CENTERIOR ENERGY

PERRY NUCLEAR POWER PLANT
10 CENTER ROAD
PERRY, OHIO 44081
(216) 259-3737

Mail Address:
P.O. BOX 97
PERRY, OHIO 44081

Robert A. Stratman
VICE PRESIDENT - NUCLEAR

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PY-CEI/NRR-1849 L

U. S. Nuclear Regulatory Commission
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Perry Nuclear Power Plant
Docket No. 50-440
Amended Response to Generic Letter 89-10, Supplement 6, Information on Schedule and Grouping, and Staff Responses To Additional Public Questions

References: 1. December 28, 1989 letter from A. Kaplan to Nuclear Regulatory Commission, Generic Letter 89-10 Safety-Related Motor Operated Valve Testing and Surveillance (PY-CEI/NRR-1115 L)

2. September 30, 1993 letter from R. A. Stratman to Nuclear Regulatory Commission, Response to Generic Letter 89-10, Supplement 5, "Inaccuracy of Motor-Operated Valve Diagnostic Equipment" (PY-CEI/NRR-1707 L)

3. April 8, 1994 letter from R. A. Stratman to Nuclear Regulatory Commission, Response to Generic Letter 89-10, Supplement 6, Information on Schedule and Grouping, and Staff Responses to Additional Public Questions (PY-CEI/NRR-1776 L)

Gentlemen:

This correspondence amends the previous response to GL 89-10 Supplement 6 (Reference 3) to include information obtained as a result of Refueling Outage (RFO) 4 activities. Reference 3 provided notification of changes to three (3) commitments involving Generic Letter (GL) 89-10 and its supplements. Specifically, these changes involved (1) the schedule for completion of the motor operated valve (MOV) initial testing program, (2) changes to the planned scope of individual MOV testing and (3) a modification to a previous commitment regarding additional testing to confirm the effects of maximum diagnostic testing inaccuracies with respect to performance of two (2) MOVs.

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Supplement 6 to GL 89-10, dated March 8, 1994, required addressees that intend to modify their current commitments to GL 89-10 and extend their schedule for responding to the generic letter to provide certain information specified in the supplement. The requested information is provided in the enclosure, Generic Letter 89-10 MOV Testing Program Schedule Extension & Application of Grouping Methodology, Bases and Justification.

Reference 1 previously committed to completing the initial MOV testing program within the schedule recommended by the generic letter (5 years or 3 Refueling outages, whichever is greater). This commitment required completion of the initial Perry Nuclear Power Plant (PNPP) MOV testing program by June 28, 1994 (5 years), or the end of RF04, August 14, 1994 (3 refueling outages). This commitment for completion was revised in Reference 3 to specify that the initial MOV testing program would be completed by the end of RF05. RF05 is currently scheduled to begin in January, 1996. By August 14, 1994, reasonable assurance was demonstrated that the GL 89-10 MOVs would perform their intended safety function under design basis conditions. The bases for making this determination are included in section III of the enclosure.

Reference 1 previously committed to testing each MOV within the program scope under static conditions and testing each MOV within the program under dynamic conditions (at or near design basis conditions), unless dynamic testing was determined to be impracticable. The commitment for testing each MOV was revised by Reference 3 to provide for (1) exempting some MOVs within the program scope from both static and dynamic testing, (2) excluding some MOVs from dynamic testing and (3) combining the remaining MOV test population into appropriate groups for the purpose of testing (both static and dynamic) of a representative sample of MOVs within the groups. Updated details are provided in the attached enclosure.

MOVs were exempted from the program in accordance with the guidance provided in NRC's response to question 6 of Supplement 1 to GL 89-10. MOVs were excluded from dynamic testing requirements if the MOV either is not required to change position or is exposed to a zero differential pressure when changing position.

Prioritization and grouping methodologies have been utilized to sequence testing and combine the remaining MOV test population into appropriate groups for the purpose of testing (both static and dynamic) of a representative sample of MOVs within the groups. The methodology and bases for the prioritization and grouping are provided in the enclosure.

Regarding the commitment for additional testing to confirm the effects of maximum diagnostic inaccuracies with respect to MOV performance, Reference 2 indicated that the 19 affected MOVs would be retested during RF04. Subsequent review has determined that two of the affected MOVs could be exempted from the program as mentioned above and were not tested (see Reference 3). Additional information regarding the status of retested MOVs due to GL 89-10, Supplement 5 is provided in section II.C of the enclosure.

If you have questions or require additional information, please contact Mr. James D. Kloosterman, Manager - Regulatory Affairs, at (216) 280-5833.

Very truly yours,

for R. A. Stratman

RAS:CRE

Enclosure

cc: NRC Project Manager
NRC Resident Inspector
NRC Region III

PY-CEI/NRR-1849 L

I, Robert W. Schrauder, being duly sworn state that (1) I am Director, Perry Nuclear Services Department of the Cleveland Electric Illuminating Company, and (2) I am duly authorized to execute and file this certification and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.

Robert W. Schrauder

Sworn and subscribed before me, this 23rd day of September, 1994

CAROLINE M. BALOG
Notary Public, State of Ohio
My Commission expires April 20, 1995
(Recorded in Lake County)

Generic Letter 89-10 MOV Testing Program
Schedule Extension & Application of Grouping Methodology, Bases and Justification

EXECUTIVE SUMMARY

On April 8, 1994, extension letter PY-CEI/NRR-1776 L was submitted stating our intentions to complete the GL 89-10 program by the end of Refueling Outage (RFO) 5.

A reasonable assurance evaluation was also provided for those MOVs in the dynamic test population that would not be dynamically tested by June 28, 1994, and for those MOVs in the static test population that would not be statically tested by June 28, 1994.

This letter further defines and provides details concerning the reasonable assurance evaluation previously submitted based on current information obtained from 88 static tests and 34 dynamic tests conducted on GL 89-10 MOVs during RF04. Numerous changes have been made to the reasonable assurance evaluation based on the large number of tests performed. In general, the diagnostic test results support the conservative design assumptions contained within the program, with the exception of a portion of the butterfly valve population. Further confirmation of the appropriate design conservatisms and reasonable assurance for butterfly valves was addressed during RF04 through additional dynamic testing on 5 MOVs.

The capability margins provided in Attachments 1 and 2 reflect a conservative margin based on test results. Several rising stem valves were also added to the RF04 dynamic test schedule based on similar considerations. The reasonable assurance evaluations have been updated to reflect the information obtained from RF04 testing.

Approximately 75 percent of the testing for the static test group and 40 percent of the testing for the dynamic test group, that are practicable to test, has now been completed. In conjunction with testing, numerous MOV modifications were implemented during RF04 to improve capability margins and resolve potential pressure lock issues. The gate and globe MOVs within the scope of the program have been statically tested. The meaningfulness of static testing of butterfly MOVs (which are limit switch operated at PNPP) is continuing to be evaluated and, at present, static testing of each butterfly valve is not planned. Rather, dynamic testing of a representative sample in each group will be performed.

The design function capability of the non-tested MOVs has been established by evaluation and analysis, and it is further defined in Attachments 1, 2, and 3. Comparative analysis utilizing the test results from RF04 has been used to further confirm this evaluation. Diagnostic test data from similarly grouped MOVs has also been used to validate original design basis assumptions and provide additional assurance that the MOVs within PNPP's GL 89-10 program are set up to perform their intended functions at design basis conditions.

I. CURRENT PROGRAM SCOPE

A. Program Administration

The Perry Nuclear Power Plant (PNPP) Motor Operated Valve (MOV) program is implemented in accordance with Plant Administrative Procedure (PAP-1116), "Motor Operated Valve Testing and Surveillance Program", and the Motor Operated Valve Program Plan for Generic Letter (GL) 89-10. These document the current program description and responsibilities and are included in the PNPP Operations Manual. Calculations and evaluations associated with the program are documented in accordance with Nuclear Engineering Instructions (NEI). Actual testing and related maintenance activities are performed in accordance with approved instructions.

B. GL 89-10 MOV Population

The criteria for inclusion of MOVs in the GL 89-10 program is outlined in the MOV Program Plan and in design bases calculations. The criteria are based on the recommendations of GL 89-10 and its supplements, Nuclear Regulatory Commission (NRC) inspection criteria for GL 89-10 and guidance from the Boiling Water Reactor Owners Group (BWROG) documents. Certain MOVs were determined to be exempt from testing in accordance with the criteria contained in the response to question 6 of Supplement 1 to GL 89-10.

