



Georgia Power

the southern electric system

C. K. McCoy  
Vice President, Nuclear  
Vogtle Project

July 9, 1992

MSV-01059  
2838

Docket No. 50-424  
50-425

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT  
REPLY TO  
NRC INSPECTION REPORT NOS. 50-424/92-01 and 425/92-01

Inspection Report No. 50-424/92-01 and 50-425/92-01 documents the results of the NRC inspection of the VEGP Generic Letter 89-10 program. In conjunction with this report, the NRC requested a written response to the following three concerns identified in the report:

1. Implementation of The Two-Stage Approach
2. Performance of In-Situ Differential Pressure Testing
3. Compliance with the Generic Letter (GL) 89-10 Schedule

The VEGP GL 89-10 program is being implemented in accordance with the two-stage approach referenced in the generic letter. In Stage 1 of the program, the MOVs are being set-up statically utilizing diagnostic equipment. Setpoints have been established by performing a detailed analytical evaluation of each MOV covered by the generic letter. The results of this evaluation represent the "best data available" at this time to establish setpoints for the MOVs included in the GL 89-10 program. In Stage 2 of the program, the analytical methodology incorporated in Stage 1 will be verified utilizing a variety of techniques including design basis differential pressure testing.

VEGP's initial response to the generic letter did not commit to perform any additional differential pressure testing beyond that which had been performed in response to I&E Bulletin 85-03. A total of forty-five (45) valves were dynamically tested at VEGP utilizing MOVATS TMD based test equipment. Concerns identified relative to the capability of the MOVATS TMD equipment to accurately measure thrust under dynamic conditions have subsequently raised questions regarding the validity of the original VEGP differential pressure test data. The MOVATS issue, as well as additional concerns which have been raised relative to anomalous valve behavior under

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high differential pressure conditions have caused GPC to reassess its position regarding differential pressure testing. Additional in-situ differential pressure testing will be performed at VEGP and a plan for performing this testing is outlined in Attachment 1.

VEGPs initial response to the generic letter committed to complete the design review and static testing of all GL 89-10 MOVs within five years or three refueling outages. This work, which essentially constitutes the VEGP Stage 1 program, will be completed within the aforementioned schedule. In addition, as a result of the design review, fifty-four (54) MOVs have been identified for modification. Modifications are currently planned to be completed within the original five year or three refueling outage schedule, or should unexpected problems occur, modifications will be completed by June 28, 1995 which includes one additional refueling outage for each unit.

With respect to the implementation of the Stage 2 activities, GPC is requesting a one year schedule extension to June 23, 1995. The extension is required to facilitate the completion of the differential pressure testing outlined in Attachment 1 and the subsequent development of justifications for valves which are not dynamically tested. A number of issues have arisen since the initial VEGP submittal which necessitate this extension, including the following:

1. A total of fifty-four (54) MOVs will be modified during the 1993 refueling outages. This work was not envisioned when the initial submittal was made and the engineering, procurement and installation activity necessary to implement these modifications will require extensive resources in terms of both manpower and outage time.
2. Problems identified relative to the MOVATS TMD based test equipment in the summer of 1991 limited the scope of static testing performed at VEGP during 1R3 (fall 1991) and 2R2 (spring 1992) and raised questions as to the validity of the dynamic testing previously performed. Alternative test equipment is being evaluated at this time and extensive testing will be required during the 1993, 1994 and 1995 refueling outages to satisfy our commitments.
3. EPRI has undertaken the MOV Performance Prediction Program with the objective of developing and verifying an analytical methodology to evaluate the performance of MOVs without the need for extensive design basis testing. However, the EPRI program is not scheduled to be complete until mid 1994 which does not allow time to evaluate and utilize the results of this program within the original GL 89-10 schedule.

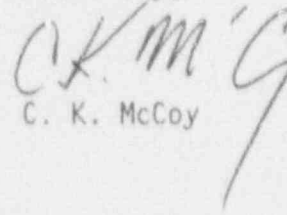
Substantial progress has been made to date at VEGP relative to the implementation of the recommendations contained in GL 89-10. The resources and technology available within the motor-operated valve arena

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remain very dynamic and VEGP will continue to aggressively pursue the resolution of GL 89-10 issues as they are identified.

If you have any questions or comments regarding this response, please contact my office.

Sincerely,

  
C. K. McCoy

/HET/lb

Attachment

xc: Georgia Power Company  
Mr. W. B. Shipman  
Mr. M. Sheibani  
NORMS

U. S. Nuclear Regulatory Commission  
Mr. S. D. Ebnetter, Regional Administrator  
Mr. D. S. Hood, Licensing Project Manager, NRR  
Mr. B. R. Bonser, Senior Resident Inspector, Vogtle

## ATTACHMENT 1

### Differential Pressure Test Plan

A prioritization process was developed to identify the motor-operated valves (MOV's) at VEGP which are candidates for differential pressure testing. The objective of the prioritization process was to rank the valves relative to the importance of performing differential pressure testing. The valves were evaluated based upon criteria aimed at identifying valves which must perform under severe service conditions and/or appear to be marginal based on an analytical evaluation.

