

September 3, 1992

OCAN099203

U. S. Nuclear Regulatory Commission Document Control Desk Mail Statlon P1-137 Washington, D. C. 20555

Subject: Arkansas Nuclear One Units 1 and 2
Docket Nos. 50-313 & 50-36*
License Nos. DPR-51 & NPF-6
Response to Inspection Report
50-313/92-18; 50-368/92-18
Motor Operated Valve Program

Gentlemen:

Arkansas Nuclear One (ANO) has initiated a comprehensive program to implement the requirements of Generic Letter 89-10, "Safet/-Related Motor Operated Valve (MOV) Testing and Surveillance." As stated in the subject inspection report, this program was developed and properly implemented to verify the capabilities of safrty-related MOVs. This response provides the information requested in Inspection Report 92-18 drted June 5, 1992.

During the review of MOV setting capability or "setpoint" calculations the inspector identified what appeared to be marginally sized MOVs in that they possessed less than desirable thrust windows between minimum required and maximum allowable values based on expanded factors to determine switch settings. These margins could be further reduced in light of several other considerations. To address this issue, the subject inspection report requested ANO to "identify all MOVs which can be categorized as marginal and reevaluate the capability of these using supportable assumptions which account for all known sources of inaccuracy. This evaluation should include the use of on-site test results to validate assumptions for valve factor, stem friction coefficient, and rate of loading. The submittal should include a description of any actions planned to correct or enhance the performance of the identified

The ANO MOV testing program contains 284 MOVs. These MOVs were screened using the criteria outlined in Attachment A which utilized the expanded factors to determine switch settings. The screening identified 36 MOVs in Unit 1 (Attachment B) and 33 in Unit 2 (Attachment C), for a total of 69 valves that do not have at least 15% design margin available above minimum thrust requirements. Even though nine (9) of these have successfully passed dynamic testing, the 69 MOVs have been evaluated using operability criteria as defined in Design Engineering Stalard MES-01, "Guideline for Preparing Motor Valve Setpoint Calculations". This operability criteria allow the use of some factors which are different than those used for design criteria for periods of

1)

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time to allow appropriate actions to be taken to return the MOV to design criteria status. These criteria are supported by average actual test results as the evaluation basis. The result of these evaluations is that the 69 MOVs have been found to contain sufficient capability to perform their safety function.

Additionally, where applicable, planned actions will be proposed to ANO's Change Review Board to ensure that program MOVs are able to meet the design criteria based on system safety significance. These actions are identified in Atlachments B and C with implementation anticipated to occur over the next two (2) refueling outages for each unit. The potential exists for schedule impacts such as long lead time parts availability, plant status, and changes to certain calculational factors. In addition, the planned scope may vary from those detailed as additional scoping is accomplished. It is our intent to meet all existing commitments related to our implementation of Generic Letter 89-10.

Should you have questions or comments please call me at 501-964-8601.

Very truly yours,

James J. Fisicaro Director, Licensing

JJF/RMC/mmg attachments

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ATTACHMENT

ANO MOV PROGRAM GENERIC LETTER 89-10 SCOPE MOV PROGRAM SCREENING OR DESIGN CRITERIA

MOVS SCREENZD: Unit 1 - 124 Unit 2 - 160

SCREENING CRITERIA:

- = 15% a) Rate of Loading (applied to Min. Reg. Thrust)
- b) Stem Friction Coefficient = 0.2
- c) Gate Valve Seat Factors (solid and flex wedge) = 0.5 (parallel disc) = 0.4
- d) Kalsi Thrust Increases Applied Where Appropriate
- e) Packing Loads = 1,000 lb/in stem dia.
- = 15% f) Thrust Margin for Setup
- g) Torque Margin for Setup = 10% - 90 degree turn
- h) Torque Margin for Setup = 5% gates and globes

SCREENING METHODOLOGY: As described in MES-01, Rev. 2

SCREENING CRITERIA BASIS:

- a) Rate of Loading: ANO DP test data to date indicate average value of 10.94% for 25 tests with no predit for negative data.
- ANO test data from 1R10 b) Stem Friction Coefficient: indicate average value of 0.162 for 37 static asleft tests.
- c) & d): As stated in MES-01, Rev. 2.
- e) Packing Loads: AND DP tests to date as well as consultation with another utility show that actual packing loads are well bo inded by this value.
- f), g) & h): As stated in MES-01, Rev 2.

