

CHARLES H. CRUSE
Vice President
Nuclear Energy

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657
410 495-4455



November 4, 1998

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Response to Request for Additional Information for the Review of the Calvert
Cliffs Nuclear Power Plant, Units 1 & 2, Integrated Plant Assessment Report for
the Emergency Diesel Generator System

- REFERENCES:
- (a) Letter from Mr. C. H. Cruse (BGE) to NRC Document Control Desk, dated January 21, 1998 "Request for Review and Approval of System and Commodity Reports for License Renewal"
 - (b) Letter from Mr. D. L. Solorio (NRC) to Mr. C. H. Cruse (BGE), August 27, 1998, "Request for Additional Information for the Review of the Calvert Cliffs Nuclear Power Plant, Units 1 & 2, Integrated Plant Assessment Report for the Emergency Diesel Generator System"
 - (c) Letter from Mr. D. L. Solorio (NRC) to Mr. C. H. Cruse (BGE), September 24, 1998, "Renumbering of NRC Requests for Additional Information on Calvert Cliffs Nuclear Power Plant License Renewal Application Submitted by the Baltimore Gas and Electric Company"

Reference (a) forwarded four Baltimore Gas and Electric Company (BGE) system and commodity reports for license renewal. Reference (b) forwarded questions from NRC staff on one of those four reports, the Integrated Plant Assessment Report for the Emergency Diesel Generator System. Reference (c) forwarded a numbering system for tracking BGE's response to all of the BGE License Renewal Application requests for additional information and the resolution of the responses. Attachment (1) provides our responses to the questions contained in Reference (b). The questions are renumbered in accordance with Reference (c).

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ATTACHMENT (1)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION;
INTEGRATED PLANT ASSESSMENT REPORT FOR THE
EMERGENCY DIESEL GENERATOR SYSTEM

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
November 4, 1998

ATTACHMENT (1)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION; INTEGRATED PLANT ASSESSMENT REPORT FOR THE EMERGENCY DIESEL GENERATOR SYSTEM

NRC Question No. 5.8.1

Figure 5-8.1 in Section 5.8.1.1 [of the Baltimore Gas and Electric Company (BGE) License Renewal Application (LRA)] provides the system boundaries and interfaces for the starting air system and appears to indicate that the check valve upstream of the air receiver is not within the scope of license renewal. Please clarify the location of the interface upstream of the air receiver and provide additional clarification as to which components on either side of the interface are within the scope of license renewal. If the starting air system equipment upstream of the receiver check valve is included in a separate section of the LRA please provide a cross reference to the applicable section.

BGE Response

The location of the interface upstream of the air receiver is at the inlet air receiver check valve, which is generically shown on the simplified drawing of Figure 5-8.1. The internals of the inlet check valve were evaluated for aging management review (AMR) since the valve is at the safety-related/non-safety-related boundary. The piping downstream of this inlet check valve is within scope of license renewal, while the piping upstream of this valve is not within scope of license renewal. The starting air system upstream of the air receiver inlet check valve is not within the scope of license renewal.

NRC Question No. 5.8.2

If the check valve upstream of the air receiver, as discussed in the previous request for additional information, is not within the scope of license renewal, provide the basis for its exclusion and emphasize how the pressure boundary is maintained at the check valve interface with the air piping it is attached to.

BGE Response

As described in the response to Question No. 5.8.1 above, the inlet air receiver check valve is within scope of license renewal.

NRC Question No. 5.8.3

Explain generally how the degradation of tank bottoms is managed, particularly the aging management for the bottom of the diesel fuel oil tanks.

BGE Response

Aging management of the internal surfaces of the fuel oil storage tank bottoms is addressed in Section 5.7, "Diesel Fuel Oil System," of the BGE LRA. Baltimore Gas and Electric Company has concluded there are no plausible age-related degradation mechanisms for the external bottom surfaces of the tanks.

NRC Question No. 5.8.4

Several plants with Fairbanks Morse emergency diesel generators (EDGs) have experienced problems with degradation of welds in the skid-mounted lube oil and jacket water piping of EDGs during normal operation. Subsequent evaluation showed significant lack of penetration and general lack of quality in the welds, which was believed to have occurred during manufacturing. Since some portions of the piping are subject to vibration induced loads, the potential exists for fatigue failure of welds in the piping during the period of license renewal. Section 5.8.1.2.2 discusses that the skid-mounted piping is not subject to AMR in accordance with 10 CFR Part 54. Discuss the basis for excluding the welds in the jacket cooling water piping beyond the skid from an AMR.