#### Service Factor

The design basis differential pressure was chosen as the criteria for evaluating the relative severity of each valves operating requirements. Differential pressure is the primary source of dynamic loads and the greater the differential pressure, the larger the difference in loads between static and dynamic conditions. Each valve was assigned a service factor as outlined below:

<u>Maximum Differential Pressure</u>	<u>Service Factor</u>
DP < 200 psi	1
200 psi ≤ DP ≤ 500 psi	2
DP > 500 psi	3

Valves which are required to operate at design basis conditions of less than 200 psi differential pressure do not experience significant dynamic loading during operation. Industry testing has not identified valves in these applications as being anomalous performers regardless of valve type. These valves appear to exhibit predictable performance and torque/thrust requirements for these valves can be determined utilizing analytical techniques.

Valves which operate in the 200 psi to 500 psi range experience moderate dynamic loading. These valves warrant more attention than valves operating at less than 200 psi. However, these are not severe valve applications by any standard. In general, industry testing has not identified significant problems for valves operating under these conditions.

## ATTACHMENT 1

### Differential Pressure Test Plan (Continued)

Valves operating against differential pressures of 500 psi and above experience the most significant loading increases under dynamic conditions. Virtually all of the concerns which have been identified within the industry relative to anomalous valve behavior involve testing performed at differential pressures greater than 500 psi. In reality, most of the problems have occurred at differential pressures considerably higher than 500 psi. However, 500 psi was chosen as a conservative value to categorize high differential pressure valves. Differential pressure test data for valves operating under these conditions would provide the most useful information regarding differences in valve performance between static and dynamic conditions.

#### Margin Factor

The percent difference in the calculated required torque/thrust versus the calculated available torque/thrust was chosen as the criteria for evaluating margins for each valve. The greater the margin between the available torque/thrust and the required torque/thrust, the less critical the accuracy of the analytical methodology becomes. Each valve was assigned a margin factor as outlined below:

<u>Calculated Margin</u>	<u>Margin Factors</u>
Margin > 200%	1
100% ≤ Margin ≤ 200%	2
Margin < 100%	3

MOV's which are equipped with operators capable of producing greater than 200% of the required torque/thrust can be setup to ensure that the valve will be capable of performing its design basis function with a high degree of confidence. Even if a valve in this category exhibited some type of anomalous behavior, the reserve capability inherent in the operator ensures that the valve will be capable of performing its design basis function.

MOV's which have margins between 100% and 200% warrant additional attention over those in the previous category. However, the operators on these valves still have substantial reserve capacity available should some type of anomalous behavior occur.

## ATTACHMENT 1

### Differential Pressure Test Plan (Continued)

MOV's with margins of less than 100% require closer scrutiny to ensure that they are set-up to operate within their design window. Diagnostic equipment accuracy, operator repeatability and the "rate of loading" phenomenon all serve to reduce the available margin. Differential pressure tests performed on valves in this category are useful in substantiating analytical methodologies which, by virtue of the reduced margins, must be inherently conservative.

#### Priority

The differential pressure testing priority for each valve was determined by adding the service factor and the margin factor. The service factor, the margin factor and the differential pressure test priority for each valve included within the scope of the VEGP Generic Letter 89-10 program is outlined in Table 1.

#### Scope

It is GPC's intent to perform differential pressure tests on all priority 5 and 6 valves which can be practicably tested. A total of ninety-nine (99) valves have been classified as priority 5 or 6 valves. A preliminary review has concluded that approximately 75% of these valves can be tested at greater than 50% of their design basis differential pressure. This number may be subject to change as individual valve test procedures are developed and potential test constraints become more apparent.

In evaluating the practicability of testing the priority 5 and 6 valves, the ability to achieve a minimum test differential pressure of 50% of the design basis was selected as a criteria for determining the feasibility of testing. It was concluded that tests performed at differential pressures of less than 50% of the design basis would provide limited technical data and would not be cost effective. Justifications will be developed for all valves which are not differential pressure tested.



