Union Electric

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July 28, 1999

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, DC 20555-0001

Gentlemen:

ULNRC-04075
TAC No. M97027

DOCKET NUMBER 50-483
CALLAWAY PLANT
UNION ELECTRIC COMPANY
NRC GENERIC LETTER 96-05
PERIODIC VERIFICATION OF DESIGN-BASIS CAPABILITY OF SAFETY-RELATED MOTOR-OPERATED VALVES

References:
1) ULNRC-3487 dated November 6, 1996
2) ULNRC-3548 dated March 13, 1997
3) NRC Inspection Report 50-483/99-04 dated April 27, 1999
4) NRC Letter to G. L. Randolph dated June 18, 1999

References 1 through 3 provide pertinent information with regard to Union Electric/AmerenUE's responses to NRC Generic Letter 96-05. Reference 4 requested additional information to allow NRC to complete its review for Callaway Plant. The attachment to this letter provides the requested information..

If you have any questions, please contact us.

1/1

Sincerely,

Alan C. Passwater
Manager, Corporate Nuclear Services

A073

JFH/DS/jdg

Attachment

STATE OF MISSOURI)
) S S
CITY OF ST. LOUIS)

Alan C. Passwater, of lawful age, being first duly sworn upon oath says that he is Manager, Corporate Nuclear Services for Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Alan C Passwater
Alan C. Passwater
Manager, Corporate Nuclear Services

SUBSCRIBED and sworn to before me this 28th day of July, 1999.

Thomas J. Bokern

THOMAS J. BOKERN
NOTARY SEAL
NOTARY PUBLIC
STATE OF MISSOURI

THOMAS J. BOKERN
NOTARY PUBLIC—STATE OF MISSOURI
ST LOUIS COUNTY
MY COMMISSION EXPIRES JULY 5, 2000

cc: M. H. Fletcher
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U.S. Nuclear Regulatory Commission
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Senior Resident Inspector
Callaway Resident Office
U.S. Nuclear Regulatory Commission
8201 NRC Road
Steedman, MO 65077

Mr. Jack Donohew (2)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
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Manager, Electric Department
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Jefferson City, MO 65102

7/28/99 Valve ID	Noun Name	Valve Manufacturer	Valve Type	Valve Size (in)	Stem Diameter (in)	Stem Pitch (in)	Stem Lead (in)	Average Seat Diameter (in)	Actuator Type	Actuator Size	Overall Actuator Ratio OAR	Voltage AC/DC
ALHV0005	MDAFP B TO S/G D HV	MASONEILAN	GLOBE	4	1.25	0.25	0.25	2.0000	SMB	OO	129.96	Rgltd DC
ALHV0007	MDAFP B TO S/G A HV	MASONEILAN	GLOBE	4	1.25	0.25	0.25	2.0000	SMB	OO	129.96	Rgltd DC
ALHV0009	MDAFP A TO S/G B HV	MASONEILAN	GLOBE	4	1.25	0.25	0.25	2.0000	SMB	OO	129.96	Rgltd DC
ALHV0011	MDAFP A TO S/G C HV	MASONEILAN	GLOBE	4	1.25	0.25	0.25	2.0000	SMB	OO	129.96	Rgltd DC
ALHV0030	ESW TO MD AFP B HV	FISHER	B'FLY	6	0.75	B'FLY	B'FLY	B'FLY	SMB	OO	24.8	AC
ALHV0031	ESW TO MD AFP A HV	FISHER	B'FLY	6	0.75	B'FLY	B'FLY	B'FLY	SMB	OO	23	AC
ALHV0032	ESW TO TD AFP HV	FISHER	B'FLY	8	1	B'FLY	B'FLY	B'FLY	SMB	OO	24.8	AC
ALHV0033	ESW TO TD AFP HV	FISHER	B'FLY	8	1	B'FLY	B'FLY	B'FLY	SMB	OO	23	AC
ALHV0034	CST TO MD AFP B HV	ANCHOR-DARLING	FW GATE	8	1.25	0.333	0.333	7.813	SMB	OO	31.9	AC
ALHV0035	CST TO MD AFP A HV	ANCHOR-DARLING	FW GATE	8	1.25	0.333	0.333	7.813	SMB	OO	31.9	AC
ALHV0036	CST TO TD AFP HV	ANCHOR-DARLING	FW GATE	10	1.25	0.333	0.333	9.1880	SMB	OO	23	AC
BBHV0013	RCP A THRM BAR COOL COIL COOL WTR OUT HV	VELAN	FW GATE	3	1.125	0.2	0.2	2.7150	SMB	OO	49	AC
BBHV0014	RCP B THRM BAR COOL COIL COOL WTR OUT HV	VELAN	FW GATE	3	1.125	0.2	0.2	2.7150	SMB	OO	49	AC
BBHV0015	RCP C THRM BAR COOL COIL COOL WTR OUT HV	VELAN	FW GATE	3	1.125	0.2	0.2	2.7150	SMB	OO	49	AC
BBHV0016	RCP D THRM BAR COOL COIL COOL WTR OUT HV	VELAN	FW GATE	3	1.125	0.2	0.2	2.7150	SMB	OO	49	AC
BBHV8000A	RCS PZR OUT PWR OPER RLF HV	WESTINGHOUSE	FW GATE	3	1.25	0.333	0.333	3.2400	SB	OO	63.3	AC
BBHV8000B	RCS PZR OUT PWR OPER RLF HV	WESTINGHOUSE	FW GATE	3	1.25	0.333	0.333	3.2400	SB	OO	63.3	AC
BBHV8037A	RCS PRT OUT TO CTMT NORM SMP ISO HV	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	3.5600	SB	OO	23	AC
BBHV8037B	RCS PRT OUT TO CTMT NORM SMP ISO HV	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	3.5600	SB	OO	23	AC
BBHV8351A	RCP A SEAL WTR SPLY ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BBHV8351B	RCP B SEAL WTR SPLY ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BBHV8351C	RCP C SEAL WTR SPLY ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BBHV8351D	RCP D SEAL WTR SPLY ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BBPV8702A	RCS LOOP 1 HOT LEG TO RHR PMPS PCV ISO	WESTINGHOUSE	FW GATE	12	3	0.4	0.8	11.8100	SMB	2	82.5	AC
BBPV8702B	RCS LOOP 4 HOT LEG TO RHR PMPS PCV ISO	WESTINGHOUSE	FW GATE	12	3	0.4	0.8	11.8100	SMB	2	82.5	AC
BGHV8100	SEAL WTR RTN OUTER CTMT ISO	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BGHV8104	EMERG BORATE TO CCP A & B HDR ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BGHV8105	CVCS CHRGNG HDR TO REGEN HX OUTER CTMT ISO HV	WESTINGHOUSE	FW GATE	3	1.25	0.333	0.333	2.6200	SB	OO	31.9	AC
BGHV8106	CVCS CHRGNG HDR TO REGEN HX OUTER CTMT ISO HV	WESTINGHOUSE	FW GATE	3	1.25	0.333	0.333	2.6200	SB	OO	31.9	AC
BGHV8109	CVCS NCP RECIRC HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BGHV8110	A CCP DISCH MINIFLOW TO SEAL WTR HX ISO	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BGHV8111	CCP B DISCH MINIFLOW ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BGHV8112	SEAL WTR RTN INNER CTMT ISO HV	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BGHV8357A	CVCS CCP A DISCH TO RCP SEALS THROT VLV	ANCHOR-DARLING	GLOBE	1	1	0.125	0.125	0.3750	SMB	OOO	102	AC
BGHV8357B	CVCS CCP B DISCH TO RCP SEALS THROT VLV	ANCHOR-DARLING	GLOBE	1	1	0.125	0.125	0.3750	SMB	OOO	102	AC
BGLCV0112B	CVCS VCT OUT UPSTRM ISO	WESTINGHOUSE	SW GATE	4	1.25	0.333	0.333	3.5600	SB	OO	23	AC
BGLCV0112C	CVCS VCT OUT DNSTRM ISO	WESTINGHOUSE	SW GATE	4	1.25	0.333	0.333	3.5600	SB	OO	23	AC