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BGE Response

Baltimore Gas and Electric Company has included the welds in the jacket cooling water piping beyond the skids in the AMR. Welds in the jacket cooling water system are considered and evaluated as part of the pipe. The pipe welds are subject to the same aging management programs as for the jacket cooling water piping. These aging management programs are described in Section 5.8.2, Group 1 (general corrosion, crevice corrosion and pitting), and Group 3 (erosion corrosion). There are expansion joints in the piping going to the skids.

NRC Question No. 5.8.5

Describe the diesel exhaust system at the location where it exits the diesel building. At some facilities, structures surrounding the exhaust components have been damaged by the exhaust gases. Debris from these damaged structures has the potential of blocking the diesel exhaust ducts. If the potential for this condition exists at Calvert Cliffs Nuclear Power Plant Units 1 and 2, provide a discussion of which aging management program is relied on for managing this condition during the proposed extended period of operation.

BGE Response

The diesel exhaust pipes are all horizontally mounted after they exit their respective diesel generator building. The diesel exhaust systems are also routed to avoid directly exposing surrounding structures to diesel exhaust gases. Therefore, due to the diesel exhaust system configuration, failures of nearby structural components affecting diesel generator exhaust gas flow is improbable.

NRC Question No. 5.8.6

Provide information regarding parameters which will be inspected, monitored and trended for detection of aging effects due to corrosion and fatigue on the internal and external surfaces of the EDG exhaust piping and mufflers. Also provide the acceptance criteria for these parameters.

BGE Response

The parameter of interest for the exhaust piping and mufflers is the wall thickness. Piping specifications establish the minimum wall thickness to be 0.25 inch. During the last Unit 1 refueling outage, exhaust components were inspected on one of the two Unit 1 diesels. The inspections included ultrasonic measurements of the piping wall thickness and cutting a hole into the muffler to inspect its internals. The included ultrasonic inspections found the piping wall thickness to be above the piping specification minimum. The muffler internal surfaces were found to be in like-new condition; there was no evidence of any corrosion, erosion, pitting, particulate wear, cracking, or any other age-related degradation mechanism. This piping and muffler were installed when the plant was constructed.

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NRC Question No. 5.8.7

Discuss the corrosion allowances in the design of EDG System components that are subject to corrosion, and how they will be addressed as part of the aging management program.

BGE Response

There were no specific corrosion allowances included in the original design of the EDG System components subject to AMR. Discussion of the aging management programs for EDG System components that are subject to corrosion are included in Section 5.8.2 of the LRA.

NRC Question No. 5.8.8

Page 5.8-1 of the report states that operating experience relevant to aging was obtained based on Calvert Cliffs Nuclear Power Plant specific information and past experience. Describe the basis upon which BGE concluded that cavitation corrosion, intergranular attack, stress corrosion cracking, and thermal damage were not plausible aging effects for EDG Systems in relation to any industry-wide experience with these aging effects in EDG Systems.

BGE Response

Electronic searches of industry and government indexes indicate that cavitation corrosion, intergranular attack, stress corrosion cracking, and thermal damage are not prevalent aging mechanisms for EDG components within the scope of license renewal. These age-related degradation mechanisms are not considered plausible based on the materials of construction used, operating environments (e.g., low flow rates, non-corrosive fluids such as lube oil, etc.) or infrequent exposure to EDG high temperature exhaust gases.

NRC Question No. 5.8.9

Are there any parts of the systems, structures and components within the EDG System that are inaccessible for inspection? If so, describe what aging management program will be relied upon to maintain the integrity of the inaccessible areas. If the aging management program for the inaccessible areas is an evaluation of the acceptability of inaccessible areas based on conditions found in surrounding accessible areas, please provide information to show that conditions would exist in accessible areas that would indicate the presence of, or result in degradation to, such inaccessible areas. If different aging effects or aging management techniques are needed for the inaccessible areas, please provide a summary to address the following elements for the inaccessible areas: (a) Preventive actions that will mitigate or prevent aging degradation; (b) Parameters monitored or inspected relative to degradation of specific structure and component intended functions; (c) Detection of aging effects before loss of structure and component intended functions; (d) Monitoring, trending, inspection, testing frequency, and sample size to ensure timely detection of aging effects and corrective actions; (e) Acceptance criteria to ensure structure and component intended functions; and (f) Operating experience that provides objective evidence to demonstrate that the effects of aging will be adequately managed.

BGE Response

Baltimore Gas and Electric Company can access all EDG System components if required.