TABLE 1

DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBR	SYS NO.	SIZE	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening			Closing			SERVICE FACTOR 200 < DP < 500	DP <= 200	MARGIN FACTOR 100% < MF < 200%	MG <= 100	MG >= 200	DP Test Priority
										Margin (%)	Thrust	Torque	Margin (%)	Thrust	Torque						
21V2041	1217	3.0	1500	GATE	ANCHOR DARR BNG	SMB000		144	2485	472	02	N/A	N/A					3		6	
21V3009	1301	4.0	900	GATE	ANCHOR DARR BNG	SMB000		1185	1185	111	90	N/A	N/A					3		6	
21V3019	1301	4.0	900	GATE	ANCHOR DARR BNG	SMB000		1185	1185	111	96	N/A	N/A					3		6	
21V5106	1301	4.0	900	GATE	ANCHOR DARR BNG	SMB000		1185	1185	111	96	N/A	N/A					3		6	
21V800A	1201	3.0	2035	GATE	WESTINGHOUSE	SB000		2485	2485	145	53	N/A	N/A					3		6	
21V9000B	1201	3.0	2035	GATE	WESTINGHOUSE	SB000		2485	2485	154	58	N/A	N/A					3		6	
21V2103A	1208	1.5	1500	GLOBE	VELAN	SMB000		2715	2715	64	64	N/A	N/A					3		6	
21V2103B	1208	1.5	1500	GLOBE	VELAN	SMB000		2715	2715	64	64	N/A	N/A					3		6	
21V6103C	1208	1.5	1500	GLOBE	VELAN	SMB000		2715	2715	64	64	N/A	N/A					3		6	
21V2103D	1208	1.5	1500	GLOBE	VELAN	SMB000		2715	2715	64	64	N/A	N/A					3		6	
21V4105	1208	3.0	2035	GATE	WESTINGHOUSE	SB000		480	2681	456	31	N/A	N/A					3		6	
21V4106	1208	3.0	2035	GATE	WESTINGHOUSE	SB000		480	2681	452	30	N/A	N/A					3		6	
21V8110	1208	2.0	1500	GLOBE	VELAN	SMB000		2644	2676	60	66	N/A	N/A					3		6	
21V8111A	1208	2.0	1500	GLOBE	VELAN	SMB000		2643	2676	59	66	N/A	N/A					3		6	
21V8111B	1208	2.0	1500	GLOBE	VELAN	SMB000		2643	2676	61	60	N/A	N/A					3		6	
21V8111C	1208	1.0	1500	GLOBE	VELAN	SMB000		2674	0	49	201	N/A	N/A					3		6	
21V8500A	1208	2.0	1500	GLOBE	VELAN	SMB000		2641	466	29	620	N/A	N/A					3		6	
21V8500B	1208	2.0	1500	GLOBE	VELAN	SMB000		2641	466	31	420	N/A	N/A					3		6	
21V88A, VA	1204	4.0	1525	GATE	WESTINGHOUSE	SB000		2674	483	16	113	N/A	N/A					3		6	
21V8801B	1204	4.0	1525	GATE	WESTINGHOUSE	SB000		2674	483	16	113	N/A	N/A					3		6	
21V8802A	1204	4.0	1525	GATE	WESTINGHOUSE	SB000		1735	0	48	656	N/A	N/A					3		6	
21V8802B	1204	4.0	1525	GATE	WESTINGHOUSE	SB000		425	267	79	119	N/A	N/A					3		6	
21V8804A	1205	8.0	316	GATE	WESTINGHOUSE	SMB000		425	267	71	119	N/A	N/A					3		6	
21V8804B	1205	8.0	316	GATE	WESTINGHOUSE	SMB000		425	267	71	119	N/A	N/A					3		6	
21V8821A	1204	4.0	900	GATE	WESTINGHOUSE	SB000		1750	1750	154	62	N/A	N/A					3		6	
21V8821B	1204	4.0	900	GATE	WESTINGHOUSE	SB000		1750	1750	156	62	N/A	N/A					3		6	
21V8835	1204	4.0	1525	GATE	WESTINGHOUSE	SB000		1728	0	50	211	N/A	N/A					3		6	

TOTAL CATEGORY 6 = 54



TABLE 1

## DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBER	SYS NO.	SIZE	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Closing Thrust Margin (%)	Opening Torque Margin (%)	Closing Torque Margin (%)	SERVICE FACTOR			MARGIN FACTOR			DP Test Priority		
														DP >= 500	200 < DP < 500	DP <= 200	MG <= 100	100% < MG < 200%	MG >= 200%			
1FV5154	1302	2.0	900	GLOBE	FISHER	SB00		1715	1715	135	135	N/A	N/A	3				2			5	
1FV5155	1302	2.0	900	GLOBE	FISHER	SB00		1715	1715	135	135	N/A	N/A	3					2			5
1HV19051	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A	3					2			5
1HV19053	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A	3					2			5
1HV19055	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A	3					2			5
1HV19057	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A	3					2			5
1HV3548	1212	1.0	1710	GLOBE	FISHER	SMB000		2485	2485	103	103	N/A	N/A	3					2			5
1HV5120	1302	4.0	900	GLOBE	FISHER	SB00		1550	1550	138	198	N/A	N/A	3					2			5
1HV5122	1302	4.0	900	GLOBE	FISHER	SB00		1550	1550	138	198	N/A	N/A	3					2			5
1HV5125	1302	4.0	900	GLOBE	FISHER	SB00		1548	1548	138	198	N/A	N/A	3					2			5
1HV5127	1302	4.0	900	GLOBE	FISHER	SB00		1548	1548	136	198	N/A	N/A	3					2			5
1HV5132	1302	4.0	900	GLOBE	FISHER	SB00		1548	1548	128	214	N/A	N/A	3					2			5
1HV5134	1302	4.0	900	GLOBE	FISHER	SB00		1548	1548	142	232	N/A	N/A	3					2			5
1HV5137	1302	4.0	900	GLOBE	FISHER	SB00		1550	1550	172	274	N/A	N/A	3					2			5
1HV5139	1302	4.0	900	GLOBE	FISHER	SB00		1550	1550	174	277	N/A	N/A	3					2			5
1HV6701A	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	186	72	N/A	N/A				2		3			5
1HV6701B	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	186	72	N/A	N/A				2		3			5
1HV6702A	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	186	72	N/A	N/A				2		3			5
1HV6702B	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	186	72	N/A	N/A				2		3			5
1HV8613	1204	2.0	1500	GLOBE	VELAN	SMB00		0	1521	368	162	N/A	N/A	3					2			5
1HV8614	1204	1.5	1500	GLOBE	VELAN	SMB00		1521	1521	162	162	N/A	N/A	3					2			5
1HV8920	1204	1.5	1500	GLOBE	VELAN	SMB00		1521	1521	162	162	N/A	N/A	3					2			5

