U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-317/90-10
50-318/90-10

Docket Nos. 50-317
50-318

License Nos. DPR-53
DPR-69

Licensee. Baltimore Gas and Electric Company
MD Rts 2&4, P.O. Box 1535
Lusby, Maryland 20657

Facility Name: Calvert Cliffs

Inspection At: Lusby, Maryland

Inspection Conducted: May 14-18, 1990

Inspectors: J. Carrasco 6-1-90
J. E. Carrasco, Reactor Engineer, Materials and Processes Section, EB, DRS — date

Approved by: CJ Anderson for 6/15/90
J. R. Strosnider, Chief, Materials and Processes Section, Engineering Branch, DRS — date

Inspection Summary: Routine Unannounced Inspection on May 14-18, 1990 (Inspection Report No. 50-317/90-10)

Areas Inspected: An inspection was performed of licensee activities related to engineering modifications. The modifications included FCR 89-24 which was completed and FCR 89-180 which was in process at the time of inspection.

Results: No violations or deviations were identified.

DETAILS

1.0 PERSONS CONTACTED

1.1 Baltimore Gas and Electric Company

*	M. Milbradt	Compliance Engineer
*	J. Volkoff	Compliance Engineer
*	G. Detter	Nuclear Regulatory Matters
	C. Cruse	Manager of Nuclear Engineering
	W. Kemper	GS Scheduling
*	E. Zumwalt	Project Management Unit
*	D. Kennedy	Mechanical Modifications
*	L. Tucker	GS Plant Engineering
	L. Weckbaugh	Gen. Supervisor Electrical Controls
*	T. Camilleri	Maintenance Superintendent
*	R. Szoch, Jr.	Principal Design Engineer
*	J. Kennedy	AGS-Electrical and Instrumentation

1.2 U.S. Nuclear Regulatory Commission

*	A. Howe	Resident Inspector
	L. Nicholson	Senior Resident Inspector

* Denotes those present during the exit meeting held on May 18, 1990

2.0 ENGINEERING MODIFICATION 89-24: CONTROL VALVE REPLACEMENT FOR DIESEL GENERATOR SERVICE WATER

2.1 Purpose

The purpose of this modification was to replace existing Masoneilan diaphragm-actuated butterfly control valves numbered 1-CV-1587, 1-CV-1588, 2-CV-1588 and 2-CV-1587 with Valtek piston actuated, high performance butterfly (H.P.B.) control valves for safety related service.

2.2 Background

The existing control valves had a swing-through disc design and a rubber-lined body. A problem with the rubber lined valve body occurred because during valve operation a vacuum formed in the vena-contracta area of the flow stream immediately downstream of the valve body. This vacuum caused the rubber lining to delaminate from the valve body and permanently bulge. Consequently, when the valve closed, the lining was sheared and the sheared material (portions of rubber) deposited in the diesel generator heat exchanger tube bundle. The failure of the lining also caused leakage through the valve. This leakage could cause potential problems with the diesel generator as discussed in cases 1 and 2, below.

Case 1 - When the diesel generator is in standby, leakage of the cold service water through the control valve could over cool the lubricating oil, causing piston-ring wear and eventually slower start-up times.

Case 2 - When the diesel generator is running, the service water control valve is controlled by local, pneumatic pressure across the diesel generator cooler. Thus, any obstruction in the bundle could cause a decrease in the flow rate starving the coolers.

In order to solve these problems, the licensee initiated a modification by issuing a Facility Change Request (FCR) numbered 89-24. After the feasibility of the FCR was established, the licensee proceeded with a 10 CFR 50.59 safety evaluation.

The safety evaluation determined that the modification prescribed by FCR 89-24 did not constitute an unreviewed safety question. The inspector found that several potential questions related to structural and mechanical issues were properly addressed in the 10 CFR 50.59 safety evaluation. One being the fact that the Valtek valve is heavier than the existing valve by 39 Lbs. This additional weight was reviewed by Bechtel relative to the original piping analysis. The other potential structural question was that the Valtek valve for Diesel Generator 11 is supported by a bracket bolted to a concrete masonry wall. Calculations performed by Bechtel indicated that the seismic stability of the masonry wall is not compromised. Bechtel had updated the subject concrete block wall calculations to account for the addition of the solenoid valve bracket. These calculations were updated as part of the Calvert Cliffs Block Wall program in response to NRC Bulletin 88-11. Further details of the analyses are presented in section 2.4 of this report.

