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Electric and Gas
Company

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Vice President and Chief Nuclear Officer

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

Gentlemen:

SUPPLEMENTAL RESPONSE TO IE BULLETIN 85-03
REQUEST FOR ADDITIONAL INFORMATION
SALEM AND HOPE CREEK GENERATING STATIONS
DOCKET NOS. 50-272, 50-311, AND 50-354

Please find attached the Public Service Electric and Gas Company (PSE&G) responses to your request for additional information relative to PSE&Gs implementation of I&E Bulletin 85-03, Motor Operated Valve Common Mode Failures During Plant Transients Due To Improper Switch Settings. Attachment 1 contains information pertinent to Salem Units 1 and 2. Attachment 2 and its Table provide Hope Creek specific information. It should be noted that on May 4, 1988, in a telephone conference with Mr. P. Swetland, NRC Region 1 Office of Inspection and Enforcement and Mr. R. Kiessel, NRR Generic Communication Branch, PSE&G requested and was granted a two week extension in the original due date.

If there are any questions regarding the attached information, please feel free to contact us.

Sincerely,



Attachments

8805250153 880523
PDR ADOCK 05000272
Q DCD

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C Mr. D. C. Fischer
 USNRC Licensing Project Manager

 Mr. G. W. Rivenbark
 USNRC Licensing Project Manager

 Mr. R. J. Kiessel
 U.S. Nuclear Regulatory Commission
 Generic Communication Branch
 Washington, D.C. 20555

 Mr. G. W. Meyer
 USNRC Senior Resident Inspector

 Mr. R. W. Borchardt
 USNRC Senior Resident Inspector

 Mr. W. T. Russell, Administrator
 USNRC Region I

 Mr. D. M. Scott, Chief
 Bureau of Nuclear Engineering
 Department of Environmental Protection
 380 Scotch Road
 Trenton, NJ 08628

ATTACHMENT 1
SALEM GENERATING STATION RESPONSE

Question 1

Has water hammer due to valve closure been considered in the determination of pressure differentials? If not, explain.

PSE&G Response

Pressure rise due to water hammer was not considered in the determination of differential pressure across the safety injection valves. The motor operated valve closure times (10 seconds) are orders of magnitude longer than the sonic transit times of the system piping runs. Therefore, the occurrence of transient pressure increases within the piping due to the rapid closure of system valves is not considered a credible event.

Question 2

If MOVATS is planned for application to some MOVs which are not included in its data base, commit to and describe an alternate method for determining the extra thrust necessary to overcome pressure differentials for these valves.

PSE&G Response

The MOVATS data base was not referenced for the determination of thrust values. All differential pressure determinations and thrust calculations were performed by PSE&G using the methods discussed in our 5-27-86 and 1-5-88 responses to the bulletin.

Question 3

MOVs 1SJ30, 11SJ33, 12SJ33, 1SJ67, 1SJ68, 11SJ134, 12SJ134, and 1SJ135 of the HPSI System are not listed in the response of 05-27-86. However, similar suction, miniflow and discharge valves 8806A, 8923A, 8923B, 8814A, 8814B, 8821A, 8821B, and 8835 are identified on Page 25 of the WOG Report of March 1986. Revise the response of 05-27-86 to include these MOVs, or justify their exclusion. As required by Action item a of the bulletin, assume inadvertent equipment operations.

Note: Similarly located valves are used for Unit 2 also.

PSE&G Response

The MOVs listed above were excluded from the 5-27-88 response on the basis of a clarification provided by Mr. R. J. Kiessel of the NRC to the effect that only those valves in the highest head portion of the safety injection system needed to be addressed. This interpretation was confirmed via telecon with Mr. Kiessel again on 5-4-88. These valves are not part of the high pressure portion of the safety injection system and are therefore not required to be addressed in the bulletin response. These valves

have however been captured within the Salem Station MOVATS Program and the applicable data is available for inspection at the site.

Question 4

Revise Page 2 of Attachment 1 of the response dated 05-27-86 to include values of differential pressure for both opening and closing the MOVs, as required by Action Item a of the bulletin.