AND UNIT 1 - MARGINAL MOV ANALYSIS RESULTS/PLANNED ACTIONS

MOV TAG NO SYST. TOR/THR VALVE VF SF NU LSB X Red. Ef Lc Fact Done THRUST TORQUE TO Meet Design Criteria.				LIMIT	SETPO	INT CR	ITERIA	OPERA	BILITY	CRIT.	i DP	AVAL MAR	GINS OVER	Modifications or Other	
VALVE VF SF MU LSE X Red. Ef lc Fact Done THRUST TORQUE TO Meet Design Criteria	VO	TAG NO	SYST.	TOR/THR				Pack	Gear	Appl	Test	CALC. M	N. REQ.	Actions Planned	
1 CV-2620 EFW TQR/THR 0.50 0.20 15X						SF MU	LSB %	Red.	Ef lo	Fact	Done	THRUST	TORQUE	To Meet Design Criteria	NOTE
2	-	****			****		****								
2. CV-2828 EFW TOR 0.50 0.20 15X		CV-2620	EFW	TOR/THR	0.50	0.20	15%	YES	YES	1.00		10.2%	9.5%	Actuator/Red MEDP1R12	12
4. CV-2670 EFW TQR 0.50 0.20 15X				TOR	0.50	0.20	15%	 +		1.00		36.6%	12.1%	Gears/Red MEDP1R12	
4. CV-2670 EFW TQR 0.50 0.20 15% 1.00 36.6% 12.1% Gears Reduce MEDP - 1R1 1. CV-2689 EFW TQR 0.50 0.20 15% YES YES 1.00 YES 51.4% 6.1% None/Meduce MEDP - 1R1 1. CV-2671 EFW TQR 0.50 0.20 15% YES YES 1.00 YES 33.3% 5.2% Motor/Reduce MEDP - 1R1 1. CV-2613 MS TQR 0.50 0.20 15% YES YES 1.00 YES 33.3% 5.2% Motor/Reduce MEDP - 1R1 2. CV-2617 MS TQR 0.50 0.20 15% YES YES 1.00 YES 38.1% 12.5% Actuator - 1R1 3. CV-2639 MS TQR 0.48 0.20 15% YES YES 1.00 44.7% 7.6% Actuator - 1R1 4. CV-2619 MS TQR/THR 0.40 0.20 15% YES 0.90 33.4% 5.1% Actuator - 1R1 4. CV-2619 MS TQR/THR 0.40 0.20 15% YES 0.90 33.4% 5.1% Actuator - 1R1 5. CV-2676 MS TQR/THR 0.40 0.20 15% YES 0.90 33.4% 5.1% Actuator - 1R1 1. CV-2624 FW NGNE 0.50 0.20 15% YES 0.90 33.4% 5.1% Actuator - 1R1 3. CV-2678 MS TQR/THR 0.40 0.20 15% YES 1.00 55.1% 6.5% Actuator - 1R1 4. CV-2625 FW TTP 0.30 0.20 15% YES 1.00 55.1% 6.5% Actuator - 1R1 3. CV-7:0) FW TUP 0.30 0.20 15% YES 1.00 55.1% 6.5% Actuator - 1R1 4. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 55.1% 6.5% Actuator - 1R1 5. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 26.2% 6.8% Gears/Revise MEDP-1R1 6. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 55.1% 6.5% Actuator - 1R1 6. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 74.6% 220.5% No Mods/Reduce MEDP 7. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 74.6% 220.5% No Mods/Reduce MEDP 8. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 74.1% 1.1% No Mods/Reduce MEDP 9. CV-2676 FW TQR 0.30 0.70 15% YES 1.00 74.1% 1.1% No Mods/Reduce MEDP 1. CV-1206 MU TQR/VLV 0.37 0.20 15% 0.90 YES 1.20 1.20 1.20 1.20 1.20 1.20 1.20 1.20				TOR/THR	0.50	0.20	15%	1		0.90		10.2%	5.4%	Actuator/Red MEDP1R12	12
6. CV-2870 EPW TOR 0.53 0.20 15X		CV-2670	EFW	TOR					1	1.00		36.6%	12.1%	Gear: Reduce MEDP1R12	
6. CV-2870 EFW TQR 0.53 0.20 15% YES YES 1.00 YES 23.3% 5.2% Motor/Reduce MEDP1RI 1. CV-2613 MS TQR 0.50 0.20 15% YES YES 1.00 66.3% 14.2% Gears		CV-2869	EFW	TOR	0.50	0.20	15%	1		0.90	YES	51.4%	6.1%	None/keduce MEDP	1
2. CV-2617 MS TQR 0.50 0.20 15X YES YES 1.00 YES 38.1X 12.5X Actuator				TOR				YES	YES	1.00	YES	23.3%	5.2%	Motor/Reduce MEDP1R12	17
2. CV-2617 MS TQR 0.50 0.20 15X YES YES 1.00 YES 38.1X 12.5X Actuator		CV-2613	MS	1 TOR	0.50	0.20	15%	1	YES	1.00		66.3%	14.2%	Gears1R11	