7/28/99 Valve ID	Pullout Efficiency PE	Application Factor AF	Reduced Voltage RV	Rated Voltage VR	Rate of Loading Assumption	Motor Rated Starting Torque (ft-lbs)	Torque Derate Factor TF	Control Switch	Design DP CLOSE (psi)	Design DP OPEN (psi)	System Pressure (psi)	Safety Related Function	Design Required DPTh/DPTq CLOSE (lbs, ft-lbs)	Design Required DPTh/DPTq with Error CLOSE (lbs, ft-lbs)
ALHV0005	0.35	0.75	97.60	NA	1.15	5	0.00000	TS	1725	1725	1725	OP & CL	3505	4273
ALHV0007	0.35	0.75	97.60	NA	1.15	5	0.00000	TS	1725	1725	1725	OP & CL	8935	10159
ALHV0009	0.35	0.75	97.60	NA	1.15	5	0.00000	TS	1725	1725	1725	OP & CL	7498	8601
ALHV0011	0.35	0.75	97.60	NA	1.15	5	0.00000	TS	1725	1725	1725	OP & CL	7779	8906
ALHV0030	0.38	0.90	221.21	460.0	B'FLY	5	0.00590	LS w/TS	157	157	157	OP	Non-Safety	Non-Safety
ALHV0031	0.38	0.90	221.67	460.0	B'FLY	5	0.00590	LS w/TS	140	140	140	OP	Non-Safety	Non-Safety
ALHV0032	0.38	0.90	221.47	460.0	B'FLY	5	0.00610	LSw/TSby-ps	140	140	140	OP	Non-Safety	Non-Safety
ALHV0033	0.38	0.90	221.27	460.0	B'FLY	5	0.00610	LS w/TS	157	157	157	OP	Non-Safety	Non-Safety
ALHV0034	0.40	0.90	227.52	460.0	1.15	15	0.01018	TS	156	156	156	CL	4250	5080
ALHV0035	0.40	0.90	228.04	460.0	1.15	15	0.01018	TS	141	25	141	CL	3841	4637
ALHV0036	0.40	0.90	230.23	460.0	1.15	15	0.01018	TS	156	25	156	CL	5770	6728
BBHV0013	0.40	0.90	231.08	460.0	1.15	10	0.18094	TS	2335	145	2335	CL	8482	9668
BBHV0014	0.40	0.90	229.59	460.0	1.15	10	0.18094	TS	2335	156	2335	CL	8482	9668
BBHV0015	0.40	0.90	228.41	460.0	1.15	10	0.18094	TS	2335	145	2335	CL	8482	9668
BBHV0016	0.40	0.90	228.31	460.0	1.15	10	0.18094	TS	2335	145	2335	CL	8482	9668
BBHV8000A	0.40	0.90	236.02	460.0	0.00	15	0.13806	LS w/o TS	2335	2485	2485	OP & CL	11981	13460
BBHV8000B	0.40	0.90	236.57	460.0	0.00	15	0.13806	LS w/o TS	2335	2485	2485	OP & CL	11981	13460
BBHV8037A	0.45	0.90	230.43	460.0	1.15	15	0.13749	TS	104	104	104	OP & CL	1337	1923
BBHV8037B	0.45	0.90	230.82	460.0	1.15	15	0.13749	TS	104	104	104	OP & CL	1337	1923
BBHV8351A	0.40	0.90	215.40	460.0	1.15	10	0.00640	TS	0	2813	2813	NONE	Non-Safety	Non-Safety
BBHV8351B	0.40	0.90	215.12	460.0	1.15	10	0.00640	TS	0	2813	2813	NONE	Non-Safety	Non-Safety
BBHV8351C	0.40	0.90	215.09	460.0	1.15	10	0.00640	TS	0	2813	2813	NONE	Non-Safety	Non-Safety
BBHV8351D	0.40	0.90	215.26	460.0	1.15	10	0.00640	TS	0	2813	2813	NONE	Non-Safety	Non-Safety
BBPV8702A	0.40	0.90	239.86	460.0	0.00	60	0.12623	TS-SS	464	380	750	OP & CL	28065	32446
BBPV8702B	0.40	0.90	241.45	460.0	0.00	60	0.12623	TS-SS	464	380	750	OP & CL	28065	32446
BGHV8100	0.40	0.90	218.61	460.0	1.15	10	0.00640	TS	155	155	155	CL	7039	8103
BGHV8104	0.40	0.90	218.62	460.0	1.15	10	0.00819	TS	125	125	125	OP & CL	2757	3462
BGHV8105	0.45	0.90	227.52	460.0	0.00	15	0.00495	LS w/o TS	2750	2750	2750	CL	11091	12496
BGHV8106	0.45	0.90	230.47	460.0	0.00	15	0.00495	LS w/o TS	2750	2750	2750	CL	12966	14528
BGHV8109	0.40	0.90	230.47	460.0	1.15	10	0.00819	TS	2900	2900	2900	NONE	Non-Safety	Non-Safety
BGHV8110	0.40	0.90	217.40	460.0	1.15	10	0.00819	TS	2750	2750	2750	OP & CL	8693	9896
BGHV8111	0.40	0.90	217.73	460.0	1.15	10	0.00819	TS	2750	2750	2750	OP & CL	7039	8103
BGHV8112	0.40	0.90	218.52	460.0	1.15	10	0.17797	TS	155	155	155	CL	7039	8103
BGHV8357A	0.35	0.80	224.90	460.0	1.15	2	0.01011	TS	2722	2722	2722	OP & CL	1024	1381
BGHV8357B	0.35	0.80	224.95	460.0	1.15	2	0.01011	TS	2722	2722	2722	OP & CL	883	1228
BGLCV0112B	0.45	0.90	238.58	460.0	1.15	15	0.01323	TS	100	100	100	CL	4221	5049
BGLCV0112C	0.45	0.90	234.51	460.0	1.15	15	0.01323	TS	100	100	100	CL	4221	5049

7/28/99 Valve ID	Measured MAT @ TST CLOSE (lbs, ft-lbs)	Measured MAT @ LST CLOSE (ft-lbs)	Measured Stem Factor	Stem-to-Stem Nut Friction Coefficent (Measured) (mu)	Design Required DPTh/DPTq OPEN (lbs, ft-lbs)	Design Required DPTh/DPTq with Error OPEN (lbs, ft-lbs)	Actuator Capacity OPEN (lbs,ft-lbs)	Assumed Packing Load (lbs,ft-lbs)	Measured Packing Load (lbs)	Allowable RV Pullout Torque (ft-lbs)	Measured Pullout Torque (ft-lbs)	Measured Pullout Thrust (lbs)	Notes
ALHV0005	10669		0.0057	0.049	2613	3040	12922	1500	95	171	16	2807	
ALHV0007	13568		0.0069	0.073	2735	3170	12922	1500	114	171	0	0	
ALHV0009	11852		0.0091	0.118	3247	3716	12922	1500	189	171	0	0	
ALHV0011	12374		0.0054	0.043	1723	2092	12922	1500	170	171	0	0	
ALHV0030	Non-Safety	Non-Safety	B'FLY	B'FLY	108	128	614	22	-	614	132	B'FLY	
ALHV0031	Non-Safety	Non-Safety	B'FLY	B'FLY	117	137	572	22	-	572	72	B'FLY	
ALHV0032	Non-Safety	Non-Safety	B'FLY	B'FLY	92	110	616	39	-	616	44	B'FLY	
ALHV0033	Non-Safety	Non-Safety	B'FLY	B'FLY	132	153	570	39	-	570	116	B'FLY	
ALHV0034	10560		0.0071	0.057	Non-Safety	Non-Safety	Non-Safety	1500	73	125	77	10845	MSD
ALHV0035	7762		0.0076	0.067	Non-Safety	Non-Safety	Non-Safety	1500	152	126	46	6053	MSD
ALHV0036	10816		0.0098	0.109	Non-Safety	Non-Safety	Non-Safety	1500	895	92	82	8367	MSD
BBHV0013	17725		0.0060	0.075	Non-Safety	Non-Safety	Non-Safety	1500	400	109	78	13000	MSD
BBHV0014	18988		0.0060	0.075	Non-Safety	Non-Safety	Non-Safety	1500	435	108	72	12000	MSD
BBHV0015	17080		0.0064	0.084	Non-Safety	Non-Safety	Non-Safety	1500	1110	107	65	10156	MSD
BBHV0016	16815		0.0059	0.073	Non-Safety	Non-Safety	Non-Safety	1500	1290	107	73	12373	MSD
BBHV8000A		7498	0.0105	0.128	9244	10107	16643	1500	1271	233	24	2286	MSD
BBHV8000B		9819	0.0070	0.009	9244	10107	16714	1500	832	234	41	5857	MSD
BBHV8037A	3877		0.0091	0.098	1190	1524	6500	1500	1586	91	26	2857	
BBHV8037B	7783		0.0079	0.074	1190	1524	6500	1500	1081	91	25	3165	
BBHV8351A	Non-Safety	Non-Safety	0.0123	0.078	Non-Safety	Non-Safety	Non-Safety	1500	1198	193	25	2033	
BBHV8351B	Non-Safety	Non-Safety	0.0134	0.102	Non-Safety	Non-Safety	Non-Safety	1500	1654	192	31	2313	
BBHV8351C	Non-Safety	Non-Safety	0.0102	0.032	Non-Safety	Non-Safety	Non-Safety	1500	1128	192	15	1471	
BBHV8351D	Non-Safety	Non-Safety	0.0111	0.052	Non-Safety	Non-Safety	Non-Safety	1500	548	193	12	1081	
BBPV8702A	42952		0.0222	0.094	19761	25100	43983	4000	2000	1557	854	38468	MSD
BBPV8702B	32228		0.0284	0.145	19761	25100	43983	4000	2008	1557	660	23239	MSD
BGHV8100	13926		0.0121	0.074	Non-Safety	Non-Safety	Non-Safety	1500	1327	199	16	1322	
BGHV8104	11013		0.0124	0.080	2328	2737	11061	1500	76	198	12	968	
BGHV8105		7386	0.0074	0.064	Non-Safety	Non-Safety	Non-Safety	1500	590	142	35	4730	
BGHV8106		7597	0.0084	0.084	Non-Safety	Non-Safety	Non-Safety	1500	951	165	36	4286	
BGHV8109	Non-Safety	Non-Safety	0.0112	0.054	Non-Safety	Non-Safety	Non-Safety	1500	170	220	10.7	955	
BGHV8110	12152		0.0108	0.044	7360	8099	10950	1500	321	196	90	8333	
BGHV8111	10202		0.0115	0.059	6185	6847	11006	1500	491	197	12	1043	
BGHV8112	12258		0.0131	0.096	Non-Safety	Non-Safety	Non-Safety	1500	1139	164	18	1374	
BGHV8357A	4120		0.0049	0.080	508	755	4100	1000	279	41	14	2857	
BGHV8357B	3245		0.0061	0.109	611	864	4100	1000	305	41	8.9	1459	
BGLCV0112B	9042		0.0096	0.109	Non-Safety	Non-Safety	Non-Safety	1500	567	111	39	4063	
BGLCV0112C	9060		0.0076	0.067	Non-Safety	Non-Safety	Non-Safety	1500	529	108	29	3816	