PSE&G Response

As identified in our 5-27-88 response, the values of differential pressure specified in Table 1 are the maximum values of differential pressure and the direction in which they exist. This value was utilized to select switch settings in both directions of valve operation. Table 1 of our 1-5-88 response reflects the application of this maximum value of differential pressure to both the open and closed direction.

Question 5

The proposed program for action items b, c, and d of the bulletin is incomplete. Provide the following details as a minimum:

- (a) commitment to a training program for setting switches, maintaining valve operators, using signature testing equipment and interpreting signatures, and
- (b) consideration of pipe break conditions as required by the bulletin.

PSE&G Response

- 5.a) A training program has been developed which provides basic instruction on MOVATS data acquisition and signature analysis for plant electrical maintenance personnel.
- 5.b) Pipe break conditions have been considered in the determination of differential pressures. In each case, atmospheric pressure was assumed to exist on the downstream side of the valve disc. Depending on the system configuration, either the maximum static head of the fluid reservoir or the maximum discharge head of the pump was assumed to exist on the upstream side of the valve disc.

ATTACHMENT 2
HOPE CREEK GENERATING STATION RESPONSE

Question 1

If MOVATS is planned for application to some MOVs which are not included in its data base, commit to and describe an alternate method for determining the extra thrust necessary to overcome pressure differentials for these valves.

PSE&G Response

All "Q" valve operators are included in Hope Creek's MOVATS Program. All valve operator seating thrusts, valve limit switch settings, motor current values and valve timing have been set and documented in accordance with system design specifications and vendor testing. This is addressed in further detail in our 5-27-86 submittal.

Question 2

Revise Table 1 of the response dated 05-27-86 to include the following MOVs, or justify their exclusion. As required by Action Item a of the bulletin, assume inadvertent equipment operations.

- 2.a) HPCI MOV V005 is shown normally open in Zone E-3 of Drawing M-55-1 Revision 20, and as MOV 3 on Page 68 of the BWROG Report NEDC-31322 dated September 1986. How would suction from the CST be ensured if this MOV were to be (a) actuated inadvertently to the closed position upon intended initiation of the system or (b) left closed inadvertently?

PSE&G Response

If the valve is inadvertently closed, the HPCI turbine will trip. If the condition still exists that requires HPCI, the valve will auto open and the turbine will restart. If the valve is inadvertently left closed, it will receive an auto open signal on HPCI initiation. The valve operator is in the Hope Creek MOVATS Program, but was excluded from the original submittal because it is a low differential pressure application and is normally open. Refer to revised Table 1.

- 2.b) RCIC MOV V001 is shown normally open in Zone F-3 of Drawing M-49-1 Revision 14, and as MOV 3 on Page 72 of the BWROG Report. The question in Item 2(a) above applies here also.

PSE&G Response

Same response as 2.a.

- 2.c) HPCI MOV FD-V006 is shown normally open in Zone C-7 of Drawing M-55-1 Revision 20, and as MOV VI on Page 71 of the BWROG Report. How would steam exhaust from the HPCI Turbine to the suppression pool be ensured if this MOV were to be

(a) actuated inadvertently to the closed position upon intended initiation of the system or (b) left closed inadvertently?

PSE&G Response

The valve operator is key locked open. If it were inadvertently closed, the exhaust rupture discs off the turbine would rupture. If it was left closed, the turbine would not start and the control room would receive an out-of-service alarm. The valve operator is in the Hope Creek MOVATS Program, but was excluded from the original submittal because it is a low differential pressure application and is normally open. Refer to revised Table 1.

- 2.d) RCIC MOV FC-V005 is shown normally open in Zone C-6 of Drawing M-49-1 Revision 14, and as MOV VI on page 74 of the BWROG Report. The question in Item 2(c) above also applies to exhaust from the RCIC Turbine.

PSE&G Response

Same response as 2.c.