The inspector found no deficiencies in the licensee's safety evaluation.

2.3 Specification for Butterfly Control Valve

The inspector reviewed the licensee's engineering specification No. 584 titled "High performance Butterfly Control Valves". Attachment D of this specification specifies the Quality Assurance Requirements, section 3.8 of attachment D states, "B.G.& E. or its agent shall perform, at the minimum, the following at the supplier's facility prior to shipment:

1. Witness hydrostatic and seat leakage testing.
2. Witness operational testing.
3. Verify the calibration status of the test equipment utilized.
4. Verify qualification status of test personnel.
5. Review associated documentation.
6. Review the packaging and shipping process."

The inspector reviewed Valtek's certification assembly traveler for the valve and noticed that this document did not have signatures indicating that the customer (B.G.& E.) had performed inspection witnessing of the valve testing. After several discussions with the licensee the inspector determined that the licensee's representative was not present at the supplier's facility to witness testing as specified.

After the inspector identified to the licensee the lack of surveillance, the licensee presented a NCR, document numbered 5983, dated 7-6-89, which indicated that on-site testing had been performed to substitute for the missed surveillances. Thus the licensee's QA program had self-identified and corrected the deficiency.

The inspector found the corrective action adequate.

2.4 Stress Analysis

Under this particular modification, the inspector reviewed the following:

(a) Bechtel calculation No. CS-227, titled "Air supply tube routing for 1-CV-1587." This calculation was performed to verified that the seismic requirements were properly incorporated in the actual design, in accordance with the seismic design criteria M-500. Based on this criteria, the inspector found that all the seismic support spans are within the maximum allowable unsupported span for seismic category 1 tubing.

(b) Bechtel calculation No. C4416, titled "Seismic qualification of solenoid valve mounting bracket for 1-CV-1587 (FCR 89-24)". The inspector, found that all the reactions in the structural members, such as the regulator plate, angle for the condulet, and the 4 x 4 x 1/2 angle for the solenoid valve are within the allowable limit for flexural bending moment. The analysis included the fact that each of the structural components's natural frequencies are greater than 33 Hertz, which make the entire structure rigid relative to the forcing frequencies in a seismic event.

(c) The mounting bracket transfers the seismic load to the adjacent block wall No.A24, at elevation 45'-0'' in the Auxiliary Building. The inspector reviewed, Bechtel calculation No. C-4204, A24. This calculation demonstrated that block wall A24 remains structurally adequate considering the new seismic loading imposed by this mounting bracket.

The inspector did not identify any deficiencies in these analyses.

2.5 System Walkdown

The inspector walked down the areas affected by modifications 89-24 and 89-180 and noticed that permanent I.D. tags on the solenoid valves were missing. The inspector identified this concern to the licensee who took the proper corrective action in a timely manner.

3.0 MODIFICATION FCR 89-180

3.1 Background of Permanent Modification

Unit 1 and 2 service water systems have the capability of supplying cooling water to the Emergency Diesel Generator (EDG) No. 12 which is a swing diesel generator. If a line break occurs on one side of the header, supply and return service water valves (1-CV-1645, 1646 and 2-CV-1645, 1646) will isolate the affected side of the header by closing, so the unaffected side will continue supplying cooling water to the EDG.

Valves 1-CV-1645 and 1646 receive air supply from the salt water air compressor (SWAC) Nos. 11 and 12 common header and 2-CV-1645 and 1646 are supplied from the SWAC Nos. 21 and 22 common header. To ensure the delivery of the air supply to these valves, the air supply tubing is being upgraded to a safety related category. It is important that these air lines remain functional during a seismic event to allow remote operation of these valves so that a service water line break in the common header could be isolated.

3.2 Temporary Modification

The licensee has in place a temporary modification (1-89-77) to ensure that a service water break in the common header will not affect units 1 and 2. Temporary modification 1-89-77 locks shut 2-SRW-170 and 2-SRW-172. This locked shut condition isolates the unit 2 service water supply at 1-IA-811 and 814. This will enable valves 1-CV-1645 and 1646 to remain open, so that unit 1 service water will supply cooling water to EDG No. 12 or vice versa depending upon the location of the break along the header. This temporary modification will be in place until the permanent modification described in section 3.1 of this report is completed in its entirety.

