

Docket Nos. 50-318
and 50-~~309~~ 317

Mr. Robert E. Denton, Vice President
Nuclear Energy Division
Baltimore Gas and Electric Company
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-47027

Dear Mr. Denton:

SUBJECT: DRAFT SAFETY EVALUATION REPORT (DSER) CONCERNING THE BALTIMORE GAS & ELECTRIC COMPANY (BG&E) REPORT ENTITLED "INTEGRATED PLANT ASSESSMENT METHODOLOGY VOLUME 1: SYSTEMS, STRUCTURES AND COMPONENTS SCREENING"

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed your "Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening" (Volume 1), and is transmitting the DSER to you as an enclosure to this letter. The NRC staff will issue a final safety evaluation report upon resolution of the exceptions identified in the DSER as open and confirmatory items.

Upon resolution of one open item and the confirmatory items noted in the DSER, the NRC staff will conclude that the BG&E Volume 1 methodology is acceptable for meeting the requirements of 10 CFR 54.21(a)(1), 10 CFR 54.21(a)(2), 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii). The one identified open item involves the screening process for non-safety-related systems, structures, and components that support non-safety-related systems, structures, and components that have been identified as important to license renewal. In addition, the recently initiated rulemaking may result in changes to the license renewal rule that may necessitate a reevaluation of your Volume 1 methodology.

Once you have reviewed the DSER, the NRC staff would like to schedule a meeting with you to discuss the findings in the DSER, the schedule for resolving the open and confirmatory items, and the status of your "Integrated Plant Assessment Methodology, Volume 2: Component Evaluation."

Sincerely,

Original signed by:
Dennis M. Crutchfield, Associate Director
for Advanced Reactors and License Renewal
Office of Nuclear Reactor Regulation

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Enclosure: DSER

cc w/enclosure: See next page

* See previous concurrence

PDLR:LA	PDLR:SPM	PDLR:SME	OGC	PDLR:SC
CNorsworthy*	RNease*	SLee*	EReis*	PTKuo*
12/21/93	12/21/93	2/17/94	2/3/94	2/17/94

PDLR:SC
FAkstulewicz*
2/11/94
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March 21, 1994

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DRAFT SAFETY EVALUATION REPORT (DSER)
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
CONCERNING
INTEGRATED PLANT ASSESSMENT METHODOLOGY VOLUME 1:
SYSTEMS, STRUCTURES AND COMPONENTS SCREENING

BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT
UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

ENCLOSURE

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SYSTEMS, STRUCTURES AND COMPONENTS SCREENING

BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT
UNIT NOS. 1 AND 2
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

1.1 The License Renewal Rule

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) 50.51, licenses to operate nuclear power plants are issued by the U.S. Nuclear Regulatory Commission (NRC) for a fixed period of time not to exceed 40 years; however these licenses may be renewed by the NRC for an additional period of up to 20 years before expiration of the current operating term. The license renewal rule, 10 CFR Part 54, published on December 13, 1991 (56 FR 64976), and effective on January 13, 1992, sets forth the requirements for the renewal of operating licenses for nuclear power plants.

Applicants for license renewal are required by the license renewal rule to perform an integrated plant assessment (IPA). The first two steps of the IPA, 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2), require the applicant to identify (1) systems, structures, and components (SSCs) that are important to license renewal (ITLR); and (2) structures and components (SCs) necessary for the performance of required functions or whose failure could prevent an SSC ITLR from performing its required function. In addition, applicants for license renewal are required by 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii) to describe and justify the methods used in meeting the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2).

1.2 Scope and Conduct of NRC Staff Review

In letters dated December 15, 1992, and February 25, 1993, Baltimore Gas and Electric Company (BG&E) notified the NRC of its intent to submit a proposed methodology for performing the IPA as described in 10 CFR Part 54. On March 2 and March 12, 1993, BG&E submitted their "Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening" (Volume 1) applicable to Calvert Cliffs Nuclear Power Plant Units 1 and 2, for NRC staff review.

The NRC staff reviewed BG&E's Volume 1 methodology to determine if the process described therein is properly described and justified pursuant to 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii), and will identify SSCs that are ITLR in accordance with 10 CFR 54.21(a)(1) and SCs necessary for the

performance of ITLR functions or whose failure could prevent an SSC ITLR from performing its ITLR function in accordance with 10 CFR 54.21(a)(2). This draft safety evaluation report (DSER) covers Chapters 1 through 4 of BG&E's Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening. The NRC staff's review did not include Chapter 5 or the attachments to Volume 1.

For guidance in performing the review of Volume 1, the NRC staff consulted the Statements of Consideration for 10 CFR Part 54 (56 FR 64943). Although not within the scope of this DSER, the NRC staff examined some of the example screening results presented in the attachments to Volume 1 for an understanding of the logic flow of the methodology using actual plant SSCs. The NRC staff also used the technical assistance of a contractor, Battelle Pacific Northwest Laboratories (PNL), to determine whether SSCs screened using the Volume 1 methodology will meet the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2).

The NRC staff's findings in this DSER are based on the requirements of 10 CFR Part 54, specifically 10 CFR 54.21(a)(4)(i), 10 CFR 54.21(a)(4)(ii), 10 CFR 54.21(a)(1), 10 CFR 54.21(a)(2), and the four subsections of the definition of SSCs ITLR in 10 CFR 54.3 summarized below.

- Subsection (1): Safety-related SSCs
- Subsection (2): Non-safety-related SSCs that directly affect performance of safety-related SSCs
- Subsection (3): SSCs relied on for meeting NRC regulations for fire protection (FP), equipment qualification (EQ), pressurized thermal shock (PTS), anticipated transient without scram (ATWS), and station black-out (SBO)
- Subsection (4): SSCs subject to operability requirements in technical specification limiting conditions for operation (LCO)

In the Volume 1 methodology, BG&E refers to the four subsections of the definition of SSCs ITLR in 10 CFR 54.3 as "criteria." However, for the purposes of this DSER, the subsections of the definition of SSCs ITLR in 10 CFR 54.3 will be referred to as Subsections (1) through (4) as shown above.

