open (14)	Gimpel	Globe	3"	800 lb.	CS	SMB-000	5 ft-lb	125 VDC
MOV-8459B	AFW Turbine Trip and Throttle Valve	Open (14)	Gimpel	Globe	3"	800 lb.	CS	SMB-000	5 ft-lb	125 VDC
MOV-8459C	AFW Turbine Trip and Throttle Valve	Open (14)	Gimpel	Globe	3"	800 lb.	CS	SMB-000	5 ft-lb	125 VDC

Notes:

1. Valve is normally open and closes on Phase A Containment Isolation Signal.
2. Valve is normally open and is remote manually closed in the event a PORV fails open or fails to recseat. It is also remotely manually closed during Normal Operation to isolate a leaking PORV.
3. Valve is normally open and closes on Phase B Containment Isolation Signal.
4. Valve is normally closed and opens on a Safety Injection Signal.
5. Valve is normally closed and is remote manually open prior to switchover from injection phase to post accident recirculation phase.
6. Valve is normally open and is remote manually closed prior to switchover from injection phase to post accident recirculation phase.
7. Valve is normally closed and is remote manually opened to establish RCS Hot Leg Injection during the Recirculation Phase.
8. Valve is normally open and is remote manually closed to mitigate passive failures within the Safety Injection system.
9. Valve is normally closed and opens on High Containment Pressure signal and High-High Containment Pressure signal.
10. Valve is normally open and closes on a Main Steam Isolation signal.
11. Valve is normally closed and opens on Auxiliary Feedwater signal. Valve may be closed to isolate the affected S/G in the event of a S/G tube rupture.
12. Valve is normally open and closes on a S/G Feedwater Pump Trip Signal.
13. Valve is normally open and closes on Phase A Containment Isolation Signal or an Auxiliary Feedwater Pump auto start signal.
14. Valve is normally open. However, the valve does receive an Auxiliary Feedwater start signal, in the event the valve is closed.
15. Valve has been conservatively included in GL 89-10 program because of Quality Related functions.

Abbreviations:

C/A - Crane-Aloyco
A/D - Anchor Darling

C/V - Copes Vulcan
SWGate - Solid Wedge Gate Valve

DDGate - Double Disc Gate Valve
FWGate - Flex Wedge Gate Valve

TABLE 8

TABLE 8

TABLE B
Setup of DP Tested Turkey Point GL 88-10 Program Valves

Valves Which Have a Safety Function to Close																
Tag Number	Valve Factor		Design Basis DP	Test DP % Design Basis	Thrust Additions (a)				Stem COF		Packing Load		Thrust		Field Set up (d)	PSA Group
	Design	Test			% Reading	DEA Full Scale (lbs)	TSR	LSB (c)	Calc	Test	Calc	Test	Min Calc	Max Calc		
Common																
MOV-878A	0.4	0.28	1715	30	2.24	437	5%	3%	0.15	0.22	1800	290	13451	14000	13090 (d)	Low
MOV-878B	0.4	0.35	1715	25	2.24	437	5%	-10%	0.15	0.10	1800	188	13451	14000	13448 (d)	Low

Notes:

- (a) MOVATS Diagnostic Equipment in use. Square Root Sum of the Squares Method used to combine DEA and TSR.
- (b) Field Set up is the thrust value recorded at Control Switch Trip at Static Conditions.
- (c) Load Sensitive Behavior was not included in the original Field Set up of the valves.
- (d) The Field Set up thrust is less than the minimum calculated thrust. This condition is acceptable based on review of the available thrust.
- (e) Data not available.