3. CV-2663 MS TQR 0.48 0.20 15% YES 1.00				TOR				YES		1.00	YES	38.1%	12.5%	Actuator	10
4. CV-2619 MS TOR/THR 0.40 0.20 15% YES 0.90 39.4% 5.1% Actuator									YES						
5. CV-2676 MS TQR/THR 0.40 0.20 15X YES 0.90 39.4X 5.1X Actuator															3.
2. CV-2625 FW TCA 0.30 0.20 15% YES 1.00 55.1% 6.5% Actuator/Raise MEDP-IRI 3. CV-7-0 FW TU- 0.40 0.20 15% YES 1.00 26.2% 6.8% Gears/Revise MEDP-IRI 4. CV-2674 F4 MONE 0.50 0.20 15% 0.90 176.9% 220.5% No Mods/Reduce MEDP 5. CV-2675 FW TQR 0.30 0 0 15% YES 1.00 55.1% 6.5% Actuator/Raise MEDP-IRI 6. CV-2680 FW TQR 0.40 0.20 15% YES 1.00 26.2% 12.8% Gears/Revise MEDP-IRI 1. CV-1206 MU TQR/VLV 0.37 0.40 0.20 15% YES 1.00 YES 20.5% 12.8% Valve disc/Gears				- 100 Marie 100		110000									
2. CV-2625 FW TCh 0.30 0.20 15% YES 1.00 55.1% 6.5% Actuator/Raise MEDP-1RI 3. CV-7-0) FW TU- 0.40 0.20 15% YES 1.00 26.2% 6.6% Gears/Revise MEDP-1RI 4. CV-2674 F4 MONE 0.50 0.20 15% 0.90 176.9% 220.5% No Mods/Reduce MEDP 5. CV-2675 FW TQR 0.30 0 00 15% YES 1.00 55.1% 6.5% Actuator/Raise MEDP-1RI 6. CV-2680 FW TQR 0.40 0.20 15% YES 1.00 26.2% 12.6% Gears/Revise MEDP-1RI 1. CV-1206 MU TQR/VLV 0.37 0.10 QX YES 1.00 YES 1.00 YES 20.5% 12.6% Gears/Revise MEDP-1RI 2. CV-1214 MU NONE 0.40 0.20 15% 0.90 YES 46.2% 17.7% None 4. CV-1233 MU NONE 0.40 0.20 15% 0.90 YES 46.2% 17.7% None 5. CV-1234 MU TQR/VLV 0.40 0.20 15% 0.90 YES 0.90 YES 3.7% 24.7% Valve/Gears		CV-2624	FV	NONE	0.50	0.20	15%	1	1	0.90		176.9%	220 5%	No Mods/Reduce MEDP	1 14
3. CV-7 0 FW TQ: 0.40 0.20 15%				1 1000					VFC					The state of the s	
4. CV-26/4 F4 MONE 0.50 0.20 15%				4											
5. CV-2675 FW TQR 0.30 0 °0 15% YES 1.00 55.1% 6.5% Actuator/Raise MEDP-1RI 6. CV-2680 FW TQR 0.40 0.20 15% YES 1.00 26.2% 12.8% Gears/Revise MEDP-1RI 1. CV-1206 MU TQR/VLV 0.37 0.20 15% 0.90 YES 20.5% 12.8% Valve disc/Gears								1	1 11.0						14
6. CV-2680 FW TQR 0.40 0.20 15% YES 1.00 26.2% 12.8% Gears/Revise MEDPIR1 1. CV-1206 MU TQR/VLV 0.37 0.20 0 YES 1.00 YES 20.5% 12.8% Valve disc/GearsIR1 2. CV-1214 MU NONE 0.40 0.20 15% 0.90 YES 46.2% 17.7% None 3. CV-1216 MU NONE 0.40 0.20 15% 0.90 46.2% 17.7% None 4. CV-1233 MU NONE 0.40 0.20 15% 0.90 92.0% 20.3% None 5. CV-1234 MU TQR/VLV 0.40 0.20 11% YES 0.90 YES 3.7% 24.7% Valve/Gears									VEC					diga peneral property control	
1. CV-1206 MU TQR/YLV 0.37 0.20 0X YES 1.00 YES 20.5X 12.8X Valve disc/Gears1R1 2. CV-1214 MU NONE 0.40 0.20 15X 0.90 YES 46.2X 17.7X None 3. CV-1216 MU NONE 0.40 0.20 15X 0.90 46.2X 17.7X None 44. CV-1233 MU NONE 0.40 0.20 15X 0.90 92.0X 20.3X None 5. CV-1234 MU TQR/VLV 0.40 0.20 11X YES 0.90 YES 3.7X 24.7X Valve/Gears		200		de Carrier	1 - S A VICE				7	1					
2. CV-1214 MU NONE 0.40 0.20 15% 0.90 YES 46.2% 17.7% None 3. CV-1216 MU NONE 0.40 0.20 15% 0.90 46.2% 17.7% None 4. CV-1233 MU NONE 0.40 0.20 15% 0.90 92.0% 20.3% None 5. CV-1234 MU TQR/VLV 0.40 0.20 11% YES 0.90 YES 3.7% 24.7% Valve/Gears		CA-5000	1.8	1 TUK	1 0.40	0.20	10%		1 11.5	1.001	-1 1	ED. EA	16.0%	dears/kevise MLDF1KII	1.13