Total Candidate MOVs	236
Exempt	56
Resulting Test (dynamic and static) Candidates	180

The 180 valves considered to be Test Candidates are classified as listed below:

Not Practicable to Dynamically Test	41
Static Test Only (No dp and/or No Position Change)	33
Practicable to Dynamically Test	106

C. Design Basis Review

The design basis reviews establish the worst case differential pressure and flow under which MOVs must change position. MOV mispositioning has been deleted from consideration in the maximum differential pressure evaluations as permitted in supplement 4 of GL 89-10. The design basis reviews are based on the information in GL 89-10 and its supplements, NRC inspection criteria for GL 89-10 and guidance from BWROG documents where appropriate. The Updated Safety Analysis Report (USAR), Technical Specifications, Operating Procedures, Design Specifications and Design Drawings were utilized in this review. An independent technical assessment of the design bases differential pressure calculations was performed in late 1993.

During the review process, consideration was given to beyond design basis events, including required MOV position changes to mitigate consequences of an accident or transient and system design control logic to determine component operating sequences.

To assess the capability of an MOV to operate as intended at worst case design basis conditions, the lowest of either the MOV reduced voltage capability, the actuator maximum rating, or the valve weak link is compared to the thrust or torque required. Setting of the MOV torque switch includes consideration of factors such as diagnostic equipment inaccuracy, stem factor, reduced voltage, valve factor, rate of loading effects, stem lubrication degradation, etc.

D. Torque Switch Setting Methodology

The MOV switch settings are established by determination of a minimum/maximum target thrust and torque window. These settings are used in verifying the torque switch setpoints during diagnostic testing. The determination of the thrust and torque windows and the recommended torque switch settings are documented in engineering calculations.

E. Prioritization and Grouping

The criteria for prioritizing MOV testing during the recent RF04 was established based on an evaluation of capability margins, performance history, Supplement 5 retesting requirements, PRA considerations and Siemens Power Corporation testing recommendations. The evaluation also considered issues such as rate of loading, temperature effects on motors and valve factors.

Further, the MOVs included in the program have been evaluated to determine their relative priority. The prioritization establishes MOV relative order of importance, thus allowing future dynamic testing activities and design upgrades to be sequenced appropriately.

The Probabilistic Risk Assessment (PRA) was used as the basis for evaluating the relative risk for motor operated valves in the GL 89-10 program. The PRA was performed for reactor operation at 100% power with normal system alignments and accounted for unavailability due to maintenance. The relative importance of the MOVs was determined using the Fussel-Vesely importance measure. The evaluation examined the impact of three different failure rates:

- Base Case - 2.93x10-3/Demand (Perry PRA Base Case)

- Sensitivity Study A - 9.00x10-3 (From NUREG/CR-4550, Table 8.2-5)

- Sensitivity Study B - 8.70x10-2 (From NUMARC Guideline 93-05)

The event tree equations in the sensitivity studies were requantified. The function equations in Sensitivity Study B were also requantified prior to event tree quantification. Following requantification, a core damage frequency (CDF) equation was generated which was used to calculate the Fussel-Vesely importance measures for each of the basic events in the core damage frequency equation. The Fussel-Vesely importance measures were used to rank the motor operated valves by their relative importance to the CDF.

Family grouping aligns MOVs by similarity of physical and operating characteristics. This family grouping is then used to establish a basis to determine if the dynamic testing of a representative sample of MOVs within a group provides sufficient information relative to performance, to apply to other MOVs in the group. The Siemens Power Corporation thrust and function verification methodology and similarity analysis has been applied to aid in establishing MOV family grouping and refining testing priority determination. The grouping methodology considers PRA results, valve actuator margins, valve type, manufacturer, safety function, expected fluid conditions and valve performance history. NPRDS reports were also examined to determine if a pattern of MOV failures exists within the industry.

Phase I of the Siemens study provides preliminary family (similarity) groupings for each valve type and recommended bounding test candidates. A subsequent Phase II technical evaluation associated with the family grouping effort provides additional technical justification for testing candidates. Along with the Phase II effort, key valve dimensional data has been obtained for plant assessment and use.

The final MOV priority categories have been established by utilizing the attributes of both the PRA and the Siemens methodology. Relative safety significance is highlighted by the PRA and reinforced by the variety of inputs in the Siemens approach which include functional design capability, design margins and failure history patterns. The prioritization selection criteria developed from this approach is as follows:

PRIORITY 1

MOVs which meet one or both of the following:

- MOVs from the PRA evaluation which contribute approximately 1% or greater to the overall core damage frequency.

- MOVs that have a high ranking for testing as identified by the Siemens evaluation.

PRIORITY 2

MOVs which do not meet the priority 1 criteria and which meet one or both of the following:

- MOVs from the PRA evaluation which contribute approximately 0.1 to 1% to the overall core damage frequency.

- MOVs that have a medium ranking for testing as identified by the Siemens evaluation.

PRIORITY 3

MOVs which do not meet the priority 1 or 2 criteria and which meet one or both of the following:

- MOVs from the PRA evaluation which contribute less than 0.1% to the overall core damage frequency.

- MOVs that have a low ranking for testing as identified by the Siemens evaluation.

PRIORITY 4

MOVs which are not included in the PRA model and are not identified as either a high, medium or low priority for testing as identified by the Siemens evaluation. These MOVs are considered to be of lower safety significance.

The priority category 1, 2, and 3 MOVs comprise 72 of the 180 MOVs in the GL 89-10 program. The remaining MOVs in the program are classified priority category 4.

II. COMPLETION STATUS

A. Extent of Static Testing Completed

STATIC TESTING STATUS

(Type)	(Population)	(Number Tested)
Gate Valves	77	77
Globe Valves	38	38
Butterfly Valves	65	20
Total	180	135

All gate and globe valves within the GL 89-10 program have been diagnostically tested under static conditions. Diagnostic static testing scheduled in RF04 included 68 gate and globe valves as a result of design modifications, maintenance activities, and/or re-evaluation of the switch settings based on the current torque/thrust window calculations.

Prior to RF04, the 65 butterfly valves within the GL 89-10 program were not statically tested using diagnostic equipment. Diagnostic testing under static conditions was completed for 20 of these valves during RF04. The remaining 45 butterfly valves are being evaluated to determine the necessity of further static testing.

B. Extent of Dynamic Testing Completed

DYNAMIC TESTING STATUS

(Type)	(Population)	(Number Tested)
Gate Valves	28	15
Globe Valves	24	11
Butterfly Valves	54	16
Total	106	42

As previously indicated, 106 of the MOVs are classified in the dynamic test populations as practicable to dynamically test. Eight (8) of the previous tests are acceptable and creditable. Thirty-four (34) dynamic flow tests were performed in RF04, which brings the total of completed, creditable tests to 42. For the remaining 64 MOVs that are practicable to dynamically test (see Attachment 1), appropriate test candidates will be identified from the family groupings. The selection of future dynamic flow test candidates will be based on priority, existing design margins, in-house dynamic flow test results, industry test information, the EPRI performance prediction program, and consideration of the final valve family grouping.

C. Valves Retested Due to GL 89-10, Supplement 5

Gate and globe MOVs in the GL 89-10 program which were previously tested statically and/or dynamically using the MOVATS open versus close methodology, have been re-evaluated to account for uncertainties described in GL 89-10 Supplement 5 and its references. The results of this evaluation were previously provided by correspondence dated September 30, 1993 (PY-CEI/NRR-1707 L). This evaluation concluded that while the affected MOVs remained capable of performing their intended functions, there were 19 MOVs identified, which required additional testing to confirm the effects of maximum diagnostic inaccuracies with respect to performance. Subsequent to the previous response, 2 of the 19 MOVs identified for retesting have been exempted from the GL 89-10 program in accordance with the exemption criteria contained in the response to question 6 of supplement 1 to GL 89-10. Consequently, these 2 MOVs (1B21-F0068 and 1E12F0074A) are no longer scheduled for retest. Four (4) of the affected GL 89-10 MOVs were retested during the October 1993 maintenance outage. The remaining 13 MOVs were completed during RF04 utilizing the torque/thrust window calculation methodology.

Subsequent to the GL 89-10 Supplement 5 evaluation, additional conservatisms were added to the GL 89-10 program and all valves tested with open versus close methodology were re-evaluated. The re-evaluation concluded that 13 valves fell outside the new conservative thrust window. These valves were determined to be operable and are scheduled for retesting by the end of RF05. Additional details will be included in an amended response to GL 89-10 Supplement 5.

D. Valve Modifications

Prior to RF04, eight GL 89-10 MOVs had been modified to improve capability.

The modifications included valve replacements, actuator gear changes, motor changes, and an internal valve modification to resolve potential pressure locking.

During RF04 thirty-one (31) GL 89-10 MOVs were modified to improve capability and reliability. The modifications include actuator changes, actuator gear changes, motor changes, internal valve changes, and cable changes. In addition, modifications were performed on 8 valves during RF04 to resolve potential pressure locking concerns.