- 2.e) RCIC MOV V022 is shown normally open in Zone E-3 of Drawing M-50-1 Revision 16, and as MOV X on page 74 of the BWROG Report. How would steam supply to the RCIC Turbine be ensured if this MOV were to be operated inadvertently as described in Item 2(a) above?

PSE&G Response

The valve is a mechanical overspeed trip valve which is normally open. If the turbine overspeeds, a mechanical latching mechanism releases the valve disc, which closes by spring force. The valve operator is only used to re-latch and open the valve after the turbine trips. The valve operator is in the Hope Creek MOVATS Program, but was excluded from the original submittal for the reasons stated above. Refer to revised Table 1.

Question 3

Revise Table 1 of the response dated 05-27-86 to include the following MOVs, or justify their exclusion. Note that they have safety actions for both opening and closing.

- 3.a) HPCI MOV V009 is shown normally closed in Zone A-7 of Drawing M-55-1 Revision 20, and as MOV 4 on Page 68 of the BWROG Report. Both opening and closing are safety actions, per Page 55.

PSE&G Response

The valve operator is in the Hope Creek MOVATS Program. It was excluded from the original submittal because it is a low differential pressure application. Refer to revised Table 1.

- 3.b) RCIC MOV V003 is shown normally closed in Zone B-7 of Drawing M-49-1 Revision 14, and as MOV 4 on Page 72 of the BWROG Report. Both opening and closing are safety actions, per Page 59.

PSE&G Response

Same response as 3.a.

- 3.c) HPCI MOV BJ-V028 is shown normally closed in Zone C-5 of drawing M-56-1 Revision 13, and as MOV 9 on Page 68 of the BWROG Report. Both opening and closing are safety actions, per Page 56 and note (f) on Page 66.

PSE&G Response

Hope Creek considers this valve's safety function to be in the open direction only. The valve operator is in the Hope Creek MOVATS Program. It was excluded from the original submittal because of low differential pressure across the valve disc when the valve is automatically opened at HPCI turbine start. Refer to revised Table 1.

- 3.d) RCIC MOV BD-V022 is shown normally closed in Zone D-6 of Drawing M-50-1 Revision 16, and as MOV 9 on Page 72 of the BWROG Report. Both opening and closing are safety actions, per Page 60 and note (f) on Page 66.

PSE&G Response

Same response as 3.c.

Question 4

Revise Table 1 of the response dated 5-25-86 to include the following MOVs, or justify their exclusion. Note that each has a safety action for either opening or closing.

- 4.a) RCLC MOV FC-V011 is shown normally open in Zone B-6 of Drawing M-49-1 Revision 14, and as MOV 7 on Page 72 of the BWROG Report. Per Page 59, opening is a safety action.

PSE&G Response

This operator is key locked and normally open. The valve operator is in the Hope Creek MOVATS Program. It was excluded from the original submittal because it is a low

differential pressure valve that is normally key locked open. Refer to revised Table 1.

- 4.b) HPCI MOV FD-V051 is shown normally closed in Zone F-6 of Drawing M-55-1 Revision 20, and as MOV IV on Page 71 of the BWROG Report. Per Page 57, closing is a safety action.

PSE&G Response

This valve operator is in the Hope Creek MOVATS Program. It was excluded from the original submittal because it is normally closed. Refer to revised Table 1.

- 4.c) HPCI MOVs FD-V007 and FD-V010 are shown normally open in zones C-7 and C-8 of Drawing M-56-1 Revision 13, and as MOVs VII and VIII on Page 70 of the BWROG Report. Per Page 58, closing is a safety action.

PSE&G Response

These valves are normally open. They will isolate on high drywell pressure of 1.68 psig and low system pressure. The valve operators are in the Hope Creek MOVATS Program. They were excluded from the original submittal because they are low differential pressure valves that are normally open. Refer to revised Table 1.

- 4.d) RCIC MOVs FC-V006 and FC-V007 are shown normally open in zones C-7 and C-8 of Drawing M-49-1 Revision 14, and as MOVs VII and VIII on Page 74 of the BWROG Report. Per Page 62, closing is a safety action.

