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 AUTH. NAME AUTHOR AFFILIATION
 EURY, L. W. Carolina Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 Region 3, Ofc of the Director

SUBJECT: Responds to IE Bulletin 85-003, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings." Rept provides info required by Action F of bulletin within time frame as discussed w/CW Hehl on 880115.

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Carolina Power & Light Company

P. O. Box 1551 • Raleigh, N. C. 27602

JAN 22 1988

SERIAL: NLS-88-011

LYNN W. EURY
Senior Vice President
Operations Support

Dr. J. Nelson Grace, Regional Administrator
United States Nuclear Regulatory Commission
101 Marietta Street, NW
Atlanta, GA 30303

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
IE BULLETIN NO. 85-03 "MOTOR-OPERATED VALVE
COMMON MODE FAILURES DURING PLANT TRANSIENTS
DUE TO IMPROPER SWITCH SETTINGS"

Reference: (1) CP&L letter from Mr. S. R. Zimmerman to Dr. J. Nelson Grace
(NRC-Region II) dated May 7, 1986, Serial No. NLS-86-132
(2) CP&L letter from Mr. A. B. Cutter to Dr. J. Nelson Grace
(NRC-Region II) dated July 30, 1986, Serial No. NLS-86-269

Dear Dr. Grace:

Carolina Power & Light Company (CP&L) hereby submits information requested by IE Bulletin No. 85-03, "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings," dated November 15, 1985. The subject bulletin required that a design basis review be performed and a program be developed and implemented to ensure that switch settings for certain safety-related, motor-operated valves (MOV) are properly selected, tested under simulated conditions, and correctly maintained. Results of the design basis review were submitted by Reference 2.

Attachments 1 and 2 of this submittal comprise a report detailing CP&L's completion of the IEB 85-03 program. The report provides a verification of completion of the requested program, a summary of the findings as to valve operability prior to any adjustment resulting from the subject bulletin, and a summary of data in accordance with the format suggested in Table 2 of the bulletin. This report provides the information required by Action f of the bulletin and is submitted within the time frame as discussed with Mr. C. W. Hehl (NRC-Region II) on January 15, 1988.

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PDR ADOCK 05000261
Q PDR

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Should you have any questions regarding this transmittal, please contact
Mr. Arnold Schmich of my staff at (919) 836-8759.

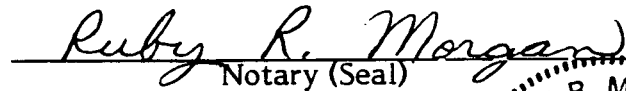
Yours very truly,


L. W. Eury

LWE/AWS/mss (5365AWS)

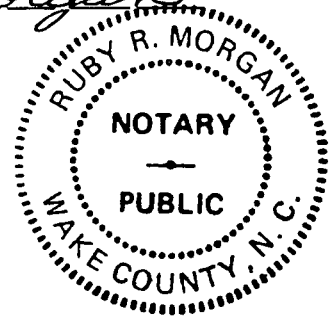
Attachments

L. W. Eury, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.


Notary (Seal)

My commission expires: 11/27/89

cc: NRC Document Control Desk
Mr. R. Lo
NRC Resident Inspector-RNP



Attachment 1

Response to NRC IE Bulletin 85-03

The following sections provide specific detail on each of the IEB 85-03 action items. References 1 and 2 refer to the references listed in the cover letter.

A. Design Basis Information

The Westinghouse Owners' Group, of which CP&L is a member, developed a program to address Action (a) of the bulletin on a generic basis. The "Westinghouse Owners' Group Safety-Related MOV Program Final Report," dated April 7, 1986, provided this generic methodology. As stated in Reference 1, this information was used to develop a plant-specific motor-operated valve (MOV) review program for HBR-2.

The results of the design basis review for the operation of MOVs in the high pressure components of the HBR-2 Safety Injection (SI), Auxiliary Feedwater (AFW), and Main Steam (MS) Systems were submitted via Reference 2. In addition, Reference 2 delineated those MOVs subject to bulletin actions and a description of the program and implementation schedule for completing bulletin Actions (b) through (d).