After completing an initial review of Volume 1, the NRC staff issued a request for additional information (RAI) on June 1, 1993, to BG&E transmitting questions concerning the Volume 1 methodology and attachments. By letter dated July 30, 1993, BG&E responded to each of the RAI questions. In the letter transmitting their responses to the RAI, BG&E redefined their request for review to cover only the Volume 1 methodology, specifically excluding the attachments to Volume 1. The responses to RAI questions applicable to the redefined scope are discussed in the body of this DSER.

The NRC staff held public meetings with BG&E on June 17, 22, and 23, 1993, to discuss the specifics of the Volume 1 methodology. BG&E provided further clarification of its screening methodology in a number of telephone conferences

conducted from July 1993 to February 1994. A listing of all correspondence including letters, meeting summaries, and telephone conference summaries is provided in Section 5 of this DSER.

The NRC staff will review the implementation of the SSC and SC screening methodology, and the results of the screening, should BG&E submit a license renewal application. At that time, the staff's review may involve audits and/or inspections in selected areas of interest.

2.0 SUMMARY OF BG&E'S VOLUME 1 SCREENING METHODOLOGY

The objective of the Volume 1 screening methodology is to provide a documented basis to ensure that SSCs ITLR defined in 10 CFR 54.3 and SCs necessary for the performance of required functions will be identified in a license renewal application in accordance with the requirements of 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii).

Chapters 1 through 4 of Volume 1 contain BG&E's methodology for evaluating SSCs to determine those that are ITLR and SCs necessary for the performance of required functions as defined in 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2). The attachments to Volume 1 include ITLR screening procedures and results from implementing those procedures for four Calvert Cliffs systems: (1) reactor coolant, (2) compressed air, (3) salt water cooling, and (4) containment. Chapter 5 of Volume 1 contains BG&E's methodology for evaluating SSCs ITLR to determine if they could experience age-related degradation unique to license renewal. As discussed above in Section 1.2, Chapter 5 and the attachments to Volume 1 are not within the scope of this review, as requested by BG&E.

Basically, the Volume 1 methodology describes a process that (1) identifies all systems and structures (S/Ss) ITLR, (2) determines the ITLR functions associated with S/Ss ITLR, (3) identifies the components associated with the systems and S/Ss ITLR, and (4) identifies structures and components (SCs) that contribute to the ITLR function or whose failure could prevent the ITLR function. The result should be identification of all SSCs ITLR and SCs necessary for the performance of ITLR functions or whose failure could prevent an SSC ITLR from performing its ITLR function.

2.1 Levels of Screening

BG&E's Volume 1 screening methodology consists of two separate levels of screening: (1) system and structure level screening, and (2) component level screening.

2.2 System and Structure (S/S) Level Screening

Chapter 3 of Volume 1 provides a process for identifying those S/Ss ITLR which is built around the definition of SSCs ITLR in 10 CFR 54.3. The results of the S/S level screening methodology in Volume 1 are presented in the following tables and screening tools shown in the Volume 1 attachments.

- (1) Table 1, System/Structure Information consists of descriptions and general functional requirements of all S/Ss.

- (2) Design Basis Event (DBE) Screening Tool consists of DBE Flow Charts identifying the safety-related S/Ss (SSCs ITLR definition, Subsection 1) and non-safety-related S/Ss that directly affect performance of safety-related SSCs (SSCs ITLR definition, Subsection 2) for each DBE described in Chapter 14 of the Calvert Cliffs Updated Final Safety Analysis Report (UFSAR).
- (3) FP, EQ, PTS, SBO, and ATWS Screening Tools identify S/Ss and functions relied on for meeting NRC regulations for FP, EQ, PTS, ATWS, and SBO (SSCs ITLR definition, Subsection 3).
- (4) LCO Screening Tool lists the S/Ss subject to LCO requirements (SSCs ITLR definition, Subsection 4).
- (5) Table 2, ITLR S/S Level Screening Results is a summary of S/Ss that are ITLR and the particular subsections of the definition of SSCs ITLR that they meet.

On completion of this step, all S/Ss that are ITLR and the corresponding subsection of the definition of SSCs ITLR that they fall within will have been identified. It should be noted that at Calvert Cliffs every component is assigned to a system or structure.

2.3 Component Level Screening

Section 4 of Volume 1 describes the methodology for meeting the requirement in 10 CFR 54.21(a)(2) to identify the SCs that contribute to the performance of a required ITLR function or could, if they fail, prevent an SSC ITLR from performing its required ITLR function.

The component level screening methodology consists of (1) component level screening for systems, (2) component level screening for structures, and (3) generic commodity component screening.

2.3.1 Component Level Screening for Systems

The component level screening methodology for systems uses the results of the S/S level screening step, specifically the systems that are ITLR, and provides a process to identify all components in each ITLR system and determine which are necessary for the systems to perform their ITLR functions or whose failure could prevent an ITLR function. Sample results of implementing the Volume 1 methodology for component level screening for systems are presented in the following tables and screening tools in the attachments to Volume 1.

- (1) Table 1, ITLR System Functions identifies specific ITLR functions for the system being screened.
- (2) Function Catalog lists each ITLR function and identifies the components in the system being screened required to perform that function.

- (3) Table 2, Component Level ITLR Screening Results lists, for every system determined to be ITLR, each component for each system that is ITLR and its associated ITLR functions.

On completion of component level screening for systems, all system components that are ITLR and their corresponding ITLR functions should have been identified and tabulated.

2.3.2 Component Level Screening for Structures

The component level screening methodology for structures takes the results of the S/S level screening step, specifically the structures that are ITLR, and applies a process to determine which structural components associated with those ITLR structures are necessary for the structures to perform their required ITLR functions, or whose failure could prevent an ITLR function. Sample results of implementing the Volume 1 methodology for component level screening for structures are presented in the following tables and screening tools in the attachments to Volume 1.

