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December 15, 1995

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 (RAI) Concerning the Baltimore Gas and Electric Company Report Entitled, "Integrated Plant Assessment Methodology," dated August 18, 1995, (TAC Nos. M93326 & M93327)

- REFERENCE:
- (a) Letter from Mr. J. P. Moulton (NRC) to Mr. R. E. Denton (BGE), dated November 16, 1995, "Request for Additional Information (RAI) Concerning the Baltimore Gas & Electric Company Report Entitled 'Integrated Plant Assessment Methodology,' dated August 18, 1995"
 - (b) Letter from Mr. R. E. Denton (BGE) to NRC Document Control Desk, dated August 18, 1995, "Integrated Plant Assessment Methodology"
 - (c) Public Meeting between NRC and BGE License Renewal Staffs, dated December 6, 1995, Discussions on Responses to a Request for Additional Information (RAI) Concerning the Baltimore Gas and Electric Company Report Entitled, "Integrated Plant Assessment Methodology"
 - (d) Letter from Mr. R. E. Denton (BGE) to NRC Document Control Desk, dated November 8, 1995, "Schedule for Submitting License Renewal Documentation"

By letter dated November 16, 1995 (Reference a), the Nuclear Regulatory Commission (NRC) requested additional information on the Baltimore Gas and Electric Company (BGE) "Integrated Plant Assessment (IPA) Methodology" (Reference b). The IPA Methodology describes the specific method used by BGE to comply with 10 CFR Part 54. Our response to questions on the methodology is contained in Attachment (1). It only addresses the 40 questions on the issues resulting from the NRC review of the IPA Methodology. Included in Attachment (1) are six administrative procedures that support some of the responses. These procedures are provided as examples that describe six of our current programs, and clarify why we rely on these programs to support specific aspects of aging management. These types of

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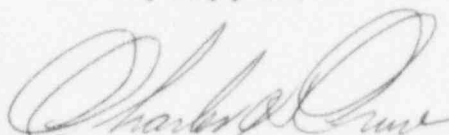
programs are representative of our extensive total program that has been developed to implement and maintain the requirements and commitments of our current licensing basis. We will provide a marked-up revision of the IPA methodology that incorporates the responses described in Attachment (1) by December 22, 1995. We will forward a final version of the methodology incorporating these responses by January 12, 1996.

We appreciate the level of detail and technical comments you had on the "10 CFR Part 54 Sample Results" (Attachment 2 of Reference b). Our response, contained in Attachment (1), does not address any of these comments. We have concluded that responses to your comments on the "10 CFR Part 54 Sample Results" will be evaluated during development of IPA System and Commodity Reports. We anticipate further discussions with the NRC as we evaluate and resolve these comments.

During BGE's review of Reference (a) and development of responses to it, BGE participated in two telephone conversations and a public meeting (Reference c) to discuss our responses. These discussions were helpful and resulted in a common understanding of concerns and issues that arose during the NRC review of the IPA Methodology. Contingent on your approval of the methodology in a Safety Evaluation Report by January 1996, the IPA System and Commodity Reports will be submitted for review and approval during 1996, as described in Reference (d).

Should you have further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,



for

R. E. Denton
Vice President - Nuclear Energy

RED/JMO/dlm

Attachment: (1) BGE Response to NRC Request for Additional Information; Integrated Plant Assessment Methodology

- Tab 1 NS-1-300, Revision 0, *Industry Operating Experience Information Processing*
- Tab 2 NO-1-106, Revision 2, *Functional Evaluation/Operability Determination*
- Tab 3 QL-2-100, Revision 3, *Issue Reporting and Assessment*
- Tab 4 RM-1-103, Revision 0, *Commitment Management*
- Tab 5 MN-3-111, Revision 0, *Erosion/Corrosion Monitoring of Secondary Piping*
- Tab 6 CP-217, Revision 4, *Specification and Surveillance: Secondary Chemistry*

cc: (Without Tabbed Documents)

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ATTACHMENT (I)

**BGE RESPONSE TO
NRC REQUEST FOR ADDITIONAL INFORMATION
INTEGRATED PLANT ASSESSMENT METHODOLOGY**

**Baltimore Gas and Electric Company
Docket Nos. 50-317 & 50-318
December 15, 1995**

ATTACHMENT (1)

**BGE RESPONSE TO
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NRC COMMENT	METHODOLOGY CHANGE	BGE RESPONSE
<p>1. <u>General</u>: CLARIFY WHAT PARTS OF THE PREVIOUS IPA SUBMITTAL are relied on in this Integrated Plant Assessment (IPA) methodology or are the same in this methodology? ALSO, CLARIFY HOW and where in this methodology Baltimore Gas and Electric Company (BGE) addresses the open and confirmatory items from the previous Draft Safety Evaluation Report if it is relied on.</p>	None	<p>Table (1) indicates where the resolution is to each of the 1993 Requests for Additional Information (RAIs) in the August 1995 version of the methodology, and how the section numbering of the 1993 submittal is related to the sections in the 1995 submittal.</p>
<p>2. <u>General</u>: <u>Documentation</u>: The methodology makes reference to the need to document the results of the analysis or screening steps. However, the degree of documentation or elements of documentation that will be prepared are not discussed in any substantive form. PROVIDE ADDITIONAL DETAIL ON HOW THE RESULTS WILL BE DOCUMENTED.</p>	Yes	<p>The Rule does not require that the results of scoping be submitted to the NRC. The first submittal product of the IPA is the list of SCs subject to aging management review (AMR) per §54.21(a)(1). Therefore, BGE does not believe it is appropriate to describe in this methodology the format of the scoping results. These results will be maintained onsite in an auditable and retrievable format.</p> <p>The documentation of the results of the Pre-Evaluation, AMR, and Commodity Evaluation steps are located in Sections 5.5, 6.4 and 7.3 respectively. The documentation of Time-Limited Aging Analysis (TLAA) results are discussed in Section 8.4, which is entitled "Summary." The title of this section will be revised to be consistent with the titles to other sections of the methodology which describe documentation.</p>
<p>3. <u>General</u>: <u>Operating Experience/Generic Communication/ Industry Topical Reports</u>: The methodology mentions the importance of operating experience yet it does not demonstrate how and where consideration of such operating experience is to occur. Such operating experience may be relevant in the identification of aging effects that should be managed and the identification of</p>	None	<p>We utilize operating experience throughout the scoping and IPA process. The method of using this experience is a reliance on the site process which incorporates operating experience into all aspects of plant documentation, maintenance and operation, currently proceduralized in NS-1-300 (see Tab 1). No special verification of such experience is needed for scoping or the IPA.</p>