The maximum operating differential pressures for the MOVs were obtained from evaluating the system configuration, system operating mode, and design basis events for each valve. The function of each MOV with reference to an applicable design drawing in the HBR-2 Final Safety Analysis Report was also identified in Reference 2. Maximum operating differential pressures were compared against MOV design specification differential pressures to verify design adequacy. The MOVs were tested from at least 20% to greater than 90% of the maximum operating differential pressures.

B. Switch Settings

The program for setting torque switches was verified by calculating the settings based on the torque wrench settings and comparing these values to the actual settings observed on the torque switches.

During data analysis it was determined that the spring pack cartridges installed in the tested MOVs had been held tightly in the actuators by transducers during testing, thereby allowing no movement. The spring cartridge cap on certain of the MOVs is nonadjustable, creating the potential for altering the torque switch setting if a gap or compression force exists between the cap and the cartridge. This could have affected torque open switch settings for the tested MOVs. The tested MOVs with a nonadjustable cap are not affected since they do not use the torque open switches in their control circuitry. An evaluation of this anomaly is in progress. Results to date indicate that the testing results are valid. Carolina Power & Light Company will notify you should the evaluation results prove to be unsatisfactory.

With regard to switch settings for valve closures, the three MS MOVs and three of the AFW MOVs required justification for continued operation. Under the worst case differential pressures conservatively assumed for the bulletin, complete isolation of the MOVs may not be ensured; however, the MOVs are capable of performing their design basis event functions in normal operating modes and during postulated accidents since the MOVs will open satisfactorily. Upgrades for the six MOVs are currently scheduled for Refueling Outage No. 13 which is presently scheduled to commence December 1989. In addition, the Plant Operating Manual Emergency Operating Procedures network has been revised to include operator local verification whenever complete valve closure is required.

A thermal overload protection study of the subject MOVs has been completed with the following results:

- The feeder cables are protected in the overload range
- Overload protection is not completely adequate for motor rotor protection but will allow for MOV operation under required differential pressures

Following the MOV testing program, switch settings were adjusted as appropriate to comply with the bulletin requirements. Table 1 provides information on individual MOV testing and switch settings.

C. Valve Testing

The MOVs were tested on multiple occasions to trend parameter values, verify repeatability of data collection methods and equipment, and to ensure valid, accurate data was available for analysis. The high differential pressure tests were performed as close to the maximum operating differential pressures as practicable. The testing plans and schedule were discussed in References 1 and 2.

The tested MOVs opened against the required differential pressures and results of the data analysis concluded that the tested MOVs have sufficient available torque for opening.

Table 1 provides further information on the operability of the tested MOVs.

D. Control of Switch Settings

Position limit switch and torque bypass limit switch settings for the tested MOVs have been standardized. The "as-found" settings are satisfactory but will be reset to the standardized values prior to the end of Refueling Outage No. 12 which is presently scheduled to commence August 1988.

Corrective Maintenance procedure CM-111 is used to check and adjust the position of limit switch and torque switch settings for the Limitorque actuators. CM-111 has been revised to list the switch settings for the MOVs subject to this bulletin. Formal evaluation and approval is necessary prior to implementing changes to these switch settings. Training of craft personnel regarding the CM-111 revisions is in progress.

MOV performance is monitored under existing procedures at HBR-2 as part of the normal operations surveillance program.

E.& F. Schedule and Report

Reference 2 provided a written report of the results of Action (a) and contained the program to accomplish Actions (b) through (d), including a schedule for completion as soon as practical and within two years of the bulletin.

This submittal provides a written report regarding the implementation and completion of the IE Bulletin 85-03 program at HBR-2. This report includes the verification of completion of the program, a summary of the findings as to MOV operability prior to any adjustments as a result of the bulletin, and a summary of data in accordance with the bulletin Table 2, "Suggested Data Summary Format."