- (1) Table 1S, ITLR Structure Functions, identifies specific ITLR functions for the structure being screened.
- (2) Table 2S, Generic Component Level ITLR Structure Screening Results, is an equipment-type listing for structures that identifies generic structural components and structure-specific components in the structure being screened.
- (3) Table 3S, Results of ITLR Structure Screening - Structural Components with Specific ITLR Functions, identifies structural components of ITLR structures and the ITLR functions associated with each structural component.

On completion of component level screening for structures, all structural components that are ITLR and their corresponding ITLR functions, should have been identified and tabulated.

2.3.3 Generic Commodity Components Screening

The component level screening methodology in Volume 1 identifies generic commodity components that provide a support function, such as cables, cable trays, and pipe hangers. The ITLR determination depends on the components that are being supported by these generic commodity components. The licensee's purpose of identifying generic commodity components separately is to allow for aging evaluation and management as commodity groups.

3.0 NRC STAFF EVALUATION

The staff reviewed Chapters 1 through 4 of BG&E's Volume 1 to determine if it meets the requirements of 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii) to describe and justify a methodology that, when implemented, will produce results in accordance with 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2) for identifying SSCs ITLR and SCs required for the performance of an ITLR function.

3.1 Levels of Screening

The first two steps of the IPA described in Part 54 provide a process for determining the scope of SSCs that contribute to required ITLR functions by requiring an applicant for license renewal to (1) identify SSCs important to license renewal in accordance with 10 CFR 54.21(a)(1), and (2) from those, identify SCs necessary for the performance of required functions or whose failure could prevent the performance of a required function in accordance with 10 CFR 54.21(a)(2).

The process described in BG&E's Volume 1 screening methodology meets the combined requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2). The screening process described in Chapters 3 and 4 of Volume 1 proposes two levels of screening: (1) S/S level screening, including those S/Ss which contain ITLR components; and (2) ITLR component level screening. The first level requires that S/Ss ITLR be identified. In this step, an entire system or structure will be ITLR if it contains a component that is ITLR. The second level of screening specifically identifies components in the S/Ss ITLR. All components in those S/Ss will be analyzed to identify those that actually perform an ITLR function or whose failure could prevent an ITLR function, thereby eliminating those components that do not contribute to the performance of an ITLR function.

BG&E's methodology combines the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2), and describes a logical progression for identifying SCs that contribute to the performance of an ITLR function. Identification of such SCs is the intended result of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2). Thus, the staff finds the Volume 1 methodology meets the basic intent of the requirements of the first two steps of the IPA described in 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2).

3.2 Source Documents

BG&E's Volume 1 methodology relies on documents containing portions of the current licensing basis (CLB) to support screening decisions. These documents include but are not limited to the following:

- (1) UFSAR
- (2) Technical Specifications
- (3) Q-list Manual
- (4) BG&E's responses to FP, EQ, PTS, ATWS, and SBO regulations

The staff finds the above list of documents acceptable for use in identifying SSCs ITLR. The staff notes that other references such as design drawings and vendor reports may be necessary for information.

In its RAI of June 1, 1993, Questions 6 and 7, the NRC staff inquired how the hierarchy of the source documents (discussed in Section 2.4 of Volume 1) is used, and if the source document list (in Table 2-1 of Volume 1) is comprehensive. In the responses to RAI Questions 6 and 7, BG&E stated that the source documents listed in Table 2-1 were used to develop the Volume 1 methodology, and proposed to delete the entire discussion on the hierarchy of source documents in Chapter 2.4 of Volume 1. This is Confirmatory Item 1.

In the response to RAI Questions 6 and 7, BG&E stated that Chapter 2.4 represented general guidance on source documents, and that a complete list of references used to perform each screening task is included with each screening result. In accordance with BG&E's request for review redefined in their letter of July 30, 1993, the NRC staff has not evaluated the screening results or the references listed as used to reach those results.

BG&E relies heavily on the use of the Calvert Cliffs Q-list Manual in implementing their Volume 1 screening methodology. On July 5, 1993, the NRC staff held a public meeting with BG&E staff to discuss the roles that ongoing plant programs, such as the Q-list Manual, play in the implementation of the BG&E Volume 1 screening process, and if review of ongoing programs is necessary. The NRC staff questioned whether it was necessary to review the Calvert Cliffs Q-list Manual to be confident that it can be used to correctly identify the SSCs ITLR. Although the Q-List Manual is not docketed and has not been formally reviewed and approved by the NRC, it is, nonetheless, implemented through the Calvert Cliff's existing quality assurance program in accordance with Appendix B to 10 CFR Part 50, and is subject to the NRC's regulatory oversight process. Thus, the staff finds that a wholesale review of the Calvert Cliffs Q-List Manual is not necessary to have confidence that it can be used as described in the Volume 1 methodology to identify SSCs ITLR. However, should BG&E submit an application for license renewal, the NRC staff may choose to audit portions of the Q-list Manual as part of the application review.

3.3 System and Structure (S/S) Level Screening

Chapter 3 of Volume 1, S/S Level Screening, describes a process for applying each of the four classes of SSCs within the definition of SSCs ITLR in Part 54 to determine S/Ss that are ITLR. The NRC staff's evaluation of how BG&E addresses each subsection on the definition of SSCs ITLR is discussed below. Results of implementing the S/S level screening step are presented as "Screening Tools" in the attachments to Volume 1. Although not within the scope of this review, the NRC staff sampled the screening tools in the attachments for further understanding of the methodology. The NRC staff will review the results of the S/S level screening presented in the screening tools if an application for license renewal is tendered.