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<p>non-safety systems that can impact a safety system. PROVIDE ADDITIONAL INFORMATION as to when and how operating experience is considered in the IPA. Further, EXPLAIN HOW EXISTING PROGRAMS resulting from responses to NRC generic communications would be factored into the IPA.</p> <p>Additionally, the report indicates that industry documents are reviewed for potential age-related degradation mechanisms (ARDMs). Sampling information in Appendix A found that BGE has referenced the Nuclear Management and Resources Council (NUMARC) industry report on the pressurized water reactor vessel internals for renewal in the second example, "Reactor Coolant System." However, BGE did not reference the NUMARC industry report on the pressurized water reactor containment in the first example, "Containment."</p> <p>The information on page 4-2 (Section 4.3 of Appendix A) is referenced from the NUMARC industry report on the internals. However, sampling the potential ARDMs discussed, the staff found several unresolved items from the staff review of the subject industry report that are identified as not significant in the BGE example, such as stress corrosion cracking and creep (core shroud assembly).</p> <p>The information on page 3-1 through 3-5 (Section 3.1 of Appendix A) is not referenced from the NUMARC industry report on the containment. However, sampling the potential ARDMs discussed, the staff found differences in information between the BGE report and the NUMARC</p>		<p>In the actual LRA submittals, more effort will be taken to ensure consistent use of references from section to section.</p> <p>We use the industry reports as a source of information much the same as Electric Power Research Institute reports and Nuclear Plant Aging Research reports. In some cases, one or more of the generic conclusions of these reports do not apply to specific Calvert Cliffs SCs. In these cases, the non-applicable report would <u>not</u> be referenced for the corresponding conclusion in the detailed AMR Report and other more pertinent information sources would be used to make the required demonstration. Because of this, BGE does not believe that it is appropriate to describe how industry reports will be used in the methodology. It is not necessary to describe in the methodology, the aging management reports or the license renewal application (LRA) each instance where a</p>

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<p>report, such as aggressive chemical attack on concrete and inaccessible areas. These differences should be discussed.</p> <p>DISCUSS THE USE OF INDUSTRY DOCUMENTS such as the NUMARC industry reports for renewal. Also, discuss how BGE assesses whether it is within the bounds of these reports.</p>		<p>conclusion in an industry reference, such as an industry report, does not apply to Calvert Cliffs equipment.</p>
<p>4. <u>General</u>: The phrase "maintain the pressure boundary" is used repeatedly. WHAT IS THE CRITERIA USED TO DETERMINE when the pressure boundary is not maintained. Is there a difference between maintaining pressure boundary integrity and maintaining pressure boundary?</p>	<p align="center">None</p>	<p>Criteria for maintaining a system pressure boundary vary from system to system and will be presented and documented on a system-by-system basis. We intended no difference between the term "pressure boundary" and "pressure boundary integrity" in this methodology. The terms are used interchangeably.</p>
<p>5. Page 7. For the definition of "passive" REPLACE "does not require motion" with "is performed without moving parts."</p>	<p align="center">Yes</p>	<p>Baltimore Gas and Electric Company will make the requested change to the methodology.</p>
<p>6. Page 12 Section 2.3.4 states that, "techniques provide an equivalent level of assurance." WHAT IS THE PURPOSE IN ASSURING THAT ALL TECHNIQUES PROVIDE EQUIVALENT ASSURANCE. HOW DOES THIS ASSURE THAT THE EVALUATION TECHNIQUES ARE TO PROVIDE the necessary evidence that the findings of §54.29 can be supported?</p>	<p align="center">Yes</p>	<p>All techniques presented in the methodology provide the demonstration necessary to support the finding of §54.29. The wording in Section 2.3.4 and in Section 7 will be revised accordingly.</p>
<p>7. Page 19, Section 3.3.1.1 states, "By relying on the Q-List Accident Shutdown Flow Sheets and Vital Auxiliaries Flow Sheets, SR SSs are identified, as well as all SSs that could fail and prevent the functioning of SR structures and components (SCs). This identification is not limited to first level, second level or any specific level of support</p>	<p align="center">None</p>	<p>As stated in the methodology, the BGE Q-List controls all SSCs which meet §54.4(a)(1) and (2) as "safety-related" at Calvert Cliffs. It makes no distinction between the SSC which satisfy criterion §54.4(a)(1) versus (2). Therefore, any example provided is controlled as SR at Calvert Cliffs.</p> <p>We do not believe that including an example in the</p>

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<p>equipment. Rather, the scoping is performed consistent with the Calvert Cliffs Nuclear Power Plant (CCNPP) Q-List Design Standard which was developed with the intent of identifying and controlling a similar scope of systems, SSCs to that defined by the first two criteria of 54.4." This statement indicates that the Vital Auxiliaries Flow Sheets in the Q-List have identified all non-safety-related (NSR) systems, structures and components (SSCs) whose failure could prevent satisfactory accomplishment of any of the functions identified in §54.4(a)(1).</p> <p>The Open Item in the Draft Safety Evaluation Report questioned how the previous methodology would identify a NSR SSC that provides supporting functions to another NSR SSC that is required for a SR SSC to perform its function. PROVIDE A DISCUSSION OR AN EXAMPLE FROM THE VITAL AUXILIARIES FLOW SHEETS IN THE Q-LIST to show that a NSR SSC that provides supporting functions to another NSR SSC that is required for a SR SSC to perform its function would be identified as within the scope of LR.</p>		<p>methodology that fits the situation described in this RAI would provide any additional clarification of how the scoping is conducted.</p> <p>The following example is provided for your information. Note that all four levels of cascading are controlled as SR at Calvert Cliffs.</p> <p>A certain heating, ventilation and air conditioning (HVAC) unit is a SR vital auxiliary because it maintains the environment in the control room and cable spreading room so that the Reactor Protective System and Engineered Safety Features Actuation Signal System can perform their required safety functions. The electrical cables and panels which supply power to these units are also included in the scope of LR because their failure would prevent the operation of the HVAC units which in turn could prevent the operation of the Reactor Protective System and Engineered Safety Features Actuation Signal System.</p>
<p>8. Page 20, Section 3.3.2 states, "These evaluations are reviewed to identify SSs that are relied on to mitigate the subject plant event as well as any systems or structures whose failure would result in failure of other equipment to mitigate the particular event." PROVIDE A DISCUSSION OR AN EXAMPLE to show that a NSR system or structure (SS) that provides supporting functions to another NSR SS that is relied on to meet the regulated events in §54.4(a)(3) would be identified as within the scope of LR.</p>	<p align="center">None</p>	<p>We do not believe that including an example in the methodology that fits the situation described in this RAI would provide any additional clarification of how the scoping is conducted.</p> <p>The following example is provided for your information. Note that both levels of cascading are NSR.</p>

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		The diesel-driven fire pump is required under 10 CFR 50.48. The description of how this pump must function to comply with this regulation includes the requirement to provide diesel fuel for the pump. Therefore, the diesel fuel oil system piping which provides the fuel oil to this pump is included within the scope of LR.
9. Page 31, Section 4.1.1 discusses system intended functions. However, it does not contain details of the current licensing basis (CLB) design loading conditions under which the system is required to function. A system may be required to have structural integrity under normal, upset, emergency, and faulted conditions in accordance with the CLB. For example, a system may be required to withstand a seismic event while another system, such as the fire protection shutdown system installed to ensure post-fire shutdown capability (Paragraph III.6 of Appendix R), may not be required to withstand a seismic event. The difference in the intended function based on the design conditions between these two systems could affect the aging management program for renewal. Thus, THE CLB DESIGN LOADING CONDITIONS SHOULD BE IDENTIFIED AND SUBSEQUENTLY TRANSFERRED TO THE SC INTENDED FUNCTIONS FOR CONSIDERATION in developing aging management programs, as appropriate.	None	The definition of intended function in §54.4(b) does not include any reference to design conditions under which a system must perform its intended function. Therefore, BGE believes that this RAI requests information not identified during the scoping step. As discussed further in subsequent RAI responses, we believe that the appropriate place to factor in the design conditions is during the assessment/analysis phase of the aging management strategy. During this phase, the effects of aging are assessed to determine whether they impact the ability of the structure or component to fulfill its intended function during all of the required conditions.
10. Page 31, Section 4.1.1 discusses system intended functions. IT SHOULD INCLUDE A DISCUSSION RELATING TO REDUNDANCY, DIVERSITY, AND DEFENSE-IN-DEPTH. Where the plant's licensing basis includes requirements for	None	The BGE methodology for scoping SSs does not recognize redundancy, diversity or defense in depth as functions. In addition, the BGE process does not allow exclusion of any SSCs based on redundancy, diversity or defense in depth

