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NUCLEAR ENGINEERING & SERVICES DEPARTMENT

August 5, 1991

Docket Nos. 50-277
50-278

License Nos. DPR-44
DPR-56

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

SUBJECT: Peach Bottom Atomic Power Station, Units 2 and 3
Response to NRC Request for Additional Information
Regarding Generic Letter 89-10, Supplement 3:
"Consideration of the Results of NRC-Sponsored
Tests of Motor-Operated Valves".

REFERENCE:

1) Letter dated March 13, 1991 from
G. J. Beck, (PECo) to the NRC

2) Letter dated June 27, 1991 from
P. Milano (NRC) to G. J. Beck (PECo)

Dear Sir:

Reference 1 submitted Philadelphia Electric Company's response to the 120 day reporting requirement of Generic Letter 89-10. Reference 2 requested additional information relative to this submittal for the Peach Bottom Atomic Power Station, Units 2 and 3.

This letter responds to Reference 2 by providing the requested information. Each individual information request is restated below followed by the PECo response.

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REQUEST 1

Identify any modifications (e.g., torque switch setting adjustments, gearing changes, or motor/actuator replacement) for each MOV within the scope of Supplement 3 to GL 89-10 since June 1990 or planned for the future.

RESPONSE 1

Review of maintenance records since June, 1990 indicates that the torque switch setting on MO-3-12-18 was adjusted from 1.75 to 2.00 on November 2, 1990. This adjustment is not considered a modification since it is between minimum and maximum values of 1.50 and 3.00 established by Nuclear Engineering.

No modifications or other switch setting adjustments have been performed on other valves within the scope of Supplement 3 since June, 1990.

In accordance with commitments made in our 120-day response to GL 89-10 Supplement 3, the torque switch settings for MO-3-13-15 and MO-3-12-18 will be adjusted during the Fall, 1991 Unit 3 refueling outage. No modifications are considered necessary for other Supplement 3 MOVs.

REQUEST 2

What are the actuator and motor sizes, and differential pressure for the RCIC MOV's?

RESPONSE 2

The actuator and motor sizes and differential pressure for the RCIC MOVs are as follows:

Valve No.	Valve Man.	Actuator Size	Motor Size (ft-lbs)	dP
MO-2-13-15	Walworth	SMB-000	5	1116
MO-2-13-16	Walworth	SMB-000	5	1116
MO-3-13-15	Walworth	SMB-000	5	1116
MO-3-13-16	Walworth	SMB-000	5	1116

REQUEST 3

Provide information necessary to confirm motor adequacy for each MOV within Supplement 3.

RESPONSE 3

Since in-situ testing of the Supplement 3 MOVs under design basis conditions is impractical, calculational results combined with valve performance data are the only viable means of demonstrating motor adequacy at this time. Valve performance data is derived from diagnostic test results. This is consistent with the "two-stage" approach indicated in GL 89-10, in that it combines analytical results with the best test information currently available.

Calculational results confirming motor adequacy are provided on the attached spreadsheet. The approach basically involves demonstrating that the motor has sufficient torque to enable the valve operator to deliver adequate thrust under design differential pressure conditions. The motor torque requirements are determined using industry accepted methodology delineated in Limitorque Selection Guides.

As noted on the attached spreadsheet, the "RUN" efficiency (operator efficiency during steady running conditions) is used to evaluate the adequacy of several MOVs. Since the safety function of the Supplement 3 MOVs is to operate from the open to close direction, this is appropriate. The "PULL-OUT" efficiency applies to initial conditions of MOV operation. The MOVs in question are not required to develop design torque until they are in full motion at the end of their stroke. Therefore, use of the "RUN" efficiency is appropriate.

Valve performance, as demonstrated by diagnostic test results, indicates that the MOVs, within the scope of GL 89-10 Supplement 3, are capable of achieving necessary target thrusts. The results of the most recent diagnostic testing were provided in Reference 1. This provides a degree of assurance that the MOVs will perform as required under design conditions and confirms calculational results indicating that the operator motors are adequate.

REQUEST 4

What are the motor sizes for the HPCI and RWCU MOV's?

RESPONSE 4

The motor sizes for the subject MOVs are as follows:

Valve No.	Description	Motor Size (ft-lbs)
MO-2-23-15	HPCI inbrd. steam isolation	40
MO-2-23-16	HPCI outbrd. steam isolation	40
MO-3-23-15	HPCI inbrd. steam isolation	40
MO-3-23-16	HPCI outbrd. steam isolation	40
MO-2-12-15	RWCU inbrd. suction isolation	10
MO-2-12-18	RWCU outbrd. suction isolation	10
MO-3-12-15	RWCU inbrd. suction isolation	60 Globe Valve
MO-3-12-18	RWCU outbrd. suction isolation	25

REQUEST 5

What is the justification for exceeding the published thrust ratings for the Limitorque SMB-0 and 00 actuators?