3.3.1 System and Structure Level Screening Using Subsections (1) and (2) of the Definition of SSCs ITLR

The Volume 1 methodology uses the DBE accident analyses described in Chapter 14 of the UFSAR and the Calvert Cliffs Q-list Manual to identify S/Ss falling within Subsections (1) and (2) in the definition of SSCs ITLR in 10 CFR 54.3. The Q-List Manual contains accident shutdown flow sheets which identify safety-related functions and systems required for the performance of safety-related functions for 17 of the accident analyses described in Chapter 14 of the UFSAR. The Volume 1 screening methodology requires that a DBE flowchart be prepared from each of the 17 accident shutdown flow sheets in the Q-list Manual to identify S/Ss falling within Subsections (1) and (2) of the definition of SSCs ITLR in 10 CFR 54.3. For the remaining accident analyses described in Chapter 14 of the UFSAR that do not have accident shutdown flow sheets in the

Q-list Manual, the Volume 1 methodology directs that DBE flowcharts be prepared from the UFSAR Chapter 14 description unless all S/Ss required to perform in the accident analysis already appear in another DBE flowchart or no S/Ss are required to perform. In addition, a vital auxiliaries flowchart is prepared to identify support equipment whose failure could prevent the performance of a safety-related function.

In RAI Question 17, the NRC staff asked for clarification concerning the term "credited" used in the Volume 1 methodology. BG&E responded by stating that a system or structure is "credited" if it is called upon to operate to mitigate the consequences of the event. Whereas, a system or structure may be "mentioned" because its operation or failure is assumed to be the initiator of the event or is assumed to make the event more severe. The staff agrees with this clarification when used in the Volume 1 methodology to identify systems and structures that are relied on in an accident analysis to operate, or relied on by BG&E in an analysis or evaluation to demonstrate compliance with the PTS, FP, SBO, ATWS, and EQ rules.

In order to ensure that structures falling within Subsections (1) and (2) of the definition of SSCs ITLR are identified, the Volume 1 screening methodology includes reviewing Chapter 5 of the UFSAR and the Q-List Manual to determine those structures or portions thereof that are Class 1. In their July 30, 1993, response to RAI Question 40 inquiring about the relationship between Class 1 and safety-related, BG&E proposed to revise Section 3.4.1.2 of Volume 1 to clarify that in the Q-list Manual all Class 1 structures are safety-related, therefore ITLR. This is Confirmatory Item 2.

In RAI Question 3, the NRC staff challenged the configuration of the flowchart in Figure 2-1 that appeared to indicate that only Class 1 structures are ITLR. In their response, BG&E stated that structures falling within Subsection (2) of the definition of SSCs ITLR are all located within Class 1 structures, and committed to modifying Figure 2-1 to more accurately represent the structures screening process. This is Confirmatory Item 3. BG&E further stated that the component level screening in Volume 1 requires identification of equipment within Class 1 structures that are mounted in accordance with seismic Class II/I criteria. See Section 3.4.2 of this DSER for discussion of component level screening of structures.

In RAI Question 27, the NRC staff asked how the Volume 1 methodology will treat a non-safety-related S/S that provides supporting functions to another non-safety-related S/S that is ITLR. In response, BG&E stated that the Volume 1 screening methodology will identify as ITLR a non-safety-related S/S whose failure could directly prevent the function of a safety-related S/S, but will not identify as ITLR a non-safety-related S/S supporting another non-safety-related S/S that is required for a safety-related S/S to perform its function. The staff regards the BG&E methodology as taking too narrow a view of the intent of the license renewal rule. While the BG&E approach has merit in its clarity, and the scope of SSCs affected may be quite small, the staff's position remains that an SSC should be ITLR if its failure could prevent another SSC from performing any of the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. The intent of this position is not to search for hidden or unanticipated failures, but to include

Q-list Manual, the Volume 1 methodology directs that DBE flowcharts be prepared from the UFSAR Chapter 14 description unless all S/Ss required to perform in the accident analysis already appear in another DBE flowchart or no S/Ss are required to perform. In addition, a vital auxiliaries flowchart is prepared to identify support equipment whose failure could prevent the performance of a safety-related function.

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In order to ensure that structures falling within Subsections (1) and (2) of the definition of SSCs ITLR are identified, the Volume 1 screening methodology includes reviewing Chapter 5 of the UFSAR and the Q-List Manual to determine those structures or portions thereof that are Class 1. In their July 30, 1993, response to RAI Question 40 inquiring about the relationship between Class 1 and safety-related, BG&E proposed to revise Section 3.4.1.2 of Volume 1 to clarify that in the Q-list Manual all Class 1 structures are safety-related, therefore ITLR. This is Confirmatory Item 2.

In RAI Question 3, the NRC staff challenged the configuration of the flowchart in Figure 2-1 that appeared to indicate that only Class 1 structures are ITLR. In their response, BG&E stated that structures falling within Subsection (2) of the definition of SSCs ITLR are all located within Class 1 structures, and committed to modifying Figure 2-1 to more accurately represent the structures screening process. This is Confirmatory Item 3. BG&E further stated that the component level screening in Volume 1 requires identification of equipment within Class 1 structures that are mounted in accordance with seismic Class II/I criteria. See Section 3.4.2 of this DSER for discussion of component level screening of structures.

In RAI Question 27, the NRC staff asked how the Volume 1 methodology will treat a non-safety-related S/S that provides supporting functions to another non-safety-related S/S that is ITLR. In response, BG&E stated that the Volume 1 screening methodology will identify as ITLR a non-safety-related S/S whose failure could directly prevent the function of a safety-related S/S, but will not identify as ITLR a non-safety-related S/S supporting another non-safety-related S/S that is required for a safety-related S/S to perform its function. The staff regards the BG&E methodology as taking too narrow a view of the intent of the license renewal rule. While the BG&E approach has merit in its clarity, and the scope of SSCs affected may be quite small, the staff's position remains that an SSC should be ITLR if its failure could prevent another SSC from performing any of the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. The intent of this position is not to search for hidden or unanticipated failures, but to include

SSCs which have a direct bearing on the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. Since the staff's position has generic implications, rulemaking is underway, and the NRC Regulatory Guidance has yet to be developed, the issue is considered open at this time. This is Open Item 1.