PSE&G Response

Same response as 4.c.

Question 5

Revise Table 1 of the response dated 05-27-86 to include the following MOVs, or justify their exclusion. According to pages 55 and 60 of the BWROG Report (for HPCI and RCIC respectively), these valves have no safety action; however, utilities are expected to report differential pressures for testing, per Note (o) on Page 66.

- 5.a) HPCI MOVs V010 and V004 are shown normally closed in zones E-5 and F-5 of Drawing M-55-1 Revision 20, and as MOVs 5 and 6 on Page 68 of the BWROG Report.

PSE&G Response

Hope Creek considers these valves to have a safety function. If they are open during testing of the system, and the system is required to perform its intended function, these

valves must close to prevent flow diversion from the reactor vessel. The valve operators are in the Hope Creek MOVATS Program. They were excluded from the original submittal because it was understood that test valves were not to be considered in the system review. Refer to revised Table 1.

- 5.b) RCIC MOV V012 is shown normally closed in Zone E-5 of Drawing M-49-1 Revision 14, and as MOV 5 on Page 72 of the BWROG Report.

PSE&G Response

Same response as 5.a.

Question 6

The proposed program for action items b, c and d of the bulletin is incomplete. Provide the following details as a minimum:

- 6.a) commitment to a training program for setting switches, maintaining valve operators, using signature testing equipment and interpreting signatures,

PSE&G Response

PSE&G has a formal training program to instruct technicians and engineers in setting switches, maintaining valve operators, use of MOVATS equipment and signature interpretation.

- 6.b) description of a method possibly needed to extrapolate valve stem thrust determined by testing at less than maximum differential pressure.

PSE&G Response

As stated in our 5-27-86 response, the torque switch settings were established based upon the calculated system design (maximum) differential pressures. Vendor testing of representative valves at design differential pressures was performed to verify the calculations and the switch settings selected.

- 6.c) consideration of pipe break conditions as required by the bulletin.

PSE&G Response

As stated in our 5-27-88 response, safety related valves have existing circuitry which permits the valve to be fully opened or closed at the control room operators demand. Should the valve be subjected to a condition that is above its maximum differential pressure and fails to fully stroke either open or closed, the control room operator depresses

and holds the control room panel valve operator switch and the valve operator will move the valve to its requested position.

QUESTION 2(a)- HPCI Pump Suction from CST:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BJ-V005	ID#	- 1-BJ-HV-F004	NORMAL OPEN	- 10 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 10 PSI
TYPE	- GATE	MODEL	- SMB-00	ABNORMAL OPEN	- 125 PSI
SIZE	- 16"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 125 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 40 SECONDS	TORQUE SET/OPEN	- 1.75
				TORQUE SET/CLOSE	- 1.0

QUESTION 2(b)- RCIC Pump Suction from CST:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BD-V001	ID#	- 1-BD-HV-F010	NORMAL OPEN	- 5 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 5 PSI
TYPE	- GATE	MODEL	- SMB-000	ABNORMAL OPEN	- 125 PSI
SIZE	- 6"	MOTOR RPM	- 1750	ABNORMAL CLOSE	- 125 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 18 SECONDS	TORQUE SET/OPEN	- 1.5
				TORQUE SET/CLOSE	- 1.25

QUESTION 2(c)- HPCI Turbine Exhaust:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FD-V006	ID#	- 1-FD-HV-F071	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 50 PSI
TYPE	- GATE	MODEL	- SMB-0	ABNORMAL OPEN	- 200 PSI
SIZE	- 20"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 200 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 50 SECONDS	TORQUE SET/OPEN	- 2.5
				TORQUE SET/CLOSE	- 2.25

QUESTION 2(d)- RCIC Turbine Exhaust:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FC-V005	ID#	- 1-FC-HV-F059	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 10 PSI
TYPE	- GATE	MODEL	- SMB-00	ABNORMAL OPEN	- 150 PSI
SIZE	- 10"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 150 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 33 SECONDS	TORQUE SET/OPEN	- 2.125
				TORQUE SET/CLOSE	- 2.25