3. CV-1216 MU NONE 0.40 0.20 15% 0.90 46.2% 17.7% None 4. CV-1233 MU NONE 0.40 0.20 15% 0.90 92.0% 20.3% None 5. CV-1234 MU TQR/VLV 0.40 0.20 15% 1.00 74.1% 5.1% Gears 181 2. CV-1408 85 TQR 0.50 0.20 15% 1.00 74.1% 11.0% Gears 181 3. CV-1436 85 TQR 0.45 0.20 15% 0.90 26.4% 5.1% None 4. CV-143 85 TQR 0.45 0.20 15% 0.90 26.4% 5.1% None 1. CV-2400 CS TQR 1.10 0.20 15% 1.00 32.0% 15.4% Gears 181 3. CV-2401 CS TQR 1.10 0.20 15% 1.00 32.0% 15.4% Gears 181 3. CV-2802 CS TQR 0.50 0.20 15% YES 1.00 YES 189.5% 18.6% Gears 181 4. CV-2802 CS TQR 0.50 0.20 15% YES 0.90 YES 255.7% 10.9% Gears/Sp Pack 181 1.00 NA 19.2% Motor 181 1.00 NA 19.2% Motor 181 181 181 181 181 181 181 181 181 181 181 181 181				A CONTRACTOR SCOTT				YES						Transferred to be a second to the second of	1 3-
4. CV-1233 MU NONE 0.40 0.20 15% 0.90 92.0% 20.3% None 5. CV-1234 MU TQR/VLV 0.40 0.20 11% YES 0.90 YES 3.7% 24.7% Valve/Gears				S. Contract				1			YES				. 2
5. CV-1234 MU TQR/VLV 0.40 0.20 11% YES 0.90 YES 3.7% 24.7% Velve/Gears															2
1. CV-1407 BS TQR 0.50 0.20 15% 1.00 74.1% 5.1% Gears															3
2. CV-1408 BS TQR 0.50 0.20 15% 1.00 74.1% 11.0% Gears		CV-1234	MU	TQR/VLV	0.40	0.20	11%	YES	1	0.90	YES	3.7%	24.7%	Valve/Gears1R11	4
3. CV-1436 BS TQR 0.45 0.20 15% 0.90 26.4% 5.1% None		CV-1407	BS	TOR	0.50	0.20	15%	1		1.00	1	74.1%	5.1%	Gears1R12	
4. CV-143 BS TQR 0.45 0.20 15% 0.90 26.4% 5.1% None 1. CV-2400 CS TQR 1.10 0.20 15% 1.00 32.0% 15.4% Gears		CV-1408	88	TOR	0.50	0.20	15%		1	1.00		74.15	11.0%	Gears1R12	
1. CV-2400 CS TQR 1.10 0.20 15% 1.00 32.0% 15.4% Gears		CV-1436	85	TOR	0.45	0.20	15%	1		0.90		26.4%	5.1%	None	7
2. CV-2401 CS TQR 1.10 0.20 15% 1.00 32.0% 15.4% Gears		CV-143	BS	TQR	0.45	0.20	15%	1		0.90	. 1	26.4%	5.1%	None	7
2. CV-2401 CS TQR 1.10 0.20 15% 1.00 32.0% 15.4% Gears		CV-2400	CS	I TOR	1.10	0.20	15%			1.00	1 1	32.0%	15.4%	Gears1R12	
3. CV-2800 CS TQR 0.50 0.20 15% YES 1.00 YES 189.5% 18.6% G :rs		CV-2401	CS	TOR						1.00		32.0%	15.4%	Gears	1
4. CV-2802 CS TQR 0.50 0.20 15% YES 0.90 YES 255.7% 10.9% Gears/Sp Pack				December 1				1.	YES		YES				
				3				YES							
T CH-1404 OH I TOP I DIAG DIPOLISE I I DIPOLI I I 14 TH I 7 ON INCOR		CV-3811	SW	TQR	NA.	NA.	NA.	1	1	1.00]	1 1	NA	19.2%	Motor1R12	
TO A TAMES THE TAMES TO A STATE OF THE STATE		CV-1404	DH	1 TOR	0 46	0.20	15%			0.901		14.1%	7.0%	None	5
1. CV-1404 DH TQR 0.46 0.20 15% 0.90 14.1% 7.0% None 2. CV-1416 DH TQR 1.10 0.20 15% YES 0.90 52.1% 11.8% Actuator/Valve1R1		CV-1416	[35]	TOR	1 10	0.20	15%	YES		0.90		52.1%	11.8%	Actuator/Valve1811	6
		474.0		141											
1. CV-2215 ICW TQR 0.40 0.20 15% 0.90 168.9% 7.2% Spring Pack		CV-2215	ICW	TOR	0.40	0.20	15%	1		0.90		168.9%	7.2%	Spring Pack1R12	8
1. CV-2215 ICW TQR 0.40 0.20 15% 0.90 168.9% 7.2% Spring Pack		CV-2221	1CW	TQR	0.40	0.20	15%	YES	1	0.90	1 -1	256.7%	20.7%	Spring Pack1R12	9
1. CV-6205 AC TQR 0.50 0.20 15% YES 0.90 497.8% 51.3% Spring Pack		CV-6205	AL.	TQR	0.50	0.20	15%	YES	1	0.90		497.8%	51.3%	Spring PackIR12	

