



Pennsylvania Power & Light Company

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MAY 31 1988

Harold W. Keiser  
Senior Vice President-Nuclear  
215/770-4194

Mr. W. T. Russell  
Regional Administrator, Region 1  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION  
RESPONSE TO SUPPLEMENT 1  
BULLETIN 85-03  
PLA-3028 FILE R41-2/R41-1A

Docket Nos. 50-387  
and 50-388

Dear Mr. Russell:

In response to Supplement 1 to Bulletin 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings," PP&L's revised results for item (a) of the bulletin are attached. The additional scope for Susquehanna was determined to be six RCIC valves and one HPCI valve on each unit. Details of our programs for items (b) through (d) were described in PLA-2632 dated May 9, 1986; PLA-2736 dated October 9, 1986; PLA-2966 dated January 12, 1988; and PLA-3020 dated April 28, 1988. The same programs will be applied to the additional valves required by the supplement to the bulletin. Since recovery from inadvertent mispositioning of valves was included in our design review for the original bulletin, no revisions to those submittals are required as a result of the supplement.

The engineering review and analyses required to determine the correct actuator switch settings for the additional valves are scheduled for completion by December 31, 1988. Implementation of any required changes to switch settings and verification of settings will be completed prior to restart from the next refueling outage on each unit, scheduled for second quarter of 1989 for Unit 1 and fourth quarter of 1989 for Unit 2. A revised final report will be submitted within 60 days of completion of the program for both units.

Subsequent to submittal of PP&L's final response to the original bulletin (PLA-2966 dated January 12, 1988) several minor errors were identified in the attachments to that letter. Corrected pages are enclosed. If you have any questions, please contact Mr. Ray Harris at (215) 770-7918.

Very truly yours,

H. W. Keiser

Enclosures

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PDR ADOCK 05000387  
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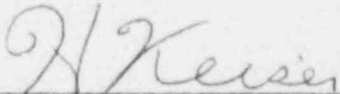
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cc: NRC Document Control Desk (original)  
NRC Region I  
Mr. F. I. Young, NRC Sr. Resident Inspector  
Mr. M. C. Thadani, NRC Project Manager


AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)  
  : SS  
COUNTY OF LEHIGH                  )

I, HAROLD W. KEISER, being duly sworn according to law, state that I am Senior Vice President, Nuclear of Pennsylvania Power & Light Company and that the facts set forth on the attached response to Supplement 1 to Bulletin 85-03 are true and correct to the best of my knowledge, information and belief.

  
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Harold W. Keiser  
Senior Vice President, Nuclear

Sworn to and subscribed  
before me this 31<sup>st</sup> day  
of May, 1988.

  
\_\_\_\_\_  
Notary Public

MARTHA C. BARTO, NOTARY PUBLIC  
ALLENTOWN, LEHIGH COUNTY  
MY COMMISSION EXPIRES JAN. 15, 1990  
Member, Pennsylvania Association of Notaries

I E Bulletin 65-02  
Supplemental Valve List

Unit 1

Valve Tag Number	System	Size (inch)	Type	Valve Manufacturer	Pressure Class	Limitorque Actuator Size	Service Description	Normal Position	Operating Basis Max P(PSID)/T(F)	
									Open	Close
HV-149F010	RCIC	6	Gate	Anchor/Darling	150	SMB-000-2	RCIC Pump Suction Isolation from CST	Open	41 / 100	41 / 100
HV-149F012	RCIC	6	Gate	Anchor/Darling	900	SMB-00-25	RCIC Pump Disch. Isolation	Open	1300 / 140	( 1 )
HV-149F022	RCIC	4	Globe	Anchor/Darling	900	SMB-0-15	Full Flow Test Return to CST	Closed	1300 / 100	1300 / 100
HV-150F045	RCIC	4	Globe	Anchor/Darling	900	SMB-0-25	Turbine Steam Inlet Isolation	Closed	1157 / 565	1157 / 565
HV-150F046	RCIC	2	Globe	Yerway	1500	SMB-000-2	Turbine Lube Oil Cooler Isolation	Closed	1305 / 140	31 / 100
HV-15012	RCIC	3	Globe	Schutte&Koerting	900	SMB-000-2	RCIC Turbine Trip & Throttle	Open	0 < 565	1157* / 565
HV-155F011	HPCI	10	Gate	Anchor/Darling	900	SMB-1-60	Return Line Isolation to CST	Closed	26 / 100	1342 / 100