TABLE 1

## DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBER	SYS NO.	SIZE	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Oper DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Closing Thrust Margin (%)	Opening Torque Margin (%)	Closing Torque Margin (%)	SERVICE FACTOR			MARGIN FACTOR			DP Test Priority
														DP >= 500	200 < DP < 500	DP <= 200	MG <= 100	101% < MG < 200%	MG >= 200	
2FV5154	1303	2.0	900	GLOBE	FISHER	SB00		1715	1715	135	135	N/A	N/A					2		5
2FV5155	1303	2.0	900	GLOBE	FISHER	SB00		1715	1715	135	135	N/A	N/A					2		5
2FV19051	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A					2		5
2FV19053	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A					2		5
2FV19055	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A					2		5
2FV19057	1217	2.5	1500	GATE	ANCHOR DARLING	SMB00		143	2485	823	130	N/A	N/A					2		5
2FV3548	1212	1.0	1710	GLOBE	FISHER	SMB000		2485	2485	103	103	N/A	N/A					2		5
2FV5120	1303	4.0	900	GLOBE	FISHER	SB00		1550	1550	138	198	N/A	N/A					2		5
2FV5122	1303	4.0	900	GLOBE	FISHER	SB00		1550	1550	138	198	N/A	N/A					2		5
2FV5125	1303	4.0	900	GLOBE	FISHER	SB00		1548	1548	138	198	N/A	N/A					2		5
2FV5127	1303	4.0	900	GLOBE	FISHER	SB00		1548	1548	138	198	N/A	N/A					2		5
2FV5132	1303	4.0	900	GLOBE	FISHER	SB00		1548	1548	138	228	N/A	N/A					2		5
2FV5134	1303	4.0	900	GLOBE	FISHER	SB00		1548	1548	142	233	N/A	N/A					2		5
2FV5137	1303	4.0	900	GLOBE	FISHER	SB00		1550	1550	172	273	N/A	N/A					2		5
2FV5139	1303	4.0	900	GLOBE	FISHER	SB00		1550	1550	172	273	N/A	N/A					2		5
2FV8701A	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	186	72	N/A	N/A			2		3		5
2FV8701B	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	181	72	N/A	N/A			2		3		5
2FV8702A	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	181	72	N/A	N/A			2		3		5
2FV8702B	1201	12.0	1525	GATE	WESTINGHOUSE	SMB1		365	425	186	72	N/A	N/A			2		3		5
2FV8813	1204	2.0	1500	GLOBE	VELAN	SMB00		0	1521	968	162	N/A	N/A					2		5
2FV8814	1204	1.5	1500	GLOBE	VELAN	SMB00		1521	1521	162	162	N/A	N/A					2		5
2FV8820	1204	1.5	1500	GLOBE	VELAN	SMB00		1521	1521	162	162	N/A	N/A					2		5
2FV9001B	1206	8.0	316	GATE	WESTINGHOUSE	SMB00		258	124	47	137	N/A	N/A			2		3		5