Additionally, the staff reviewed BG&E's methodology for screening of non-safety-related S/Ss that have been identified as ITLR using Subsection (4) of the definition of ITLR in 10 CFR 54.3. BG&E's methodology requires that non-safety-related S/Ss be ITLR if they directly support SSCs ITLR under Subsection (4) of the definition of ITLR in 10 CFR 54.3. The staff finds that the BG&E position and methodology are again at odds with the intent of the rule. Specifically, the staff's position for the current rule is that an SSC should be ITLR if it is necessary for an SSC with operability requirements contained in the technical specifications LCOs, to be operable. Therefore, the staff cannot accept BG&E's methodology for screening non-safety-related S/Ss under Subsection (4) of the definition of ITLR at this time. Because this issue is closely related to Open Item 1 discussed above, and is being reconsidered in the rulemaking underway, the staff has expanded the scope of Open Item 1 to include both of the staff's concerns.

With the exception of Open Item 1 discussed above, the NRC staff finds that the process described in Section 3.4.1 of BG&E's Volume 1 screening methodology is acceptable for use in identifying S/Ss that fall within Subsections (1) and (2) of the definition of SSCs ITLR in 10 CFR 54.3.

3.3.2 System and Structure Level Screening Using Subsection (3) of the Definition of SSCs ITLR

The Volume 1 methodology requires BG&E to review their evaluations for meeting the requirements of the FP, EQ, PTS, ATWS, and SBO rules and various CLB documents to identify the S/Ss falling within Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3. In Subsection (3) of the definition of ITLR in 10 CFR Part 54.3, SSCs relied on in safety analyses or plant evaluations to demonstrate compliance with the requirements of the FP, EQ, PTS, SBO, and ATWS rules are ITLR. The Volume 1 screening methodology states that S/Ss will be identified as ITLR if they are "credited" in the analysis or evaluation that demonstrates compliance with the regulation listed in Subsection (3). As discussed above in Section 3.3.1, BG&E's response to RAI Question 17 clarified the term "credited" used in the Volume 1 methodology by stating that a system or structure is "credited" if it is called upon to operate to mitigate the consequences of the event; whereas, a system or structure may be "mentioned" because its operation or failure is assumed to be the initiator of the event or is assumed to make the event more severe, i.e., used in establishing the worst case scenario. Based on this clarification of the term "credited," the staff finds that identifying S/Ss that are credited in an analysis or evaluation that demonstrates compliance with the FP, EQ, PTS, SBO or ATWS rules as ITLR meets the Subsection (3) definition of SSCs ITLR in 10 CFR 54.3.

FP, EQ, ATWS: Chapter 3 of the Volume 1 screening methodology basically echoes the provisions of 10 CFR 54.3 by stating that all S/Ss that are relied on to demonstrate compliance with the FP, EQ, and ATWS rules, will be ITLR. The

methodology further states that evaluations performed to demonstrate compliance, CLB documents, the Calvert Cliffs Q-list Manual, and BG&E submittals to the NRC are some of the documents that will be reviewed to identify S/Ss that meet Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3. The complete list of documents reviewed to identify these S/Ss is included with each of the screening tools in the attachments to Volume 1. Because the screening tools are not within the scope of this DSER, the NRC staff chooses not to judge whether the lists of documents reviewed are comprehensive enough to capture all S/Ss relied on to comply with the FP, EQ, and ATWS rules.

Because the methodology essentially restates Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3, the NRC staff finds that the Volume 1 methodology requirement to identify as ITLR all S/Ss that are relied on to demonstrate compliance with the FP, EQ, and ATWS rules is acceptable for meeting the FP, EQ, and ATWS requirements in Subsection (3) in the definition of SSCs ITLR in 10 CFR 54.3.

SBO: In Chapter 3.3.2.5 of the Volume 1 methodology, BG&E will review their SBO analysis to identify all S/Ss that are relied upon during an SBO event, specifically excluding those S/Ss relied on for power restoration of an SBO event. In RAI Question 20, the NRC staff stated that equipment necessary for power restoration after an SBO event falls within the scope of the SBO rule (10 CFR 50.63), thus should be considered ITLR. In their response to RAI Question 20, BG&E proposed a revision to the Volume 1 methodology stating that SSCs relied on for power restoration following an SBO event were considered in developing the Volume 1 methodology. This is Confirmatory Item 4. BG&E concluded that all SSCs relied on for power restoration will fall within the other subsections in the definition of SSCs ITLR in 10 CFR 54.3, therefore a separate step in the methodology to look at SSCs relied on for power restoration is not necessary. Upon satisfactory resolution of Confirmatory Item 4, the NRC staff will find that the Volume 1 methodology requirement to identify as ITLR all S/Ss that are relied on during an SBO event is acceptable for meeting the SBO provision in Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3.

The complete list of reference documents to be used to identify these S/Ss is included in the SBO screening tool in Attachment C to Volume 1. Because the screening tools are not within the scope of this DSER, the NRC staff chooses not to judge whether the list of documents reviewed are comprehensive enough to capture all S/Ss relied on to comply with the SBO rule.

PTS: In RAI Question 19, the NRC staff questioned the scope of what is to be included in the Volume 1 screening methodology for PTS, described in Chapter 3.3.2.3. In the response to RAI Question 19, BG&E proposed a change to the Volume 1 methodology that will provide a PTS screening process only if the PTS criteria in 10 CFR 50.61 are exceeded. This is Confirmatory Item 5. If the PTS criteria are exceeded, BG&E will perform a Regulatory Guide 1.154 ("Format and Content of Plant-Specific Pressurized Thermal Shock Safety Analysis Reports for Pressurized Water Reactors") analysis to satisfy the requirements of 10 CFR 50.61 which will, in turn, trigger an update to the system level and component level screening results to identify SSCs that are relied on to meet the PTS rule. Upon resolution of Confirmatory Item 5, the NRC staff will find that the Volume 1 methodology requirement to identify all S/Ss in a Regulatory

Guide 1.154 analysis that are relied on to comply with the PTS rule, meets the PTS provision of Subsection (3) in the definition of SSCs ITLR in 10 CFR 54.3.