7/28/99 Valve ID	Noun Name	Valve Manufacturer	Valve Type	Valve Size (in)	Stem Diameter (in)	Stem Pitch (in)	Stem Lead (in)	Average Seat Diameter (in)	Actuator Type	Actuator Size	Overall Actuator Ratio OAR	Voltage AC/DC
BNHV0003	RWST TO CTMT SPRY PMP B HV	ANCHOR-DARLING	FW GATE	12	1.375	0.333	0.333	10.6880	SMB	OO	46.8	AC
BNHV0004	RWST TO CTMT SPRY PMP A HV	ANCHOR-DARLING	FW GATE	12	1.375	0.333	0.333	10.6880	SMB	OO	46.8	AC
BNHV8806A	SI PMP A SUCT FROM RWST ISO	WESTINGHOUSE	FW GATE	8	1.25	0.333	0.333	6.5050	SB	OO	23	AC
BNHV8806B	SI PMP B SUCT FROM RWST ISO	WESTINGHOUSE	FW GATE	8	1.25	0.333	0.333	6.5050	SB	OO	23	AC
BNHV8812A	RWST TO RHR PMP A SUCT ISO VLV	WESTINGHOUSE	FW GATE	14	2	0.25	0.5	12.0050	SB	1	27.2	AC
BNHV8812B	RWST TO RHR PMP B SUCT ISO VLV	WESTINGHOUSE	FW GATE	14	2	0.25	0.5	12.0050	SB	1	27.2	AC
BNHV8813	SI PMPS MINIFLOW TO RWST ISO VLV (3.0.3)	VELAN	GLOBE	2	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
BNLCV0112D	CCP A SUCT FROM RWST ISO VLV	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	6.5050	SB	OO	23	AC
BNLCV0112E	CCP B SUCT FROM RWST ISO VLV	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	6.5050	SB	OO	23	AC
ECHV0011	FUEL POOL HX A SHELL SIDE CCW OUT ISO	FISHER	B'FLY	12	1.25	B'FLY	B'FLY	B'FLY	SMB	OOO	100	AC
ECHV0012	FUEL POOL HX B SHELL SIDE CCW OUT ISO	FISHER	B'FLY	12	1.25	B'FLY	B'FLY	B'FLY	SMB	OOO	90.5	AC
EFHV0023	SERV WTR/ESW TRN A XCON HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0024	SERV WTR/ESW TRN B XCON HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0025	SERV WTR/ESW TRN A XCON HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0026	SERV WTR/ESW TRN B XCON HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0031	ESW TRN A TO CTMT AIR CLRS OUTER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0032	ESW TRN B TO CTMT AIR CLRS OUTER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0033	ESW TRN A TO CTMT AIR CLRS INNER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0034	ESW TRN B TO CTMT AIR CLRS INNER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0037	ESW TRN A TO UHS HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0038	ESW TRN B TO UHS HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0039	ESW TRN A TO SERV WTR UPSTRM HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0040	ESW TRN B TO SERV WTR UPSTRM HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0041	ESW TRN A TO SERV WTR DNSTRM HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0042	ESW TRN B TO SERV WTR DNSTRM HV	ANCHOR-DARLING	B'FLY	30	3	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0045	ESW TRN A FROM CTMT AIR CLRS INNER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0046	ESW TRN B FROM CTMT AIR CLRS INNER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0047	ESW TRN A FROM CTMT AIR CLRS BYPASS ISO HV	NELES-JAMESBURY	B'FLY	10	1.125	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0048	ESW TRN B FROM CTMT AIR CLRS BYPASS ISO HV	NELES-JAMESBURY	B'FLY	10	1.125	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0049	ESW TRN A FROM CTMT AIR CLRS OUTER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0050	ESW TRN B FROM CTMT AIR CLRS OUTER CTMT HV	NELES-JAMESBURY	B'FLY	14	1.625	B'FLY	B'FLY	B'FLY	SMB	OOO	47.85	AC
EFHV0051	ESW TRN A TO CCW HX A HV	FISHER	B'FLY	24	2	B'FLY	B'FLY	B'FLY	SMB	OO	94	AC
EFHV0052	ESW TRN B TO CCW HX B HV	FISHER	B'FLY	24	2	B'FLY	B'FLY	B'FLY	SMB	OO	94	AC
EFHV0059	ESW TRN A FROM CCW HX A HV	FISHER	B'FLY	24	2	B'FLY	B'FLY	B'FLY	SMB	OO	94	AC
EFHV0060	ESW TRN B FROM CCW HX B HV	FISHER	B'FLY	24	2	B'FLY	B'FLY	B'FLY	SMB	OO	94	AC
EFHV0065	ESW UHS COOL-TWR TRN A BYP HV	JAMESBURY	B'FLY	30	3.5	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC
EFHV0066	ESW UHS COOL-TWR TRN B BYP HV	JAMESBURY	B'FLY	30	3.5	B'FLY	B'FLY	B'FLY	SMB	OO	49	AC