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<p>redundancy, diversity, and defense-in-depth, the system intended functions include providing for the same redundancy, diversity, and defense-in-depth during the period of extended operation. For example, a system with two independent trains, according to the plant's CLB, has to perform the intended functions by each independent train.</p>		<p>arguments. Therefore, the suggested discussion is not needed in the methodology.</p>
<p>11. Page 31, Section 4.1.1 pressure boundary function SHOULD INCLUDE:</p> <p>(1) Structural integrity under CLB design loading conditions, and</p> <p>(2) General Design Criterion 19, "Control Room," in addition to Part 100 when discussing adequate radiation protection.</p>	<p align="center">Yes</p>	<p>The current definition of pressure boundary is quoted directly from the Calvert Cliffs Q-List Design Standard and BGE does not see the need to modify this definition for license renewal. Safety-related equipment must perform their intended functions as described in the CLB. A statement to this effect will be added to the first paragraph in Section 4.1.1.</p>
<p>12. Page 39, Section 4.3 shows the commodity groups. ARE CABLE TRAYS CONSIDERED PART OF A SPECIFIED COMMODITY GROUP?</p>	<p align="center">None</p>	<p>Cable trays are in the component supports commodity evaluation.</p>
<p>13. Page 42, Sections 5.1.1 and 5.1.2, REPLACE the word "motion" with "moving parts".</p>	<p align="center">Yes</p>	<p>We will make the requested change to the methodology.</p>
<p>14. Page 43, Section 5.2, Determination of Long-lived: Replacement on performance or condition.</p> <p>The rule does not allow SCs to be determined to be short-lived (not long-lived) based on a condition monitoring program. The portion of the Statement of Consideration (SOC) that is referenced on page 43 is intended to clarify</p>	<p align="center">Yes</p>	<p>The replacement on condition steps of Section 5.2 resulted from a BGE misinterpretation of the SOC (60FR22478). We will move the discussion of replacement on condition to a new Section 6.1.4 (including Table 5-1) and characterize these steps as another approach to performing an AMR without specifically addressing ARDMs.</p>

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<p>the agency's position that SCs are considered long-lived if they are subject to a condition monitoring program (and not subject to a replacement based on a qualified life or specified time period) and that these SCs are subject to an AMR. Additionally, the SOC indicates that an applicant can use replacement programs based on performance or condition that provides reasonable assurance that the functionality of that SC will be maintained. THIS SECTION NEEDS TO BE REVISED TO BE IN COMPLIANCE WITH THE RULE OR A DISCUSSION NEEDS TO BE PROVIDED AS TO HOW THIS WOULD SATISFY THE REQUIREMENTS OF THE RULE.</p> <p>Additionally, it is not clear what site documentation will be available that justifies that the three criteria of Table 5-1 are met. PROVIDE ADDITIONAL INFORMATION EXPLAINING THE SITE DOCUMENTATION that will exist for these determinations and the level of detail in this documentation.</p>		<p>Based on the above change, the documentation to support this step will be changed to be consistent with the AMR process documentation.</p>
<p>15. Page 50, Section 6.1.1 indicates that the pressure-retaining components in the diesel generator supporting equipment would be managed by the diesel generator performance and condition monitoring program. The staff does not believe that the performance and condition monitoring program ensures the structural integrity of these pressure-retaining components under CLB design loading conditions during the period of extended operation. PROVIDE ADDITIONAL DISCUSSION TO DEMONSTRATE HOW STRUCTURAL INTEGRITY UNDER DESIGN LOADS IS ADDRESSED BY THE PERFORMANCE AND CONDITION MONITORING</p>	<p>Yes</p>	<p>The ability of SCs to perform their intended functions under all design conditions should be addressed during the assessment/analysis phase of the aging management program after the effects of aging are discovered.</p> <p>We agree that the discovery techniques available through performance and condition monitoring <u>may</u> require additional supporting evaluations or inspection to ensure that degradation of pressure-retaining components is discovered in a timely manner such that there is a reasonable assurance that the CLB is maintained. In these cases, BGE would develop a</p>

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PROGRAM.		<p>sampling inspection of selected pressure-retaining components. The inspection would be conducted prior to the period of extended operation to discover aging effects that might impact the intended functions under design conditions. The extent of follow-on inspections and/or other activities will be determined based on the results of the sampling inspections.</p> <p>Section 6.1.1 will be modified to include this discussion. Additionally, Section 6.3.3.4 will be expanded to include guidelines for establishing sampling inspections for LR consistent with the executive committee discussions on December 7, 1995.</p>
16. Page 50, Section 6.1.1. In addition to the diesel generator supporting equipment, WHAT OTHER COMPLEX ASSEMBLIES whose only passive function is closely linked to active performance have been identified?	None	This process was also applied to the refrigerant loops of the Control Room HVAC System and the Auxiliary Building and Radiation Waste HVAC System.
<p>17. Page 51, Section 6.1.1, Criteria for use of performance and condition monitoring of complex assemblies as adequate aging management for passive function.</p> <p>One of the criteria is that the "complex assembly" be covered by the Maintenance Rule. PROVIDE SPECIFIC EXAMPLES THAT DEMONSTRATE THE USE OF THIS CRITERION. INCLUDE THE TECHNICAL BASIS for how the passive functions of that "complex assembly" would be preserved by existing Maintenance Rule programs.</p>	Yes	The BGE methodology does not rely on the Maintenance Rule alone to manage the effects of aging. The methodology includes the Maintenance Rule as one factor among many in providing the required demonstration. The contribution of the Maintenance Rule to the IPA demonstration is primarily that the existing performance and condition monitoring programs would have a process which would require periodic assessment of their effectiveness and would lead to improvements in the programs, if needed. The methodology will be changed to clarify that the bullets on page 51 describe the circumstances when this approach should be applied, not the steps of the approach itself.

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<p>18. Page 51, Section 6.1.2 discusses component assemblies subject to refurbishment. It is not clear how the proposed approach addresses the pressure boundary function. For example, page 52 states, "The assembly components and subcomponents are inspected for signs of aging and other degraded conditions." WORDS LIKE "INCLUDING THE PRESSURE-RETAINING BOUNDARY" SHOULD BE INSERTED AFTER THE WORD "SUBCOMPONENTS" in this statement to indicate that the inspection includes looking for degradation in the pressure-retaining boundary. In addition, page 52 states, "The component assembly's intended functions are tested after the refurbishment." CLARIFY THIS STATEMENT because the intended functions are to be performed under CLB design loading conditions which may be difficult to simulate in a test.</p>	<p align="center">Yes</p>	<p>We will add "including pressure boundary" as requested to the cited section of the methodology.</p> <p>The refurbishment activity specifically includes a direct visual observation of the effects of aging and includes a post-refurbishment test consistent with current industry practices and the CLB. The last bullet in Section 6.1.2 will be modified to reflect the above wording in place of "component assembly's intended functions are tested"</p>
<p>19. Page 52, Section 6.1.3, Long-Lived Environmental Qualification (EQ) components</p> <p>This section states that components having an EQ life of greater than 40 years are adequately managed by the EQ program. This is not an acceptable argument. PROVIDE THE RATIONALE TO BE USED TO DEMONSTRATE FURTHER QUALIFICATION OF THESE COMPONENTS for the extended period of operation. For example, how will the qualification of cables for the additional period of service life be demonstrated?</p> <p>Additionally, this section states that the EQ program requires that the component be reanalyzed to extend the qualified life. THE NRC WILL GENERALLY NOT ACCEPT</p>	<p align="center">Yes</p>	<p>The portions of the long-lived EQ components which are covered by the EQ program (organic materials) will be identified as a TLAA and evaluated as a TLAA. (See response to RAI 36.) The options for addressing this TLAA are discussed further in the BGE response to RAI 40.</p> <p>The portions of the long-lived EQ program which are not covered by the EQ program (e.g., valve bodies of solenoid valves) will be addressed in a separate IPA report which addresses the effects of aging using the process described in Section 6.2 of the methodology.</p> <p>Section 6.1.3 will be changed consistent with the above discussion.</p>