RESPONSE 5

When establishing target thrusts for MOV operation, the primary goal is to achieve sufficient thrust to assure valve operation under worst case conditions. For the subject MOVs with SMB-0 and SMB-00 operators, this may require operating at or above the published thrust rating of the valve operator. The MOVs in question are considered to be MO-2-12-15, 18 and MO-2-23-15. Limitorque has performed tests to determine the maximum loads that the SMB-0 and SMB-00 operators can withstand. These test results indicate that the SMB-00 and SMB-0 operators can withstand loads of 44,000 and 70,700 pounds, respectively. In a letter to PECo dated 5/24/84, Limitorque indicated that the operators can be operated at up to 60% of these test loads with no detrimental effects. The thrusts delivered by the subject MOVs are within 60% of the Limitorque test thrusts.

In addition to the information from Limitorque, the overthrusting condition of the subject valves was analyzed by PECo Engineering as part of the PBAPS safety-related MOV rebuild and test program (Mod. No. 2231). The analysis concluded that the valves were

capable of performing their safety function in the existing condition.

While routinely operating at this level of thrust is not the preferred means of achieving required thrust, it does not constitute a deficiency which would impact the "as-is" capability of the subject MOVs.

REQUEST 6

What is the schedule for adjusting the torque switches for the RCIC and RWCU MOV's in Unit 3? In Supplement 3 to GL 89-10, the NRC staff indicated that its safety assessment provided support for continued operation for 18 months or one refueling outage. If the schedule for adjusting the torque switches exceeds those dates, provide specific justification.

RESPONSE 6

The torque switches for the RCIC and RWCU MOVs will be adjusted during the Fall, 1991 Unit 3 Refueling Outage.

REQUEST 7

How have you addressed the rate of loading phenomenon in MOV sizing and torque switch settings?

RESPONSE 7

"Rate of loading", generally described as the difference in MOV thrust measured under static and dynamic conditions, is the subject of much study within the industry. In addition to INEL efforts, EPRI plans to investigate this effect as part of its "MOV Performance Prediction Program". PECo is a participating utility in this effort, and plans to use the results in our MOV program.

MOVs are currently set up using diagnostic equipment under static conditions. In setting up MOVs at PBAPS, a target thrust value is established by Nuclear Engineering. This value is obtained during static stroking of the MOV. It includes a 30% margin above the calculated design thrust intended to account for instrument accuracies and differences in valve performance under static and dynamic conditions. Since a specific numerical factor for the "rate of loading" effect cannot be assigned at this time, PECo uses this overall margin to set MOV switch settings.

If you have any questions or require additional information please contact us.

Sincerely,

G. J. Beck, Manager
Licensing Section
Nuclear Engineering & Services

cc: T. T. Martin, Administrator, Region I, USNRC
J. J. Lyash, USNRC Senior Resident Inspector, FB

PBAPS SUPP. 3 MOV MOTOR ADEQUACY INFORMATION

MOV NO.	DESIGN THRUST (lbs.)	STEM FACTOR	DESIGN TORQUE (ft-lbs)	UNIT RATIO	UNIT EFFICIENCY **	APPLICATION FACTOR	REQUIRED MTR. TORQUE (ft-lbs)	ACTUAL MTR. TORQUE (ft-lbs)	REDUCED VOLTAGE MTR. TORQUE (ft-lbs) *
MO-2-12-15	12842	0.0168	215.7	72	0.4	0.9	8.3	10	***
MO-2-12-18	12842	0.0168	215.7	82	0.4	0.9	7.3	10	***
MO-3-12-18	11273	0.0159	179.2	58	0.4	0.9	8.6	25	***
MO-2-13-15	3892	0.0116	45.1	48	0.4	0.9	2.6	5	3.2
MO-2-13-16	3892	0.0116	45.1	52	0.4	0.9	2.4	5	4.9
MO-3-13-15	3892	0.0116	45.1	48	0.4	0.9	2.6	5	3.2
MO-3-13-16	3892	0.0116	45.1	52	0.4	0.9	2.4	5	4.8
MO-2-23-15	18558	0.0189	350.7	35	0.55	0.9	20.3	40	25.6
MO-2-23-16	18558	0.0189	350.7	38	0.5	0.9	20.5	40	23.7
MO-3-23-15	16128	0.0189	304.8	35	0.55	0.9	17.6	40	25.6
MO-3-23-16	18558	0.0189	350.7	38	0.5	0.9	20.5	40	22.4

* 80% VOLTAGE IS USED AS THE REDUCED VOLTAGE LEVEL FOR AC MOVS, PENDING COMPLETION OF AC CABLE ANALYSIS

** RUN EFFICIENCY USED FOR MO-2(3)-23-15,16

*** VALVE RECEIVES NO AUTOMATIC SIGNAL. NOT SUBJECT TO DEGRADED VOLTAGE CONDITIONS.