

# The Light company

Houston Lighting & Power

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June 10, 1988  
ST-HL-AE-2689  
File No.: G3.3  
10CFR50

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

South Texas Project Electric Generating Station  
Unit 1 & 2  
Docket Nos. STN 50-498/50-499  
Supplemental Response to NRC Bulletin 85-003:  
"Motor-Operated Valve Common Mode Failures During  
Plant Transients Due to Improper Switch Settings"

- References:
1. Letter of February 27, 1987, from J. H. Goldberg to the NRC Document Control Desk (ST-HL-AE-1918).
  2. Letter of April 14, 1988, from J. H. Goldberg to the NRC Document control Desk (ST-HL-AE-2613)

Per Reference 2 above, Houston Lighting & Power Company (HL&P) submits the following supplemental report detailing the information required by Action Item (f) of NRC Bulletin (IEB) 85-003.

Action Item (f) (1)

Provide a verification of completion of the requested program.

Response

The requirements and recommendations of NRC Bulletin 85-003 have been incorporated into the initial torque switch setting and operability testing programs for the valves of concern in both Unit 1 and Unit 2. Operability testing is complete for Unit 1 and will be complete for Unit 2 prior to fuel load. For the purposes of Action Item (f) of this bulletin, the requested program is complete.

Action Item (f)(2)

Provide a summary as to the findings of valve operability prior to any adjustments as a result of this bulletin.

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A subsidiary of Houston Industries Incorporated

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Response

Each of the valves listed in the attached table (Attachment A) has been or will be tested in the STP Startup Preoperational Test program. All of the Unit 1 valves and some of the Unit 2 valves have been tested. No failures in the performance of the valves have been identified to date. As is evident in the attached table, the torque switch settings did not change as a result of this bulletin; however, the control and documentation of switch settings was improved (see Reference 1).

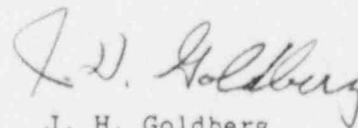
Action Item (f)(3)

Provide a summary of data in accordance with Table 2, Suggested Data Summary Format. Table 2 should be expanded, if appropriate, to include a summary of all data required to evaluate the response to this bulletin.

Response

The summary of data is provided in Attachment A.

If you should have any questions on this matter, please contact Mr. S. M. Head at (512) 972-8392.



J. H. Goldberg  
Group Vice President, Nuclear

JHG/SMH/tp

Attachment: NRC Bulletin (IEB) 85-003 Valve  
Data

cc:

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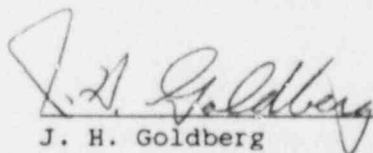
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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter )  
 )  
Houston Lighting & Power ) Docket Nos. 50-498  
Company, et al., ) 50-499  
 )  
South Texas Project )  
Units 1 and 2 )

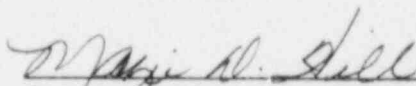
AFFIDAVIT

J. H. Goldberg being duly sworn, hereby deposes and says that he is Group Vice President, Nuclear of Houston Lighting & Power Company; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached response to NRC Bulletin 85-003; is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge and belief.



J. H. Goldberg  
Group Vice President, Nuclear

Subscribed and sworn to before me, a Notary Public in and for The State of Texas this 10<sup>th</sup> day of June, 1988.



Notary Public in and for the  
State of Texas

My commission expires:

2-2-89

MAZIE D. HILL  
Notary Public, State of Texas  
My Commission Expires 2-2-89

Valve	Function	AFW to S/G <sup>(1)</sup>	AFW to S/G	AFW Flow <sup>(1)</sup>
Valve #	Isol. Valve	AF-0019	AF-0048	AF-FV-7526
Manufacturer	Rockwell	Rockwell	Rockwell	Valtek
Type	Stop-Check	Stop-Check	Stop-Check	Globe
Model	D85-32184	D85-32184	D85-32185	Channelstream
Size, inches	4	4	4	4
Rating, PSIG	2700	1800	1800	2700
<u>Valve Operator</u>				
Manufacturer	Limitorque	Limitorque	Limitorque	Limitorque
Model	SMB-2-40	SMB-2-60	SMB-0-10	SMB-0-10
Motor RPM	1900 <sup>(2)</sup>	1800	1900 <sup>(2)</sup>	1900 <sup>(2)</sup>
Stroke time, sec	60	45	60	55
Max $\Delta$ P, as purchased				
To Open, psi	2700	1800	1800	2700
To Close, psi	2700	1800	1800	2700
Max $\Delta$ P, Safety Design Basis				
To Open, psi	1925 (6)	1570	1570	1925 (6)
To Close, psi	2010	1660	1660	2010
Data also applies valve numbers:			AF-0065	
			AF-0085	
Test $\Delta$ P <sup>(7)</sup>				
To Open, psi	1680	1680	1680	1680
To Close, psi	1680	1680	1680	1680
Switch Settings Prior to IEB 85-03				
Open/Close	Unit 1 Unit 2	Unit 1 Unit 2	Unit 1 Unit 2	Unit 1 Unit 2
	2/3.25 2/3.25	2/3.25 2/3.25	1.5/1.75 1.5/1.5	1.5/1.75 1.5/1.5
		2/3.5 4/4		
		2/3.25 4/4		
Present Switch Settings	<-----Same as above----->			
As Found Operability	<-----See the response to item (f)(2) in the text----->			
Test Method Description	<-----See the response to Action item (C) in St-HL-AE-1918----->			

IEB 85-003 VALVE DATA  
(Continued)

Attachment A  
ST-HL-AE-2689  
File No. G3.3  
Page 2 of 6

<u>Valve</u>		Aux Feedwater Turbine	HHSI Pump	HHSI to		
Function		Throttle Valve	Disch.	Cold Leg		
Valve #		XMS0514	XSI-0004A	XSI-0006A		
Manufacturer		Gimpel Machine Works	West.	West.		
Type		Trip and Throttle	Gate	Gate		
Model		NP 1566	6GM77FHA	6GM78FNB		
Size, inches		4	6	6		
Rating, PSIG		1500	1750	2500		
<u>Valve Operator</u>		Limitorque	Limitorque	Limitorque		
Manufacturer		SMB-000	SB-1	SB-1		
Model		1900	3600	3600		
Motor RPM		10	15	15		
Stroke Time, sec						
Max $\Delta P$ , as purchased						
To Open, psi		1350	1500	2750		
To Close, psi		1350	1000	1000		
Max $\Delta P$ , Safety Design Basis						
To Open, psi		1324	0 (3)	20 (3)		
To Close, psi		1324	38 (3)	20 (3)		
Data also applied to valve numbers			XSI-0004b XSI-0004c	XSI-0006b XSI-0006c		
Test $\Delta P$ (7)						
To open, psi		1190 (3)	Refer to the differential test pressure table (p. 4 of 6)			
To Close, psi		1190				
Switch Settings Prior to IEB 85-03	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
Open/Close	2/3.5	1/1	2.4/2.4	1.75/2	2/2	2/2
			1.75/1.75	2.5/2.5	1.9/1.9	2/2
			1.75/1.75	2/2	2/2	2/2
Present Switch Settings	<-----Same as above----->					
As Found Operability	<-----See the response to Item (f)(2) in the text----->					
Test Method Description	<-----See the response to Action Item (C) in ST-HL-AE-1918----->					

IEB 85-003 VALVE DATA  
(Continued)

Attachment A  
ST-HL-AE-268  
File No. G3.5  
Page 3 of 6

Valve

Function	AFW Flow	HHSI to Hot Leg	HHSI Min Flow
Valve #	Control	XSI-0008A	SI-0011A
Manufacturer	AF-FV-7523	West.	Kerotest
Type	Valtek	Gate	PMD Globe
Model	Globe	6GM78FNB	0909M0
Size, inches	Channelstream	6	2
Rating, PSIG	4	2500	2485
	1800		

Valve Operator

Manufacturer	Limitorque	Limitorque	Limitorque
Model	SMB-0-10	SB-1	SMB-00-10
Motor RPM	1700	3600	1700
Stroke Time, sec	Not Available	15	15

Max  $\Delta P$ , as purchased

To Open, psi	1680	2750	2485
To Close, psi	1680	1000	2485

Max  $\Delta P$ , Safety Design Basis

To Open, psi	1570	10 (3)	0 (4)(5)
To Close, psi	1660	20 (3)	1730 (5)