TOTAL CATEGORY

5 = 45

TABLE 1

## DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBER	SYS		ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Closing Thrust Margin (%)	Opening Torque Margin (%)	Closing Torque Margin (%)	SERVICE FACTOR			MARGIN FACTOR			DP Test Priority
	NO.	SIZE												DP >= 500	200 < DP < 500	DP <= 200	MG <= 100	100% < MG < 200%	MG >= 200	
1FV0610	1205	3.0	2035	GATE	WESTINGHOUSE	SMB000		202	202	248	140	N/A	N/A		2			2		4
1FV0611	1205	3.0	2035	GATE	WESTINGHOUSE	SMB000		202	202	248	140	N/A	N/A		2			2		4
1HV1668A	1203	24.0	150	BUTTERFLY	FISHER	SM900	H3B	103	103	N/A	N/A	81	81			1	3			4
1HV1668B	1203	18.0	150	BUTTERFLY	FISHER	SM900	H2B	101	101	N/A	N/A	71	71		1	3				4
1HV1669A	1203	24.0	150	BUTTERFLY	FISHER	SM600	H3B	103	103	N/A	N/A	81	81		1	3				4
1HV1669B	1203	18.0	150	BUTTERFLY	FISHER	SM600	H3B	100	100	N/A	N/A	71	71		1	3				4
1HV1974	1217	10.0	150	BUTTERFLY	FISHER	SM6000	H1B	153	137	N/A	N/A	96	96		1	3				4
1HV1975	1217	10.0	150	BUTTERFLY	FISHER	SM6000	H1B	164	138	N/A	N/A	96	96		1	3				4
1HV1978	1217	10.0	150	BUTTERFLY	FISHER	SM6000	H1B	163	137	N/A	N/A	96	96		1	3				4
1HV1979	1217	10.0	150	BUTTERFLY	FISHER	SM6000	H1B	164	138	N/A	N/A	96	96		1	3				4
1HV5113	1303	10.0	150	BUTTERFLY	FISHER	SM6000	H0B	25	23	N/A	N/A	73	148		1	3				4
1HV6146	1208	3.0	2035	GATE	WESTINGHOUSE	SMB000		490	0	165	347	N/A	N/A		2			2		4
1HV8147	1208	3.0	2035	GATE	WESTINGHOUSE	SMB000		490	0	165	347	N/A	N/A		2			2		4
1HV8716A	1209	8.0	316	GATE	WESTINGHOUSE	SM900		253	273	174	116	N/A	N/A		2			2		4
1HV8716B	1209	8.0	316	GATE	WESTINGHOUSE	SM900		253	273	155	116	N/A	N/A		2			2		4
1HV8806	1204	8.0	150	GATE	WESTINGHOUSE	SM900		210	210	112	102	N/A	N/A		2			2		4
1HV8812A	1203	12.0	316	GATE	WESTINGHOUSE	SB1		430	25	49	954	N/A	N/A			1	3			4
1HV8812B	1203	12.0	316	GATE	WESTINGHOUSE	SB1		430	25	41	931	N/A	N/A			1	3			4
1HV8923A	1204	6.0	150	GATE	WESTINGHOUSE	SM900		220	220	233	162	N/A	N/A		2			2		4
1HV8923B	1204	6.0	150	GATE	WESTINGHOUSE	SM900		220	220	233	162	N/A	N/A		2			2		4
1HV8924	1205	6.0	150	GATE	WESTINGHOUSE	SM900		0	220	656	162	N/A	N/A		2			2		4
1HV9001A	1206	8.0	316	GATE	WESTINGHOUSE	SM900		255	124	117	182	N/A	N/A		2			2		4
1HV9001B	1206	8.0	316	GATE	WESTINGHOUSE	SM900		258	124	110	239	N/A	N/A		2			2		4
1FV9002A	1209	10.0	150	GATE	WESTINGHOUSE	SM900		101	58	66	117	N/A	N/A			1	3			4
1HV9002B	1209	10.0	150	GATE	WESTINGHOUSE	SM900		101	58	53	100	N/A	N/A			1	3			4
1HV9003A	1209	10.0	150	GATE	WESTINGHOUSE	SM900		150	58	83	154	N/A	N/A			1	3			4
1HV9003B	1209	10.0	150	GATE	WESTINGHOUSE	SM900		150	58	66	167	N/A	N/A			1	3			4
1HV9017A	1204	10.0	150	GATE	WESTINGHOUSE	SM900		66	23	97	177	N/A	N/A			1	3			4
1HV9017B	1204	10.0	150	GATE	WESTINGHOUSE	SM900		66	23	85	191	N/A	N/A			1	3			4
1HV9080A	2401	4.0	150	GATE	ANCHOR DARLING	SM9000		132	132	68	88	N/A	N/A			1	3			4
1HV9080B	2401	4.0	150	GATE	ANCHOR DARLING	SM9000		132	132	67	88	N/A	N/A			1	3			4