3.3.3 System and Structure Level Screening Using Subsection (4) of the Definition of SSCs ITLR

The Volume 1 screening methodology will identify S/Ss which are specifically required to be operable by an LCO in the technical specifications and all supporting systems necessary for their operation. In RAI Question 21, the NRC staff questioned the use of technical specification improvement criteria to eliminate certain S/Ss from being identified as ITLR. The NRC staff further stated that this is not consistent with 10 CFR Part 54. In their response, BG&E stated that S/Ss that have operability requirements in the version of the technical specifications at the time of application should be identified as ITLR. Therefore, BG&E agrees with the NRC staff that S/Ss with operability requirements written expressly into the technical specifications are ITLR.

The BG&E methodology also requires S/Ss to be ITLR if they are necessary to support S/Ss with operability requirements in technical specifications LCOs. However, the methodology is such that non-safety-related S/Ss will be identified as ITLR only if they directly support an SSC that is ITLR under Subsection (4) of the definition of ITLR in 10 CFR 54.3. Consequently, a non-safety-related S/S that supports another non-safety-related S/S that supports an S/S that is ITLR under Subsection (4) will not be identified as ITLR. The staff disagrees with the BG&E methodology on this point. The staff position concerning the identification of non-safety-related S/Ss as ITLR is discussed as Open Item 1 in Section 3.3.1 of this report.

3.4 Component Level Screening

Section 4 of the Volume 1 methodology instructs that components of S/Ss be identified as ITLR if they are required for a system or structure to perform its required ITLR function or, if they fail, could prevent a system or structure from performing its required ITLR function, in accordance with 10 CFR 54.21(a)(2). All components are parts of systems and structures. Component level screening described in the Volume 1 methodology is divided into three areas: (1) component level screening for systems, (2) component level screening for structures, and (3) screening of generic commodity components. The NRC staff's evaluation of BG&E's component level screening methodology which is discussed below follows this format.

3.4.1 Component Level Screening for Systems

The component level screening for systems described in the Volume 1 methodology starts with the systematic review of all systems determined to be ITLR in the S/S level screening steps discussed above to identify the associated ITLR functions that these systems perform. The results of this step are compiled in the ITLR System Function Table, with each ITLR function assigned an identification number. The plant's Master Equipment List provides a listing of all components for each ITLR system. For each function in the ITLR System Function Table a list of the components required to perform that function is identified and compiled in the Function Catalog. The Function Catalog is used

to produce the Component Level Screening Results Table which lists the components of each ITLR system, designates whether they are ITLR, and provides the ITLR function(s). A component that does not perform an ITLR function will be listed in the component level screening results, but designated as not ITLR.

The NRC staff finds the component level screening process for systems described in Chapter 4.1 of Volume 1 acceptable for use in identifying components of systems that contribute to the performance of a required ITLR function or whose failure could prevent an SSC ITLR from performing its ITLR function in accordance with the requirements of 10 CFR 54.21(a)(2).

3.4.2 Component Level Screening for Structures

The Volume 1 methodology consists of reviewing the structures determined to be ITLR in the S/S level screening steps to identify the structural components that contribute to the performance of an ITLR function, or whose failure could prevent an SSC from performing its ITLR function. To do this, BG&E has identified a generic list of structural components and a generic list of ITLR functions that structures or structural components perform. For certain structures that are also part of a system, such as the containment, the system components will also be screened in the component level screening process for systems described above.

The Volume 1 methodology requires that each ITLR structure be reviewed against the generic list of structural ITLR functions to determine the ITLR function(s) that each ITLR structure performs. The ITLR structure is then reviewed against the generic list of structural components to list the structural components actually contained in the ITLR structure. Any structure-specific components in the ITLR structures, such as prestressed tendons in the containment, will be added to this listing. The last step is to combine the structural component listing with the ITLR structural functions. The results will be presented in Table 3S, Results of ITLR Structure Screening - Structural Components with Specific ITLR Functions, which identifies each ITLR structural component and its ITLR function(s) for the ITLR structure being screened.

The NRC staff finds the component level screening process for structures described in Chapter 4.2 of Volume 1 acceptable for use in identifying components of structures that contribute to the performance of a required ITLR function or whose failure could prevent an SSC ITLR from performing its ITLR function in accordance with the requirements of 10 CFR 54.21(a)(2).

3.4.3 Generic Commodity Components Screening

Chapter 4.3 of the Volume 1 methodology provides for screening generic commodity components such as cables, snubbers, and pipe hangers to determine if they are ITLR. These commodity components provide a support function for other SSCs and their ITLR determination will be based on Subsection (2) of the SSCs ITLR definition, therefore a commodity component will be ITLR if it supports a safety-related S/S. The purpose stated in the Volume 1 methodology for such grouping of components is to allow for aging evaluation and management of these components generically as groups rather than individually. The staff's position concerning identification of SSCs meeting Subsection (2) of the definition of

ITLR in 10 CFR 54.3 is discussed as open Item 1 in Section 3.3.1 of this report. Upon resolution of Open Item 1, the staff will conclude that a separate screening for commodity components ITLR is acceptable for identifying items within Subsection (2) of the definition of SSCs ITLR in 10 CFR 54.3.

4.0 CONCLUSIONS

Based on the evaluation of BG&E's Volume 1 screening methodology as discussed above, and upon satisfactory resolution of the open and confirmatory items noted in the foregoing text of this DSER, the NRC will conclude that the BG&E methodology is acceptable for meeting the requirements of 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii), in that it describes and justifies a process to be used to meet the requirements of paragraphs 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2) including specific criteria for determining whether an SSC is important to license renewal and criteria for determining whether a system or structure is necessary for the performance of a required function.