Data also apply to valve numbers

AF-FV-7524	XSI-0008B	SI-0011B
AF-FV-7525	XSI-0008C	SI-0011C
		SI-0012A
		SI-0012B
		SI-0012C

Test  $\Delta P$ <sup>(7)</sup>

To open, psi	1680	Refer to the differential test pressure table (page 4 of 6)
To Close, psi	1680	

Switch Settings Prior to IEB 85-03

Open/Close	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
	2.5/2.75	2.5/2.5	2/2	2.25/2.25	1/2	1/2
	2.5/2.75	2.5/2.75	2/2	2.25/2.25	1/2	1/1
	2.5/2.75	2.5/2.5	2.25/2.25	1.80/1.80	1/2	1/3
					1/2	1/2
					1/2	1/1
					1/2	1/1

Present Switch Settings  
As Found Operability  
Test Method Description

<-----Same as above----->  
<-----See the response to Item (f)(2) in the text----->  
<-----See the response to Action Item (C) in ST-HL-AE-1918----->

IEB 85-003 VALVE DATA  
(Continued)

Differential Test Pressure Table

<u>VALVE #</u>	<u>Approximate Differential Pressure during valve testing (psi)</u> <u>(open and closing directions)</u>	
XSI-0004A	1480	
XSI-0004B	1520	
XSI-0004C	1520	
XSI-0006A	1480	
XSI-0006B	1520	
XSI-0006C	1520	
XSI-0008A	1480	
XSI-0008B	1520	
XSI-0008C	1520	
SI-0011A	25	See note 5
SI-0011B	70	" "
SI-0011C	25	" "
SI-0012A	0	" "
SI-0012B	0	" "
SI-0012C	0	" "



NOTES

1. Turbine Drive Pump Train
2. DC Motor
3. It is not practical to establish the safety design basis differential pressure for stroke testing. It is acceptable to test with no  $\Delta P$  established because the safety design basis differential pressures are negligible in comparison to the as-purchased capability of the operator.

Valves XSI-0004 A, B, and C are normally open and remain open for the duration of a design basis accident. Post-accident operation of these valves would only be needed in conjunction with a long term passive failure in the recirculation piping outside of containment. The associated HHSI pumps would not be operating if these valves were closed. There is no safety function which requires opening of the valve.

Valves XSI-0006 A, B, and C are normally open and remain open for several hours after initiation of a loss of coolant accident. After approximately thirteen (13) hours, valves XSI-0008 A, B, and C (respectively in parallel with XSI-0006 A, B and C) are opened and XSI-0006 A, B, and C are closed. The calculated safety design basis differential pressure for opening and closing XSI-0008 A, B, and C is less than 10 psi. The calculated safety design basis differential pressure for opening and closing XSI-0006 A, B, and C is less than 20 psi. These values are much less than the rated values of the valves.

4. There is no safety design basis requirement for valve movement in this direction.
5. The only practical method of closing this valve under the safety design basis differential pressure would be to close the valve while the HHSI pump is running. There are no suitable alternative flow paths available. Running the 1000 HP HHSI pump with no flow would run an unacceptable risk of damaging or degrading the pump.
6. The test is performed at the actual AFW pump discharge pressure on minimum flow recirculation through the Automatic Recirculation Control (ARC) valve with the steam generator pressure near 0 PSIG.

Testing at less than the maximum safety design basis differential pressure is acceptable for the following reasons:

- a. The safety design basis  $\Delta P$  is based on a secondary line break.

- b. There are two alternative ways to stop the flow to a faulted steam generator:
  - 1. Stop the pump.
  - 2. Close the other valve (AF-0019 and AF-FV-7526 are in series).
- c. The safety design basis differential pressure is less than the as-purchased capability of the operator.
- 7. These values were developed from Unit 1 Startup preoperational test data and can be considered as representative of the test pressures expected for Unit 2 valves.
- 8. The test pressure is lower than the maximum safety design basis differential because the maximum differential is based on the lowest main steam relief valve setting plus three percent accumulation.

The only method of providing the maximum design basis differential pressure to test valve XMS-0514 would be to pressurize the main steam line beyond the setting of the steam relief valve. The monthly operability testing of the auxiliary feedwater pumps provides a satisfactory alternative test of the operability of valve XMS-0514 when subjected to a differential pressure of at least 1000 psi.