Abbreviations:

- DEA - Diagnostic Equipment Accuracy
- TSR - Torque Switch Repeatability
- COF - Coefficient of Friction
- PSA - Probabilistic Safety Assessment
- SC - Self Closing

TABLE B
Setup of DP Tested Turkey Point GL 89-10 Program Valves

Valves Which Have a Safety Function to Open															
Tag Number	Valve Factor		Design Basis DP	Test DP % Design Basis	Thrust Additions (a)			Stem COF		Packing Load		Thrust		Field Set up (b)	PSA Group
	Design	Test			DEA %	Full Scale	TSR	Calc	Test	Calc	Test	Minimum Calc	Maximum Calc		
Unit 3															
MOV-3-748A	0.5	0.28	95	72	2.24	747	5%	0.20	0.09	3000	1484	12591	24000	18728	High
MOV-3-748B	0.5	0.37	95	87	2.24	747	5%	0.20	0.13	3000	2677	12591	24000	15034	High
MOV-3-843A	0.2	0.22	2235	54	2.24	747	5%	0.15	0.04	3000	2400	12742	24000	15048	High
MOV-3-843B	0.2	0.1	2235	55	10	0	5%	0.15	0.12	3000	4830	12742	24000	18783	High
MOV-3-883A	0.5	0.4	210	77	2.24	437	5%	0.20	0.10	1800	500	5478	10550	5519 (c)	High
MOV-3-883B	0.5	0.48	210	59	2.24	437	5%	0.20	0.12	1800	1280	5478	10550	8430	High
MOV-3-888A	1.1	S0	1858	87	2.24	437	5%	0.20	N/A (d)	1800	2388	9555	14000	12499	Low
MOV-3-888B	1.1	S0	1858	83	2.24	437	5%	0.20	N/A (d)	1800	1984	9555	14000	11575	Low
MOV-3-889	0.4	0.18	1715	89	2.24	437	5%	0.20	0.05	1800	1404	7979	14000	9738	Low
MOV-3-872	0.5	0.4	188	87	2.24	747	5%	0.20	0.14	3000	1719	7072	24000	8810 (c)	Low
MOV-3-1403	1.1	0.13	1118	57	3.74	117	5%	0.2	N/A (d)	1800	1800	10785	14000	11580 (c)	Low
MOV-3-1405	1.1	S0	1118	78	3.74	117	5%	0.20	N/A (d)	1800	1810	10785	14000	N/A (f)	Medium
Unit 4															
MOV-4-843A	0.2	0.17	2235	42	2.24	747	5%	0.15	0.11	3000	2854	12742	24000	14041 (c)	High
MOV-4-843B	0.2	0.24	2235	37	2.24	747	5%	0.15	0.12	3000	2285	12742	24000	18584	High
MOV-4-883A	0.55	0.48	210	72	2.24	437	5%	0.20	0.15	1800	547	5818	10550	8390 (c)	High
MOV-4-883B	0.55	0.81	210	73	2.24	437	5%	0.20	0.11	1800	444	5818	10550	6591	High
MOV-4-888A	1.1	S0	1858	90	2.24	437	5%	0.20	N/A (d)	1800	3408	9555	14000	11890	Low
MOV-4-888B	1.1	S0	1858	90	2.24	437	5%	0.20	N/A (d)	1800	3222	9555	14000	11817	Low
MOV-4-889	0.4	0.79	1715	35	2.24	437	5%	0.20	0.11	1800	1922	7979	14000	10745	Low
MOV-4-872	0.7	0.84	188	78	2.24	747	5%	0.20	0.15	3000	974	8388	24000	8589 (c)	Low
MOV-4-1403	1.1	0.24	1118	55	3.74	437	5%	0.20	N/A (d)	1800	712	10785	14000	12933 (a)	Low
MOV-4-1404	1.1	S0	1118	82	3.74	437	5%	0.20	N/A (d)	1800	1170	10785	14000	11818 (c)	Low
MOV-4-1405	1.1	0.37	1118	75	3.74	437	5%	0.20	0.18	1800	417	10785	14000	12080	Medium

Notes:

(a) MOVATS Diagnostic Equipment in use. Square Root Sum of the Squares Method used to combine DEA and TSR.

(b) Field Set up is the thrust value recorded at Control Switch Trip at Static Conditions.

(c) The Field Set up thrust is less than the minimum calculated thrust. This condition is acceptable based on review of the available thrust.

(d) Valve is a Self Opening (SO) globe valve. Meaningful test data could not be obtained.

(e) Valve is controlled by the limit switch in the open direction. Potential overthrust in the open direction is small and would only occur in the event of a limit switch failure.

(f) Thrust data not available. Adequate operating margin demonstrated by available torque. Actuator capability is 185 ft-lbs versus a Required Design Torque of 154 ft-lbs.