Attachment A of this report shows a P. & I. D. of the permanent as well as the temporary modification

3.3 Ongoing Field Activities

The inspector observed the field implementation of the modification and determined that about 80% of the 135-feet of piping is complete; and about 50% of the instrumentation tubing is complete. This estimate excludes tie-ins to the existing systems.

3.4 Stress Analysis

The inspector reviewed Bechtel calculation No. P2168 titled "Salt water air line to Diesel generator service water control valve". The purpose of this calculation was to determined the actual maximum stresses on the 3/4 inch salt water instrument airline to the diesel generator service water valves.

The inspector reviewed the calculational assumptions, the analysis method, the computer model and the results. These results show that the support loads are low.

The inspector noticed that some conservative assumptions were made to account for unknown values. For example: the loads at the existing XYZ restraint (referred as nodal point 5 in the mathematical model) were doubled to account for the seismic loads from the other side of the restraint.

No deficiencies in the assumptions or methods of calculation were found, and the results show that the piping met all code requirements.

The inspector also reviewed the functional description for the modification FCR 89-0180 and the 10CFR 50.59 safety evaluation. The latter shows that the modification does not constitute an unreviewed safety question.

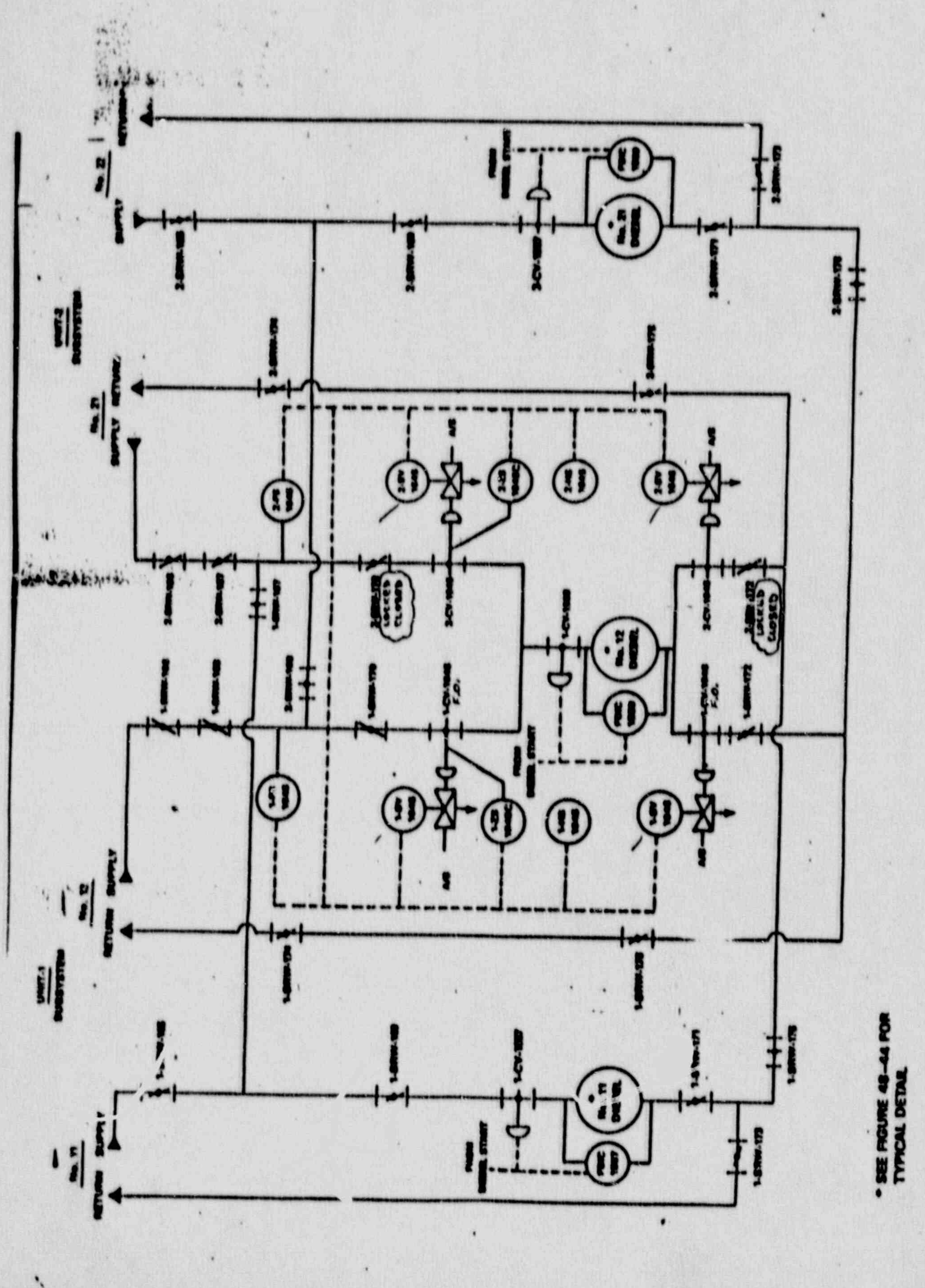
4.0 MANAGEMENT MEETING

Licensee management was informed of the scope and purpose of the inspection at the beginning of the inspection. The findings of the inspection were discussed with the licensee representatives during the course of the inspection and presented to licensee management at the May 18,1990 exit meeting.

At no time during the inspection was written material provided to the licensee by the inspector. The licensee did not indicate that proprietary information was involved within the scope of this inspection.

ATTACHMENT 'A'

SERVICE WATER PIPING DIAGRAM



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Docket No. 50-317
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Baltimore Gas and Electric Company
ATTN: Mr. George C. Creel
Vice President
Nuclear Energy
Calvert Cliffs Nuclear Power Plant
MD Rts 2 & 4, P.O. Box 1535
Lusby, Maryland 20657

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Gentlemen:

Subject: CORRECTION TO COVER LETTER FOR INSPECTION REPORT 50-317;318/90-10