TABLE 1

## DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAC NUMBER	SYS NO	SIZE	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Closing Thrust Margin (%)	Opening Torque Margin (%)	Closing Torque Margin (%)	SERVICE FACTOR			MARGIN FACTOR		DP Test Priority
														DP >= 500	200 < DP < 500	DP <= 200	MG <= 100	100% < MG < 200%	
2FV0610	1205	3.0	2035	GATE	WESTINGHOUSE	SMB000		202	202	248	140	N/A	N/A						4
2FV0511	1205	3.0	2035	GATE	WESTINGHOUSE	SMB000		202	202	248	140	N/A	N/A		2			2	4
2HV1669A	1202	24.0	150	BUTTERFLY	FISHER	SMB00	H3B	103	103	N/A	N/A	81	81				1	3	4
2HV1669B	1202	18.0	150	BUTTERFLY	FISHER	SMB00	H2B	101	101	N/A	N/A	71	71				1	3	4
2HV1669A	1202	24.0	150	BUTTERFLY	FISHER	SMB00	H3B	103	103	N/A	N/A	81	81				1	3	4
2HV1669B	1202	18.0	150	BUTTERFLY	FISHER	SMB00	H2B	100	100	N/A	N/A	71	71				1	3	4
2HV1974	1217	10.0	150	BUTTERFLY	FISHER	SMB000	H1B	163	137	N/A	N/A	96	96				1	3	4
2HV1975	1217	10.0	150	BUTTERFLY	FISHER	SMB000	H1B	164	138	N/A	N/A	96	96				1	3	4
2HV1976	1217	10.0	150	BUTTERFLY	FISHER	SMB000	H1B	163	137	N/A	N/A	96	96				1	3	4
2HV1979	1217	10.0	150	BUTTERFLY	FISHER	SMB000	H1B	164	138	N/A	N/A	96	96				1	3	4
2HV5113	1302	10.0	150	BUTTERFLY	FISHER	SMB000	H0B	23	23	N/A	N/A	73	148				1	3	4
2HV8146	1208	3.0	2035	GATE	WESTINGHOUSE	SMB000		490	0	165	347	N/A	N/A		2			2	4
2HV8147	1208	3.0	2035	GATE	WESTINGHOUSE	SMB000		490	0	165	347	N/A	N/A		2			2	4
2HV8716A	1205	8.0	316	GATE	WESTINGHOUSE	SMB00		253	273	158	116	N/A	N/A		2			2	4
2HV8716B	1205	8.0	316	GATE	WESTINGHOUSE	SMB00		253	273	153	116	N/A	N/A		2			2	4
2HV8806	1204	8.0	150	GATE	WESTINGHOUSE	SMB00		210	210	110	102	N/A	N/A		2			2	4
2HV8812A	1204	12.0	316	GATE	WESTINGHOUSE	SMB1		430	25	40	919	N/A	N/A				1	3	4
2HV8812B	1205	12.0	316	GATE	WESTINGHOUSE	SMB1		430	25	41	931	N/A	N/A				1	3	4
2HV8933A	1204	6.0	150	GATE	WESTINGHOUSE	SMB00		220	220	233	162	N/A	N/A		2			2	4
2HV8923B	1204	6.0	150	GATE	WESTINGHOUSE	SMB00		220	220	233	162	N/A	N/A		2			2	4
2HV8924	1208	6.0	150	GATE	WESTINGHOUSE	SMB00		0	220	656	162	N/A	N/A		2			2	4
2HV9001A	1208	8.0	316	GATE	WESTINGHOUSE	SMB00		55	124	105	182	N/A	N/A		2			2	4
2HV9002A	1208	10.0	150	GATE	WESTINGHOUSE	SMB1		101	58	66	117	N/A	N/A				1	3	4
2HV9002B	1206	10.0	150	GATE	WESTINGHOUSE	SMB0		101	58	49	95	N/A	N/A				1	3	4
2HV9003A	1206	10.0	150	GATE	WESTINGHOUSE	SMB0		150	58	77	184	N/A	N/A				1	3	4
2HV9003B	1206	10.0	150	GATE	WESTINGHOUSE	SMB0		150	58	61	159	N/A	N/A				1	3	4
2HV9017B	1204	10.0	150	GATE	WESTINGHOUSE	SMB0		66	23	83	158	N/A	N/A				1	3	4
2HV9380A	2401	4.0	150	GATE	ANCHOR DARLING	SMB000		132	132	87	87	N/A	N/A				1	3	4
2HV9380B	2401	4.0	150	GATE	ANCHOR DARLING	SMB000		132	132	86	86	N/A	N/A				1	3	4

TABLE 1

TOTAL CATEGORY

4 = 60

TABLE 1

DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBER	SYS NO.	ANSI SIZE	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Closing Thrust Margin (%)	SERVICE FACTOR		MARGIN FACTOR		DP Test Priority
												DP >= 500	DP <= 500	100% < MG < 200%	MG >= 200	
IHW1600	1202	18.0	150	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	115					3
IHW1605	1202	18.0	150	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	115					3
IHW1606	1202	18.0	150	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	115					3
IHW1607	1202	18.0	150	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	115					3
IHW1612	1202	18.0	150	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	115					3
IHW1613	1202	18.0	150	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	115					3
IHW1606	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	117	117	N/A	131					3
IHW1607	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	131					3
IHW1608	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	117	117	N/A	131					3
IHW1609	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	131					3
IHW1622	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	117	117	N/A	131					3
IHW1623	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	131					3
IHW1630	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	131					3
IHW1631	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	131					3
IHW1634	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	131					3
IHW2136	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	116	116	N/A	104					3
IHW2138	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	104					3
IHW2139	1202	8.0	150	BUTTERFLY	FISHER	SMB000	H1B	116	116	N/A	105					3
IHW6438	1208	4.0	1525	GATE	WESTINGHOUSE	S800		G	227	556	N/A		2			3
IHW645A	1208	4.0	1525	GATE	WESTINGHOUSE	S800		227	227	368	N/A		2			3
IHW645B	1208	4.0	1525	GATE	WESTINGHOUSE	S800		227	227	363	N/A		2			3
IHW6509A	1208	2.0	1500	GLOBE	VELAN	SMB000		499	476	394	N/A		2			3
IHW6509B	1208	2.0	1500	GLOBE	VELAN	SMB000		499	476	395	N/A		2			3
IHW694A	1208	3.0	150	GATE	WESTINGHOUSE	SMB000		17	17	108	153					3
IHW694B	1208	3.0	150	GATE	WESTINGHOUSE	SMB000		17	17	106	150					3
ILV0112D	1208	8.0	150	GATE	WESTINGHOUSE	SMB000		71	199	350	110					3
ILV0112E	1208	8.0	150	GATE	WESTINGHOUSE	SMB000		71	199	350	110					3