Abbreviations:

DEA - Diagnostic Equipment Accuracy

TSR - Torque Switch Repeatability

COF - Coefficient of Friction

PSA - Probabilistic Safety Assessment

SO - Self Opening

TABLE C
Setup of Not DP Tested Turkey Point GL 89-10 Program Valves

Valves Which Have a Safety Function to Close														
Tag Number	Valve Factor- Design	Design Basis DP	Thrust Additions (a)			Stem COF		Packing Load		Thrust		Field Set up	PSA Group	Basis for Closure
			DEA	Full Scale	TSR	Calc	Test	Calc	Test	Min Calc	Max Calc			
			%											
Unit 3														
MOV-3-381	0.89	155	2.24	87	10%	0.15	0.14	1200	297	2438	8000	2583 (b)	Low	Grouping
MOV-3-535	0.5	2580	3.74	117	5%	0.20	0.08	1800	887	9434	14000	12354	High	EPRI
MOV-3-538	0.5	2850	2.24	437	5%	0.20	0.18	1800	588	9434	14000	11478	High	EPRI
MOV-3-828	0.5	2733	2.24	437	5%	0.15	0.10	1800	570	9950	14000	11079	Low	EPRI
MOV-3-730	0.4	95	58.30 (d)	N/A (d)	5%	0.20	N/A (g)	1800	878	3134	14000	4152 (b)	Low	Grouping
MOV-3-744A	0.5	880	13.89	3840	5%	0.20	N/A (g)	3000	2840	22313	80024	48970	Medium	EPRI
MOV-3-744B	0.5	880	13.89	3840	5%	0.20	N/A (g)	3000	3000	22313	80024	52755	Medium	EPRI
MOV-3-882A	0.4	210	2.24	747	5%	0.20	N/A (g)	3000	2050	15309	24000	23528 (c)	High	EPRI
MOV-3-882B	0.4	210	35.57 (d)	N/A (d)	5%	0.20	N/A (g)	3000	N/A (e)	12309 (f)	24000	21845 (c, f)	High	EPRI
MOV-3-884A	0.4	25	2.24	747	5%	0.20	0.12	3000	1408	4485	24000	15351	High	EPRI
MOV-3-884B	0.4	25	2.24	747	5%	0.20	0.12	3000	1878	4485	24000	13824	High	EPRI
MOV-3-1400	1.1	1118	2.24	87	10%	0.20	0.13	1200	440	4830	7815	8214	Low	Grouping
MOV-3-1401	1.1	1118	2.24	87	10%	0.20	0.13	1200	530	4830	7815	5805	Low	Grouping
MOV-3-1402	1.1	1118	2.24	87	10%	0.20	0.15	1200	474	4830	7815	5255 (b)	Low	Grouping
MOV-3-1404	1.1	1118	2.24	437	5%	0.20	0.11	1800	1239	10785	14000	12757	Low	Grouping
MOV-3-1425	0.89	1118	2.24	87	20%	0.20	0.11	1200	113	2475	8849	2570 (b)	Low	Grouping
MOV-3-1428	0.89	1118	2.24	87	10%	0.20	0.18	1200	145	2475	8849	2458 (b)	Low	Grouping
MOV-3-1427	0.89	1118	2.24	87	10%	0.20	0.18	1200	184	2475	8849	2348 (b)	Low	Grouping
MOV-3-8388	0.89	158	2.24	87	10%	0.20	0.14	875	335	1843	8000	2403	Low	Grouping
Unit 4														
MOV-4-381	0.89	155	32.84 (d)	N/A (d)	10%	0.15	N/A (g)	1200	N/A (e)	1238	8000	4020 (f)	Low	Grouping
MOV-4-535	0.5	2580	2.24	437	5%	0.20	0.07	1800	2389	9434	14000	10905	High	EPRI
MOV-4-538	0.5	2580	2.24	437	5%	0.20	0.12	1800	741	9434	14000	11879	High	EPRI
MOV-4-828	0.5	2733	2.24	437	5%	0.15	0.19	1800	301	9950	14000	9257 (b)	Low	EPRI
MOV-4-718B	0.45	118	2.24	437	5%	0.20	0.19	1800	800	3853	14000	3148 (b)	Low	Grouping
MOV-4-730	0.45	95	2.24	437	5%	0.20	0.08	1800	1282	3278	14000	4848	Low	Grouping
MOV-4-744A	0.5	880	2.24	3738	5%	0.20	0.04	3000	3428	22313	80024	55182	Medium	EPRI
MOV-4-744B	0.5	880	2.24	3738	5%	0.20	0.09	3000	5489	22313	80024	48818	Medium	EPRI