LEGENO: VF = Valve Friction Factor
SF MU = Stam Thread Friction Coefficient
LSB = Load Sensitive Bahavior Pack Red. * Packing Load Reduction

Gear Ef Ic * Increase in Gear Efficiency for Motor Pullout Equation

Appl Fact - Application Factor Removal

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NOTES:

- 1. : V-1206 DP test successfully completed. Actual test results for VF, LSB, Packing used for operability.
- 2. CV-1214/1216 AD parallel disc valves. DP test successful on 1214. Test data bounded by evaluation assumptions
- 3. CV-1233 AD parallel di valve.
- 4. CV-1234 DP test success. Jlly completed. Actual data used for VF, LSB & Packing. Valve seats limiting.
- CV-1404 VF of 0.46 acceptable for Design Criteria since valve is low pressure, and water service.
 Present analysis assumes no inadvertent operation. If 10 remains in program, mod will be needed 1R12.
- 6. CV-1416 Actuator replacement required to meet Design Criteria. Valve replacement to eliminate obsolete design
- 7. CV-1436/1437 VF of 0.45 accentable for Design Criteria since MEDP is low (320) in cold water service.

 Used 100% voltage since operation is during Rec. Mode more than 3 minutes after ES initiation.
- 8. CV-2215 AD parallel disc valve.
- 9. CV-2221 AD parallel disc valve.
- 10. CV-2617 D/ Test successfully completed. Design Criteria envelopes test data.
- 11. CY-2619/2676 VF acceptable for temporary use (Non-Blowdown).
- 12. CV-2620/2627 Limited by actuator thrust rating.
- 13. CV-2630/2680 AD parallel disc valves.
- 14. CV-2624/2674 MEDP reduced since ADV downstream closes first. Will pursue program removal as MOVs are non-Q.
- 15. CV-2625/2675 AD parallel disc valve, two speed actuator. Low speed meets Design Criteria.
- 16. CV-2800 DP Test successfully completed. Test data enveloped by Design Criteria.
- 17. CY-2870 Full MEDP test sucessfully run. Test data used where above Design Criteria. Mods recommended to restore setup margin.

ATTACHMENT C

AND UNIT 2 - MAPGINAL MOV ANALYSIS RESULTS/PLANNED ACTIONS

			LIMIT	SETPO	INT	CRI	ERIA		The second	BILITY		1 7 7			Modifications or Other	
MOV	TAG NO	SYST.	TQR/THR		le.	- 3				Gear		1	SALC. MI	Control of the contro	Actions Planned	L
			VALVE	VF		MU	.58 %		Red.	Ef Ic	Fact	Done	THRUST	TORQUE	To Meet Design Criteria	TOM
1.	2CV-0795	EFW	TOR			.20	15%			YES	1.00		146.8%		Gears2R10	