(1) Closing of this valve is not a design function.

\* Closing of this valve is by spring force not motor actuator.

I E Bulletin 85-03  
Supplemental Valve List

Unit 2

Valve Tag Number	System	Size (inch)	Type	Valve Manufacturer	Pressure Class	Limit Torque		Service Description	Normal Position	Operating Basis Max P (PSID) / T (F)	
						Actuator Size				Open	Close
HV-249F010	RCIC	6	Gate	Anchor/Darling	150	SMB-000-2		RCIC Pump Suction Isolation from CST	Open	41 / 100	41 / 100
HV-249F012	RCIC	6	Gate	Anchor/Darling	900	SMB-00-25		RCIC Pump Disch. Isolation	Open	1300 / 140	( 1 )
HV-249F022	RCIC	4	Globe	Anchor/Darling	900	SMB-0-15		Full Flow Test Return to CST	Closed	1300 / 100	1300 / 100
HV-250F045	RCIC	4	Globe	Anchor/Darling	900	SMB-0-25		Turbine Steam Inlet Isolation	Closed	1157 / 565	1157 / 565
HV-250F046	RCIC	2	Globe	Yarway	1500	SMB-000-2		Turbine Lube Oil Cooler Isolation	Closed	1305 / 140	31 / 100
HV-25012	RCIC	3	Globe	Schuttco/Koerting	900	SMB-000-2		RCIC Turbine Trip & Throttle	Open	0 / < 565	1157* / 565
HV-255F011	HPCI	10	Gate	Anchor/Darling	900	SMB-1-60		Return Line Isolation to CST	Closed	26 / 100	1342 / 100

(1) Closing of this valve is not a design function.

\* Closing of this valve is by spring force not motor actuator.

switch contact is opened; should an overload condition occur in test, the overload contact opens interrupting control power and the valve stops. During normal operation (non-test mode), with the bypass switch contacts closed, an overload does not interrupt control power.

E. Switch Setting Implementation

Summarized below are the methods used for resetting the subject switches. Valve specific information (including as-found and as-left switch settings) is included on the valve summary sheets in Attachment 6.

1) Torque Switches

Required torque switch settings were calculated as described above. Spring pac data as well as design torque switch settings, and corresponding output torques were obtained from the actuator manufacturer. If the required torque switch setting was determined to be less than the design normal setting stated by the manufacturer, the torque switch was set at the previously determined normal setting to eliminate the need for new torque switch calibration charts. If the required torque switch setting was determined to be between the design normal and maximum settings, the setting was determined by linear interpolation as described above.

2) Limit Switches (Opening Direction):

*no greater than* The limit switch which interrupts power to the actuator at the valve full open position was reset, as necessary, to stop valve travel at <sup>97%</sup> full open. This was visually verified by noting additional stem travel in the opening direction after electrically opening the valve, thereby accounting for any momentum of the valve disc and its continued motion after limit switch trip.

The limit switch which acts as a torque switch bypass was reset, as necessary, to bypass the torque switch for the first 3% of stem travel. This setting was determined by physical verification of stem travel or by counting handwheel turns. If handwheel turns were counted, the count did not begin until lost motion within the actuator and play between the disc/stem interface were taken up. Again it must be noted that on a valve which must open to perform its safety function, a torque switch bypass is not employed; the torque switch is not in the circuit at all.