TABLE C
Setup of Not DP Tested Turkey Point GL 88-10 Program Valves

Valves Which Have a Safety Function to Close														
Tag Number	Valve Factor - Design	Design Basis DP	Thrust Additions (a)			Stem COF		Packing Load		Thrust		Field Set up	PSA Group	Basis for Closure
			DEA %	Full Scale	TSR	Calc	Test	Calc	Test	Min Calc	Max Calc			
MOV-4-882A	0.4	210	2.24	747	5%	0.20	0.10	3000	1178	15309	24000	18274	High	EPRI
MOV-4-882B	0.4	210	2.24	747	5%	0.20	0.13	3000	2351	15309	24000	18012	High	EPRI
MOV-4-884A	0.4	25	2.24	747	5%	0.20	0.17	3000	838	4485	24000	14511	High	EPRI
MOV-4-884B	0.4	25	2.24	747	5%	0.20	0.13	3000	831	4485	24000	18103	High	EPRI
MOV-4-1400	1.1	1118	2.24	117	5%	0.20	0.12	1200	451	4830	7815	5718	Low	Grouping
MOV-4-1403	1.1	1118	3.74	437	5%	0.20	0.38	1800	593	10785	14000	12577	Low	Grouping
MOV-4-1404	1.1	1118	3.74	437	5%	0.20	0.08	1800	702	10785	14000	11818 (b)	Low	Grouping
MOV-4-1405	1.1	1118	3.74	437	5%	0.20	0.12	1800	324	10785	14000	12529	Medium	Grouping
MOV-4-1421	0.78443	312	2.24	1888	5%	0.15	0.09	8000	989	44895	88884	51523	Low	Grouping
MOV-4-1425	0.89	1118	2.24	87	10%	0.20	0.12	1200	128	2475	8849	3433	Low	Grouping
MOV-4-1426	0.89	1118	2.24	87	10%	0.20	0.05	1200	479	2475	8849	3578	Low	Grouping
MOV-4-1427	0.89	1118	2.24	87	10%	0.20	0.10	1200	849	2475	8849	3885	Low	Grouping
MOV-4-8388	0.89	155	2.24	87	10%	0.20	0.11	875	1025	1843	8000	2758	Low	Grouping

Notes:

- (a) MOVATS Diagnostic Equipment in use. Square Root Sum of the Squares Method used to combine DEA and TSR.
- (b) The Field Set up thrust is less than the minimum calculated thrust. This condition is acceptable based on review of the available thrust.
- (c) The Field Set up thrust exceeds the Maximum calculated thrust. This condition has been evaluated and found to be acceptable.
- (d) Equipment accuracy based on MOVATS Engineering Report 5.2 for Open TMD Calibration Methodology.
- (e) Running load not recorded
- (f) These values are represent available thrust . Packing or Running Load is not included.
- (g) Data not available.

Abbreviations:

- DEA - Diagnostic Equipment Accuracy
- TSR - Torque Switch Repeatability
- COF - Coefficient of Friction
- PSA - Probabilistic Safety Assessment