2.	2CV-1026	EFW	TOR	0.40	0 0	105	15%			YES	1.00	1 1	47.9%	7.1%	Motor/Spg Pack2R10	4
3.	2CV-1036	CEW	TOP	0.4	0 0	20	15%				1.00	- 1	27.1%	13.0%	Gears/Spg Pack2R10	4
4.	2CV-1037	EFW	TQR	0.50	0 0	.20	15%		1		1.00	1. 1	37.7%	14.1%	Gears2R10	
5.	2CV-1038	EFW	70R	0.4	0 0	.20	15%		1	1	1.00		27.1%	13.0%	Gears/Spg Pack2R10	4
6.	2CV-1039	EFW	1 1QR	0.5	0 0	.20	15%		1		0.90		37.7%	7.6%	None	
	2CV-1076		TQR	0.4	0 0	.20	15%		1	YES	1.00		22.0%	7.1%	Motor/Spg Pack2R10	
1.	2CV-1418	SW	TQR	NA	1	NA	NA.		[-]	1	1.00	1	NA	6.4%	No Mods/Peduce MEDP	
2.	2CV-1419	SW	TOR	NA.		NA	NA.		1	1	0.90		NA .	6.5%	No Mods/Reduce MEDP	1
3.	2CV-1421	SW	TOR	NA.	1	NA	NA		1	1	1.00		NA	10.8%	No Mods/Reduce MEDP	
4.	2CV-1422	SW	TOR	NA.	1.	NA	NA		1	1	1.00	1	NA	10.8%	No Mods/Reduce MEDP	
5.	2CV-1425	SW	TOR	NA.		NA	N.A.		1	1	1.00		NA.	7.4%	Nu Mods/Reduce MEDP	
6.	2CV-1427	SW	TOR	NA.		NA	NA		1	YES	1.00		NA	9.3%	No Mods/Reduce MEDP	
7.	2CV-1511	1 SW	TOR	NA.		NA	NA		1	YES	1.00		NA.	22.4%		
8.	2CV-1513	SW	TOR	NA.		NA	NA		1	YES	1.00		NA		Motor/HBC/Spg Pack2R9	
9.	2CV-1519	SW	TQR	NA.	1	NA	NA		1	YES	1.00		NA.	22.4%	Motor/HBC/Spg Pack2R9	
1.	2CV-0340	MS	NONE	0.5	0 0	20	15%		1	1	0.90	YES	57.3%	9.3%	None	
2.	2CV-1000	MS	TOR	1.0.5	0 (0.20	15%			1	1.00		52.6%		Gears/Sp Pack2R9	
3.	2CV-1002	MS MS	TOR/VLV	1 0.4	0 (0.17	15%		YES	1	1.00		23.9%	Water Control	A.cuator2R9	ž.
4.	2CV-1050		1				15%			1	0.90,		52.6%		Gears/Sp Pack2R9	
5.	2CV-1052	MS MS	TOR/VL	1 0.4	10	0.17	15%		YES	1	0.90		23.9%	6.8%	Actuator2R9	1
1.	2CV-5612	el BS	TQR				15%	1	YES		0.90	1	1112.8%		None	1
2.	2CV-5613	BS BS	TOR	10.4	15 1	0.20	15%		YES		0.90		113.8%		None	1
3.	2CV-5621	B BS	NONE	0.	50	0.20	15%	1		1	0.90		58.1%	23.1%	Reduce MEDP	ŀ
1.	2CV-102	3 HFW	TOR	1 0.	50	NA	5%		YES	1	[0.90]	1	10.8%	12.3%	None	ľ
2.	2CV-102	4 MEW	TOR	0.1	50)	NA	1.6%	1	4.0	1	0.90		14.3%		None	I
3	2CV-107	3 MFW	TOR	10.	50	NA	5%	l:	YES	1	0.90		10.8%		None	ŀ
4.	204-107	4 MFW	TOR	10.	50	NA	1 10X	1	T.	1	0.90		14.3%	23.6%	None	ŀ
1	2CV-508	1 LPS	I TOR	1 0.	50	0.20	15%		YES	1	0.90		138.3%	44.1%	None	Ĭ,
1	2CV-482	ol cvc	S TOR				15%	1	1	1	[0.90]			1	No results available	1
2	2CV-482	4 CVC	S NONE	1.	10	0.20	15%		1		0.90		16.6%		None	-
3	2CV-482	7 CVC	S NONE	11.	10	0.20	15%	1	1		0.90		14.6%	30.8%	No Mods/Reduce MEDP	1
4	2CV-483	1 CVC	S NONE	11.	10	0.20	1 15%	1			0.90		14.6%	30.8%	No Mods/Reduce MEDP	1