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<p>ANALYSIS IN LIEU OF TESTING to determine the qualified life of components. Any one of the four methods in §50.49(f) is acceptable to extend the qualified life of a component.</p>		
<p>20. Page 55, Section 6.2.3 indicates that the rationale for designating whether each ARDM is applicable or not is maintained onsite. This assessment is part of the aging review and SHOULD BE DISCUSSED AS PART OF THE RENEWAL APPLICATION to demonstrate how the requirements of §54.21(a)(3) are being met.</p>	<p align="center">Yes</p>	<p>Baltimore Gas and Electric Company believes that the level of detail requested in this RAI is not required to be included in the LRA by the Rule and accompanying SOC. The SOC (60FR22479) states only that, "the demonstration must include a description of activities, as well as any changes to the CLB and plant modifications that are relied on to demonstrate that the intended functions will be adequately maintained despite the effects of aging in the period of extended operations." The requested rationale will be available onsite for detailed review by NRC Staff and for the use of plant personnel.</p> <p>However, we will modify Section 6.2.3 to state that a listing of all potential ARDMs evaluated during the AMR will be included in the LRA section for each system, structure or commodity group.</p>
<p>21. Page 55, Section 6.3.1 states, "The first phase of a maintenance strategy is identification that detrimental effects of aging are or could be occurring." TIE THE DISCUSSION ON "DISCOVERY" TO THE SC INTENDED FUNCTIONS UNDER CLB DESIGN LOADING CONDITIONS. For example, a phrase like "affecting the structure and component intended functions under CLB design loading conditions" could be inserted after the word "aging" in the above statement. The remainder of the text</p>	<p align="center">Yes</p>	<p>We believe that the ability of SCs to perform their intended functions under all design conditions should be addressed during the assessment/analysis phase of the aging management program after the effects of aging are discovered. This approach is consistent with the current functional evaluation and operability determination procedures (NO-1-106, see Tab 2) used at BGE for maintaining equipment functionality. Once the effects are discovered, a determination will be made of their impact on</p>

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<p>should also be revised accordingly, such as Sections 6.3.2 and 6.3.3. This would avoid relying on inspections that would not discover aging effects before a loss of intended function under a CLB design load.</p>		<p>the ability of the affected components to perform their intended functions under CLB conditions.</p> <p>In order to clarify this point, we will add a statement to the introduction of Section 6.3 to state that one of the goals of aging management is to manage the effects of aging such that the intended functions are maintained consistent with the CLB. The paragraph will also clarify that each of the four phases of the maintenance strategy takes this goal into consideration when determining the adequacy of an existing or proposed program or activity. Additionally, 6.3.1(1) will be modified to state that discovery methods may require augmentation for LR to ensure that the effects of aging are discovered in a timely manner such that there is reasonable assurance that the CLB will be maintained.</p>
<p>22. Page 55, Section 6.3.1 discusses "Discovery." DOES THE METHODOLOGY CALL FOR THE SPECIFIC FREQUENCY of the associated activities, such as inspections, to be described in the renewal application?</p>	<p align="center">None</p>	<p>The methodology does not require inclusion of this level of detail in the LRA. Such information is available, where appropriate, in controlled documents maintained onsite.</p>
<p>23. Page 55, Section 6.3.1 states, "Monitoring and evaluating industry experience also serves as a discovery activity for managing aging since other plants may discover aging effects before CCNPP." Page 60 (Section 6.3.3.5) states, "Monitoring plant and industry experience therefore provides reasonable assurance that these ARDMs will be discovered before they severely affect intended functions at CCNPP." THIS IS NOT CONSISTENT WITH THE REQUIREMENTS OF THE RENEWAL RULE.</p>	<p align="center">Yes</p>	<p>As stated in the methodology, this is a technique used for "unknown, emerging and hypothetical ARDMs" It is not appropriate to take any other actions to manage such aging mechanisms unless and until the need for other actions is demonstrated and what actions would be effective are determined. We believe that this technique for managing such aging mechanisms does meet the requirements of the Rule and is the only reasonable technique under these circumstances. We will not eliminate this option from the methodology.</p>

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NRC COMMENT	METHODOLOGY CHANGE	BGE RESPONSE
<p>The SOC's accompanying the renewal rule explicitly addresses how aging-related Generic Safety Issues (GSIs) and Unresolved Safety Issues (USIs), that is, those being tracked in NUREG-0933, will be treated in renewal (60FR22484). However, for other applicable aging effects, the applicant is expected to provide a demonstration that the effects of aging will be adequately managed to ensure the intended function for renewal. Monitoring industry experience to manage aging for renewal is similar to relying on the regulatory process to manage aging for renewal which was a proposal considered during rule-making to revise the rule but was not adopted in the final rule.</p> <p>Industry operating experience is important in identifying potential aging effects for evaluation in a renewal application. However, a renewal applicant cannot rely solely on monitoring future industry development in lieu of proposing adequate aging management programs in the renewal application. As permitted by the renewal rule, a licensee can modify the aging management programs for renewal to take advantage of future industry development following the requirements of §50.59 or §50.92 if the program is addressed by a technical specification or license condition.</p> <p>DELETE THIS OPTION AS AGING MANAGEMENT FROM THE METHODOLOGY.</p>		<p>However, to clarify the use of this forward-looking and proactive practice, we will modify Section 6.3.1(1) to state that this form of aging management is used as the sole means for unknown and theorized aging mechanisms. The discussion in Section 6.3.3.5 will be amplified to describe the manner in which monitoring industry experience contributes to a more complex aging management program.</p>
<p>24. Page 55, Section 6.3.1 discusses "Assessment/Analysis." DISCUSS HOW THE SC INTENDED FUNCTION UNDER</p>	<p>Yes</p>	<p>During the assessment/analysis phase of the maintenance strategy, the need for and the nature of required corrective</p>