Listed in Table 1 of this report is a short description of each open and confirmatory item discussed in the text of this DSER. Open and confirmatory items are referred to by number in the body of this DSER and in Table 1. The section of this safety evaluation where the item is discussed is referenced in the description. Confirmatory Items are those issues for which the NRC staff and BG&E have reached agreement on the resolution, but the appropriate documentation has not been formally submitted to the NRC. Open Items are those issues for which an agreement has not been reached.

5.0 CORRESPONDENCE

1. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated December 21, 1992, prepared by R. Anand of the NRC for a meeting between the NRC and BG&E held on November 19, 1992.
2. Letter to U.S. Nuclear Regulatory Commission, Attention Dr. T. E. Murley, from Robert E. Denton of Baltimore Gas and Electric Company dated December 15, 1992.
3. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated February 24, 1993, prepared by R. Anand of the NRC for a meeting between the NRC and BG&E held on February 4, 1993.
4. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated February 25, 1993.

5. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated March 2, 1993. This letter transmitted the following portions of the "Calvert Cliffs Nuclear Power Plant Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening:"
 - Systems, Structures and Components Screening Methodology
 - Systems and Structures Screening Procedure
 - Systems and Structures Screening Results
6. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated March 12, 1993. This letter transmitted the remaining portions of the "Calvert Cliffs Nuclear Power Plant Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening:"
 - Component Level ITLR Screening Procedure for Systems
 - Component Level ITLR Screening Procedure for Structures
 - Component Level ITLR Screening Results for the Reactor Coolant, Compressed Air, Saltwater, and Containment Systems
7. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated May 3, 1993, prepared by R. Anand of the NRC for a meeting between the NRC and BG&E held on April 14, 1993.
8. Letter to Robert E. Denton of Baltimore Gas and Electric Company from Rebecca L. Nease of the NRC dated June 1, 1993. This letter was a request for additional information that transmitted 42 questions to BG&E concerning their "Calvert Cliffs Nuclear Power Plant Integrated Plant Assessment Methodology: Systems, Structures and Components Screening."
9. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated July 15, 1993, prepared by R. L. Nease of the NRC for a meeting between the NRC and BG&E held on June 17, 1993.
10. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated July 15, 1993, prepared by R. L. Nease of the NRC for a meeting between NRC and BG&E held on June 22 and 23, 1993.
11. Summary of conference call held on July 28, 1993, between NRC, PNL, and BG&E staff to discuss PNL's comments on the Volume 1 methodology.
12. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated July 30, 1993. This letter transmitted BG&E's responses to the NRC's RAI of June 1, 1993.
13. Summary of conference call held on August 18, 1993, between NRC staff and BG&E staff to discuss specific examples of implementing the Volume 1 methodology.

14. Summary of conference call held on August 26, 1993, between NRC staff and BG&E staff to discuss how the polar crane will be handled in the Volume 1 methodology.
15. Summary of conference call held on December 9, 1993, between NRC staff and BG&E staff to discuss points of clarification concerning BG&E's RAI responses.
16. Summary of conference call held on December 21, 1993, between NRC staff and BG&E staff to discuss points of clarification concerning the difference between source documents used to develop the methodology and source documents used to perform the screening for SSCs ITLR.
17. Summary of conference call held on February 4, 1994, between NRC staff and BG&E staff to discuss points of clarification concerning the screening of generic commodity components for identifying SSCs ITLR.
18. Summary of conference call held on February 15, 1994, between NRC staff and BG&E staff to discuss points of clarification concerning the screening of generic commodity components for identifying SSCs ITLR.

TABLE 1 - OPEN AND CONFIRMATORY ITEMS

<u>OPEN ITEM NUMBER</u>	<u>DESCRIPTION</u>
1.	<p>S/S Level Screening Using Subsections (2) and (4) - Sections 3.3.1 and 3.3.3: The staff views the BG&E identification of non-safety-related S/Ss as ITLR under Subsection (2) of the definition of SSCs ITLR in 10 CFR 54.3 as taking too narrow a view of the Commission's intent under the rule. The staff's position is that an SSC should be ITLR if its failure could prevent another SSC from performing any of the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. Additionally, the staff has concluded that the BG&E methodology for identifying non-safety-related S/Ss using Subsection (4) of the definition of SSCs ITLR in 10 CFR 54.3 is also at odds with the intent of the rule. Specifically, for Subsection (4), the staff's position is that an SSC is ITLR if it must be operable in order for an SSC subject to operability statements in the technical specifications LCOs to be operable.</p>

<u>CONFIRMATORY ITEM NUMBER</u>	<u>DESCRIPTION</u>
1.	<p>Source Documents, Section 3.2: BG&E has agreed to delete the discussion of hierarchy of source documents in Chapter 2.4 of Volume 1.</p>
2.	<p>System and Structure Level Screening Using Subsections (1) and (2), Section 3.3.1: BG&E agreed to clarify the terms "Class 1" and "safety-related" with respect to structures screening.</p>
3.	<p>System and Structure Level Screening Using Subsections (1) and (2), Section 3.3.1: BG&E agreed to revise Figure 2-1 to clarify that structures meeting both Subsections (1) and (2) are ITLR.</p>
4.	<p>System and Structure Level Screening Using Subsection (4) - SBO, Section 3.3.3: BG&E proposed a revision to the Volume 1 methodology stating that SSCs relied on for power restoration following an SBO event were considered in developing the Volume 1 methodology.</p>
5.	<p>System and Structure Level Screening Using Subsection (4) - PTS, Section 3.3.3: In the response to RAI Question 19, BG&E proposed a change to the Volume 1 methodology that will provide a PTS screening process only if the PTS criteria in 10 CFR 50.61 is exceeded.</p>

March 21, 1994

Mr. Robert E. Denton
Baltimore Gas and Electric Company

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March 21, 1994

Docket Nos. 50-318
and 50-319

Mr. Robert E. Denton, Vice President
Nuclear Energy Division
Baltimore Gas and Electric Company
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-47027

Dear Mr. Denton:

SUBJECT: DRAFT SAFETY EVALUATION REPORT (DSER) CONCERNING THE BALTIMORE GAS & ELECTRIC COMPANY (BG&E) REPORT ENTITLED "INTEGRATED PLANT ASSESSMENT METHODOLOGY VOLUME 1: SYSTEMS, STRUCTURES AND COMPONENTS SCREENING"

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed your "Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening" (Volume 1), and is transmitting the DSER to you as an enclosure to this letter. The NRC staff will issue a final safety evaluation report upon resolution of the exceptions identified in the DSER as open and confirmatory items.