QUESTION 2(e)- RCIC Mechanical Overspeed Trip Valve:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FC-V022	ID#	- 1-FC-HV-F060	NORMAL OPEN	- 0 PSI
MANUFACTURER	- SHUTTE & KOERTING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 1120 PSI
TYPE	- GLOBE	MODEL	- SMB-000	ABNORMAL OPEN	- 1340 PSI
SIZE	- 3"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 1340 PSI
RATING	- 1500 LB.	OUTPUT SPEED	- 10 SECONDS	TORQUE SET/OPEN	- 2.0
				TORQUE SET/CLOSE	- 2.0

QUESTION 3(a)- HPCI Suction from Torus:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BJ-V009	ID#	- 1-BJ-HV-F042	NORMAL OPEN	- 5 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 5 PSI
TYPE	- GATE	MODEL	- SMB-00	ABNORMAL OPEN	- 125 PSI
SIZE	- 16"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 125 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 43 SECONDS	TORQUE SET/OPEN	- 1.0
				TORQUE SET/CLOSE	- 1.0

QUESTION 3(b)- RCIC Suction from Torus:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BD-V003	ID#	- 1-BD-HV-F031	NORMAL OPEN	- 5 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 5 PSI
TYPE	- GATE	MODEL	- SMB-000	ABNORMAL OPEN	- 125 PSI
SIZE	- 6"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 125 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 16 SECONDS	TORQUE SET/OPEN	- 1.5
				TORQUE SET/CLOSE	- 1.5

QUESTION 3(c)- HPCI Lube Oil Cooler Supply:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BJ-V028	ID#	- 1-BJ-HV-F059	NORMAL OPEN	- 305 PSI
MANUFACTURER	- ROCKWELL	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 305 PSI
TYPE	- GLOBE	MODEL	- SMB-000	ABNORMAL OPEN	- 550 PSI
SIZE	- 2"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 550 PSI
RATING	- 1500 LB.	OUTPUT SPEED	- 22 SECONDS	TORQUE SET/OPEN	- 3.0
				TORQUE SET/CLOSE	- 2.5

QUESTION 3(d)- RCIC Lube Oil Cooler Supply:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BD-V022	ID#	- 1-BD-HV-F046	NORMAL OPEN	- 1275 PSI
MANUFACTURER	- ROCKWELL	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 1275 PSI
TYPE	- GLOBE	MODEL	- SMB-000	ABNORMAL OPEN	- 1620 PSI
SIZE	- 2"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 1620 PSI
RATING	- 1500 LB.	OUTPUT SPEED	- 21 SECONDS	TORQUE SET/OPEN	- 2.0
				TORQUE SET/CLOSE	- 2.0

QUESTION 4(a)- RCIC Vacuum Pump Discharge:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FC-V011	ID#	- 1-FC-HV-F060	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ROCKWELL	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 10 PSI
TYPE	- GLOBE	MODEL	- SMB-000	ABNORMAL OPEN	- 100 PSI
SIZE	- 2"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 100 PSI
RATING	- 1500 LB.	OUTPUT SPEED	- 22 SECONDS	TORQUE SET/OPEN	- 1.5
				TORQUE SET/CLOSE	- 1.5

QUESTION 4(b)- HPCI Isolation Valve Bypass:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FD-V051	ID#	- 1-FD-HV-F100	NORMAL OPEN	- 1120 PSI
MANUFACTURER	- ROCKWELL	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 0 PSI
TYPE	- GLOBE	MODEL	- SMB-000	ABNORMAL OPEN	- 1250 PSI
SIZE	- 2"	MOTOR RPM	- 1700	ABNORMAL CLOSE	- 1250 PSI
RATING	- 1500 LB.	OUTPUT SPEED	- 29 SECONDS	TORQUE SET/OPEN	- 2.0
				TORQUE SET/CLOSE	- 2.0