7/28/99 Valve ID	Pullout Efficiency PE	Application Factor AF	Reduced Voltage RV	Rated Voltage VR	Rate of Loading Assumption	Motor Rated Starting Torque (ft-lbs)	Torque Derate Factor TF	Control Switch	Design DP CLOSE (psi)	Design DP OPEN (psi)	System Pressure (psi)	Safety Related Function	Design Required DPTh/DPTq CLOSE (lbs, ft-lbs)	Design Required DPTh/DPTq with Error CLOSE (lbs, ft-lbs)
BNHV0003	0.40	0.90	236.48	460.0	1.15	10	0.01638	TS	32	32	32	OP & CL	3356	4111
BNHV0004	0.40	0.90	237.11	460.0	1.15	10	0.01638	TS	32	32	32	OP & CL	3356	4111
BNHV8806A	0.45	0.90	228.51	460.0	0.00	15	0.00690	LS w/o TS	241	50	241	CL	2350	3021
BNHV8806B	0.45	0.90	230.60	460.0	0.00	15	0.00690	LS w/o TS	241	50	241	CL	1948	2585
BNHV8812A	0.45	0.90	231.93	460.0	1.20	60	0.00550	TS	33	33	33	CL	4607	6513
BNHV8812B	0.45	0.90	234.72	460.0	1.20	60	0.00550	TS	33	33	33	CL	4607	6513
BNHV8813	0.40	0.90	217.46	460.0	1.15	10	0.00819	TS	1552	1552	1552	CL	3298	4048
BNLCV0112D	0.45	0.90	227.05	460.0	0.00	15	0.00690	LS w/o TS	242	92	242	OP & CL	3793	4585
BNLCV0112E	0.45	0.90	227.84	460.0	0.00	15	0.00690	LS w/o TS	242	92	242	OP & CL	2514	3199
ECHV0011	0.35	0.90	209.93	460.0	B'FLY	2	0.02092	LS w/ TS	119	119	119	OP & CL	70	87
ECHV0012	0.35	0.90	210.81	460.0	B'FLY	2	0.01981	LS w/ TS	119	119	119	OP & CL	70	87
EFHV0023	0.35	0.90	237.42	460.0	B'FLY	25	0.01896	LSw/TSby-ps	139	81	139	CL	1107	1226
EFHV0024	0.35	0.90	237.54	460.0	B'FLY	25	0.01896	LSw/TSby-ps	149	81	149	CL	3005	3249
EFHV0025	0.35	0.90	236.04	460.0	B'FLY	25	0.01896	LSw/TSby-ps	139	81	139	CL	2923	3161
EFHV0026	0.35	0.90	236.72	460.0	B'FLY	25	0.01896	LSw/TSby-ps	149	81	149	CL	2550	2764
EFHV0031	0.35	0.90	221.10	460.0	B'FLY	5	0.00670	LS w/ TS	134	134	134	OP & CL	300	334
EFHV0032	0.35	0.90	221.00	460.0	B'FLY	5	0.00670	LS w/ TS	152	152	152	OP & CL	445	488
EFHV0033	0.35	0.90	223.17	460.0	B'FLY	5	0.12190	LS w/ TS	131	131	131	OP & CL	251	282
EFHV0034	0.35	0.90	223.37	460.0	B'FLY	5	0.12140	LS w/ TS	150	150	150	OP & CL	414	455
EFHV0037	0.35	0.90	236.09	460.0	B'FLY	25	0.01896	LS w/ TS	144	144	144	OP	Non-Safety	Non-Safety
EFHV0038	0.35	0.90	235.71	460.0	B'FLY	25	0.01896	LS w/ TS	151	151	151	OP	Non-Safety	Non-Safety
EFHV0039	0.35	0.90	236.04	460.0	B'FLY	25	0.01896	LSw/TSby-ps	82	146	146	CL	560	643
EFHV0040	0.35	0.90	236.36	460.0	B'FLY	25	0.01896	LSw/TSby-ps	96	80	96	CL	2189	2379
EFHV0041	0.35	0.90	237.71	460.0	B'FLY	25	0.01896	LSw/TSby-ps	82	146	146	CL	91	143
EFHV0042	0.35	0.90	237.61	460.0	B'FLY	25	0.01896	LS w/ TS	96	80	96	CL	2282	2478
EFHV0045	0.35	0.90	223.11	460.0	B'FLY	5	0.12190	LS w/ TS	131	131	131	OP & CL	227	256
EFHV0046	0.35	0.90	223.37	460.0	B'FLY	5	0.12140	LS w/ TS	157	157	157	OP & CL	164	189
EFHV0047	0.35	0.90	220.39	460.0	B'FLY	5	0.00570	LS w/ TS	50	0	50	CL	87	105
EFHV0048	0.35	0.90	220.39	460.0	B'FLY	5	0.00570	LS w/ TS	57	0	57	CL	21	35
EFHV0049	0.35	0.90	221.04	460.0	B'FLY	5	0.00570	LSw/TSby-ps	50	0	50	OP & CL	181	207
EFHV0050	0.35	0.90	221.01	460.0	B'FLY	5	0.00570	LSw/TSby-ps	57	10	57	OP & CL	59	77
EFHV0051	0.35	0.90	235.01	460.0	B'FLY	10	0.01281	LS w/ TS	123	123	123	OP	Non-Safety	Non-Safety
EFHV0052	0.35	0.90	230.66	460.0	B'FLY	10	0.01296	LS w/ TS	157	123	157	OP	Non-Safety	Non-Safety
EFHV0059	0.35	0.90	232.76	460.0	B'FLY	10	0.01281	LS w/ TS	60	60	60	CL	226	287
EFHV0060	0.35	0.90	230.77	460.0	B'FLY	10	0.01281	LS w/ TS	77	77	77	CL	470	547
EFHV0065	0.35	0.90	239.91	460.0	B'FLY	25	0.02046	LS w/ TS	20	20	20	OP & CL	206	266
EFHV0066	0.35	0.90	239.78	460.0	B'FLY	25	0.02046	LS w/ TS	20	20	20	OP & CL	206	266

7/28/99 Valve ID	Measured MAT @ TST CLOSE (lbs, ft-lbs)	Measured MAT @ LST CLOSE (ft-lbs)	Measured Stem Factor	Stem-to-Stem Nut Friction Coefficent (Measured) (mu)	Design Required DPTh/DPTq OPEN (lbs, ft-lbs)	Design Required DPTh/DPTq with Error OPEN (lbs, ft-lbs)	Actuator Capacity OPEN (lbs,ft-lbs)	Assumed Packing Load (lbs,ft-lbs)	Measured Packing Load (lbs)	Allowable RV Pullout Torque (ft-lbs)	Measured Pullout Torque (ft-lbs)	Measured Pullout Thrust (lbs)	Notes
BNHV0003	8578		0.0102	0.104	3301	3774	8344	1500	459	131	53	5196	
BNHV0004	7647		0.0112	0.121	3301	3774	8408	1500	292	132	74	6607	
BNHV8806A		7465	0.0091	0.100	Non-Safety	Non-Safety	Non-Safety	1500	1532	103	26	2857	
BNHV8806B		7927	0.0083	0.082	Non-Safety	Non-Safety	Non-Safety	1500	802	105	26	3133	
BNHV8812A	22779		0.0128	0.075	Non-Safety	Non-Safety	Non-Safety	2500	1168	501	102	7969	
BNHV8812B	15130		0.0154	0.106	Non-Safety	Non-Safety	Non-Safety	2500	2882	513	144	9351	
BNHV8813	7659		0.0136	0.106	Non-Safety	Non-Safety	Non-Safety	1500	700	196	18	1324	
BNLCV0112D		5995	0.0096	0.109	4529	5082	7214	1500	400	101	27	2813	
BNLCV0112E		12468	0.0073	0.061	4963	5545	7286	1500	571	102	36	4932	
ECHV0011		148	B'FLY	B'FLY	357	393	809	82	-	809	153	B'FLY	
ECHV0012	368	74	B'FLY	B'FLY	475	519	739	82	-	739	105	B'FLY	
EFHV0023	4046	1490	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	561	-	6353	1880	B'FLY	
EFHV0024	4244	0	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	442	-	6360	0	B'FLY	
EFHV0025	4074	0	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	442	-	6280	0	B'FLY	
EFHV0026	4332	0	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	442	-	6316	2059	B'FLY	
EFHV0031	975	197	B'FLY	B'FLY	306	340	1090	35	-	1090	199	B'FLY	
EFHV0032	1006	325	B'FLY	B'FLY	306	340	1089	35	-	1089	273	B'FLY	
EFHV0033	1556	404	B'FLY	B'FLY	635	691	981	35	-	981	547	B'FLY	
EFHV0034	1340	541	B'FLY	B'FLY	635	691	984	35	-	984	488	B'FLY	
EFHV0037	Non-Safety	Non-Safety	B'FLY	B'FLY	4570	4916	6282	442	-	6282	0	B'FLY	
EFHV0038	Non-Safety	Non-Safety	B'FLY	B'FLY	2890	3126	6262	442	-	6262	1953	B'FLY	
EFHV0039	4331	1929	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	561	-	6280	0	B'FLY	
EFHV0040	3738	0	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	442	-	6297	31	B'FLY	
EFHV0041	4089	1318	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	561	-	6369	2002	B'FLY	
EFHV0042	3635	0	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	442	-	6363	1946	B'FLY	
EFHV0045	922	144	B'FLY	B'FLY	272	304	981	35	-	981	116	B'FLY	
EFHV0046	1030	476	B'FLY	B'FLY	407	448	984	35	-	984	0	B'FLY	
EFHV0047	1061	309	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	17	-	1084	323	B'FLY	
EFHV0048	835	324	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	17	-	1084	0	B'FLY	
EFHV0049	1145	184	B'FLY	B'FLY	28	44	1090	35	-	1090	251	B'FLY	
EFHV0050	1268	934	B'FLY	B'FLY	40	57	1090	35	-	1090	228	B'FLY	
EFHV0051	Non-Safety	Non-Safety	B'FLY	B'FLY	1807	1972	4807	288	-	4807	1223	B'FLY	
EFHV0052	Non-Safety	Non-Safety	B'FLY	B'FLY	2099	2283	4630	288	-	4630	1360	B'FLY	
EFHV0059	3670	190	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	288	-	4715	105	B'FLY	
EFHV0060	2298	0	B'FLY	B'FLY	Non-Safety	Non-Safety	Non-Safety	288	-	4635	381	B'FLY	
EFHV0065	3212	2123	B'FLY	B'FLY	251	314	7938	561	-	7938	2734	B'FLY	
EFHV0066	2458	2382	B'FLY	B'FLY	1098	1216	7938	561	-	7938	3827	B'FLY	