ATTACHMENT 2

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT
UNIT NO. 2
IEB 85-03 RESPONSE

Table 1

<u>Valve</u>	<u>Valve Operator</u>	<u>Valve Function</u>	<u>Design Basis Delta P</u> <u>Open/Close†</u>	<u>Tested Delta P</u> <u>Open/Close</u>	<u>Prior Switch Settings</u> <u>Open/Close</u> ** ***	<u>Final Switch Settings</u> <u>Open/Close</u> ** ***	<u>As-Found Operability</u>	<u>Test Method Description/Justification</u>
ID SI-870A	MFR Limitorque	BIT Outlet Isolation	1516/0	1424/1424	1.00/125	2.75/125	Note 1	A Safety Injection Pump was aligned during refueling to take a suction on the Refueling Water Storage Tank, run on miniflow, and then discharge to the Reactor Vessel with the head removed through each of the SI-870 MOVs individually.
MFR Anchor/ Darling	Model SMB-00-15							
Type Gate*	Motor rpm 1700							
Size 3"	Output rpm 34.7							
Rating 1500								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

** Open torque switch dial setting

*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT
UNIT NO. 2
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<u>Valve</u>	<u>Valve Operator</u>	<u>Valve Function</u>	<u>Design Basis Delta P Open/Close†</u>	<u>Tested Delta P Open/Close</u>	<u>Prior Switch Settings Open/Close ** ***</u>	<u>Final Switch Settings Open/Close ** ***</u>	<u>As-Found Operability</u>	<u>Test Method Description/Justification</u>
ID SI-870B	MFR Limitorque	BIT Outlet Isolation	1516/0	1459/1459	1.5/115	2.75/115	Note 1	A Safety Injection Pump was aligned during refueling to take a suction on the Refueling Water Storage Tank, run on miniflow, and then discharge to the Reactor Vessel with the head removed through each of the SI-870 MOVs individually.
MFR Anchor/ Darling	Model SMB-00-15							
Type Gate*	Motor rpm 1700							
Size 3"	Output rpm 34.7							
Rating 1500								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

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CAROLINA POWER & LIGHT COMPANY
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ID AFW-V2- 16A	MFR Limitorque	Motor-Driven AFW Pump Discharge Isolation	1460/1378	1414/1414	Note 2/115	Note 2/185	Note 3	A motor-driven AFW Pump was aligned during cold shutdown to take a suction on the Condensate Storage Tank, run on miniflow, and then discharge to a vented cold steam generator through each of the V2-16 MOVs individually.
MFR Anchor/ Darling	Model SMB-00-15							
Type Gate*	Motor rpm 1700							
Size 4"	Output rpm 36							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

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CAROLINA POWER & LIGHT COMPANY
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ID AFW-V2- 16B	MFR Limitorque	Motor-Driven AFW Pump Discharge Isolation	1460/1378	1400/1400	Note 2/125	Note 2/187	Note 3	A motor-driven AFW Pump was aligned during cold shutdown to take a suction on the Condensate Storage Tank, run on miniflow, and then discharge to a vented cold steam generator through each of the V2-16 MOVs individually.
MFR Anchor/ Darling	Model SMB-00-15							
Type Gate*	Motor rpm 1700							
Size 4"	Output rpm 36							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

** Open torque switch dial setting

*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

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ID	MFR	Motor-Driven AFW Pump	1460/1378	1396/1396	Note 2/150	Note 2/185	Note 3	A motor-driven AFW Pump was aligned during cold shutdown to take a suction on the Condensate Storage Tank, run on miniflow, and then discharge to a vented cold steam generator through each of the V2-16 MOVs individually.
AFW-V2-16C	Limiter	torque Discharge Isolation						
MFR	Model							
Anchor/ Darling	SMB-00-15							
Type	Motor rpm							
Gate*	1700							
Size	Output rpm							
4"	36							
Rating								
900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