III. BASES FOR ESTABLISHING DESIGN BASIS CAPABILITY OF REMAINING MOVS

The MOVs in the GL 89-10 program have been evaluated to ensure that at the end of RF04, reasonable assurance has been provided that each MOV will operate properly under design basis conditions. The MOVs tested and modified during the 1993 Fall outage and RF04 were determined by evaluation to be of higher safety significance. The prioritization scheme enacted earlier this year has affirmed the evaluation results. For those MOVs that have not been tested with diagnostic equipment by the completion of RF04, an evaluation has been performed relative to the design basis capabilities for each MOV. The results of this evaluation are provided in Attachments 1, 2 and 3. Each attachment provides MOV specific information including identification number, valve type, valve size, safety function(s), design basis flow rate and differential pressure, valve priority and available margin(s).

The valve priority categories are those discussed in section I.E and encompass the PRA based safety significance. The capability margin provided in Attachments 1 and 2, is the difference between the lowest of MOV reduced voltage capability, the actuator maximum rating, or the valve weak link (or torque switch setting for butterfly valves) and the calculated required thrust/torque for each MOV expressed as a percentage of the required thrust/torque. In calculating margin, thrust is used for gate and globe valves and torque is used for butterfly valves. Torque switch setting margins have also been defined for rising stem MOVs and are documented in engineering calculations.

Attachment 1 provides the evaluation of MOV capabilities for those MOVs, practicable to dynamically test, which were not tested by the conclusion of RF04. Attachment 2 provides the evaluation of MOV capabilities for those MOVs which are identified as not practicable to dynamically test. Attachment 3 provides the evaluation of MOV capabilities for 5 additional butterfly MOVs which were not statically tested by the conclusion of RF04, and for which no dynamic testing is necessary.

Torque switch settings for GL 89-10 gate and globe MOVs tested during RF04 were set per the current torque/thrust window calculations, which account for higher valve factor, diagnostic uncertainties, torque switch repeatability, stem lubrication degradation, and rate of loading. Torque switch settings for the balance of the GL 89-10 gate and globe MOVs have been evaluated against the current torque/thrust window calculations to ensure the MOVs are capable of performing their intended safety functions. Switch settings are controlled, maintained, and verified in accordance with Plant Administrative Procedures whenever maintenance activities which affect switch settings are performed.

For gate and globe MOVs tested using the open versus closed Thrust Measuring Device (TMD) methodology, switch setting evaluations were performed in engineering calculations using the most conservative bounding analysis approach per MOVATS instruction 5.2. MOVs tested with a torque thrust cell or strain gauge were evaluated using a torque\thrust window calculation. In either evaluation the allowances due to diagnostic equipment accuracy, torque switch repeatability, rate of loading and stem lubrication degradation were considered. Higher (more conservative) valve factors based on vendor information, testing results and/or industry data were used, where appropriate. A conservative stem friction coefficient was also used.

Butterfly MOVs within the GL 89-10 program are set such that there is reasonable assurance that they will operate properly under design basis conditions. Switch settings have been verified in accordance with approved instructions. Butterfly MOVs are position seated in the open and close directions by limit switch actuation. The torque switches are used as a backup mechanical protection device and are not normally actuated during MOV stroking. The torque switches are set appropriately so that they do not open during design basis events and normal operation. Diagnostic testing of selected butterfly valves under static and dynamic conditions during RF04 determined that the vendor calculated minimum required torque values were not conservative. Incorporation of the test results and the application of the more conservative industry information into the design calculations increased the calculated minimum required torque which subsequently reduced the design margins from those submitted in the original extension letter. These efforts have provided additional assurance that the switch settings are appropriate and there is sufficient capability for the valves to perform their intended design basis safety functions.

Future dynamic testing of MOVs is being prioritized as noted above. The family grouping methodology refines the bases for verifying the capability of the MOVs in the dynamic flow test population that are not practicable to dynamically test. The family grouping methodology has been applied to identify performance bounding candidates in each family (similarity) group. These will be a factor in determining the additional test candidates.

Dynamic flow testing results obtained during RF04 have provided additional assurance that the remaining GL 89-10 dynamic test population MOVs will perform their intended safety functions. The MOV capability margins are evaluated following testing and as appropriate, results are applied to other MOVs within the family groups. The post test evaluation process validates and verifies the established design considerations and dictates the application of additional conservatisms and evaluations where appropriate.

Industry, vendor and/or EPRI flow test performance evaluations are applied where practical and appropriate to provide additional assurance that the GL 89-10 MOVs will perform their design basis functions.

IV. SCHEDULE FOR PROGRAM COMPLETION

The initial GL 89-10 test program will be completed by the end of the next scheduled refueling outage, RF05. The final population of MOV tests and modifications will be based on the results of RF04 testing, industry test results, the EPRI Performance Prediction Program and final implementation of the Siemens thrust and function verification methodology.

Attachment 1

Perry Nuclear Power Plant

MOVs That Are Practicable To Dynamically Test After RFO4

The information presented in this attachment encompasses a total of sixty-four (64) MOVs consisting of thirteen (13) globe valves, thirteen (13) gate valves and thirty-eight (38) butterfly valves.

One of the gate valves (1E51F0031) and one of the butterfly valves (0P42F0150B), which have not been tested are designated Category 1 based on PRA significance.

- 1E51F0031 is a 6-inch Borg-Warner gate valve which has been grouped with 21 similar valves in family group 4. Four of the 21 valves were dynamically tested during RFO4. The capability margin for this valve is over 400% and includes a higher valve factor which was determined by testing.

- 0P42F0150B is a 10-inch Contromatics butterfly valve which has been grouped with 42 similar valves in family group 16. Six of the valves have been dynamically tested during RFO4. The capability margin for this valve is over 85%.

Two valves are designated Category 1 based solely on a Siemens ranking of high for testing (enveloping candidate).

- 1C41F0001A is a 4-inch Rockwell globe valve grouped in family group 12. The valve is required to open under a DBdP of only 18.5 psid and has a capability margin greater than 41%. A sister valve, 1C41F0001B, was added to the dynamic testing work scope of RFO4 and was successfully tested during the outage. The flow margin was found to be more than 30%.

  1E12F0042A, the Low Pressure Cooling Injection shutoff valve, is a 12-inch Borg Warner gate valve in family group 6. Testing is recommended for either 1E12F0042A or B. The operator for this valve was modified during RFO4. This resulted in a capability margin of 9% in the open direction and 162% in the close direction for 1E12F0042A. The 1E12F0042B valve was dynamically tested during the RFO4 outage, and the results further confirmed the adequacy of this MOV. Refer to further discussion on Gate Valve (Item 10) for margin.

GLOBE VALVES

1. **1C41F0001A**

This valve, in the C41 (Standby Liquid Control) system, is a 4-inch normally closed globe valve and is required to open to perform its design basis function. This valve is grouped with the F0001B valve in family group 12. This valve has been designated as Category 1, based on a Siemens ranking of high for testing one of the two valves. This priority designation is not a function of PRA-based safety significance. This valve is required to open under a Design Basis differential pressure (DBdP) of 18.5 psid which is the result of the combination of static heads on the upstream and downstream side. The valve is limit switch operated in the open direction. By analysis, the capability margin for valve opening has been conservatively determined to be at least 41%. Previously, this valve has been satisfactorily tested statically, and was retested statically (GL 89-10, Supplement 5) during RF04. The F0001B valve was dynamically tested during RF04 with adequate flow margin and thus the F0001A valve is judged to be acceptable based on satisfactory performance testing, low DbdP flow, and reasonable capability margin.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	Margin (%)
					OPEN	CLOSE		
1C41F0001A	GLOBE	4	OPEN	1	18.5	NA	43 gpm	41

2. **1P22F0015**

This valve, in the P22 (Mixed Bed Demineralizer) system, is a unique 1.25-inch globe valve, which is required to close in performing its design basis function. This is the only valve in family group 14. The valve has been designated as Category 3, based on a Siemens ranking of low for testing. This priority designation is not a function of PRA-based safety significance. The valve uses a torque switch for the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the closing stroke. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. By analysis, the capability margin has been conservatively determined to be 85%. This is judged to be acceptable based on adequate margin.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1P22F0015	GLOBE	1.25	CLOSE	3	NA	152.5	3700 cc/min	85

3. **1E51F0076, 1M51F0020A, 1M51F0020B, 1N27F0737, 1N27F0740, 1P51F0652, 1P52F0200, 1P52F0646, and 1P86F0002**

These valves are similar 1, 1.5 and 2-inch globe valves which have been grouped in family group 13. These valves are designated Category 4 as they have no PRA-based safety significance and are not testing candidates based on the Siemens ranking criteria. These valves do not use torque switches in the open direction. The 1E51F0076 is the steam supply inboard isolation bypass valve in the E51 (Reactor Core Isolation Cooling) system. This valve is maintained normally closed and is not required to change position during a design basis event. The valve is administratively opened only during the placement of the RCIC system into the standby readiness condition. The valve uses a torque switch for the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the closing stroke. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. The 1M51F0020A and F0020B valves, in the M51 (Combustible Gas Control) system, have capability margins which have been conservatively calculated to be in excess of 115%. The 1N27F0737 and F0740 valves, in the N27 (Feedwater) system, and the 1P52F0200 and 1P52F0646 valves, in the P52 (Instrument Air) system which are installed in a pressurized air system, have capability margins in excess of 150%. The 1P51F0652 valve in the P51 (Service Air) system, which is installed in a pressurized air system has a capability margin conservatively calculated to be in excess of 30%. The 1P86F0002 valve is nitrogen supply containment isolation valve in the P86 (Nitrogen Supply) system. The valve is maintained normally closed and is not expected to see any differential pressure during a design basis event. The valve is administratively opened only during the nitrogen charging operation. The valve uses a torque switch for the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the closing stroke. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke.