7/28/99 Valve ID	Noun Name	Valve Manufacturer	Valve Type	Valve Size (in)	Stem Diameter (in)	Stem Pitch (in)	Stem Lead (in)	Average Seat Diameter (in)	Actuator Type	Actuator Size	Overall Actuator Ratio OAR	Voltage AC/DC
EFHV0097	ESW PMP A DISCH RECIRC HV	VELAN	SW GATE	3	1.125	0.2	0.4	2.6250	SMB	OOO	57	AC
EFHV0098	ESW PMP B DISCH RECIRC HV	VELAN	SW GATE	3	1.125	0.2	0.4	2.6250	SMB	OOO	57	AC
EFPDV0019	ESW S-C STR A DRN DP CTRL VLV	VELAN	SW GATE	3	1.125	0.2	0.4	2.6250	SMB	OOO	57	AC
EFPDV0020	ESW S-C STR B DRN DP CTRL VLV	VELAN	SW GATE	3	1.125	0.2	0.4	2.6250	SMB	OOO	57	AC
EGHV0011	ESW TO CCW TRN A UPSTRM HV	YARWAY	GLOBE	1.5	0.937	0.167	0.167	1.3750	SMB	OOO	57	AC
EGHV0012	ESW TO CCW TRN B UPSTRM HV	YARWAY	GLOBE	1.5	0.937	0.167	0.167	1.3750	SMB	OOO	57	AC
EGHV0013	ESW TO CCW TRN A DNSTRM HV	YARWAY	GLOBE	1.5	0.937	0.167	0.167	1.3750	SMB	OOO	57	AC
EGHV0014	ESW TO CCW TRN B DNSTRM HV	YARWAY	GLOBE	1.5	0.937	0.167	0.167	1.3750	SMB	OOO	57	AC
EGHV0015	CCW TRN A SPLY/RTN ISO HV	FISHER	B'FLY	18	1.5	B'FLY	B'FLY	B'FLY	SMB	OOO	100	AC
EGHV0016	CCW TRN B SPLY/RTN ISO HV	FISHER	B'FLY	18	1.5	B'FLY	B'FLY	B'FLY	SMB	OOO	90.5	AC
EGHV0053	CCW TRN A SPLY ISO HV	FISHER	B'FLY	18	1.5	B'FLY	B'FLY	B'FLY	SMB	OOO	90.5	AC
EGHV0054	CCW TRN B SPLY ISO HV	FISHER	B'FLY	18	1.5	B'FLY	B'FLY	B'FLY	SMB	OOO	90.5	AC
EGHV0058	CCW TO CTMT OUTER ISO HV	ANCHOR-DARLING	PDG	12	1.625	0.5	0.5	11.9375	SMB	OO	30	AC
EGHV0059	CCW FROM CTMT OUTER ISO HV	ANCHOR-DARLING	PDG	12	1.625	0.5	0.5	11.9375	SMB	OO	30	AC
EGHV0060	CCW FROM RCS IN CTMT ISO HV	ANCHOR-DARLING	PDG	12	1.625	0.5	0.5	11.9375	SMB	OO	28.2	AC
EGHV0061	CCW FROM RCP THERM BAR OUTER CTMT ISO	VELAN	PSG	4	1.125	0.2	0.2	2.7500	SMB	OOO	36.5	AC
EGHV0062	CCW FROM RCS IN CTMT ISO HV	VELAN	PSG	4	1.125	0.2	0.2	2.7500	SMB	O	39.11	AC
EGHV0071	CCW TO CTMT OUTER ISO HV	ANCHOR-DARLING	FW GATE	12	1.375	0.25	0.5	10.6875	SMB	OO	31.9	AC
EGHV0072	CCW TO PASS UPSTRM ISO HV	YARWAY	GLOBE	2	0.937	0.167	0.167	1.5625	SMB	OOO	57	AC
EGHV0073	CCW TO PASS DNSTRM ISO HV	YARWAY	GLOBE	2	0.937	0.167	0.167	1.5625	SMB	OOO	57	AC
EGHV0074	CCW FROM PASS UPSTRM ISO HV	YARWAY	GLOBE	2	0.937	0.167	0.167	1.5625	SMB	OOO	57	AC
EGHV0075	CCW FROM PASS DNSTRM ISO HV	YARWAY	GLOBE	2	0.937	0.167	0.167	1.5625	SMB	OOO	57	AC
EGHV0101	CCW TO RHR HX A ISO	FISHER	B'FLY	18	1.5	B'FLY	B'FLY	B'FLY	SMB	OOO	90.5	AC
EGHV0102	CCW TO RHR HX B ISO	FISHER	B'FLY	18	1.5	B'FLY	B'FLY	B'FLY	SMB	OOO	90.5	AC
EGHV0126	CCW TO CTMT BYP VLV	ANCHOR-DARLING	FW GATE	12	1.375	0.25	0.5	10.6875	SMB	OO	31.9	AC
EGHV0127	CCW TO CTMT BYP ISO HV	ANCHOR-DARLING	PDG	12	1.625	0.5	0.5	11.9375	SMB	OO	28.2	AC
EGHV0130	CCW FROM RCS CTMT EGHV0060 BYP ISO HV	ANCHOR-DARLING	PDG	12	1.625	0.5	0.5	11.9375	SMB	OO	28.2	AC
EGHV0131	CCW FROM CTMT EGHV0059 BYP ISO	ANCHOR-DARLING	PDG	12	1.625	0.5	0.5	11.9375	SMB	OO	28.2	AC
EGHV0132	CCW FROM RCS CTMT EGHV0062 BYP ISO HV	VELAN	PSG	4	1.125	0.167	0.167	2.7500	SMB	OO	38.6	AC
EGHV0133	CCW FROM RCP THRM BAR EGHV0061 BYP ISO	VELAN	PSG	4	1.125	0.2	0.2	2.7500	SMB	OOO	36.5	AC
EJFCV0610	A RHR PMP MINIFLOW RECIRC FLOW CTRL VLV	WESTINGHOUSE	FW GATE	3	1.125	0.25	0.5	3.2400	SMB	OOO	36.5	AC
EJFCV0611	RHR PMP B MINIMUM FLOW CTRL VLV	WESTINGHOUSE	FW GATE	3	1.125	0.25	0.5	3.2400	SMB	OOO	36.5	AC
EJHV8701A	RHR PUMP A SUCT ISO	WESTINGHOUSE	FW GATE	12	3	0.4	0.8	11.8100	SMB	2	82.5	AC
EJHV8701B	RHR PUMP B SUCT ISO	WESTINGHOUSE	FW GATE	12	3	0.4	0.8	11.8100	SMB	2	82.5	AC
EJHV8716A	RHR TRN A SI SYS HOT LEG RECIRC ISO (3.0.3)	WESTINGHOUSE	FW GATE	10	2.5	0.25	0.5	10.0250	SB	1	27.2	AC
EJHV8716B	RHR TRN B SI SYS HOT LEG RECIRC ISO (3.0.3)	WESTINGHOUSE	FW GATE	10	2.5	0.25	0.5	10.0250	SB	1	27.2	AC
EJHV8804A	RHR TRN A CHARGING PUMPS SPLY ISO	WESTINGHOUSE	FW GATE	8	1.25	0.333	0.333	7.0960	SB	OO	23	AC