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NRC COMMENT	METHODOLOGY CHANGE	BGE RESPONSE
<p>CLB DESIGN LOADING CONDITIONS would be factored into the assessment/analysis. Also, VERIFY THAT THE ACCEPTANCE CRITERIA would be included in the renewal application.</p>		<p>actions are based on the effects of aging that are discovered, and their impact on the ability of the component to perform its intended function under all design conditions. (This is currently a requirement of site procedures [NO-1-106, see Tab 2]). The following statement will be added to Section 6.3.1(2) - "A safety or safety support system shall be capable of performing its specified safety function for accident prevention and/or mitigation as described in the CLB. Likewise, a system providing a function for a regulated event must be capable of performing that function under the conditions described in the CLB evaluation of the regulated event. The assessment/analysis phase incorporates such requirements in determining the need for and nature of corrective actions after abnormal or degraded conditions are discovered. One possible result of such assessment/analysis would be to repeat the discovery phase using an expanded sample size or using an augmented or improved technique for discovering and quantifying the extent of a particular aging effect."</p> <p>With respect to whether the acceptance criteria are included in the LRA, the methodology does not require inclusion of this level of detail in the LRA. Such information is available, where appropriate, in controlled documents maintained onsite.</p>
<p>25. Page 56, Section 6.3.1 discusses "Corrective Action." IT SHOULD ALSO INCLUDE ROOT CAUSE DETERMINATION AND CORRECTIVE ACTIONS to preclude recurrence.</p>	<p>Yes</p>	<p>We will revise the methodology to clarify that such activities are already required, when appropriate, under site procedures (QL-2-100, see Tab 3) in accordance with 10 CFR Part 50 Appendix B.</p>

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<p>26. Page 58, Section 6.3.3.1 discusses plant programs relied on for renewal. It indicates that the inservice inspection program is one of the programs. Sampling the examples in Appendix A of the report found that the specific edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI inservice inspection program proposed for renewal is not identified. Because the ASME Section XI program can vary with code editions, REVISE THE METHODOLOGY TO HAVE SPECIFIC CODE EDITIONS IDENTIFIED FOR RENEWAL PROGRAMS BEING EVALUATED.</p> <p>Also DISCUSS HOW THE METHODOLOGY WOULD ENSURE the reliability of ultrasonic examinations as described in Appendix VIII of the ASME Section XI code.</p>	<p align="center">Yes</p>	<p>We will revise the methodology to require the specific edition to an industry code to be included in the LRA where the code is credited as part or all of the aging management program.</p> <p>It is not appropriate to address the reliability of any specific program in the methodology. As stated in Section 6.4, BGE will demonstrate the adequacy of any credited aging management program in the specific system, structure or commodity aging management report, not in the methodology.</p>
<p>27. Page 58, second paragraph. DEFINE THE CONTENT OF A "CONDITION MONITORING" PROGRAM as discussed in this paragraph.</p>	<p align="center">None</p>	<p>We believe the phrase is already well understood in the industry and needs no further definition in our methodology. Several examples of condition monitoring programs are included in Table 6-1 (e.g., eddy current testing, vibration monitoring, thermography . . .).</p>
<p>28. Page 58, fifth paragraph. The report states that the LRA could include a commitment to implement a program or modification at an appropriate future date before or during the extended period of operation. THE REPORT SHOULD REFLECT THAT FOR PROGRAMS or modifications delayed until sometime during the extended period of operation and after the initial licensed term, a justification must be</p>	<p align="center">Yes</p>	<p>The methodology will be modified to clarify that justification must be provided for actions which will not be taken until after the beginning of the period of extended operations.</p> <p>With respect to implementation dates of future activities, the methodology does not require inclusion of this level of detail in the LRA. Such information is available, where appropriate, in controlled documents maintained onsite.</p>

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NRC COMMENT	METHODOLOGY CHANGE	BGE RESPONSE
<p>managed. The staff believes that THE CORRECT ARGUMENT SHOULD BE THAT THE DEGRADATION THAT IS OCCURRING WILL NOT RESULT IN LOSS OF THE COMPONENT FUNCTION during the period of extended operation and, therefore, no additional aging management activities or programs are necessary.</p> <p>c) The report also concludes that if industry experience in the interim resolves an aging issue, a one-time inspection would be canceled. The staff agrees that industry resolution of important aging issues will be valuable, however, A DETERMINATION THAT THE INDUSTRY HAS RESOLVED AN ISSUE WOULD NOT RELIEVE AN APPLICANT OF A REQUIREMENT OR COMMITMENT to perform an inspection. (See Comment No. 23 for options to modify aging management programs.)</p> <p>d) Page 60 (Section 6.3.3.4) indicates that a one-time inspection may be completed before the submittal of the renewal application. It also indicates that if no significant degradation is found in the inspection sample, no program is needed other than documenting the inspection. DISCUSS HOW THE RESULTS OF THIS EARLY ONE-TIME INSPECTION WOULD BE EXTRAPOLATED TO DEMONSTRATE THAT THE EFFECTS OF AGING WILL BE ADEQUATELY MANAGED FOR THE PERIOD OF EXTENDED OPERATION.</p>	<p align="center">Yes</p>	<p>The methodology will be modified to clarify that if a commitment which has been previously made needs to be adjusted or canceled, the site commitment management process would be used to govern this activity.</p> <p>The need to extrapolate the results of one-time inspections will depend on the results of the inspection. If the effects of aging are expected to be minimal and no effects are found, no extrapolation would be needed. In such cases, activities such as those described in Section 6.3.3.2 will serve to substantiate the results of the one-time inspections. Other "one-time" inspections could result in the development of a periodic inspection program if results warrant such activities.</p> <p>A discussion consistent with the above paragraph will be added to this section of the methodology.</p>

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NRC COMMENT	METHODOLOGY CHANGE	BGE RESPONSE
<p>31. Page 60, Section 6.3.3.4 gives specific examples of one-time inspection of certain SCs for renewal. Although the one-time inspection is a useful tool for renewal, the staff has not determined whether the cited SCs would be adequately managed for renewal by one-time inspections. For example, freeze-thaw of external concrete is weather condition related, and Alloy 600 materials have cracked in service. Because the review at this time is a methodology review, BGE SHOULD REMOVE THE SPECIFIC EXAMPLES.</p> <p>Similarly, on the same page, the report discusses how the one-time inspection sample may be selected. Again, the concept is useful, but THE REPORT SHOULD NOT MENTION SPECIFIC COMPONENTS such as "valves" and "Alloy 600" in the methodology.</p>	Yes	<p>We believe that the examples provided clarify the steps of the IPA and, therefore, should not be deleted. We are not requesting specific approval of the technical details of the examples as part of the review of this methodology. However, to ensure that examples are not misinterpreted, the specific example pertaining to stress corrosion cracking of Alloy 600 will be deleted.</p>
<p>32. Page 62, Section 6.3.4 indicates that "Assessment," "Corrective Action," and "Confirmation" phases of the aging management are performed through the existing "site issue reporting" and "corrective action program." Describe how the existing site issue reporting and corrective action program would be sensitive to LR issues. For example, "Assessment" would contain acceptance criteria for evaluation to ensure LR intended functions. DESCRIBE HOW THE SITE ISSUE REPORTING AND CORRECTIVE ACTION PROGRAM WOULD BE ALERTED TO THOSE criteria, including NSR equipment that may not have attracted much attention before renewal.</p>	None	<p>None of the SSCs within the scope of LR are any more important because of LR. They are within the scope of LR because they perform important functions independent of LR. Consequently, controls are already in place for such components which ensure issues related to their ability to perform their intended functions are adequately addressed.</p>