TABLE C
Setup of Not DP Tested Turkey Point GL 89-10 Program Valves

Valves Which Have a Safety Function to Open														
Tag Number	Valve Factor- Design	Design Basis DP	Thrust Additions (a)			Stem COF		Packing Load		Thrust		Field Set up	PSA Group	Basis for Closure
			DEA %	Full Scale	TSR	Calc	Test	Calc	Test	Minimum Calc	Maximum Calc			
Unit 3														
MOV-3-535	0.5	2580	3.74	117	5%	0.20	0.11	1800	887	9434	14000	11188	High	EPRI
MOV-3-538	0.5	2580	2.24	437	5%	0.20	0.23	1800	588	9434	14000	9885 (b)	High	EPRI
MOV-3-744A	0.3	2235	2.00	3800	5%	0.20	N/A (a)	3000	N/A (f)	35858	73008	59118	Medium	EPRI
MOV-3-744B	0.3	2235	2.00	3800	5%	0.20	N/A (a)	3000	N/A (f)	35858	73008	52103	Medium	EPRI
MOV-3-880A	1.13	59	2.24	938	5%	0.20	N/A (a)	3000	1558	12510	24000	17828	High	EPRI
MOV-3-880B	1.13	59	2.24	938	5%	0.20	N/A (a)	3000	1594	12510	24000	18659	High	EPRI
MOV-3-881A	1.13	59	2.24	747	5%	0.20	0.12	3000	1378	12510	24000	15809	High	EPRI
MOV-3-881B	1.13	59	2.24	747	5%	0.20	0.09	3000	2427	12510	24000	15815	High	EPRI
MOV-3-880A	0.4	407	2.24	747	5%	0.15	0.13	1800	438	8131	24000	8093 (b)	Medium	EPRI
MOV-3-880B	0.4	407	2.24	747	5%	0.15	0.12	1800	438	8131	24000	7892 (b)	Medium	EPRI
MOV-3-1404	1.1	1118	2.24	437	5%	0.20	0.14	1800	1320	10765	14000	12509	Low	Grouping
Unit 4														
MOV-4-535	0.5	2580	2.24	437	5%	0.20	0.10	1800	2314	9434	14000	12034	High	EPRI
MOV-4-538	0.5	2580	2.24	437	5%	0.20	0.10	1800	537	9434	14000	10312 (b)	High	EPRI
MOV-4-744A	0.3	2235	2.24	3738	5%	0.20	0.04	3000	4331	35858	73008	48339	Medium	EPRI
MOV-4-744B	0.3	2235	2.24	1000	10%	0.20	0.02	3000	5057	35858	73008	50708	Medium	EPRI
MOV-4-748A	0.5	95	2.24	747	5%	0.20	0.13	3000	605	12591	24000	20457	High	Grouping
MOV-4-748B	0.5	95	2.24	747	5%	0.20	0.07	3000	1302	12591	24000	18758	High	Grouping
MOV-4-880A	1.13	59	2.24	747	5%	0.20	0.08	3000	642	12510	24000	23287 (c)	High	EPRI
MOV-4-880B	1.13	59	2.24	747	5%	0.20	0.09	3000	1107	12510	24000	27757 (c)	High	EPRI
MOV-4-881A	1.13	59	2.24	747	5%	0.20	0.13	3000	1210	12510	24000	18184	High	EPRI
MOV-4-881B	1.13	59	2.24	747	5%	0.20	0.11	3000	1412	12510	24000	18838	High	EPRI
MOV-4-880A	0.4	407	2.24	747	5%	0.15	0.10	1800	820	8131	24000	8508	Medium	EPRI
MOV-4-880B	0.4	407	2.24	747	5%	0.15	0.20	1800	685	8131	24000	7440 (d)	Medium	EPRI
Common														
MOV-6459A	N/A	1118	2.83	200	10%	0.20	N/A (a)	1000	1000	2024	8000	4124	Medium	Grouping
MOV-6459B	N/A	1118	2.83	200	20%	0.20	N/A (a)	1000	1505	2024	8000	5559	Medium	Grouping
MOV-6459C	N/A	1118	2.83	240	10%	0.20	N/A (a)	1000	1800	2024	8000	5407	Medium	Grouping



TABLE C
Setup of Not DP Tested Turkey Point GL 89-10 Program Valves

Notes:

- (a) MOVATS Diagnostic Equipment in use. Square Root Sum of the Squares Method used to combine DEA and TSR.
- (b) The Field Set up thrust is less than the minimum calculated thrust. This condition is acceptable based on review of the available thrust.
- (c) The Field Set up thrust exceeds the Maximum calculated thrust. This condition has been evaluated and found to be acceptable.
- (d) The Field Set up thrust is less than the Minimum calculated thrust. This condition has been evaluated and found to be acceptable.
- (e) Data not available
- (f) Packing load not recorded.