7/28/99 Valve ID	Pullout Efficiency PE	Application Factor AF	Reduced Voltage RV	Rated Voltage VR	Rate of Loading Assumption	Motor Rated Starting Torque (ft-lbs)	Torque Derate Factor TF	Control Switch	Design DP CLOSE (psi)	Design DP OPEN (psi)	System Pressure (psi)	Safety Related Function	Design Required DPTh/DPTq CLOSE (lbs, ft-lbs)	Design Required DPTh/DPTq with Error CLOSE (lbs, ft-lbs)
EFHV0097	0.40	0.90	221.10	460.0	1.15	5	0.01530	TS	125	125	125	CL	1138	1504
EFHV0098	0.40	0.90	221.11	460.0	1.15	5	0.01530	TS	150	150	150	CL	1818	2241
EFPDV0019	0.40	0.90	226.05	460.0	1.15	5	0.01530	TS	134	134	134	OP & CL	1023	1379
EFPDV0020	0.40	0.90	225.76	460.0	1.15	5	0.01530	TS	150	150	150	OP & CL	1146	1513
EGHV0011	0.40	0.90	220.20	460.0	1.15	5	0.00380	TS	123	123	123	OP	Non-Safety	Non-Safety
EGHV0012	0.40	0.90	219.68	460.0	1.15	5	0.00380	TS	139	139	139	OP	Non-Safety	Non-Safety
EGHV0013	0.40	0.90	220.28	460.0	1.15	5	0.00380	TS	123	123	123	OP	Non-Safety	Non-Safety
EGHV0014	0.40	0.90	219.62	460.0	1.15	5	0.00380	TS	139	139	139	OP	Non-Safety	Non-Safety
EGHV0015	0.35	0.90	219.15	460.0	B'FLY	5	0.00800	LS w/ TS	109	109	109	OP & CL	324	359
EGHV0016	0.35	0.90	220.36	460.0	B'FLY	5	0.00750	LSw/TSby-ps	109	109	109	OP & CL	324	359
EGHV0053	0.35	0.90	219.46	460.0	B'FLY	5	0.00750	LS w/ TS	109	109	109	OP & CL	281	314
EGHV0054	0.35	0.90	220.57	460.0	B'FLY	5	0.00750	LSw/TSby-ps	108	108	108	OP & CL	304	338
EGHV0058	0.40	0.90	238.21	460.0	1.15	25	0.00786	TS	112	112	112	CL	6537	7559
EGHV0059	0.40	0.90	238.29	460.0	1.15	25	0.00786	TS	112	112	112	CL	5834	6797
EGHV0060	0.40	0.90	236.57	460.0	1.15	25	0.15155	TS	112	112	112	CL	6375	7384
EGHV0061	0.40	0.90	219.71	460.0	0.00	5	0.00570	LS w/ TS	112	112	112	CL	967	1319
EGHV0062	0.40	0.90	227.87	460.0	0.00	40	0.15229	LSw/TSby-ps	2335	112	2335	CL	12984	14884
EGHV0071	0.40	0.90	232.42	460.0	1.15	15	0.00745	TS	112	112	112	NONE	Non-Safety	Non-Safety
EGHV0072	0.40	0.90	220.99	460.0	1.15	5	0.00380	TS	105	105	105	CL	612	1033
EGHV0073	0.40	0.90	219.29	460.0	1.15	5	0.00380	TS	105	105	105	CL	1171	1609
EGHV0074	0.40	0.90	219.44	460.0	1.15	5	0.00380	TS	105	105	105	CL	463	879
EGHV0075	0.40	0.90	220.94	460.0	1.15	5	0.00380	TS	105	105	105	CL	787	1126
EGHV0101	0.35	0.90	219.18	460.0	B'FLY	5	0.00750	LSw/TSby-ps	104	104	104	OP & CL	265	297
EGHV0102	0.35	0.90	220.84	460.0	B'FLY	5	0.00750	LSw/TSby-ps	109	109	109	OP & CL	354	391
EGHV0126	0.40	0.90	232.60	460.0	1.15	15	0.00745	TS	112	112	112	NONE	Non-Safety	Non-Safety
EGHV0127	0.40	0.90	229.50	460.0	1.15	25	0.00786	TS	112	112	112	CL	9660	10945
EGHV0130	0.40	0.90	237.42	460.0	1.15	25	0.15155	TS	112	112	112	CL	5809	6770
EGHV0131	0.40	0.90	229.10	460.0	1.15	25	0.00786	TS	112	112	112	CL	7213	8292
EGHV0132	0.40	0.90	238.79	460.0	0.00	10	0.18094	LS w/ TS	112	112	112	CL	2300	2641
EGHV0133	0.40	0.90	219.81	460.0	0.00	5	0.00570	LS w/ TS	112	112	112	CL	1993	2429
EJFCV0610	0.40	0.90	216.88	460.0	0.00	10	0.00864	LS w/o TS	200	200	200	OP & CL	809	1147
EJFCV0611	0.40	0.90	221.12	460.0	0.00	10	0.00819	LS w/o TS	200	200	200	OP & CL	857	1199
EJHV8701A	0.40	0.90	239.76	460.0	0.00	60	0.12623	TS-SS	464	380	464	OP & CL	28065	32446
EJHV8701B	0.40	0.90	239.90	460.0	0.00	60	0.12623	TS-SS	464	380	464	OP & CL	28065	32446
EJHV8716A	0.45	0.90	230.84	460.0	0.00	60	0.00426	LS w/o TS	228	228	228	OP & CL	8523	10757
EJHV8716B	0.45	0.90	232.90	460.0	0.00	60	0.00426	LS w/o TS	228	228	228	OP & CL	17057	20008
EJHV8804A	0.45	0.90	233.87	460.0	0.00	15	0.00552	LS w/o TS	251	251	251	OP & CL	7966	9108

7/28/99 Valve ID	Measured MAT @ TST CLOSE (lbs, ft-lbs)	Measured MAT @ LST CLOSE (ft-lbs)	Measured Stem Factor	Stem-to-Stem Nut Friction Coefficent (Measured) (mu)	Design Required DPTh/DPTq OPEN (lbs, ft-lbs)	Design Required DPTh/DPTq with Error OPEN (lbs, ft-lbs)	Actuator Capacity OPEN (lbs,ft-lbs)	Assumed Packing Load (lbs,ft-lbs)	Measured Packing Load (lbs)	Allowable RV Pullout Torque (ft-lbs)	Measured Pullout Torque (ft-lbs)	Measured Pullout Thrust (lbs)	Notes
EFHV0097	3107		0.0010	0.098	Non-Safety	Non-Safety	Non-Safety	1500	518	70	23	23000	
EFHV0098	4028		0.0123	0.153	Non-Safety	Non-Safety	Non-Safety	1500	1500	70	43	3496	
EFPDV0019	2018		0.0125	0.157	834	1102	5034	1500	1750	73	25	2000	
EFPDV0020	3211		0.0121	0.149	934	1208	5034	1500	1622	73	39	3223	
EGHV0011	Non-Safety	Non-Safety	NA	NA	1500	1812	7224	1000	685	70	60	NA	
EGHV0012	Non-Safety	Non-Safety	NA	NA	1710	2035	7224	1000	1000	70	30	NA	
EGHV0013	Non-Safety	Non-Safety	NA	NA	1500	1812	7224	1000	1170	70	39.07	NA	
EGHV0014	Non-Safety	Non-Safety	NA	NA	1710	2035	7224	1000	1000	70	37	NA	
EGHV0015	1548	681	B'FLY	B'FLY	361	399	2234	118	-	2234	636	B'FLY	
EGHV0016	930	170	B'FLY	B'FLY	480	526	2045	118	-	2045	345	B'FLY	
EGHV0053	948	561	B'FLY	B'FLY	311	346	2029	118	-	2029	528	B'FLY	
EGHV0054	1336	322	B'FLY	B'FLY	613	667	2049	118	-	2049	343	B'FLY	
EGHV0058	13853		0.0141	0.123	Non-Safety	Non-Safety	Non-Safety	2500	1266	216	42	2979	
EGHV0059	9881		0.0129	0.103	Non-Safety	Non-Safety	Non-Safety	2500	1112	216	57	4419	
EGHV0060	11959		0.0138	0.118	Non-Safety	Non-Safety	Non-Safety	2500	208	171	0	0	
EGHV0061	4101		0.0088	0.138	Non-Safety	Non-Safety	Non-Safety	1500	1193	45	25	2841	
EGHV0062	5256		NA	NA	Non-Safety	Non-Safety	Non-Safety	1500	1500	351	1	NA	
EGHV0071	Non-Safety	Non-Safety	0.0127	0.106	Non-Safety	Non-Safety	Non-Safety	1500	814	131	75	5906	
EGHV0072	4511		NA	NA	Non-Safety	Non-Safety	Non-Safety	1000	NA	71	0	NA	
EGHV0073	3181		NA	NA	Non-Safety	Non-Safety	Non-Safety	1000	NA	70	19	NA	
EGHV0074	4244		NA	NA	Non-Safety	Non-Safety	Non-Safety	1000	NA	70	26	NA	
EGHV0075	5543		NA	NA	Non-Safety	Non-Safety	Non-Safety	1000	NA	71	26	NA	
EGHV0101	779	251	B'FLY	B'FLY	652	709	2023	118	-	2023	145	B'FLY	
EGHV0102	1105	123	B'FLY	B'FLY	702	762	2054	118	-	2054	0	B'FLY	
EGHV0126	Non-Safety	Non-Safety	0.0124	0.104	Non-Safety	Non-Safety	Non-Safety	1500	171	131	96	7742	
EGHV0127	7880		0.0127	0.100	Non-Safety	Non-Safety	Non-Safety	2500	359	188	16	1260	
EGHV0130	9028		0.0129	0.102	Non-Safety	Non-Safety	Non-Safety	2500	730	172	30	2326	
EGHV0131	10440		0.0129	0.103	Non-Safety	Non-Safety	Non-Safety	2500	1029	187	34	2636	
EGHV0132	6487		0.0091	0.147	Non-Safety	Non-Safety	Non-Safety	1500	1305	92	13	1429	
EGHV0133	2927		0.0094	0.142	Non-Safety	Non-Safety	Non-Safety	1500	2058	45	20	2128	
EJFCV0610		4084	0.0123	0.126	816	1083	5506	1500	1082	87	70	5691	MSD
EJFCV0611		2518	0.0114	0.106	507	753	5696	1500	600	90	10	877	MSD
EJHV8701A	21956		0.0292	0.151	19761	25100	43983	4000	4000	1557	1202	41164	MSD
EJHV8701B	22830		0.0295	0.153	19761	25100	43983	4000	5901	1557	926	31390	MSD
EJHV8715A		23274	0.0151	0.082	13148	14225	18073	2500	136	497	22	1457	
EJHV8716B		15247	0.0132	0.064	12801	13855	18400	2500	1326	506	232	17576	
EJHV8804A		4032	0.0086	0.089	2922	3370	7714	1500	837	108	35	4070	MSD