TABLE 1

DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBER	SYS NO.	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/ISB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Opening Torque Margin (%)	SERVICE FACTOR			MARGIN FACTOR	DP Test Priority
											DP >= 500	200 < DP < 500	DP <= 200		
2HV11600	1202	18.0	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	N/A	115	115	1	2	3
2HV11605	1202	18.0	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	N/A	115	115	1	2	3
2HV11606	1202	18.0	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	N/A	115	115	1	2	3
2HV11607	1202	18.0	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	N/A	115	115	1	2	3
2HV11612	1202	18.0	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	N/A	115	115	1	2	3
2HV11613	1202	18.0	BUTTERFLY	FISHER	SMB000	H3B	173	0	N/A	N/A	115	115	1	2	3
2HV1806	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	117	117	N/A	N/A	131	131	1	2	3
2HV1807	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV1808	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	117	117	N/A	N/A	131	131	1	2	3
2HV1809	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV1822	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV1823	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	117	117	N/A	N/A	131	131	1	2	3
2HV1830	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV1831	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV2134	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV2135	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	113	113	N/A	N/A	131	131	1	2	3
2HV2136	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	116	116	N/A	N/A	131	131	1	2	3
2HV2138	1202	8.0	BUTTERFLY	FISHER	SMB000	H1B	116	116	N/A	N/A	131	131	1	2	3
2HV8438	1208	4.0	GATE	WESTINGHOUSE	SB000		0	227	564	294	N/A	N/A	2	1	3
2HV8445A	1208	4.0	GATE	WESTINGHOUSE	SB000		227	227	352	294	N/A	N/A	2	1	3
2HV8445B	1208	4.0	GATE	WESTINGHOUSE	SB000		227	227	353	332	N/A	N/A	2	1	3
2HV8508A	1208	2.0	GLOBE	VELAN	SMB000		499	476	383	415	N/A	N/A	2	1	3
2HV8508B	1208	2.0	GLOBE	VELAN	SMB000		499	476	387	415	N/A	N/A	2	1	3
2HV8964A	1208	3.0	GATE	WESTINGHOUSE	SMB000		17	17	194	202	N/A	N/A	1	2	3
2HV8964B	1208	3.0	GATE	WESTINGHOUSE	SMB000		66	25	140	238	N/A	N/A	1	2	3
2LV9017A	1208	8.0	GATE	WESTINGHOUSE	SMB000		71	199	350	110	N/A	N/A	1	2	3
2LV0112D	1208	8.0	GATE	WESTINGHOUSE	SMB000		71	199	350	110	N/A	N/A	1	2	3
2LV0112E	1208	8.0	GATE	WESTINGHOUSE	SMB000		71	199	350	110	N/A	N/A	1	2	3