The capability of these valves has been determined to be acceptable based on adequate margin. Additionally, valve 1E51F0019 of this family group was dynamically tested during RFO4, and the test results further confirm the adequacy of these valves.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E51F0076	GLOBE	1	NONE[1]	4	NA	1048.3	<34,200 #/hr	269
1M51F0020A	GLOBE	2	OPEN	4	160	NA	120 gpm	117
1M51F0020B	GLOBE	2	OPEN	4	160	NA	120 gpm	117
1N27F0737	GLOBE	1.5	OPEN	4	32.1	NA	30 gpm	151
1N27F0740	GLOBE	1.5	OPEN	4	25	NA	30 gpm	151
1P51F0652	GLOBE	1.5	CLOSE	4	NA	120	1751 acfm	39
1P52F0200	GLOBE	2	CLOSE	4	NA	120	500 acfm	169
1P52F0646	GLOBE	2	CLOSE	4	NA	120	500 acfm	151
1P86F0002	GLOBE	2	NONE[1]	4	NA	1265	60000 scfh	42

NOTE: 1. Design basis accident initial conditions consider this valve to be closed. The design basis differential pressure and margin reflect the condition where the valve is administratively open at the time of accident initiation.

4. **1E12F0021**

This valve, in the E12 (Residual Heat Removal) system, is an 18-inch globe valve, which is grouped in family group 10. The valve has been designated as Category 4, as it has no PRA-based safety significance and is not a testing candidate based on the Siemens ranking criteria. The valve is the "C" train test return isolation valve and is maintained normally closed and is not required to change position during a design basis event. By analysis, the capability margin has been conservatively determined to be greater than 35%. This is judged to be acceptable based on adequate margin.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E12F0021	GLOBE	18	NONE[1]	4	NA[1]	301.2[1]	1650 gpm	79[1]

NOTE: 1. Design basis accident initial conditions consider this valve to be closed. The design basis differential pressure and margin reflect the condition where the valve is administratively open at the time of accident initiation.

5. **1E22F0023**

This valve, in the E22 (High Pressure Core Spray) system, is a 12-inch globe valve, which is grouped in family group 9. The valve has been designated as Category 4, as it has no PRA-based safety significance and is not a testing candidate based on the Siemens ranking criteria. The valve is the high pressure core spray pump test return line to suppression pool isolation valve and is maintained normally closed and is not required to change position during a design basis event. By analysis, the capability margin has been conservatively determined to be 40%. This is judged to be acceptable based on adequate margin.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E22F0023	GLOBE	12	NONE[1]	4	NA	1395[1]	725 gpm	80[1]

NOTE: 1. Design basis accident initial conditions consider this valve to be closed. The design basis differential pressure and margin reflect the condition where the valve is administratively open at the time of accident initiation.

GATE VALVES

6. 1E51F0010 and 1E51F0031

These valves are 6-inch gate valves, which have been grouped in family group 4. They are in the E51 (Reactor Core Isolation Cooling) system. The 1E51F0031 valve has been designated as Category 1 based on its PRA safety significance. The 1E51F0010 valve has been designated Category 4 as it has no PRA-based safety significance and is not a testing candidate based on the Siemens ranking criteria. Each valve is required to operate against a low DBdP and has a capability margin which is in excess of 340%. These valves are limit switch operated in the open direction. The torque switch is bypassed by the limit switch for 95% of the stroke in the close direction. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. Valve 1E12F0609 in this family group has been dynamically tested, and the results indicate a higher valve factor for the valve. These valves are judged to be acceptable based on the high capability margin which includes application of the increased (more conservative) valve factor determined from actual dynamic testing, and in conjunction with the low DBdP.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E51F0010	GATE	6	CLOSE	4	NA	22.2	700 gpm	362
1E51F0031	GATE	6	OPEN	1	22.2	NA	700 gpm	432

7. 1G61F0030, 1G61F0035, and 1P22F0010

These gate valves have been grouped in family group 4. Each valve is required to close in performing it's design basis function. The 1P22F0010 valve, in the P22 (Mixed Bed Demineralizer) system, has been designated as Category 2 based on a Siemens ranking of medium for testing. This category designation is not a function of PRA-based safety significance. Both the 1G61F0030 and F0035 valves, in the G61 (Liquid Radwaste) system, are designated as Category 4 as they do not have a PRA-based safety significance and are not Siemens candidates for testing. Each of these valves is torque switch operated in the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the stroke in the closing direction. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. Four other valves in this family group (1G61F0150, F0155, F0075 and F0080) have been dynamically tested, and the results indicate higher valve factors for the valve. The capability margin for 1P22F0010 is in excess of 200%. The capability margin for the 1G61F0030 and F0035 valves are in excess of 375%. These valves are judged to be acceptable based on the high capability margin which includes application of the increased (more conservative) valve factor determined from actual dynamic testing.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1G61F0030	GATE	2.5	CLOSE	4	NA	34.4	100 gpm	384
1G61F0035	GATE	2.5	CLOSE	4	NA	34.4	100 gpm	383
1P22F0010	GATE	3	CLOSE	2	NA	161.8	380 gpm	276

8. **1E22F0001**

This 16-inch gate valve is one of only two valves grouped in family group 1. This valve is in the E22 (High Pressure Core Spray) system and has been designated as Category 3 based on a Siemens ranking of low for testing. This priority designation is not a function of PRA-based safety significance. This valve is torque switch operated in the close direction only. The torque switch is bypassed by the limit switch during approximately 95% of the stroke in the closing direction. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. The capability margin has been conservatively determined to be in excess of 250% and the Design Basis differential pressure (DbdP) is low. The capability of this valve has been determined to be acceptable based on its very high margin and low DBdP. The other valve in this family, 1E22F0015, was dynamically tested during RF04, and the test results further confirm the adequacy of this valve.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E22F0001	GATE	16	CLOSE	3	NA	22.2	6110 gpm	261

9. **1G50F0272 and 1G50F0277**

These 4-inch gate valves grouped in family group 4 are part of the G50 (Liquid Radwaste) system, and are designated Category 4 as they have no PRA-based safety significance and are not testing candidates based on the Siemens ranking criteria. These valves are limit switch operated in the open direction. The torque switch is bypassed by the limit switch for 95% of the stroke in the close direction. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. A similar 12-inch valve was removed from the unused Perry Unit 2 and shipped to EPRI for testing (EPRI Valve #10). Preliminary EPRI test results indicate a higher valve factor than originally assumed. Valve 1E21F0011, which is similar and therefore also grouped with these valves, has been dynamically tested and a valve factor even higher than that calculated from the EPRI testing was determined. The capability margin calculations for the 1G50F0272 and F0277 valves using the highest valve factor (from testing 1E21F0011), result in margins exceeding 350%. Five other valves in family group 4 were also dynamically tested which further confirms the adequacy of the conservatism applied. These valves are judged to be acceptable based on the large capability margins which include application of the higher valve factor determined from the actual dynamic testing of 1E21F0011.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN %
					OPEN	CLOSE		
1G50F0272	GATE	4	CLOSE	4	NA	5.2	350 gpm	353
1G50F0277	GATE	4	CLOSE	4	NA	5.2	350 gpm	369

10. **1C11F0083, 1E12F0042A, 1E12F0042C, 1G33F0028, and 1G33F0034**

Valve 1C11F0083, is a 2.5-inch gate valve in the C11 (Control Rod Drive) system, and has been grouped in family group 6. The 1C11F0083 valve is designated as Category 4 as it does not have a PRA-based safety significance and is not a Siemens candidate for testing. It is required to close to perform its design basis function. This valve is torque switch operated in the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the stroke in the closing direction. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. The EPRI test valve #7 (similar to the 1C11F0083 valve) has been tested at significantly higher dP and flow than design basis for the 1C11F0083 valve. The preliminary EPRI testing results indicate that the valve factor used in the PNPP capability margin calculations was not conservative. The capability margin has been conservatively determined to be in excess of 670% and the DBdP is approximately 30 psid. Therefore, the capability of this valve has been determined to be acceptable based on its high capability margin which includes application of the higher EPRI calculated valve factor.