Please be advised of the fact that the letter dated June 29, 1990 which transmitted the report of the inspection conducted by Mr. J. Carrasco during the period May 14-18, 1990 was in error. The number of that inspection report was 90-10 not 90-12 and 90-11 as indicated in the letter.

You will find the correct cover letter attached. We are sorry for any confusion this may have caused.

No reply to this letter is required.

Sincerely,

Original Signed By:
J. Durr

Jacque P. Durr, Chief
Engineering Branch
Division of Reactor Sa[illegible]

Attachment

cc w/encl:
T. Magette, Administrator, Nuclear Evaluations
J. Walter, Engineering Division, Public Service Commission of Maryland
G. Adams, Licensing
(CCNPP)
K. Burger, Esquire, Maryland People's Counsel
P. Birnie, Maryland Safe Energy Coalition
Public Document Room (PDR)
Local Public Document Room (LPDR)
Nuclear Safety Information Center (NSIC)
NRC Resident Inspector
State of Maryland (2)

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bcc w/encl:
Region I Docket Room (with concurrences)
Management Assistant, DRMA (w/o encl)
R. Bellamy, DRSS
J. Linville, DRP
C. Cowgill, DRP
D. Limroth, DRP
K. Lathrop, DRP
M. Conner, SALP Reports Only
M. Callahan, OCA
D. McDonald, NRR
K. Abraham, PAO (20) SALP Report and (2) All Inspection Reports
J. Caldwell, EDO

RI:DRS	RI:DRS	RI:DRS
Carrasco	Strosnider	Durr
7/12/90	7/12/90	7/18/90

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07/12/90

JUL 1 8 1990

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Baltimore Gas and Electric Company
ATTN: Mr. George C. Creel
Vice President
Nuclear Energy
Calvert Cliffs Nuclear Power Plant
MD Rts 2 & 4, P.O. Box 1535
Lusby, Maryland 20657

Gentlemen:

Subject: Inspection Report Nos. 50-317/90-10 and 50-318/90-10 (Revised)

This letter refers to the routine inspection conducted by Mr. Joseph E. Carrasco of this office on May 14 to May 18, 1990 at the Calvert Cliffs Unit 1 Nuclear Power Plant in Lusby, Maryland. Mr. Carrasco discussed the findings of the inspection with Mr. M. Milbradt of your staff at the conclusion of the inspection.

Areas examined during this inspection are described in the NRC Region I inspection report which is enclosed with this letter. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector.

Within the scope of this inspection, no violations were observed.

No reply to this letter is required. Your cooperation with us in this matter is appreciated.

Sincerely,

Original Signed By:

Jacque P. Durr, Chief
Engineering Branch
Division of Reactor Safety

Enclosure: NRC Region I Inspection Report No. 50-317/90-10 and 50-318/90-10

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