Abbreviations:

DEA - Diagnostic Equipment Accuracy
TSR - Torque Switch Repeatability
COF - Coefficient of Friction
PSA - Probabilistic Safety Assessment

TABLE C
Setup of Not DP Tested Turkey Point GL 89-10 Program Valves

Valves Which Have a Quality Function to Close														
Tag Number	Valve Factor - Design	Design Basis DP	Thrust Additions (a)			Stem COF		Packing Load		Minimum Calc	Thrust		PSA Group	Basis for Closure
			DEA	Full Scale	TSR	Calc	Test	Calc	Test		Maximum Calc	Field Set up		
			%											
Unit 3														
MOV-3-115C	0.89	89	2.24	193	10%	0.20	N/A (b)	1200	515	2427	7398	3180	Low	Grouping
MOV-3-832	1.1	183	2.24	87	10%	0.20	0.12	1200	417	2280	8000	3992	Low	Grouping
MOV-3-885A	0.4	400	2.24	1888	5%	0.20	0.07	3000	2654	12481	70000	27590	Low	EPRI
MOV-3-885B	0.4	400	2.24	1888	5%	0.20	0.08	3000	3088	12481	70000	28257	Low	EPRI
MOV-3-885C	0.4	400	2.24	1888	5%	0.20	0.05	3000	1050	12481	70000	31911	Low	EPRI
Unit 4														
MOV-4-115C	0.89	89	2.24	117	10%	0.20	0.12	1200	1057	2427	8000	3800	Low	Grouping
MOV-4-832	1.1	183	2.24	87	10%	0.20	0.08	1200	707	2280	8000	4740	Low	Grouping
MOV-4-885A	0.4	400	2.24	1888	5%	0.20	0.08	3000	3881	12481	70000	28579	Low	EPRI
MOV-4-885B	0.4	400	2.24	1888	5%	0.20	0.06	3000	2094	12481	70000	25130	Low	EPRI
MOV-4-885C	0.4	400	2.24	1888	5%	0.20	0.06	3000	2858	12481	70000	28238	Low	EPRI

Notes:

(a) MOVATS Diagnostic Equipment in use. Square Root Sum of the Squares Method used to combine DEA and TSR.

(b) Data not available.

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TABLE C
Setup of Not DP Tested Turkey Point GL 89-10 Program Valves

Valves Which Have a Quality Function to Open														
Tag Number	Valve Factor- Design	Design Basis DP	Thrust Additions (a)			Stem COF		Packing Load		Thrust			PSA Group	Basis for Closure
			DEA	Full Scale	TSR	Calc	Test	Calc	Test	Minimum Calc	Maximum Calc	Field Set up		
			%											
Unit 3														
MOV-3-350	0.89	108	2.24	87	20%	0.20	0.11	1200	331	1830	5328	2451	Low	Grouping
MOV-3-750	0.4	535	2.24	1401	5%	0.20	0.10	3000	2400	21488	39118	32968	Medium	Grouping
MOV-3-751	0.4	535	2.24	1401	5%	0.20	0.08	3000	1800	21488	39118	35037	Medium	Grouping
MOV-3-832	1.1	183	2.24	87	10%	0.20	0.14	1200	203	2280	8000	3473	Low	Grouping
Unit 4														
MOV-4-350	0.89	108	2.24	87	10%	0.20	0.14	1200	384	1830	5328	3458	Low	Grouping
MOV-4-750	0.4	535	2.24	1401	5%	0.20	0.09	3000	2515	21488	39118	28952	Medium	Grouping
MOV-4-751	0.4	535	2.24	1401	5%	0.20	0.07	3000	1828	21488	39118	27700	Medium	Grouping
MOV-4-832	1.1	183	2.24	87	10%	0.20	0.09	1200	274	2280	8000	4783	Low	Grouping

Notes:

(a) MOVATS Diagnostic Equipment in use. Square Root Sum of the Squares Method used to combine DEA and TSR.

Abbreviations:

DEA - Diagnostic Equipment Accuracy

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