The 1E12F0042A valve has been designated Category 1 as a result of Siemens ranking of high for testing of the F0042A or F0042B valve. The 1E12F0042A valve also has a PRA-based safety significance of 2. The 1E12F0042C valve has been designated as Category 2 based on its PRA safety significance. These are the injection and shutoff valves within the RHR low pressure coolant injection system. The valves are normally closed and are required to open during a design basis event. Valve 1E12F0042A is then required to close in preparation for suppression pool cooling initiation. Testing of these valves requires complex test preparation and analysis. Additionally, the open DBdP value accounts for check valve leakage, and this cannot be simulated for actual dynamic testing. However, the F0042B valve was dynamically tested during RFO4. The test approximated the DBdP through the use of pump head. It is not intended that testing will be performed on 1E12F0042A and F0042C due to the significance of injection into the vessel.

The EPRI test valve #9 is also similar to these valves, and the preliminary test results indicate that the valve factor used in the capability margin calculations for these valves was not conservative. As a result, modifications to the operators to improve valve capability margin for both 1E12F0042A and F0042C were performed during RFO4. Setting of the torque switches by static testing was performed and the resultant capability margin between the DBdP required thrust and reduced voltage capability have been conservatively determined to be greater than 5%. Open capability margin for 1E12F0042A, 1E12F0042B, and 1E12F0042C are low due to the following conservative assumptions.

1) The open required thrust is based on 0.5 valve factor (VF) and neglecting piston effect force (piston effect force is not deducted).

2) The open capability is based on various conservative assumptions such as application factor of 0.9 and stem factor based on 0.2 stem coefficient of friction.

Recent site flow testing of 1E12F0042B shows open VF of 0.27 instead of assumed 0.5. The close VF was found to be 0.37. The open/close flow margins (extrapolated) are 239% and 132% respectively. Therefore, based on the above discussion and the actual higher flow margin, the above valves are acceptable.

Valves 1G33F0028 and F0034 are 4-inch valves in the G33 (Reactor Water Cleanup) system. These valves are the system blowdown line containment isolation valves which are maintained closed during normal plant operation. These two valves are designated as Category 4 as they do not have a PRA-based safety significance and are not a Siemens candidate for testing. These valves utilize a torque switch for the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the closing stroke. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. These valves are administratively opened only during reactor startup, shutdown, and pre-refueling operation.

VALVE	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1C11F0083	GATE	2.5	CLOSE	4	NA	30.6	180 gpm	679
1E12F0042A	GATE	12	OPEN/CLOSE	1	530	305	7100 gpm	9/162
1E12F0042C	GATE	12	OPEN	2	530	NA	7100 gpm	6
1G33F0028	GATE	4	NONE[1]	4	NA	140	<100 gpm	257
1G33F0034	GATE	4	NONE[1]	4	NA	140	<100 gpm	277

NOTE: 1. Design basis accident initial conditions consider these valves to be closed. The design basis differential pressure and margin reflect the condition where each valve is administratively open at the time of accident initiation.

BUTTERFLY VALVES

11. 1M17F0015, 1M17F0025, 1M17F0035, and 1M17F0045

These 24-inch butterfly valves in the M17 (Containment Vacuum Relief) system are required to cycle open and close in performing their intended function during a design basis event. They are grouped in family group 17. The valves have been designated as Category 3 based on a Siemens ranking of low for static testing at least one of the four valves. This category designation is not a function of PRA-based safety significance. These butterfly valves are limit switch operated in both open and close directions. Torque switches provide a backup in both the open and close directions. By analysis, the capability margin for each of these valves has been conservatively determined to be greater than 25%. The DBdP of the air which passes through these valves is only on the order of 0.2 psid. These valves have been satisfactorily tested during routine surveillance testing. These valves are adequate based on the reasonable capability margin in conjunction with the low DBdP.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1M17F0015	BUTT	24	OPEN/CLOSE	3	0.2	0	NA	26/26
1M17F0025	BUTT	24	OPEN/CLOSE	3	0.2	0	NA	26/26
1M17F0035	BUTT	24	OPEN/CLOSE	3	0.2	0	NA	26/26
1M17F0045	BUTT	24	OPEN/CLOSE	3	0.2	0	NA	26/26

12. **1G41F0100**

This butterfly valve has been placed in family group 15. Valve 1G41F0100 has been designated Category 3 based on a Siemens ranking of low for testing. The category 3 designation is not a function of PRA-based safety significance. This butterfly valve is limit switch operated in both open and close directions. A torque switch provides a backup in both the open and close directions.

The normally open 1G41F0100 valve is required tc close during a design basis event. The normal system operating flow through this valve is 300 gpm, with a dP of 56 psid. In accordance with system operating procedures, this valve has been successfully stroked closed under normal flow and dP conditions. This normal operating flow is close to design basis value and the dP is approximately 50% of design basis dP. By analysis, the capability margin has been conservatively determined to be over 10%. This valve is acceptable based on the adequate capability margin and the satisfactory performance during operation.

Eight other valves of family group 15 were dynamically tested during RF04. The testing results indicated that the bearing and seating torque were found to be higher than the original design assumptions. This valve is determined to be acceptable based on the application of the higher torque values determined from actual dynamic testing of similar valves.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1G41F0100	BUTT	8	CLOSE	3	NA	92.3	300 gpm	12

13. **0P42F0150B, 0P42F0255A, 0P42F0255B, 0P42F0260A, 0P42F0260B, 0P42F0265A, 0P42F0265B, 0P42F0295A, 0P42F0295B, 0P42F0300B, 0P42F0325A, 0P42F0325B, 0P42F0330A, 0P42F0330B, 0P42F0380A, 0P42F0380B, 0P42F0390A, 0P42F0390B, 0P42F0440, 0P42F0445, 1P43F0355, 1P43F0400, 1P43F0410 and 1P45F0140**

These 8 and 10-inch butterfly valves in the P42 (Emergency Closed Cooling) system are 24 of the 43 valves in family group 16. The 0P42F0150B valve, which is required to close to perform its safety function, has been designated Category 1, based on PRA safety significance. The remaining valves are designated Category 4, as they have no PRA-based safety significance and are not testing candidates based on the Siemens ranking criteria. These butterfly valves are limit switch operated in both open and close directions. Torque switches are provided as a backup in both the open and close directions. By analysis, the capability margin for each of these valves has been conservatively determined to be at least 15% (The margin for the Category 1 valve, 0P42F0150B, is greater than 85% and for the Category 2 valves is greater than 20%). These valves are adequate based on the sufficient capability margin in comparison to reasonably low dP.

Valves 1P43F0355, F0400 and F0410 located in the P43 (Nuclear Closed Cooling) system, are required to close in performing their design basis function. By analysis, the capability margin has been conservatively determined to be greater than at least 33% for these valves. These valves are adequate based on reasonable margin and low dP.

