September 3, 1998

Mr. Charles H. Cruse, Vice President
Nuclear Energy Division
Baltimore Gas & Electric Company
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 & 2, INTEGRATED PLANT ASSESSMENT, SECTIONS 4.1, 4.2, 5.2, 5.7, 5.15, AND 5.16 (TAC NOS. MA1016, MA1017, M99223, M99587, M99588, M99206, MA0601, MA0602, M99227, M95457, M95458, M99180, MA1108, MA1109, M99222, MA1020, MA1021, AND M99219)

Dear Mr. Cruse:

By letter dated April 8, 1998, Baltimore Gas and Electric Company (BGE) submitted for review its license renewal application. The Nuclear Regulatory Commission (NRC) staff has reviewed Sections 4.1, "Reactor Coolant System," 4.2, "Reactor Pressure Vessels and CEDMs/Electrical Systems," 5.2, "Chemical and Volume Control System," 5.7, "Diesel Fuel Oil System," 5.15, "Safety Injection System," and 5.16, "Saltwater System," of Appendix A to the application against the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(3). Based on a review of the information submitted, the staff has identified in the enclosure, areas where additional information is needed to complete its review.

Please provide a schedule by letter or telephonically for the submittal of your responses within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with BGE prior to the submittal of the responses to provide clarifications of the staff's requests for additional information.

Sincerely,

/original signed by/

David L. Solorio, Project Manager
License Renewal Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-317 and 50-318
Enclosure: Request for Additional Information
cc w/encl: See next page
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REQUEST FOR ADDITIONAL INFORMATION
CALVERT CLIFFS NUCLEAR POWER PLANT, UNIT NOS. 1 & 2
INTEGRATED PLANT ASSESSMENT, SECTIONS 4.1, 4.2, 5.2, 5.7, 5.15, AND 5.16
DOCKET NOS. 50-317 AND 50-318

Section 4.1, "Reactor Coolant System," and Section 4.2, "Reactor Pressure Vessels and CEDMs/Electrical Systems"

1. Discuss whether there are reactor coolant system (RCS) and reactor pressure vessel (RPV) components fabricated from Inconel alloys other than Alloy 600, for example, Alloy 690 and Alloy 800. Discuss whether stress corrosion cracking (SCC) of these components is plausible, including basis for BGE's determination.

2. On pages 4.1-42 and 4.2-27 of the application, BGE indicated that the RCS and RPV components most susceptible to SCC have been or will be replaced. Identify the most susceptible Alloy 600 pressure boundary components and discuss the characteristics that render these components most susceptible to SCC. Describe what material has been or will be used in the replacement components, the schedule for replacement, and the basis for the schedule (i.e., how does the schedule ensure that the components will be replaced before the intended function(s) are compromised). Indicate if the replacement components are or will be within the scope of the Alloy 600 Program.

3. Describe the specific inspection activities for the most susceptible RCS and RPV components under the Alloy 600 program. Include a description of and the bases for the included components, inspection schedules, inspection techniques, inspection procedures, inspection personnel qualification, acceptance criteria, and sample expansion criteria.

4. Describe the most recent example of implementation of BGE's corrective action program initiated by, or related to, the Alloy 600 program. Include a description of the initiating event, the corrective action(s) taken, and how the issue was resolved.

5. The application indicates that the Alloy 600 program will be modified. Describe the reason for the program changes, schedule, and proposed content related to this program modification to include all Alloy 600 RCS and RPV components, including RCS nozzle thermal sleeves.

6. Provide the results of BGE's most recent internal audit of the Alloy 600 program; including areas of strengths and weaknesses, safety implication of findings, and corrective action plans and schedule for implementation.

Enclosure

Section 5.2, "Chemical and Volume Control System"

7. Based on the description found on page 5.2-23 of the application, the scope of the Boric Acid Corrosion Inspection (BACI) program appears to be limited to components located inside the containment building. BGE also stated on the same page that the "program also requires examination of specific components for discovery of leakage during each refueling outage." State precisely the scope of Chemical and Volume Control System (CVCS) components in the BACI program and describe how the scope encompasses or bounds all the susceptible CVCS components.

8. Describe how the inspection scope and frequency of the BACI program would detect and correct boric acid corrosion of CVCS components before there is a loss of integrity and component intended functions.

9. Provide the results of BGE's most recent internal audit of the BACI Program; including areas of strengths and weaknesses, safety implication of findings, and corrective action plans and schedule for implementation.

10. System walkdowns can identify some aging effects. Explain why Procedure PEG-7, "System Walkdowns," is not explicitly included as part of BGE's aging management program to maintain the CVCS components.

11. A foreign material exclusion program limits the introduction of halogens, loose parts, etc., into the reactor coolant system. Explain why such a program is not explicitly included as part of BGE's aging management program to maintain the CVCS components.

12. Flashing erosion of let down system orifices has been identified at other facilities (Surry and Diablo Canyon). Erosion also occurred downstream of the orifices and compromised welds in the pipe. The BGE application does not address this aging mechanism for the CVCS. Are there similar components at Calvert Cliffs units, and, if so, are there plans for inspection? If so, provide a summary of the inspection plan and schedule.