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ID AFW-V2-14A	MFR Limitorque	AFW Pump Discharge Isolation	1522/1420	265/265	Note 2/125	Note 2/125	Note 4	The steam-driven AFW Pump was aligned during power operations to take a suction on the Condensate Storage Tank, run on miniflow, and then discharged to a pressurized main feed header through each of the V2-14 MOVs individually.
MFR Anchor/ Darling	Model SMB-00-10							
Type Gate*	Motor rpm 1700							
Size 4"	Output rpm 36							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

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*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

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ID	MFR	Steam-Driven AFW Pump	1522/1420	310/310	Note 2/105	Note 2/105	Note 4	The steam-driven AFW Pump was aligned during power operations to take a suction on the Condensate Storage Tank, run on miniflow, and then discharged to a pressurized main feed header through each of the V2-14 MOVs individually.
AFW-V2-14B	Limiter torque	Discharge Isolation						
MFR	Model							
Anchor/Darling	SMB-00-10							
Type Gate*	Motor rpm 1700							
Size 4"	Output rpm 36							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

** Open torque switch dial setting

*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

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ID AFW-V2-14C	MFR Limitorque	Steam-Driven AFW Pump Discharge Isolation	1522/1420	310/310	Note 2/98	Note 2/98	Note 4	The steam-driven AFW Pump was aligned during power operations to take a suction on the Condensate Storage Tank, run on miniflow, and then discharged to a pressurized main feed header through each of the V2-14 MOVs individually.
MFR Anchor/ Darling	Model SMB-00-10							
Type Gate*	Motor rpm 1700							
Size 4"	Output rpm 36							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

** Open torque switch dial setting

*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

CAROLINA POWER & LIGHT COMPANY
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ID MS-V1-8A	MFR Limitorque	Steam- Driven AFW Pump	1175/1175	830/830	Note 2/22	Note 2/20	Note 4	The V1-8 MOVs were individually cycled open and closed to start and stop the steam driven AFW pump while at power operations.
MFR Anchor/ Darling	Model SMB-000-2	Discharge Isolation						
Type Gate*	Motor rpm 1700							
Size 2"	Output rpm 42.5							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

** Open torque switch dial setting

*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

CAROLINA POWER & LIGHT COMPANY
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ID MS-V1-8B	MFR Limitorque	Steam- Driven AFW Pump	1175/1175	830/830	Note 2/26	Note 2/26	Note 4	The V1-8 MOVs were individually cycled open and closed to start and stop the steam driven AFW pump while at power operations.
MFR Anchor/ Darling	Model SMB-000-2	Discharge Isolation						
Type Gate*	Motor rpm 1700							
Size 2"	Output rpm 42.5							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

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ID MS-V1-8C	MFR Limitorque	Steam- Driven AFW Pump	1175/1175	850/850	Note 2/25	Note 2/25	Note 4	The V1-8 MOVs were individually cycled open and closed to start and stop the steam driven AFW pump while at power operations.
MFR Anchor/ Darling	Model SMB-000-2	Discharge Isolation						
Type Gate*	Motor rpm 1700							
Size 2"	Output rpm 42.5							
Rating 900								

† Maximum operating differential pressures (Reference 2)

* Double disc parallel seat gate valve

** Open torque switch dial setting

*** Close torque switch setting in inch-pounds; torque wrench setting on worm shaft

- Note 1: MOV capable of operating against maximum operating differential pressure conditions in both the open and close direction.
- Note 2: Torque open switch not used in MOV.
- Note 3: MOV capable of operating in both the open and close directions during normal operations, but may have been unable to close against maximum operating differential pressure conditions. Close torque switch adjusted to allow MOV to be capable of opening and closing against maximum operating differential pressure.
- Note 4: MOV capable of operating in both the open and close directions during normal operations, but may be unable to close against maximum operating differential pressure conditions. Inadequate sizing of motor on MOV prevented close torque switch adjustment; torque switch settings left as listed in Maintenance documentation and an Engineering Evaluation was issued as justification for continued operation. Motor upgrade is currently scheduled for Refueling Outage No. 13, to commence December 1989.