7/28/99 Valve ID	Noun Name	Valve Manufacturer	Valve Type	Valve Size (in)	Stem Diameter (in)	Stem Pitch (in)	Stem Lead (in)	Average Seat Diameter (in)	Actuator Type	Actuator Size	Overall Actuator Ratio OAR	Voltage AC/DC
EJHV8804B	RHR TRN B SI PUMPS SPLY ISO	WESTINGHOUSE	FW GATE	8	1.25	0.333	0.333	7.0960	SB	OO	23	AC
EJHV8809A	RHR TRN A ACC INJ SPLY ISO (3.0.3)	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.667	8.7550	SBD	3	38.34	AC
EJHV8809B	RHR TRN B ACC INJ SPLY ISO (3.0.3)	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.667	8.7550	SBD	3	38.34	AC
EJHV8811A	CTMT RECIRC SUMP A TO RHR PUMP A SUCT ISO	WESTINGHOUSE	FW GATE	14	2	0.25	0.5	12.6600	SB	1	27.2	AC
EJHV8811B	CTMT RECIRC SUMP B TO RHR PUMP B SUCT ISO	WESTINGHOUSE	FW GATE	14	2	0.25	0.5	12.6600	SB	1	27.2	AC
EJHV8840	RHR TRN A & B SI SYS HOT LEG RECIRC ISO (3.0.3)	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.666	8.7550	SBD	3	38.34	AC
EMHV8801A	BIT OUT TO COLD LEGS ISO A	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	4.0120	SBD	OO	38.6	AC
EMHV8801B	BIT OUT TO COLD LEGS ISO B	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	4.0120	SBD	OO	36.2	AC
EMHV8802A	SI PMP A DISCH TO HOT LEG INJ ISO (3.0.3)	WESTINGHOUSE	FW GATE	3	1.25	0.333	0.333	3.4400	SBD	OO	28.2	AC
EMHV8802B	SI PMP B DISCH TO HOT LEG INJ ISO (3.0.3)	WESTINGHOUSE	FW GATE	3	1.25	0.333	0.333	3.4400	SBD	OO	28.2	AC
EMHV8803A	BIT SPLY FROM CCP A ISO	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	4.0120	SBD	OO	40.6	AC
EMHV8803B	BIT SPLY FROM CCP B ISO	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	4.0120	SBD	OO	41	AC
EMHV8807A	RHR HX A TO SI PMPS SUCT DNSTRM ISO VLV A	WESTINGHOUSE	FW GATE	6	1.25	0.333	0.667	6.5050	SMB	OO	43.6	AC
EMHV8807B	RHR HX A TO SI PMPS SUCT DNSTRM ISO VLV B	WESTINGHOUSE	FW GATE	6	1.25	0.333	0.667	6.5050	SMB	OO	43.6	AC
EMHV8814A	SI PMP A RECIRC TO RWST ISO	VELAN	GLOBE	1.5	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
EMHV8814B	SI PMP B RECIRC TO RWST ISO	VELAN	GLOBE	1.5	1.125	0.333	0.667	1.8750	SMB	OO	82	AC
EMHV8821A	SI PMP A DISCH TO COLD LEG INJ ISO	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	3.5000	SB	OO	38.6	AC
EMHV8821B	SI PMP B DISCH TO COLD LEG INJ ISO	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	3.5000	SB	OO	38.6	AC
EMHV8835	SI PMPS DISCH TO COLD LEG INJ ISO (3.0.3)	WESTINGHOUSE	FW GATE	4	1.25	0.333	0.333	4.0120	SBD	OO	28.2	AC
EMHV8923A	RWST TO SI PMP A SUCT ISO HV (3.0.3)	WESTINGHOUSE	FW GATE	6	1.25	0.333	0.667	6.0650	SMB	OO	43.6	AC
EMHV8923B	RWST TO SI PMP B SUCT ISO HV	WESTINGHOUSE	FW GATE	6	1.25	0.333	0.667	6.0650	SMB	OO	43.6	AC
ENHV0001	CTMT RECIRC SMP TO CTMT SPRY PMP A HV	ANCHOR-DARLING	FW GATE	12	1.375	0.333	0.667	11.0620	SMB	OO	43.6	AC
ENHV0006	CTMT SPRY PMP A DISCH HV	ANCHOR-DARLING	FW GATE	10	1.5	0.333	1	10.2500	SMB	OO	41	AC
ENHV0007	CTMT RECIRC SMP TO CTMT SPRY PMP B HV	ANCHOR-DARLING	FW GATE	12	1.375	0.333	0.667	11.0620	SMB	OO	43.6	AC
ENHV0012	CTMT SPRY PMP B DISCH HV	ANCHOR-DARLING	FW GATE	10	1.5	0.333	1	10.2500	SMB	OO	41	AC
EPHV8808A	SI ACC TK A OUT ISO	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.666	8.7550	SBD	3	40.66	AC
EPHV8808B	SI ACC TK B OUT ISO	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.666	8.7550	SBD	3	40.66	AC
EPHV8808C	SI ACC TK C OUT ISO	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.666	8.7550	SBD	3	40.66	AC
EPHV8808D	SI ACC TK D OUT ISO	WESTINGHOUSE	FW GATE	10	2.5	0.333	0.666	8.7550	SBD	3	40.66	AC
FCHV0312	AFP TURB MECH TRIP/THROT HV	GIMPEL	GLOBE	4	1.125	0.2	0.2	1.4950	SMB	OOO	68	DC
GSHV0020	*H2 PURGE IN CTMT ISO HV*	*FISHER*	*B'FLY*	*6*	*0.75*	*B'FLY*	*B'FLY*	*B'FLY*	*SMB*	*OOO*	19.41	AC
GSHV0021	H2 PURGE OUTER CTMT ISO HV	FISHER	B'FLY	6	0.75	B'FLY	B'FLY	B'FLY	SMB	OOO	19.41	AC
KAHV0030	H2 CTRL SYS M/U AIR HV	BORG-WARNER	SW GATE	1.5	0.875	0.167	0.333	1.6050	SMB	OOO	43.75	AC
KCHV0253	F-PROT LOOP TO Rx BLD OUTER CTMT DNSTRM ISO	VELAN	PSG	4	1.125	0.2	0.2	2.7500	SMB	OOO	36.5	AC
LFFV0095	CTMT NORM SMP PMPS DIC\SCH HDR CTMT FV	ANCHOR-DARLING	FW GATE	6	1	0.25	0.25	5.7188	SMB	OO	30	AC
LFHV0105	DRW SMPS DISCH HDR DNSTRM HV	ANCHOR-DARLING	FW GATE	6	1	0.333	0.333	5.7188	SMB	OOO	40	AC
LFHV0106	DRW SMPS DISCH HDR UPSTRM HV	ANCHOR-DARLING	FW GATE	6	1	0.333	0.333	5.7188	SMB	OOO	40	AC