Four 10-inch valves from family group 16 were dynamically tested during RFO4. The results of this testing which have been applied conservatively, further confirm the adequacy of the above valves. The test results indicate that the bearing and seating torque values were higher than the engineering assumptions. The margin reflects the higher required design torque.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
0P42F0150B	BUTT	10	CLOSE	1	NA	56	1700 gpm	87
0P42F0255A	BUTT	10	CLOSE	4	NA	63.2	2000 gpm	75
0P42F0255B	BUTT	10	CLOSE	4	NA	63.2	2000 gpm	74
0P42F0260A	BUTT	10	OPEN	4	79	NA	2000 gpm	39
0P42F0260B	BUTT	10	OPEN	4	79	NA	2000 gpm	64
0P42F0265A	BUTT	10	OPEN	4	79	NA	2000 gpm	64
0P42F0265B	BUTT	10	OPEN	4	79	NA	2000 gpm	63
0P42F0295A	BUTT	10	CLOSE	4	NA	90.1	1700 gpm	25
0P42F0295B	BUTT	10	CLOSE	4	NA	90.1	1700 gpm	25
0P42F0300B	BUTT	10	OPEN	4	103.9	NA	1700 gpm	54
0P42F0325A	BUTT	10	CLOSE	4	NA	90.1	1700 gpm	34
0P42F0325B	BUTT	10	CLOSE	4	NA	90.1	1700 gpm	34
0P42F0330A	BUTT	10	OPEN	4	105	NA	1700 gpm	23
0P42F0330B	BUTT	10	OPEN	4	105	NA	1700 gpm	26
0P42F0380A	BUTT	10	CLOSE	4	NA	90.1	1000 gpm	58
0P42F0380B	BUTT	10	CLOSE	4	NA	90.1	1000 gpm	58

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
0P42F0390A	BUTT	10	CLOSE	4	NA	90.1	1000 gpm	58
0P42F0390B	BUTT	10	CLOSE	4	NA	90.1	1000 gpm	58
0P42F0440	BUTT	10	CLOSE	4	NA	90.1	2000 gpm	58
0P42F0445	BUTT	10	CLOSE	4	NA	90.1	2000 gpm	31
1P43F0355	BUTT	10	CLOSE	4	NA	37.1	1750 gpm	33
1P43F0400	BUTT	10	CLOSE	4	NA	37.1	1750 gpm	33
1P43F0410	BUTT	10	CLOSE	4	NA	37.1	1750 gpm	33
1P45F0140	BUTT	8	OPEN	4	20.6	NA	900 gpm	29

14. **1P43F0055, 1P43F0140, 1P43F0215, 1P45F0014B, 1P45F0068B, 1P45F0130B, 1P50F0060, 1P50F0140, and 1P50F0150.**

These valves are 9 of the total of 43 butterfly valves which have been grouped in family group 16. The 1P45F0014B valve, which is required to open to perform its safety function, has been designated Category 2 based on a Siemens ranking of medium for testing. The remaining valves are have all been designated Category 4, as they have no PRA-based safety significance and are not testing candidates based on the Siemens ranking criteria.

The 1P45F0014B and F0068B valves in the P45 (Emergency Service Water) system are normally closed and required to open during a design basis event. By analysis, the margin between the capability (limited by the reduced voltage capability) and the required torque has been conservatively determined to be approximately 10%. The calculated required torque is based on higher seating and bearing torque determined from actual flow test results of butterfly valves by the same manufacturer. Similar valves 1P45F0014A and 1P45F0068A in the redundant loop have been flow tested and the flow margins were found to be higher than 70%. Prior to the flow test, the "A" valves were changed from carbon steel to stainless steel body. Although there is a difference in material type, the valve design as well as the system parameters, are sufficiently similar to make a reasonable correlation between the valves. Valves 1P45F0014B and 1P45F0068B are scheduled for similar modifications as the "A" valves and flow test in the next refueling outage. This modification, when implemented, will cause the grouping of these valves to change from family group 16 to family group 15. Based on the above discussion, 1P45F0014B and 1P45F0068B are determined to be adequate.

Valves 1P43F0055, F0140 and F0215 located in the P43 (Nuclear Closed Cooling) system, are required to close in performing their design basis function. By analysis, the capability margin has been conservatively determined to be greater than at least 13% for these valves. Additionally, these valves have had extra conservatism applied as a result of the testing performed on the butterfly valves during RFO4. These valves are adequate based on reasonable margin and low dP.

Valve 1P45F0130B, also of the P45 (Emergency Service Water) system, is required to open to perform its design basis function. By analysis, the capability margin has been conservatively determined to be greater than 45%. A sister valve in the redundant train was dynamically tested with results that have been applied to this valve. Therefore, this valve is adequate based on the sufficient margin in conjunction with the low DBdP.

The 1P50F0060, F0140, and F0150 valves, located in the P50 (Containment Vessel Chilled Water) system, are required to close in performing their design basis function. By analysis, the capability margin has been conservatively determined to be greater than 75% for these valves. Additionally, these valves have had extra conservatism applied as a result of the testing performed on the butterfly valves during RFO4. These valves are adequate based on sufficient margin and low dP.

Six valves from family group 16 were dynamically tested during RFO4, and the results further confirm the adequacy of the above valves.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1P43F0055	BUTT	12	CLOSE	4	NA	37.7	2451 gpm	18
1P43F0140	BUTT	12	CLOSE	4	NA	37.7	2451 gpm	18
1P43F0215	BUTT	12	CLOSE	4	NA	37.7	2451 gpm	13
1P45F0014B	BUTT	20	OPEN	2	133.2	NA	7300 gpm	8
1P45F0068B	BUTT	20	OPEN	4	86.1	NA	7300 gpm	7
1P45F0130B	BUTT	24	OPEN	4	23.2	NA	12900 gpm	48
1P50F0060	BUTT	6	CLOSE	4	NA	37	600 gpm	77
1P50F0140	BUTT	6	CLOSE	4	NA	37	600 gpm	77
1P50F0150	BUTT	6	CLOSE	4	NA	37	600 gpm	77

Attachment 2

Perry Nuclear Power Plant

MOVs That Are Not Practicable To Dynamically Test

GLOBE VALVES

1. **1E32F0006, 1E32F0007, 1E51F0077, 1E51F0078, 1M51F0090, and 1M51F0110**

These valves are similar 1.5 and 2-inch globe valves which have been placed in family group 13. Of the total of 14 valves in this family group, these 6 valves are not practicable to test.

The 1E32F0006 and F0007 valves have been designated Priority 3, based on a Siemens ranking of low for testing one of the two valves. This priority designation is not a function of PRA-based safety significance. These valves are the MSIV Leakage Control System outboard blower, inlet isolation valves. The valves are normally closed and are required to be opened by operator action post-LOCA, to initiate operation of the leakage control outboard system. These valves are interlocked such that they cannot open if the main steam line pressure is greater than 0.5 psig These valves cannot be dynamically tested as it is not practical to provide a sustained pressure source with the plant shutdown to duplicate the DBdP. The torque switches for these valves have been set by static testing. By analysis, the capability margin has been conservatively determined to be greater than 150%. These valves are adequate based on the high capability margin in conjunction with the low DBdP.

The 1E51F0077 and 1E51F0078 valves have been designated Priority 4 as they have no PRA-based safety significance. These valves are the turbine exhaust vacuum breaker isolation valves in the E51 (Reactor Core Isolation Cooling) system. These two valves are normally open and are required to close upon receipt of concurrent signals for reactor vessel low pressure and drywell high pressure. This DBdP of 7.8 psid occurs as a result of pressure inside the containment post-LOCA and cannot be duplicated for testing. The torque switches for these valves will be set by static testing. By analysis, the capability margin has been conservatively determined to exceed 100%. These valves are adequate based on the high margin in conjunction with the low DBdP.

The 1M51F0090 and F0110 valves are in the M51 (Combustible Gas Control) system, and have been designated Priority 4 as they have no PRA-based safety significance. These valves are the drywell purge line containment isolation valves located in the M51 (Combustible Gas Control) system. The valves are normally closed and are cycled open during plant operation for drywell pressure control. The DBdP of 22.1 psid occurs as a result of pressure in the drywell post-LOCA and cannot be duplicated to support dynamic testing. The torque switches for these valves have been set by static testing. By analysis, the capability margin has been conservatively determined to be greater than 175%. These valves are adequate based on the high margin in conjunction with the low DBdP.

Additionally, valve 1E51F0019 of family group 13 was dynamically tested during RF04, and the test results further confirm the adequacy of the above valves.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E32F0006	GLOBE	2	OPEN/CLOSE	3	0.5	0.5	100 scfh	158/219
1E32F0007	GLOBE	2	OPEN/CLOSE	3	0.5	0.5	100 scfh	157/219
1E51F0078	GLOBE	2	CLOSE	4	NA	7.8	NA	217
1E51F0077	GLOBE	1.5	CLOSE	4	NA	7.8	NA	86
1M51F0090	GLOBE	2	CLOSE	4	NA	22.1	78 scfh	188
1M51F0110	GLOBE	2	CLOSE	4	NA	22.1	78 scfh	194

GATE VALVES

2. **1E21F0005, 1E51F0013, 1E51F0063, 1E51F0064, 1G33F0001, and 1G33F0004**

These valves are similar gate valves ranging in size from 3 to 12 inch which have been grouped in family group 6. Of the total of 10 valves in this group, these 6 valves are not practicable with respect to performing a dynamic test.