QUESTION 4(c)1- HPCI Vacuum Relief Isolation:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FD-V007	ID#	- 1-FD-HV-F075	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 35 PSI
TYPE	- GATE	MODEL	- SMB-000	ABNORMAL OPEN	- 200 PSI
SIZE	- 3"	MOTOR RPM	- 1700	ABNORMAL CLOSE	- 200 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 15 SECONDS	TORQUE SET/OPEN	- 2.0
				TORQUE SET/CLOSE	- 2.0

QUESTION 4(c)2- HPCI Vacuum Relief Isolation:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FD-V010	ID#	- 1-FD-HV-F079	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 35 PSI
TYPE	- GATE	MODEL	- SMB-000	ABNORMAL OPEN	- 200 PSI
SIZE	- 3"	MOTOR RPM	- 1700	ABNORMAL CLOSE	- 200 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 14 SECONDS	TORQUE SET/OPEN	- 1.75
				TORQUE SET/CLOSE	- 2.5

QUESTION 4(d)1- RCIC Vacuum Relief Isolation:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FC-V006	ID#	- 1-FC-HV-F062	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 10 PSI
TYPE	- GATE	MODEL	- SMB-000	ABNORMAL OPEN	- 200 PSI
SIZE	- 3"	MOTOR RPM	- 1700	ABNORMAL CLOSE	- 200 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 13 SECONDS	TORQUE SET/OPEN	- 1.0
				TORQUE SET/CLOSE	- 1.25

QUESTION 4(d)2- RCIC Vacuum Relief Isolation:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-FC-V007	ID#	- 1-FC-HV-F084	NORMAL OPEN	- 0 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 10 PSI
TYPE	- GATE	MODEL	- SMB-000	ABNORMAL OPEN	- 200 PSI
SIZE	- 3"	MOTOR RPM	- 1700	ABNORMAL CLOSE	- 200 PSI
RATING	- 150 LB.	OUTPUT SPEED	- 14 SECONDS	TORQUE SET/OPEN	- 3.0
				TORQUE SET/CLOSE	- 2.5

QUESTION 5(a)1- HPCI Pump Test Line to CST:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BJ-V010	ID#	- 1-BJ-HV-F008	NORMAL OPEN	- 1300 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 1300 PSI
TYPE	- GLOBE	MODEL	- SMB-3	ABNORMAL OPEN	- 1500 PSI
SIZE	- 10"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 1500 PSI
RATING	- 900 LB.	OUTPUT SPEED	- 34 SECONDS	TORQUE SET/OPEN	- 1.5
				TORQUE SET/CLOSE	- 1.5

QUESTION 5(a)2- HPCI/RCIC Pump Test Line to CST:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-AP-V004	ID#	- 1-AP-HV-F011	NORMAL OPEN	- 1300 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 1300 PSI
TYPE	- GATE	MODEL	- SMB-1	ABNORMAL OPEN	- 1500 PSI
SIZE	- 10"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 1500 PSI
RATING	- 900 LB.	OUTPUT SPEED	- 32 SECONDS	TORQUE SET/OPEN	- 3.25
				TORQUE SET/CLOSE	- 3.25

QUESTION 5(b)- RCIC Pump Test Line to CST:

<u>VALVE</u>		<u>VALVE OPERATOR</u>		<u>DIFFERENTIAL PRESSURE DATA</u>	
ID#	- 1-BD-V012	ID#	- 1-BD-HV-F022	NORMAL OPEN	- 1275 PSI
MANUFACTURER	- ANCHOR/DARLING	MANUFACTURER	- LIMITORQUE	NORMAL CLOSE	- 1275 PSI
TYPE	- GLOBE	MODEL	- SMB-0	ABNORMAL OPEN	- 1500 PSI
SIZE	- 4"	MOTOR RPM	- 1900	ABNORMAL CLOSE	- 1500 PSI
RATING	- 900 LB.	OUTPUT SPEED	- 19 SECONDS	TORQUE SET/OPEN	- 2.0
				TORQUE SET/CLOSE	- 2.5