13. Are there any parts of the systems, structures, and components within the CVCS 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.

14. Page 9.1-31 (Rev. 21) of the Calvert Cliffs Updated Final Safety Analysis Report (UFSAR) indicates that boric acid solution is stored in heated and insulated tanks and is piped in heat-traced and insulated lines to preclude precipitation of the boric acid. If the storage tank and pipe insulation material within the CVCS were subject to an aging management review, identify where they are evaluated in the BGE application. If not, justify why these components have been excluded from the renewal scope.

Section 5.7, "Diesel Fuel Oil System"

15. On Page 5.7-12 of the application, cathodic protection of external surfaces of underground piping is mentioned. However, a statement is made that no credit is taken for the cathodic protection program. National Association of Corrosion Engineers (NACE) International has published Recommended Practice (RP) 01-69 (92), "Control of External Corrosion on Underground or Submerged Metallic Piping Systems," that gives guidance on the protection of underground pipelines. RP 01-69 indicates that coatings and cathodic protection are to be used together. In light of the NACE guidance, clarify BGE's basis for not relying on the cathodic protection program.

16. NACE RP 01-69 also describes methods to determine the effectiveness of coatings and cathodic protection programs. Describe the extent to which BGE includes these methods in its programs.

17. There are additional NACE standards, such as RP0193-93, for managing aging of tank bottoms, such as the fuel oil storage tank (FOST) shell and bottom external exposed surfaces. Discuss the extent to which BGE includes these methods in its programs.

Section 5.15, "Safety Injection System"

18. System walkdowns can identify some aging effects. Explain why Procedure PEG-7, "System Walkdowns," is not explicitly included as part of BGE's aging management program to maintain the Safety Injection System (SIS) components.

19. A foreign material exclusion program limits the introduction of halogens, loose parts, etc., into the reactor coolant system. Explain why such a program is not explicitly included as part of BGE's aging management program to maintain the SIS components.

20. The application describes two instances of water hammer in the SIS that resulted in damage to piping supports. Discuss whether these water hammer events contribute to the aging effects of the SIS components. Also, discuss what corrective actions have been taken to preclude recurrence of water hammers.

21. State precisely the scope of SIS components in the BACI program and describe how the scope encompasses or bounds all the susceptible SIS components.

22. Describe how the inspection scope and frequency of the BACI program would detect and correct boric acid corrosion of SIS components before there is a loss of the structure and component intended functions.

23. Page 5.15-36 indicates that BGE will perform an engineering assessment of SCC for the refueling water tank (RWT) penetrations. Describe the scope of the assessment, and provide the completion schedule.

24. Plant walkdown procedures have been described by both PEG-7 and MN-1-319. As discussed at the meeting on June 26, 1998, clarify the status of the two procedures and describe any significant differences.

25. Table 5.15-1 of the application lists SIS piping with designated "Device Codes" of "-CC," "-DC," "-GC," and "-HC" are subject to aging management review. Please explain these device codes, and describe the piping components in terms of the piping size, piping material, and corrosion allowances.

26. Are there any parts of the systems, structures, and components within the SIS 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.

27. In the report, several plant surveillance test procedures and administrative procedures were mentioned, such as STP M-571G-1(2), STP M-571L-1(2), and CP-204 for managing aging of SIS (Groups 2 and 4) for license renewal. Please provide a summary description of the procedures regarding how their implementation will address the following elements for their related aging management program(s): (a) The scope of structures and components managed by the program; (b) Preventive actions designed to mitigate or prevent aging degradation; (c) Parameters monitored or inspected relative to degradation of specific structure and component intended functions; (d) Detection of aging effects before loss of structure and component intended functions; (e) Monitoring, trending, inspection, testing frequency, and sample size to ensure timely detection of aging effects and corrective actions; (f) Acceptance criteria to ensure structure and

component intended functions; and (g) Operating experience that provides objective evidence to demonstrate that the effects of aging will be adequately managed.

Section 5.16, "Saltwater System"

28. If an unacceptable degree of internal pitting were discovered while examining a saltwater system group 1 component, describe how BGE would resolve that condition, in accordance with established procedures, through final disposition. Include a discussion of how augmented inspection might be developed.

29. Provide a summary of the buried piping inspection program as applied to the saltwater system (groups 1 and 2). In the discussion include details of:

    a) inspection scope basis;

    b) inspection methods used;

    c) frequency of inspections and the rationale.

30. Page 5.16-16 of the application indicates that the buried saltwater system piping is protected from corrosion, in part, by an impressed current cathodic protection program. However, the application does not indicate that the cathodic protection program will be relied on to manage aging of buried piping for license renewal.

    Clarify whether BGE relies on cathodic protection for buried piping. If cathodic protection is relied upon for aging management, provide a summary of the program, describe the related inspection and verification activities, and describe corrective measures, if any, resulting from operating experience.

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