7/28/99 Valve ID	Pullout Efficiency PE	Application Factor AF	Reduced Voltage RV	Rated Voltage VR	Rate of Loading Assumption	Motor Rated Starting Torque (ft-lbs)	Torque Derate Factor TF	Control Switch	Design DP CLOSE (psi)	Design DP OPEN (psi)	System Pressure (psi)	Safety Related Function	Design Required DPTh/DPTq CLOSE (lbs, ft-lbs)	Design Required DPTh/DPTq with Error CLOSE (lbs, ft-lbs)
EJHV8804B	0.45	0.90	236.06	460.0	0.00	15	0.00690	LS w/o TS	251	251	251	OP & CL	6677	7711
EJHV8809A	0.45	0.90	237.47	460.0	0.00	150	0.00258	TS-SS	228	228	228	CL	37153	44323
EJHV8809B	0.45	0.90	237.03	460.0	1.20	150	0.00258	TS	228	228	228	CL	24689	30812
EJHV8811A	0.45	0.90	232.66	460.0	1.20	60	0.00985	TS	53	53	53	OP & CL	7399	9539
EJHV8811B	0.45	0.90	233.24	460.0	1.20	60	0.03752	TS	53	53	53	OP & CL	7399	9539
EJHV8840	0.45	0.90	235.44	460.0	1.20	150	0.00258	TS	228	228	228	OP & CL	20713	26502
EMHV8801A	0.45	0.90	230.11	460.0	0.00	15	0.00552	LS w/o TS	2169	2713	2713	OP	Non-Safety	Non-Safety
EMHV8801B	0.45	0.90	226.27	460.0	0.00	15	0.00552	LS w/o TS	2169	2713	2713	OP	Non-Safety	Non-Safety
EMHV8802A	0.45	0.90	232.25	460.0	1.15	15	0.00495	TS	250	250	250	OP & CL	3767	4557
EMHV8802B	0.45	0.90	232.02	460.0	1.15	15	0.00495	TS	250	250	250	OP & CL	2787	3494
EMHV8803A	0.45	0.90	236.53	460.0	0.00	15	0.00690	LS w/o TS	2180	2724	2724	OP & CL	4632	5494
EMHV8803B	0.45	0.90	228.57	460.0	0.00	15	0.00690	LS w/o TS	2180	2724	2724	OP & CL	1567	2172
EMHV8807A	0.40	0.90	231.83	460.0	1.15	25	0.00748	TS	0	0	252	OP & CL	930	1482
EMHV8807B	0.40	0.90	234.23	460.0	1.15	25	0.00748	TS	0	0	252	OP & CL	930	1482
EMHV8814A	0.40	0.90	216.61	460.0	1.15	10	0.00819	TS	1552	1552	1552	CL	6919	7973
EMHV8814B	0.40	0.90	216.47	460.0	1.15	10	0.00819	TS	1552	1552	1552	CL	6838	7886
EMHV8821A	0.45	0.90	228.84	460.0	0.00	15	0.00690	LS w/o TS	1734	1552	1734	CL	4277	5110
EMHV8821B	0.45	0.90	230.47	460.0	0.00	15	0.00690	LS w/o TS	1734	1552	1734	CL	3050	3780
EMHV8835	0.45	0.90	231.89	460.0	1.15	15	0.00495	TS	249	0	249	CL	4094	4911
EMHV8923A	0.40	0.90	232.38	460.0	1.15	25	0.00748	TS	215	50	215	CL	1900	2533
EMHV8923B	0.40	0.90	233.58	460.0	1.15	25	0.00748	TS	215	50	215	CL	2566	3255
ENHV0001	0.40	0.90	236.94	460.0	1.15	15	0.01490	TS	10	54	54	OP & CL	2584	2584
ENHV0006	0.40	0.90	241.34	460.0	1.15	25	0.00599	TS	0	244	244	OP	Non-Safety	Non-Safety
ENHV0007	0.40	0.90	235.42	460.0	1.15	15	0.07005	TS	10	54	54	OP & CL	2584	2584
ENHV0012	0.40	0.90	239.39	460.0	1.15	25	0.00599	TS	0	244	244	OP	Non-Safety	Non-Safety
EPHV8808A	0.45	0.90	233.70	460.0	1.20	150	0.06452	TS	0	0	726	CL	4300	8711
EPHV8808B	0.45	0.90	227.16	460.0	1.20	150	0.06452	TS	0	0	726	NONE	Non-Safety	Non-Safety
EPHV8808C	0.45	0.90	227.81	460.0	1.20	150	0.06452	TS	0	0	726	NONE	Non-Safety	Non-Safety
EPHV8808D	0.45	0.90	234.14	460.0	1.20	150	0.06452	TS	0	0	726	CL	4300	8711
FCHV0312	0.40	0.90	77.57	NA	1.15	5	0.00000	TS	1220	1220	1220	OP	Non-Safety	Non-Safety
GSHV0020	0.55	0.90	230.56	460.0	B'FLY	2	0.10237	LS w/ TS	48	3	48	OP & CL	8	10
GSHV0021	0.55	0.90	230.01	460.0	B'FLY	2	0.00327	LS w/ TS	48	3	48	OP & CL	8	10
KAHV0030	0.40	0.90	223.28	460.0	1.15	5	0.11890	TS	149	149	149	NONE	Non-Safety	Non-Safety
KCHV0253	0.40	0.90	221.97	460.0	0.00	5	0.00570	LS w/ TS	189	189	189	OP & CL	1507	1904
LFFV0095	0.40	0.90	238.04	460.0	1.15	10	0.18094	TS	58	10	58	CL	1766	2388
LFHV0105	0.40	0.90	224.16	460.0	1.15	5	0.02850	TS	18	18	18	CL	548	865
LFHV0106	0.40	0.90	223.97	460.0	1.15	5	0.02850	TS	18	18	18	CL	548	865

7/28/99 Valve ID	Measured MAT @ TST CLOSE (lbs, ft-lbs)	Measured MAT @ LST CLOSE (ft-lbs)	Measured Stem Factor	Stem-to-Stem Nut Friction Coefficent (Measured) (mu)	Design Required DPTh/DPTq OPEN (lbs, ft-lbs)	Design Required DPTh/DPTq with Error OPEN (lbs, ft-lbs)	Actuator Capacity OPEN (lbs,ft-lbs)	Assumed Packing Load (lbs,ft-lbs)	Measured Packing Load (lbs)	Allowable RV Pullout Torque (ft-lbs)	Measured Pullout Torque (ft-lbs)	Measured Pullout Thrust (lbs)	Notes
EJHV8804B		13612	0.0053	0.019	5778	6413	9483	1500	532	110	45	8491	MSD
EJHV8809A	60695		0.0147	0.058	Non-Safety	Non-Safety	Non-Safety	2500	1264	1857	957	65102	
EJHV8809B	61567		0.0210	0.124	Non-Safety	Non-Safety	Non-Safety	2500	221	1850	1177	56048	
EJHV8811A	22413		0.0133	0.082	7199	7885	21638	2500	1430	502	153	11504	MSD
EJHV8811B	21317		0.0189	0.149	7199	7885	21164	2500	2302	491	180	9524	MSD
EJHV8840	47011		0.0198	0.107	17327	22507	61898	2500	8798	1826	450	22727	
EMHV8801A	Non-Safety	Non-Safety	0.0075	0.065	4518	5071	12500	1500	1494	175	37	4933	MSD
EMHV8801B	Non-Safety	Non-Safety	0.0067	0.049	6144	6803	11357	1500	1385	159	34	5075	MSD
EMHV8802A	9752		0.0101	0.119	1357	1702	9286	1500	1118	130	66	6535	
EMHV8802B	6922		0.0090	0.096	2009	2397	9286	1500	1966	130	110	12222	
EMHV8803A		8630	0.0075	0.066	10586	11537	13857	1500	2976	194	53	706	MSD
EMHV8803B		7271	0.0084	0.084	3791	4296	13071	1500	1600	183	31	3690	MSD
EMHV8807A	8673		0.0149	0.122	930	1247	15714	1500	707	297	92	6174	
EMHV8807B	11378		0.0155	0.134	930	1247	16032	1500	775	303	111	7161	
EMHV8814A	11070		0.0125	0.083	Non-Safety	Non-Safety	Non-Safety	1500	324	195	12	960	
EMHV8814B	11726		0.0131	0.095	Non-Safety	Non-Safety	Non-Safety	1500	596	195	16	1221	
EMHV8821A		6758	0.0099	0.115	Non-Safety	Non-Safety	Non-Safety	1500	3165	173	14.34	1448	
EMHV8821B		8278	0.0095	0.107	Non-Safety	Non-Safety	Non-Safety	1500	1211	175	36.15	3805	
EMHV8835	6854		0.0096	0.110	Non-Safety	Non-Safety	Non-Safety	1500	1504	130	72	7500	MSD
EMHV8923A	9050		0.0137	0.098	Non-Safety	Non-Safety	Non-Safety	1500	803	298	78	5693	
EMHV8923B	11489		0.0127	0.078	Non-Safety	Non-Safety	Non-Safety	1500	399	301	73	5748	
ENHV0001	5364		0.0118	0.052	9714	9714	15678	1500	736	185	62	5254	MSD
ENHV0006	Non-Safety	Non-Safety	0.0187	0.170	8970	9815	13797	1500	266	367	94	5027	MSD
ENHV0007	4166		0.0139	0.089	8446	8446	12374	1500	1060	172	40	2878	MSD
ENHV0012	Non-Safety	Non-Safety	0.0201	0.106	8970	9815	13797	1500	255	367	89	4428	MSD
EPHV8808A	36327		NA	NA	Non-Safety	Non-Safety	Non-Safety	2500	1740	1789	NA	NA	
EPHV8808B	Non-Safety	Non-Safety	NA	NA	Non-Safety	Non-Safety	Non-Safety	2500	1986	1691	NA	NA	
EPHV8808C	Non-Safety	Non-Safety	NA	NA	Non-Safety	Non-Safety	Non-Safety	2500	2500	1700	NA	NA	
EPHV8808D	57454		NA	NA	Non-Safety	Non-Safety	Non-Safety	2500	3390	1796	NA	NA	
FCHV0312	Non-Safety	Non-Safety	NA	NA	4350	4832	10776	0	0	125	53.94	NA	
GSHV0020	141	0	B'FLY	B'FLY	0	2	277	22	-	277	0	B'FLY	
GSHV0021	206	117	B'FLY	B'FLY	0	2	306	22	-	306	0	B'FLY	
KAHV0030	Non-Safety	Non-Safety	0.0094	0.142	Non-Safety	Non-Safety	Non-Safety	1000	68	49	12	1277	
KCHV0253	2617		0.0093	0.149	1291	1589	3966	1500	2189	46	27	2903	
LFFV0095	7477		0.0069	0.094	Non-Safety	Non-Safety	Non-Safety	1000	69	71	34	4928	
LFHV0105	2777		0.0096	0.140	Non-Safety	Non-Safety	Non-Safety	1000	80	50	9	938	
LFHV0106	5743		0.0058	0.037	Non-Safety	Non-Safety	Non-Safety	1000	28	50	13	2241	

Notes:

1. Average Seat Diameter is based upon a review of drawings or field measurements.
   Mean Seat Diameter is provided where available. (see notes column)

2. Rate of Loading is based upon test data provided by MOVATS

3. System pressure is generally based upon pump pressure adjusted for change in elevation.

4. Design Required DPth/DPtq with Error (lbs/ftlbs) is based upon Callaway Procedure EDP-ZZ-01114 and MOVATS Engineering Report 5.0 applied through an Excell Spreadsheet program used to establish field test criteria.

5. Actuator Capacity is provided for the opening direction because the TS is bypassed beyond the point where DP effect and pullout is a concern. (generally 80 - 85%)