3) Limit Switches (Closing Direction):

On valves which employ a limit switch to initially bypass the torque switch, the limit switch was reset, if necessary, to bypass the torque switch for the first 3% of travel to account for peak thrusts due to actuator hammer-blow. This setting was determined by physical verification of stem travel or by counting handwheel turns from the valve open

1E VALLETIN 85-03 SWITCH SETTINGS IMPLEMENTATION SUMMARY  
REACTOR CORE ISOLATION CIRCUIT

UNIT	VALVE TAG NUMBER	AS FOUND SWITCH SETTINGS			AS LEFT SWITCH SETTINGS			TEST DIFFERENTIAL PRESSURE OPEN/CLOSE	TEST METHOD		
		FULL OPEN	OPEN TORQUE	CLOSE TORQUE	FULL OPEN	OPEN TORQUE	CLOSE TORQUE				
HW-1496-007	953 Open	MA	953 Closed	MA / 2.25	Operable	971 Open	MA	971 Closed	MA / 1.5 <sup>m</sup>	0 / 0	Static MOVMTs
HW-1496-002	851 Open	MA	771 Closed	MA / 2.25	Indeterminant	971 Open	MA	971 Closed	MA / 2 <sup>d</sup>	0 / 0	Static MOVMTs
HW-1496-013	971 Open	MA	971 Open	MA / 2.25	Indeterminant	971 Open	MA	971 Open	MA / 2 <sup>m</sup>	0 / 0	Similarity to HW-1496-013
FV-1496-019	851 Open	MA	953 Closed	MA / 1.25	Operable	971 Open	MA	971 Closed	MA / 1.25	190/790	Static MOVMTs
HW-1496-011	971 Open	MA	971 Open	MA / 2	Operable	971 Open	MA	971 Open	MA / 1.25	0 / 0	Static Stroke
HW-1496-029	971 Open	MA	971 Open	MA / 1.5	Operable	971 Open	MA	971 Open	MA / 1.5	0 / 0	Stroke at Design Basis Conditions
HW-1496-040	971 Open	MA	971 Open	MA / 1.5	Operable	971 Open	MA	971 Open	MA / 1.5	12 / 0	Special Test
HW-1496-042	942 Closed	942 Closed	942 Closed	1 / 1.25	Operable	971 Open	971 Closed	971 Closed	1.5 / 1.5 <sup>d</sup>	0 / 0	Static MOVMTs
HW-1496-004	961 Open	961 Closed	961 Closed	1.5 / 1.5	Operable	961 Open	961 Closed	961 Closed	1.5 / 1.5 <sup>d</sup>	0 / 0	Similarity to HW-1496-042

NOTES:

<sup>m</sup> Spring Not Replaced

<sup>d</sup> For Additional Discussion See Individual Valve Summary Sheets

96%



IE BULLETIN 85-03 SWITCH SETTINGS IMPLEMENTATION SUMMARY

REACTOR CORE ISOLATION CIRCUITS

UNIT #	AS FORWARD SWITCH SETTINGS				AS LEFT SWITCH SETTINGS				TEST DIFFERENTIAL		TEST METHOD
	FULL OPEN	OPEN TORQUE	CLOSE TORQUE	TORQUE SWITCH	FULL OPEN	OPEN TORQUE	CLOSE TORQUE	TORQUE SWITCH	PRESSURE		
NUMBER	SWITCH	SWITCH BYPASS	SWITCH BYPASS	OPER/CLOSE	SWITCH	SWITCH BYPASS	SWITCH BYPASS	OPER/CLOSE	OPER/CLOSE		
HW-2499007	972 Open	NA	972 Closed	NA / 2.75	Operable	972 Open	NA	972 Closed	NA / 1.5"	0 / 0	Similarity to HW-1499007
HW-2499008	972 Open	NA	972 Closed	NA / 2	Indeterminate	972 Open	NA	972 Closed	NA / 2"	1160 / 0	Static MOVALS
HW-2499013	972 Open	NA	972 Open	NA / 2.25	Indeterminate	972 Open	NA	972 Open	NA / 3	1350 / 0	Static MOVALS
FV-2499019	972 Open	NA	972 Closed	NA / 1.25	Operable	972 Open	NA	972 Closed	NA / 1.25	1300 / 190	Similarity to FV-1499019
HW-2499031	972 Open	NA	972 Open	NA / 4.5	Operable	972 Open	NA	972 Open	NA / 4	0 / 0	Static Stroke
HW-2499039	962 Open	NA	962 Open	NA / 1.5	Operable	962 Open	NA	962 Open	NA / 1.5	0 / 0	Stroke at Design Basis Conditions
HW-2499060	972 Open	NA	972 Open	NA / 1.5	Operable	972 Open	NA	972 Open	NA / 2	0 / 0	Similarity to HW-1499060
HW-2499062	972 Open	972 Closed	972 Closed	1.75 / 1	Operable	972 Open	972 Closed	972 Closed	1.75 / 1.5	0 / 0	Static Stroke
HW-2499084	972 Open	972 Closed	972 Closed	2 / 1.5	Operable	972 Open	972 Closed	972 Closed	1.75 / 1.5	0 / 0	Similarity to HW-1499082

NOTES:

\* Spring Pac Replaced

\*\* For Additional Discussion See Individual Valve Summary Sheets

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## VALVE SUMMARY SHEET

HV-255F075

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VALVE SIZE: 3"                      VALVE TYPE: Gate                      VALVE MANUFACT.: Anchor Darling  
ACTUATOR TYPE: SMB                      ACTUATOR SIZE: 000                      ACT. MANUFACT.: Limatorque  
MOTOR SIZE: 2 FT-LBS                      MOTOR SPEED: 1900 RPM

VALVE FUNCTIONAL DESCRIPTION: ~~RCIC Outboard Steam Isolation Valve~~  
Outboard Turbine Exhaust Vacuum  
Breaker Isolation

DESIGN BASIS:

MAXIMUM DIFFERENTIAL PRESSURE (PSID):

OPENING: 50

CLOSING: 44

DISCUSSION:

This valve is normally in its correct position which is open. Valve automatically closes on low HPCI steam supply pressure coincident with high drywell pressure. Abnormal opening is based on recovery from inadvertant closing during turbine operation at maximum discharge pressure. Abnormal closing is based on maximum suppression pool pressure and 0 PSIA in the steam line.

## VALVE SUMMARY SHEET

HV-155F007

VERIFICATION OF SWITCH SETTINGS:

## TORQUE SWITCH:

OPEN DIRECTION:	AS-FOUND: N/A	AS LEFT: N/A
CLOSE DIRECTION:	AS-FOUND: 2-1/2	AS-LEFT: 1-1/2

CORRECT SPRING PAC INSTALLED (Y/N/NOT VERIFIED): See Discussion

## LIMIT SWITCHES:

## OPEN DIRECTION:

T.S. BYPASS:	AS-FOUND: N/A	AS LEFT: N/A
FULL OPEN LIMIT:	AS-FOUND: 94% Open	AS LEFT: 94% Open

## CLOSE DIRECTION:

T.S. BYPASS:	AS-FOUND: 94% Open	AS LEFT: 94% Open
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## DISCUSSION:

1 1/2 Design spring pac is a 60-600-0011-1 with a normal torque switch setting of ~~2-1/2~~ for an output torque of 1374 ft-lbs. As-found was a 60-600-0078-1 spring pac with a torque switch setting of 2-1/2 for an output torque of 1400 ft-lbs. As-left spring pac was a 60-600-0079-1 with a torque switch setting of 1-1/2 for an output torque of 2100 ft-lbs.

## AS-FOUND OPERABILITY:

The valve was concluded to be operable in the as-found condition.