The 1E21F0005 valve has been designated as Category 2, as a function of PRA-based safety significance. This valve is the injection and shutoff valve in the E21 (Low Pressure Core Spray) system. It is normally closed and required to open and close during a design basis event. This valve cannot be dynamically tested since the system lineup would require injecting water from the suppression pool into the reactor vessel. Additionally, the DBdP value accounts for check valve leakage, and this cannot be simulated for actual dynamic testing. The EPRI test valve #9 is similar to this valve, and the preliminary EPRI test results indicate that the valve factor used in the capability margin calculations for this valve was not conservative. As a result, modifications to the operator for 1E21F0005 have been completed to improve margin. The resultant capability margin has been conservatively determined to be approximately 12% in the open direction. Open capability margin for 1E21F0005 is low due to the following conservative assumptions

1) The open required thrust is based on 0.5 valve factor (VF).

2) The open capability is based on various conservative assumptions such as application factor of 0.9 and stem factor on 0.2 stem coefficient of friction.

Recent site flow testing of similar valve (same bill of material and dimensions) 1E12F0042B shows open VF of 0.27 instead of assumed 0.5. The close VF was found to be 0.37. The open/close flow margins (extrapolated) are 239% and 132% respectively. Therefore, based on the above discussion and the actual higher flow margin, the 1E21F0005 valve is acceptable.

The 1E51F0013 valve has been designated as Category 1, as a function of PRA-based safety significance. This valve is the pump discharge isolation valve in the E51 (Reactor Core Isolation Cooling) system. The valve is maintained normally closed and is required to open for flow injection to the reactor vessel. This valve cannot be dynamically tested since the system lineup would require injecting water into the reactor vessel. The EPRI test valve #9 is similar to this valve, and the preliminary EPRI test results indicated that the valve factor used in the margin calculations for this valve was not conservative. As a result, to improve the capability margin, a modification to the operator was completed during RF04. Setting of the torque switches by static testing was performed and the resultant capability margin has been conservatively determined to exceed 40%. This valve is therefore adequate based on the adequate margin following the implementation of the operator modification.

Valves 1E51F0063 and F0064 have been designated as Category 2, based on a Siemens ranking of medium for testing 1 of the 2 valves. This priority designation is not a function of PRA-based safety significance and is countered by the impracticability of testing. These valves are the turbine steam supply isolation valves within the E51 (Reactor Core Isolation Cooling) system. They are normally open and are required to close during a design basis event. The calculated DBdP considers the effects of a high energy line break, and since the high DBdP due to line break considerations can not be achieved, dynamic testing is not possible. The limit switch for these two valves are set such that the torque switch is bypassed approximately 98% of the closing stroke. The valve orifice area is fully covered and the disc passes beyond the seat ring prior to limit switch actuation. The EPRI test valve #9 is similar to these valves, and the preliminary EPRI test results indicated that the valve factor used in the margin calculations for these valves was not conservative. As a result, to improve the capability margin, modifications to replace the operators for 1E51F0063 and 1E51F0064 were completed during RF04. Setting of the torque switches by static testing was performed and the

resultant capability margin

between the DBdP required thrust and reduced voltage capability have been conservatively determined to exceed 45%. These valves are determined to be adequate based on the adequate margin following the implementation of the operator modifications.

The 1G33F0001 and F004 valves have been designated as Priority 1, based on a Siemens ranking of high for testing one of the two valves. This priority designation is not a function of PRA based safety significance. These valves are the G33 (Reactor Water Cleanup) system inboard and outboard suction line containment isolation valves. They are normally open and are required to close during a design basis event. The calculated DBdP considers the effects of a high energy line break downstream of these isolation valves. During an isolation sequence without a line break, the RWCU pumps would trip and the valves would close against essentially zero flow and DP. Since the DBdP can not be achieved, dynamic testing is not possible. The limit switches for these two valves are set such that the torque switches are bypassed approximately 98% of the closing stroke. The valve orifice area is fully covered and the disc passes beyond the seat ring prior to limit switch actuation. The EPRI test valve #9 is also similar to these valves, and the preliminary EPRI test results indicate a higher valve factor than originally assumed for these valves would be necessary. As a result, modifications to replace the operators for 1G33F0001 and F0004 were implemented during RF04 to improve margin. Setting of the torque switches by static testing was performed and the resultant capability margin between the DBdP required thrust and reduced voltage capability have been conservatively determined to be greater than 100%. These valves are acceptable based on adequate margin following the completed RF04 modifications.

It is anticipated that final EPRI test data will also be used to confirm the adequacy of the 1E51F0063, 1E51F0064, 1G33F0001, and 1G33F0004 valves.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E21F0005	GATE	12	OPEN	2	610.1	NA	4100 gpm	12
1E51F0013	GATE	6	OPEN	1	1098.7	NA	700 gpm	49
1E51F0063	GATE	10	CLOSE	2	NA	1048.3	34,200 lbs/hr	66
1E51F0064	GATE	10	CLOSE	2	NA	1048.3	34,200 lbs/hr	78
1G33F0001	GATE	6	CLOSE	1	NA	1059	408 gpm	113
1G33F0004	GATE	6	CLOSE	1	NA	1059	409 gpm	135

3. **1E12F0028A, 1E12F0028B, 1E12F0537A, E12F0537B, and 1E51F0068**

These valves are 12-inch gate valves which have been grouped in family group 4, with 2.5 through 12-inch valves, based on the similarity grouping. Of the total of 22 valves in this family group, these 5 valves are not practicable to test.

The 1E12F0028A, F0028B, F0537A and F0537B valves have been designated as Category 1, as a function of PRA-based safety significance and a Siemens ranking of high for testing. These valves are the RHR containment spray shutoff valves. The four valves are normally closed and are required to open to initiate containment spray and then re-close to allow suppression pool cooling operation. These valves cannot be dynamically tested, since testing would require the initiation of containment spray. A similar 12-inch valve was removed from the unused Perry Unit 2 and shipped to EPRI for testing (EPRI test valve #10). Preliminary EPRI test results indicate a higher valve factor than originally assumed in design calculations would be required. As a result, modifications to the operators for 1E12F0028A, F0028B, F0537A and F0537B were performed during the RF04 outage to improve actuator capability. Setting of the torque switches by static testing was also performed. For the 1E12F0537A and F0537B valves, the resultant capability margin between the DBdP required thrust and reduced voltage capability have been conservatively determined to exceed 130% in the open stroke and 95% in the close stroke. For 1E12F0028A and F0028E valves, the resultant capability margins have been conservatively determined to be greater than 35% in the open stroke and 25% in the close stroke. Therefore, these valves are adequate based on sufficient margin upon completion of the identified modifications.

Valve 1E51F0068 has been designated Category 4 as it has no PRA-based safety significance. This valve is the RCIC turbine exhaust isolation valve and is normally open. The valve is required to close upon receipt of concurrent high drywell pressure and low reactor water level signals. The DBdP of 7.8 psid occurs as a result of pressure in the containment post-LOCA and cannot be duplicated to support dynamic testing. The margin has been conservatively determined to be greater than 300%. This valve is adequate based on the high margin in conjunction with the low DBdP.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E12F0537A	GATE	12	OPEN/CLOSE	1	131	256.9	5250 gpm	135/95
1E12F0537B	GATE	12	OPEN/CLOSE	1	131	256.9	5250 gpm	157/114
1E12F0028A	GATE	12	OPEN/CLOSE	1	151	256.9	5250 gpm	39/29
1E12F0028B	GATE	12	OPEN/CLOSE	1	151	256.9	5250 gpm	52/41
1E51F0068	GATE	12	CLOSE	4	NA	7.8	34,200 lbs/hr	305

4. **1E32F0001A, 1E32F0001E, 1E32F0001J, 1E32F0001N, 1E32F0002A, 1E32F0002E, 1E32F0002J, 1E32F0002N, 1E32F0003A, 1E32F0003E, 1E32F0003J, 1E32F0003N, 1E32F0008, and 1E32F0009.**