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<p>33. Page 62, Section 6.4 indicates that the renewal application would contain a description of the programs and activities that are relied upon to manage the effects of aging. Detailed justification of the adequacy of the programs will be maintained onsite. THIS PROPOSAL COULD RESULT IN A RENEWAL APPLICATION WITHOUT SUFFICIENT DETAIL FOR AN NRC REVIEW. The renewal application must describe the aging management programs and justify why the proposed programs, either existing or additional, are adequate for renewal. Detailed program procedures need not be included in the application. The place for a summary description of programs and activities for managing the effects of aging is the Final Safety Analysis Report supplement and not the renewal application. The documentation description needs to be revised accordingly.</p>	<p align="center">Yes</p>	<p>Sections 6.4 and 7.3 will be modified to clarify that the LRA will contain a demonstration that the effects of aging are adequately managed, as well as a description of programs and activities which manage the aging effects. The detailed justification of the adequacy of each program or activity will continue to be maintained onsite in an auditable format. The discussion in Section 8.4 will also be adjusted as necessary to incorporate this concept.</p>
<p>34. Page 63, Section 7.0 addresses "Commodity Groups." Although the use of commodity groups is generally acceptable, Section 7.0 actually contains the specific aging management programs for these commodity groups. Because the report addresses the IPA methodology and the review at this time is on the methodology, the staff has not reviewed the aging management programs. BALTIMORE GAS AND ELECTRIC COMPANY SHOULD RELOCATE SPECIFIC AGING MANAGEMENT PROGRAMS FOR COMMODITY GROUPS TO APPENDIX A AS EXAMPLES. Aging management of commodities could follow the methodology in Section 6 of the report.</p> <p>Further, the need for Section 7 of the report is unclear. Page 63 (Section 7.0) creates potential confusion by calling</p>	<p align="center">Yes</p>	<p>Section 7 will be modified to include only a description of the alternate process steps. The technical conclusions, which in some cases dictate the nature of the alternate process, will be presented in the individual LRA section on each commodity group.</p>

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<p>some commodity evaluations "equivalent to entire IPA" and some evaluations "equivalent to just AMR." It seems that all of the commodity groups could be pre-evaluated in Section 5.3, including a discussion of any special steps which caused the "equivalent to entire IPA" and "equivalent to just AMR" distinction. Then, based on the above comment, SECTION 7.0 MAY BE DELETED WITH THE SPECIFIC AGING MANAGEMENT PROGRAMS RELOCATED TO APPENDIX A.</p>		
<p>35. Page 68, Section 7.2.1.2. For all non-EQ cables, in addition to thermal aging, potential RADIATION HOT SPOTS SHOULD BE ACCOUNTED FOR in the AMR for the cable commodity.</p>	Yes	<p>No radiation hot spots exist outside of containment and, therefore, radiation hot spots do not need to be considered for non-EQ cable. However, based on the BGE response to RAI 34, this technical detail will be included in the LRA section for this commodity rather than in the methodology.</p>
<p>36. Page 82, Figure 8-1 indicates that, for an evaluation that otherwise meets the definition of TLAA, a "yes" response to "Is SSC covered by CLB program which updates potential TLAA?" would make the evaluation not a TLAA. This is not consistent with §54.3. The CLB program could be a basis for re-evaluating the TLAA for renewal in §54.21(c), but not a basis for disposing of the issue as not a TLAA in 54.3. THE REPORT NEEDS TO BE REVISED TO PROPERLY LABEL TLAAS.</p>	Yes	<p>We will revise the methodology to move the cited TLAA step. Potential TLAAs which satisfy this criterion will be identified as TLAAs and listed in the LRA. This step will be used in the TLAA evaluation process as an aid in resolving the TLAA issue.</p>
<p>37. Page 83 Section 8.1 - What was the RANGE OF SEARCHES USED TO IDENTIFY TLAAS?</p>	None	<p>The range of TLAA searches will be provided in the TLAA submittal, not in the methodology. For your information, the searches which were used are provided in Tables (3), (4) and (5).</p>

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<p>Time-Limited Aging Analyses generally address aging effects that are difficult to be directly monitored. For example, there are currently no acceptable non-destructive methods to measure the extent of embrittlement of a reactor vessel. Also, there are currently no acceptable non-destructive methods to measure the integrity of cables. Thus, in general, it may be unrealistic to rely on the IPA to completely address TLAAAs.</p> <p>The TLAA DISCUSSION NEEDS TO BE REVISED TO BETTER REFLECT THE AGING MANAGEMENT EXPECTATIONS.</p>		<p>The IPA requires a demonstration that the effects of aging are adequately managed for all SCs within the scope of LR that are passive and long-lived. Paragraph 54.21(c) allows three options for addressing TLAAAs, one being a demonstration that the effects of aging are adequately managed for the SCs affected by the TLAA. The definition of TLAA provides that only analyses affecting SCs within the scope of LR are defined as TLAAAs. Therefore, if the IPA was able to demonstrate that the effects of aging associated with the TLAA are adequately managed during the period of extended operations) for a set of SCs, it follows that the requirement under §54.21(c) would also be satisfied. (The requirements are identical.)</p> <p>If certain aging effects associated with the TLAA are difficult or impossible to monitor directly as suggested, the IPA process would have been unsuccessful in demonstrating that the effects of aging are adequately managed by a plant program. Instead, the IPA process would have chosen a more analytical approach, either by extending the existing time-related analysis or substituting an alternate analysis, to demonstrate that the effects of aging would not prevent performance of the intended function. In either case, the requirements of §54.21(c) would still have been satisfied, since §54.21(c) allows extending the TLAA or justifying by analysis that the current analysis remains valid for the period of extended operation.</p> <p>Thus, the only remaining step would be to review the IPA results to ensure that the associated TLAA requirements are also met.</p>

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<p>40. Page 84, Section 8.3 does not provide a methodology on how the re-evaluation of TLAA's would be performed. The rule in §54.21(c) provides options in evaluating TLAA's. Take metal fatigue, as an example: A component would meet §54.21(c)(1)(i) if it has been designed for 200 fatigue cycles and is expected to see less than 200 cycles for 60 years. A component would meet §54.21(c)(1)(ii) if it has a fatigue "cumulative usage factor (CUF)" of less than 0.6 for 40 years, which would be less than unity if increased by 50 percent to cover 60 years. The option in §54.21(c)(1)(iii) would be evaluated case-by-case, such as ASME Section XI ongoing activities regarding management of components with cumulative usage factors that may have exceeded the code limit of unity.</p> <p>The REPORT SHOULD EXPAND SECTION 8.3 TO DESCRIBE THE METHODOLOGY FOR RE-EVALUATING TLAA'S.</p>	<p align="center">Yes</p>	<p>We believe that the actual techniques for reanalysis or extending an existing TLAA would be specific to each time-dependent issue. Where there is already a well defined, widely accepted practice (such as 10 CFR 50.61, 10 CFR 50.49 or ASME code) which governs the TLAA, we will continue to use that process to re-evaluate or extend the TLAA. Wording will be added to Section 8.3 to reflect this discussion.</p> <p>For example, 10 CFR 50.61 clearly describes the requirements associated with pressurized thermal shock. These requirements would be implemented to account for pressurized thermal shock during the period of extended operations. Because this regulation requires a submittal prior to LRA approval, the results of this analysis would be submitted and approved prior to LRA approval.</p> <p>If there is an outstanding generic issue associated with the reanalysis process (such as for EQ), the SOC to the Rule (60FR22484) provides three options: (1) if the issue is resolved before LRA submittal, the applicant can incorporate the resolution into their LRA; (2) an applicant can justify that the CLB will be maintained until a point in time when one or more reasonable options would be available to adequately manage the effects of aging (for this alternative, the applicant would have to describe how the CLB would be maintained until the chosen point in time and generally describe the options available in the future); (3) an applicant could develop a plant-specific program that incorporates a resolution to the aging issue.</p>