LEGEND: VF = Valve Friction Factor
SF MU = Stem Thread Friction Coefficient
LSB = Load Sensitive Behavior Pack Red. = Packing Load Reduction

Gear Ef lc = Increase in Gerr Efficiency for Motor Pullout Equation

Appl Fact = Application Factor Removal

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MOTES

- 1. 2CV-1002/1052 Reduced VF, SF MU and Packing based on DP test results averages to date. Act.replacment 10/92.
- 2. 2CV-1023/1073 Lower LSB acceptable ball screw stem nut design. Lower packing based on av age test results.
- 3. 2CV-1024/1074 Lower LSB acceptable ball screw stem nut design.
- 4. 2CV-1026/1036/1038/1076 VF reduced from 0.50 to 0.40 pending modifications. (NON-BLOWDOWN MOVS)
- 5. 2CV-1418/1419/1421/1422/1425/1427 No mods recommended. MEDP to be revised to allow for alternate flowpaths.
- 6. 2Cl'-1511 No mods recommended since mods are a result of inadvertent operation. Mods may be ren. 2R11.
 Operability also includes taking credit for increased HBC unit capability based on test program.
- 7. 2CV-1513/1519 Operability also include taking credit for increasing HBC capability based on test program.
- 8. 2CV-4820 Correct valve component calculation on order. Initial evaluation used inappropriate calculation.
- 9. 2CV-5081 No operability concerns. 2R9 test to confirm use of lower packing for design.
- 10. 2CV-5612/5613 VF reduced from 0 50 to 0.45 pending further test information. Considered acceptable for design since valves are low pressure, cold water service with safety direction to open.