TOTAL CATEGORY 3 = 55

TABLE 1

## DIFFERENTIAL PRESSURE TEST PRIORITY

Continued

TAG NUMBER	REV	SIZE	ANSI RATING	VALVE TYPE	MANUFACTURER	SMB/SB SIZE	HBC SIZE	Open DP (psid)	Close DP (psid)	Opening Thrust Margin (%)	Closing Thrust Margin (%)	Opening Torque Margin (%)	Closing Torque Margin (%)	SERVICE FACTOR			MARGIN FACTOR			DP Test Priority	
														DP >= 500	200 < DP < 500	DP <= 200	MG <= 100	100% < MG < 200%	MG >= 200		
1HV2624A	1508	4.0	150	BUTTERFLY	FISHER	SMB000	H1B	0	50	N/A	N/A	244	244			1				1	2
1HV2624B	1508	4.0	150	BUTTERFLY	FISHER	SMB000	H1B	0	50	N/A	N/A	244	244			1				1	2
1HV2626A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
1HV2627A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
1HV2628A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
1HV2629A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
1HV511B	1302	6.0	150	BUTTERFLY	FISHER	SMB020	H0B	24	24	N/A	N/A	266	266			1				1	2
1HV511v	1302	3.0	150	BUTTERFLY	FISHER	SMB000	H0B	24	24	N/A	N/A	266	266			1				1	2
1HV8100	1208	2.0	1500	GLOBE	VELAN	SMB00		160	160	661	707	N/A	N/A			1				1	2
1HV8104	1208	2.0	1500	GLOBE	VELAN	SMB00		91	91	802	802	N/A	N/A			1				1	2
1HV8112	1208	2.0	1500	GLOBE	VELAN	SMB00		158	158	708	708	N/A	N/A			1				1	2
1HV8471A	1208	6.0	150	GATE	WESTINGHOUSE	SMB00		0	90	443	279	N/A	N/A			1				1	2
1HV8471B	1208	6.0	150	GATE	WESTINGHOUSE	SMB00		0	90	433	277	N/A	N/A			1				1	2
1HV8807A	1204	6.0	150	GATE	WESTINGHOUSE	SMB00		0	43	431	373	N/A	N/A			1				1	2
1HV8807B	1204	6.0	150	GATE	WESTINGHOUSE	SMB00		0	43	443	383	N/A	N/A			1				1	2
1HV8809A	1204	8.0	1525	GATE	WESTINGHOUSE	SB1		199	199	634	595	N/A	N/A			1				1	2
1HV8809B	1204	8.0	1525	GATE	WESTINGHOUSE	SB1		199	199	454	432	N/A	N/A			1				1	2
1HV8811A	1205	14.0	316	GATE	WESTINGHOUSE	SB1		57	57	380	449	N/A	N/A			1				1	2
1HV8811B	1205	14.0	316	GATE	WESTINGHOUSE	SB1		57	57	301	359	N/A	N/A			1				1	2
1HV8840	1204	12.0	1525	GATE	WESTINGHOUSE	SB2		193	0	542	2398	N/A	N/A			1				1	2
1LV0112B	1208	4.0	150	GATE	WESTINGHOUSE	SMB000		78	42	207	200	N/A	N/A			1				1	2
1LV0112C	1208	4.0	150	GATE	WESTINGHOUSE	SMB000		78	42	207	200	N/A	N/A			1				1	2
2HV2624A	1508	4.0	150	BUTTERFLY	FISHER	SMB000	H1B	0	50	N/A	N/A	244	244			1				1	2
2HV2624B	1508	4.0	150	BUTTERFLY	FISHER	SMB000	H1B	0	50	N/A	N/A	244	244			1				1	2
2HV2626A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
2HV2627A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
2HV2628A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
2HV2629A	1508	24.0	150	BUTTERFLY	FISHER	SMB00	H2B	0	0	N/A	N/A	313	313			1				1	2
2HV511B	1302	6.0	150	BUTTERFLY	FISHER	SMB000	H0B	24	24	N/A	N/A	266	266			1				1	2
2HV511v	1302	6.0	150	BUTTERFLY	FISHER	SMB000	H0B	24	24	N/A	N/A	266	266			1				1	2
2HV8100	1208	2.0	1500	GLOBE	VELAN	SMB00		160	160	657	707	N/A	N/A			1				1	2
2HV8104	1208	2.0	1500	GLOBE	VELAN	SMB00		91	91	802	802	N/A	N/A			1				1	2
2HV8112	1208	2.0	1500	GLOBE	VELAN	SMB00		158	158	708	708	N/A	N/A			1				1	2
2HV8471A	1208	6.0	150	GATE	WESTINGHOUSE	SMB00		0	90	426	268	N/A	N/A			1				1	2
2HV8471B	1208	6.0	150	GATE	WESTINGHOUSE	SMB00		0	90	426	268	N/A	N/A			1				1	2
2HV8807A	1204	6.0	150	GATE	WESTINGHOUSE	SMB00		0	43	425	367	N/A	N/A			1				1	2
2HV8807B	1204	6.0	150	GATE	WESTINGHOUSE	SMB00		0	43	439	380	N/A	N/A			1				1	2
2HV8809A	1204	8.0	1525	GATE	WESTINGHOUSE	SB1		199	199	627	595	N/A	N/A			1				1	2
2HV8809B	1204	8.0	1525	GATE	WESTINGHOUSE	SB1		199	199	443	421	N/A	N/A			1				1	2
2HV8811A	1205	14.0	316	GATE	WESTINGHOUSE	SB1		57	57	368	435	N/A	N/A			1				1	2
2HV8811B	1205	14.0	316	GATE	WESTINGHOUSE	SB1		57	57	346	410	N/A	N/A			1				1	2
2HV8840	1204	12.0	1525	GATE	WESTINGHOUSE	SB2		193	0	542	2398	N/A	N/A			1				1	2
2LV0112B	1208	4.0	150	GATE	WESTINGHOUSE	SMB000		78	42	207	200	N/A	N/A			1				1	2
2LV0112C	1208	4.0	150	GATE	WESTINGHOUSE	SMB000		78	42	207	200	N/A	N/A			1				1	2

TOTAL CATEGORY 2 = 44

TOTAL GL 89-10 SCOPE MOVs 250