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		<p>For example, the requirements for extending a qualified life under the EQ Program are defined in §50.49 and supporting regulatory information. If as a result of current activities, a GSI is associated with EQ, BGE may chose option (2) above to resolve this TLAA. Reliance on the existing 40-year qualification would demonstrate that the CLB is maintained until the 40-year point. The regulatory documents related to the GSI already describe the alternatives which would be available to resolve the issue.</p> <p>Because the above discussion includes BGE's approach for TLAA's which are subject to a GSI or USI, a new Section 6.3.5 will also be added to the methodology to explain the BGE approach for aging management programs which are the subject of a GSI or USI.</p>

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TABLE (1)
Relationship Between Previous and Current Revisions of
IPA Methodology Revision

1993 METHODOLOGY	1995 METHODOLOGY
Volume 1, Section 1: "Introduction" & Volume 2, Section 1: "Introduction."	Section 1: "Introduction."
Volume 1, Section 2: "Screening Methodology Basis and Overview." Volume 2, Section 2: "Component Evaluation Methodology Basis and Overview."	Section 2: "IPA Methodology Basis and Overview."
Volume 1, Section 3: "System Level Screening."	Section 3: "System Level Scoping."
Volume 1, Section 4: "Component Level Screening."	Section 4: "Component Level Scoping."
Volume 1, Section 5: "Component Evaluation and Component Aging Evaluation Tasks."	Deleted. This section in the previous methodology was a brief introduction to the next volume.
Volume 2, Section 3: "Component Evaluation."	Section 5: "Pre-Evaluation."
Volume 2, Section 4: "Component Aging Evaluation."	Section 6: "Aging Management Review", specifically 6.2 "Performing the Aging Management Review by Evaluating Aging Mechanisms." Section 6.1 was added to describe other methods for conducting the AMR.
Volume 2, Section 5: "Implementation Planning Overview."	Section 6.3: "Methods to Manage the Effects of Aging".
-----	Section 7: "Commodity Evaluations." This section describes six cases where the normal IPA process was modified to add efficiency to specific evaluations.
-----	Section 8: "Time Limited Analyses Review." This section describes the process for completing this new requirement in the revised LR Rule.

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TABLE (2)
Resolution of NRC Review Items Associated with the 1993 IPA Methodology

NRC Review Item	Methodology Page	NRC Review Item	Methodology Page
RAI 1	2	RAI 22	No changes
RAI 2	3	RAI 23	No changes
RAI 3 (Conf Item 3)	15	RAI 24	35
RAI 4	Deleted reference to CLB/D throughout the methodology.	RAI 25	37
RAI 5	No changes	RAI 26	38
RAI 6 (Conf Item 1)	Section deleted from the methodology as requested.	RAI 27 (Open Item 1)	19 & 20
RAI 7	13	RAI 28	9 & 10
RAI 8	See response to RAI 6	RAI 29	Bracketed information was deleted as requested.
RAI 9	17	RAI 30	Terminology changes made for consistency throughout.
RAI 10	See response to RAI 6	RAI 31	2
RAI 11	No changes	RAI 32	Terminology changes made for consistency throughout.
RAI 12	See response to RAI 35	RAI 33	15, 29 & 30
RAI 13	16	RAI 34	13
RAI 14	19	RAI 35	Terminology changes made for consistency throughout.
RAI 15	18 & 19	RAI 36	No changes
RAI 16	See response to RAI 14	RAI 37	Definition deleted.
RAI 17	No changes	RAI 38	See response to RAI 4
RAI 18	No changes	RAI 39	22
RAI 19 (Conf Item 5)	21	RAI 40 (Conf Item 2)	22
RAI 20 (Conf Item 4)	21 & 34	RAI 41	No changes
RAI 21	No longer applicable due to rule change.	RAI 42	38 & 39

Note: Page numbers refer to the August 18, 1995 submittal of the BGE IPA Methodology. These page numbers will vary slightly in the marked up version of the methodology.

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TABLE (3)

List of Search Criteria in CCNPP Electronic Docket 1968-92 & Updated Final Safety Analysis Report Revision 17 for Identifying Potential TLAAs During Plant-Specific Search

Search was performed using the first word within five words of the second word. For those with an asterisk, search was also performed using the second word within five words of the first word. Different forms of the words were included in the search using the "+" command.

plant/life
design/life
component/life*
fatigue/life*
fatigue/analysis*
fatigue/analyses*
fatigue/evaluation*
analysis/year
analyses/year
analysis/yr*
analyses/yr*
40/year or 40/yr
forty/year or forty/yr
license/term
license/period
license/life*
erosion/allowance*
corrosion/allowance*
EFPY
effective full power years (searched as complete phrase)
effective full power yr (searched as complete phrase)
life/limit
equipment/life
cycle/year
useful/life*
installed/life*
service/life*
qualified/life*
residual/life*
life expectancy (searched as complete phrase)
life of the plant (searched as complete phrase)

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TABLE (4)

List of Search Criteria in CCNPP Electronic Docket 1968-92 & Updated Final Safety Analysis Report Revision 17 for Identifying Potential Based on Other Utility's Results

Search was performed using the first word within five words of the second word.

reactor/coolant/pump/flywheel/missile
RCP/flywheel/missile
pump/flywheel/missile
pump/flywheels/missile
flywheel
CE/topical/report
Combustion/Engineering/topical report
CEOG/topical/report
Bechtel/topical/report
vendor/topical/report
topical/report
topical/reports

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TABLE (5)

POTENTIAL TLAAs ASSOCIATED WITH CODES, STANDARDS AND REGULATORY DOCUMENTS

CODE/STANDARD/ REGULATORY DOCUMENT	ISSUE DATE(S)	SSC	TLAA-ISSUE
10 CFR Part 50, Appendix G,		Reactor Vessel	Fracture Toughness
10 CFR Part 50, Appendix H		Reactor Vessel	Embrittlement-Neutron Fluence Limit
10 CFR 50.49		Electrical Components Instrumentation Controls	Resistance to Radiation Degradation Effects Aging Qualification Tests
10 CFR 50.61		Reactor Vessel	Embrittlement-Ductility
ACI 318	1971, 1983	Intake Structure Class 1 Structures Containment Offgas Stack and Flue Intake Canal Equipment Supports and Foundations	Loss of Prestress
ACI 349	1980 (1977)	Class 1 Concrete Structures	Loss of Prestress
AISC	1970 Seventh Edition	Class 1 Structures Spent Fuel Pool Liner Intake Structures Primary Containment Structure Reactor Vessel Supports Intake Canal	Fatigue
AISC	1970 Seventh Edition	Crane Rails	Fatigue
ANSI B31.1 B31.1.0	1967	Class 1, 2, 3 Piping Non-Nuclear Piping Hangers, Supports, Blind Flanges, Fittings	Fatigue Corrosion Embrittlement
ANSI B31.7	1969	Class 1, 2, 3 Piping Class 1 Hangers, Supports, and Snubbers Service Water Piping (Saltwater at BGE)	Irradiation Corrosion Fatigue

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TABLE (5)