These fourteen, 2.5-inch gate valves comprise family group 8 based on the similarity grouping. The 1E32F0008 and F0009 valves have been designated Category 2 based on a Siemens ranking of medium for testing one of the two valves. Valves 1E32F0001A, F0001E, F0001J and F0001N have been designated Category 3, based on Siemens ranking of low for testing one of the four valves. This priority designation is not a function of PRA-based safety significance and is countered by the impracticability of testing. The remaining 8 valves are Priority 4 as they have no PRA-based safety significance. All of these valves are in the E32 (MSIV Leakage Control) system and are normally closed. Each valve is individually opened by operator action post-LOCA to initiate operation of the MSIV leakage control system. The valves have a pressure permissive to open which is set at 20 psig and will re-close once this pressure is exceeded. Therefore, during normal operation these valves cannot be operated nor can the dynamic test conditions be duplicated with the plant off line. The capability margin for these valves has been conservatively determined to exceed 350% for the open stroke and 460% for the close stroke. These valves are adequate based on the very high margin in conjunction with the low DBdP.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E32F0001A	GATE	2.5	OPEN/CLOSE	3	20.7	20.7	25 scfh	356/464
1E32F0001E	GATE	2.5	OPEN/CLOSE	3	20.7	20.7	25 scfh	355/463
1E32F0001J	GATE	2.5	OPEN/CLOSE	3	20.7	20.7	25 scfh	354/461
1E32F0001N	GATE	2.5	OPEN/CLOSE	3	20.7	20.7	25 scfh	356/464
1E32F0008	GATE	2.5	OPEN/CLOSE	2	20.7	20.7	100 scfh	367/477
1E32F0009	GATE	2.5	OPEN/CLOSE	2	20.7	20.7	100 scfh	364/473
1E32F0002A	GATE	2.5	OPEN/CLOSE	4	20.7	20.7	25 scfh	357/465
1E32F0002E	GATE	2.5	OPEN/CLOSE	4	20.7	20.7	25 scfh	356/464
1E32F0002J	GATE	2.5	OPEN/CLOSE	4	20.7	20.7	25 scfh	360/532
1E32F0002N	GATE	2.5	OPEN/CLOSE	4	20.7	20.7	25 scfh	358/528
1E32F0003A	GATE	2.5	OPEN/CLOSE	4	21.9	21.9	25 scfh	359/466
1E32F0003E	GATE	2.5	OPEN/CLOSE	4	21.9	21.9	25 scfh	359/466
1E32F0003J	GATE	2.5	OPEN/CLOSE	4	21.9	21.9	25 scfh	359/466
1E32F0003N	GATE	2.5	OPEN/CLOSE	4	21.9	21.9	25 scfh	359/466

5. **1E12F0008 and 1E12F0009**

These 20-inch gate valves are grouped in family group 5, and each valve is required to close in performing its design basis function. The 1E12F0009 valve has been designated as Category 3 based on a Siemens ranking of low for testing. This category designation is not a function of PRA-based safety significance. Valve 1E12F0008 is designated as Category 4 as it does not have a PRA-based safety significance and is not a Siemens candidate for testing.

These valves are the shutdown cooling inboard and outboard suction isolation valves in the E12 (Residual Heat Removal) system. Dynamic testing under flow would require shutting the valves with the RHR pumps running and could result in pump damage. Although an alternate test method, using reactor water level as the head, could be utilized, the test does not develop sufficient flow and/or dP to constitute a meaningful test. Therefore, dynamic testing of these two valves is considered not practicable.

Each of these valves is torque switch operated in the close direction. The torque switch is bypassed by the limit switch during approximately 95% of the stroke in the closing direction. The torque switch has been appropriately set within the torque/thrust window for the remaining 5% of the stroke. The capability margin for each has been conservatively determined to be in excess of 165%.

These valves have been determined to be acceptable based on the high margin for capability.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1E12F0008	GATE	20	CLOSE	4	NA	164.8	14,200 gpm	166
1E12F0009	GATE	20	CLOSE	3	NA	169.3	14,200 gpm	180

6. **1B21F0016 and 1B21F0019**

These two similar gate valves comprise family group 7 and are not practicable to dynamically test.

Valves 1B21F0016 and F0019 are in the B21 (Nuclear Boiler) system and have been designated as Category 1, based on a Siemens ranking of high for testing one of the two valves. This priority designation is not a function of PRA-based safety significance and is countered by the impracticability of testing. These valves are the Main Stream line drain inboard and outboard isolation valves and are normally open. The valves are required to close if reactor water level 1 is reached during a LOCA. Valve F0016 is located inside the drywell and valve 1B21F0019 is located in the steam tunnel and neither are accessible during operation due to radiation levels and temperature. The pressure and flow to support dynamic testing cannot be achieved with the plant shutdown. The EPRI test valve #7 is similar to these valves, and the preliminary EPRI test results indicate a higher valve factor than originally assumed in the design calculations. As a result, modifications to replace the operators on these valves were completed during RF04 to improve the capability margin. Setting of the torque switches by static testing was performed and the resultant capability margin have been conservatively determined to exceed 100%. These valves are adequate based on adequate margin following the implementation of the identified modifications.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1B21F0016	GATE	3	CLOSE	1	NA	978	320 lbs/hr	113
1B21F0019	GATE	3	CLOSE	1	NA	978	320 lbs/hr	117

BUTTERFLY VALVES

7. 1G43F0030A, 1G43F0030B, 1G43F0040A, and 1G43F0040B

These valves are 24-inch butterfly valves which have been grouped in family group 15, with 8, 10, 12, 20 and 24-inch valves, based on the similarity grouping. Of the total of 14 valves in this group, these 4 are not practicable to test.

Valves 1G43F0030A and F0040A have been designated Category 3, based on PRA based significance and a Siemens ranking of low for testing. Whereas, valves 1G43F0030B and F0040B have been designated Category 3 as a function of PRA-based safety significance. These four valves are within the G43 (Suppression Pool Make-Up) system and are normally closed. They are required to open post-LOCA to provide flow from the upper pool to the suppression pool. Dynamic testing of these valves would require the simultaneous opening of both the F0030 and F0040 valves which would create an inadvertent upper pool dump, violating Tech Spec normal operation suppression pool high water level limit. Therefore, it is not practicable to dynamically test these valves. The capability margin has been conservatively determined to be greater than 95%. These valves are adequate based on the high margin with respect to the low DBdP.

A total of five other valves within family group 15 were dynamically tested during RF04, and the results of this testing further confirm the adequacy of these valves. Additionally, these valves have had extra conservatism applied as a result of the testing performed on the butterfly valves during RF04.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1G43F0040B	BUTT	24	OPEN	3	17.15	NA	35,600 gpm	99
1G43F0030A	BUTT	24	OPEN	3	12.36	NA	35,600 gpm	95
1G43F0030B	BUTT	24	OPEN	3	12.36	NA	35,600 gpm	118
1G43F0040A	BUTT	24	OPEN	3	9.49	NA	35,600 gpm	115

8. 1G42F0010 and 1G42F0020

These valves are 12-inch butterfly valves which have been grouped in family group 16, and are required to close to perform their safety function. These valves have been designated Category 2, based on PRA safety significance. These valves are the first and second suction isolation valves in the G42 (Suppression Pool Cleanup) system. Dynamic testing under flow would require shutting the valves with the pump running and could result in pump damage. Although an alternative test method, using suppression pool level as the head, could be utilized, the test would not develop sufficient flow and/or dP to constitute a meaningful test. Therefore, dynamic testing of these valves is considered not practicable. By analysis, the capability margin has been conservatively determined to be greater than 30%. These valves have been determined to be adequate based on the sufficient margin in conjunction with the low dP.

A total of six valves within family group 16 were dynamically tested during RF04, and the test results further confirm the adequacy of these two valves.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1G42F0010	BUTT	12	CLOSE	2	NA	15.5	2000 gpm	34
1G42F0020	BUTT	12	CLOSE	2	NA	15.5	2000 gpm	33

Attachment 3

Perry Nuclear Power Plant

MOVs Not Statically Tested - No Dynamic Test Required

1. **1G42F0080, 0P42F0550, 0P42F0551, 1M16F0010A and 1M16F0010B**

The five butterfly valves identified below have been designated Category 4 as they do not have a PRA-based safety significance and are not candidates for testing from the Siemens evaluation.

Valve 1G42F0080 is the demineralized water to suppression pool isolation valve, is normally closed and not required to change position. It has been grouped in family group 15 for evaluation. It has reduced voltage capability margin in excess of 20%.

Valves 0P42F0550 and F0551 are the Closed Cooling Water chiller isolation valves. They are normally open and close in response to a design basis event at 0 flow and 0 dP conditions. The valves are grouped in family group 16 for evaluation and have capability margins in excess of 100%.

Valves 1M16F0010A and F0010B are the Drywell vacuum relief isolation valves, and they are maintained normally closed and are not required to change position. They are grouped in family group 17 for evaluation and have reduced voltage capability margins in excess of 200%.

VALVE NO.	VALVE TYPE	VALVE SIZE (inches)	SAFETY FUNCTION OPEN/CLOSE	VALVE PRIORITY CATEGORY	DESIGN BASIS dP (psid)		FLOW RATE	MARGIN (%)
					OPEN	CLOSE		
1G42F0080	BUTT	8	CLOSE[1]	4	NA	NA	NA	23
0P42F0550	BUTT	10	CLOSE	4	NA	0	0	111
0P42F0551	BUTT	10	CLOSE	4	NA	0	0	110
1M16F0010A	BUTT	10	CLOSE[1]	4	NA	NA	NA	202
1M16F0010B	BUTT	10	CLOSE[1]	4	NA	NA	NA	202

NOTE: 1. These valves do not have to change position for a design basis event. They are normally required to remain closed.