POTENTIAL TLAAS ASSOCIATED WITH CODES, STANDARDS AND REGULATORY DOCUMENTS

CODE/STANDARD/ REGULATORY DOCUMENT	ISSUE DATE(S)	SSC	TLAA-ISSUE
API 620	12/31/78 Revision 2 Sixth Edition	Condensate Storage Tanks	Settlement Corrosion
API 650	1979 Revision 3 Sixth Edition	Above Ground Oil Tanks Condensate Storage Tanks	Corrosion Settlement
ASME Section III Nuclear Vessels	1965 Edition	Reactor Vessel Steam Generator Pump Bodies Valve Bodies Pressurizer Accumulator Containment	Embrittlement Fatigue Corrosion
ASME Section VIII Division 1 Pressure Vessels	1968 Edition	Pressure Vessels Heat Exchanger Demineralizers Containment Accumulators Head Tanks	Corrosion
ASME Section VIII Division 1 Pressure Vessels	1968 Edition	Air Dryers	Corrosion
ASME Section XI Inservice Inspection	1983 Edition	Reactor Vessel Steam Generator Pressurizer Pumps Valves Supports Piping Core Structures	Fatigue Crack Growth Hydrotest Temperature
ASME Section III Division 2 (Code for Concrete Reactor Vessels and Containments)	1977	Concrete Containment	Loss of Prestress Settlement Fatigue

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TABLE (5)

POTENTIAL TLAAs ASSOCIATED WITH CODES, STANDARDS AND REGULATORY DOCUMENTS

CODE/STANDARD/ REGULATORY DOCUMENT	ISSUE DATE(S)	SSC	TLAA-ISSUE
ASME Section III Nuclear Power Plant Components Division 1	1971 Edition	Reactor Vessel Steam Generator Pressurizer Accumulator Pumps Valves Piping Containment Classes 1, 2, 3 MC	Fatigue
ASME Section III Nuclear Power Plant Components Division 1	1971 Edition	Steam Generator Pressurizer Accumulator Pumps Valves Piping Containment Classes 1, 2, 3 MC	Embrittlement
ASME Section III Nuclear Power Plant Components Division 1	1971 Edition	Reactor Vessel	Embrittlement
ASME Section III Nuclear Power Plant Components Division 1	1971 Edition	Reactor Vessel Steam Generator Pressurizer Accumulator Piping Containment MC	Corrosion
ASME Section III Nuclear Power Plant Components Division 1	1971 Edition	Pumps Valves Classes 1, 2, 3	Corrosion

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TABLE (5)

POTENTIAL TLAAs ASSOCIATED WITH CODES, STANDARDS AND REGULATORY DOCUMENTS

CODE/STANDARD/ REGULATORY DOCUMENT	ISSUE DATE(S)	SSC	TLAA-ISSUE
ASME Section III Nuclear Power Plant Components Division 1	1971 Edition	Reactor Vessel Steam Generator Pressurizer Accumulator Pumps Valves Piping Containment Classes 1, 2, 3 MC	Deterioration of Materials in Service
AWS D1.1	1975	Class 1 Structures (steel) Reactor Vessel Supports Pipe Whip Restraints and Jet Impingement Shields Hangers and Supports	Fatigue
AWWA D100	1973	CST	Corrosion
AWWA D100	1973	Reservoirs	Corrosion
EJMA	1969 3rd Edition	Bellows	Fatigue Corrosion
IEEE-317	1976	Electrical Penetration Assemblies	Qualified Life
IEEE-323	1974	Class 1E Electrical and Instrumentation Equipment in Harsh Environments	General Aging
IEEE-334	1974	Motors	Aging Simulation Motor Life
IEEE-382	1972, 1980	Safety-Related Valve Actuators	Qualified Life
IEEE-383 (ANSI N41.10)	1974	Cables, Splices, Connectors	Environmental Aging
NUREG-0800 SRP 3.6.2	June 1987	Class 1 Piping	Pipe Rupture Locations
NUREG-0800 SRP 8.2	June 1987	Circuit Breakers	Life Cycle Operability
NUREG-0800 SRP 3.6.1	June 1987	Class 1 Piping	Fatigue

ATTACHMENT

**BGE RESPONSE TO
NRC REQUEST FOR ADDITIONAL INFORMATION
INTEGRATED PLANT ASSESSMENT METHODOLOGY**

TABLE (5)

POTENTIAL TLAAs ASSOCIATED WITH CODES, STANDARDS AND REGULATORY DOCUMENTS

CODE/STANDARD/ REGULATORY DOCUMENT	ISSUE DATE(S)	SSC	TLAA-ISSUE
NUREG-0800 SRP 3.7.3	June 1987	Conduits Tunnels Buried Piping	Soil Settlement
NUREG-0800 SRP 3.8.2	June 1987	Steel Containment	Fatigue
NUREG-0800 SRP 3.9.1	June 1987	Reactor Coolant Pressure Boundary	Fatigue
NUREG-0800 SRP 3.9.3	June 1987	Snubbers (Piping Supports)	Evaluation of Fatigue Strength
NUREG-0800 SRP 3.9.4	June 1987	Control Rod Drive System	Life Cycle Operability
NUREG-0800 SRP 3.11	June 1987	Class 1E Equipment	Equipment Qualification
NUREG-0800 SRP 5.3.1	June 1987	Reactor Vessel	Material Surveillance of Vessel
NUREG-0800 SRP 5.3.2	June 1987	Reactor Vessel	Material Surveillance of Vessel
NUREG-0800 BTP MTEB 5-2, B.1.2	June 1987	Reactor Vessel	Fracture Toughness
NUREG-0800 BTP MTEB 5-2, B.3.2	June 1987	Reactor Vessel	Fracture Toughness
NUREG-0800 SRP 5.3.2	June 1987	Reactor Vessel	Fracture Toughness
NUREG-0800 SRP 6.1.1	June 1987	ECCS Components	Corrosion
NUREG-0800 SRP 6.1.1	June 1987	MSIV Actuators	Corrosion
Regulatory Guide 1.121 Revision 0	August 1976	Steam Generator Tubes	Fatigue
Regulatory Guide 1.131 Revision 0	August 1977	Class 1E Electric Cables	Qualification Testing
Regulatory Guide 1.154 Revision 0	January 1987	Reactor Vessel	Operation Under Pressurized Thermal Shock Situation
Regulatory Guide 1.35.1 Revision 0	July 1990	Concrete Containment Structures	Loss of Prestress
Regulatory Guide 1.89 Revision 1	June 1984	Safety-Related Electric Equipment	Requalification of Electrical Components
Regulatory Guide 1.90 Revision 1	August 1977	Concrete Containment Structures	Loss of Prestress

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TABLE (5)

POTENTIAL TLAAS ASSOCIATED WITH CODES, STANDARDS AND REGULATORY DOCUMENTS

CODE/STANDARD/ REGULATORY DOCUMENT	ISSUE DATE(S)	SSC	TLAA-ISSUE
Regulatory Guide 1.99 Revision 2	May 1988	Reactor Vessel	Embrittlement



Calvert Cliffs Nuclear Power Plant

Supporting Information for BGE/NRC License Renewal Discussions

December 6, 1995

For information Only

Industry Operating Experience
Information Processing

1
NS-1-300

2
Functional Evaluation/Operability
Determination

NO-1-106

3
Issue Reporting and Assessment

QL-2-100

4
Commitment Management

RM-1-103

5
Erosion/Corrosion Monitoring of
Secondary Piping

MN-3-111

6
Specification and Surveillance:
Secondary Chemistry

CP-217

7
Not Used

8
Not Used