Upon resolution of one open item and the confirmatory items noted in the DSER, the NRC staff will conclude that the BG&E Volume 1 methodology is acceptable for meeting the requirements of 10 CFR 54.21(a)(1), 10 CFR 54.21(a)(2), 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii). The one identified open item involves the screening process for non-safety-related systems, structures, and components that support non-safety-related systems, structures, and components that have been identified as important to license renewal. In addition, the recently initiated rulemaking may result in changes to the license renewal rule that may necessitate a reevaluation of your Volume 1 methodology.

Once you have reviewed the DSER, the NRC staff would like to schedule a meeting with you to discuss the findings in the DSER, the schedule for resolving the open and confirmatory items, and the status of your "Integrated Plant Assessment Methodology, Volume 2: Component Evaluation."

Sincerely,

Original signed by:
Dennis M. Crutchfield, Associate Director
for Advanced Reactors and License Renewal
Office of Nuclear Reactor Regulation

Enclosure: DSER

cc w/enclosure: See next page

* See previous concurrence

PDLR:LA	PDLR:SPM	PDLR:SME	OGC	PDLR:SC
CNorsworthy*	RNease*	SLee*	EReis*	PTKuo*
12/21/93	12/21/93	2/17/94	2/3/94	2/17/94

PDLR:SC	PDLR:D
FAkstulewicz*	SNewberry
2/17/94	3/9/94
Document Name:	DSERBG&E.RN

ADAM AD
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3/21/94

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DRAFT SAFETY EVALUATION REPORT (DSER)
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
CONCERNING
INTEGRATED PLANT ASSESSMENT METHODOLOGY VOLUME 1:
SYSTEMS, STRUCTURES AND COMPONENTS SCREENING

BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT
UNIT NOS. 1 AND 2

DOCKET NOS. 50-317 AND 50-318

ENCLOSURE

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DRAFT SAFETY EVALUATION REPORT (DSER)
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CONCERNING
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SYSTEMS, STRUCTURES AND COMPONENTS SCREENING

BALTIMORE GAS AND ELECTRIC COMPANY
CALVERT CLIFFS NUCLEAR POWER PLANT
UNIT NOS. 1 AND 2
DOCKET NOS. 50-317 AND 50-318

1.0 INTRODUCTION

1.1 The License Renewal Rule

Pursuant to Title 10 of the Code of Federal Regulations (10 CFR) 50.51, licenses to operate nuclear power plants are issued by the U.S. Nuclear Regulatory Commission (NRC) for a fixed period of time not to exceed 40 years; however these licenses may be renewed by the NRC for an additional period of up to 20 years before expiration of the current operating term. The license renewal rule, 10 CFR Part 54, published on December 13, 1991 (56 FR 64976), and effective on January 13, 1992, sets forth the requirements for the renewal of operating licenses for nuclear power plants.

Applicants for license renewal are required by the license renewal rule to perform an integrated plant assessment (IPA). The first two steps of the IPA, 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2), require the applicant to identify (1) systems, structures, and components (SSCs) that are important to license renewal (ITLR); and (2) structures and components (SCs) necessary for the performance of required functions or whose failure could prevent an SSC ITLR from performing its required function. In addition, applicants for license renewal are required by 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii) to describe and justify the methods used in meeting the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2).

1.2 Scope and Conduct of NRC Staff Review

In letters dated December 15, 1992, and February 25, 1993, Baltimore Gas and Electric Company (BG&E) notified the NRC of its intent to submit a proposed methodology for performing the IPA as described in 10 CFR Part 54. On March 2 and March 12, 1993, BG&E submitted their "Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening" (Volume 1) applicable to Calvert Cliffs Nuclear Power Plant Units 1 and 2, for NRC staff review.

The NRC staff reviewed BG&E's Volume 1 methodology to determine if the process described therein is properly described and justified pursuant to 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii), and will identify SSCs that are ITLR in accordance with 10 CFR 54.21(a)(1) and SCs necessary for the

performance of ITLR functions or whose failure could prevent an SSC ITLR from performing its ITLR function in accordance with 10 CFR 54.21(a)(2). This draft safety evaluation report (DSER) covers Chapters 1 through 4 of BG&E's Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening. The NRC staff's review did not include Chapter 5 or the attachments to Volume 1.

For guidance in performing the review of Volume 1, the NRC staff consulted the Statements of Consideration for 10 CFR Part 54 (56 FR 64943). Although not within the scope of this DSER, the NRC staff examined some of the example screening results presented in the attachments to Volume 1 for an understanding of the logic flow of the methodology using actual plant SSCs. The NRC staff also used the technical assistance of a contractor, Battelle Pacific Northwest Laboratories (PNL), to determine whether SSCs screened using the Volume 1 methodology will meet the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2).

The NRC staff's findings in this DSER are based on the requirements of 10 CFR Part 54, specifically 10 CFR 54.21(a)(4)(i), 10 CFR 54.21(a)(4)(ii), 10 CFR 54.21(a)(1), 10 CFR 54.21(a)(2), and the four subsections of the definition of SSCs ITLR in 10 CFR 54.3 summarized below.

- Subsection (1): Safety-related SSCs
- Subsection (2): Non-safety-related SSCs that directly affect performance of safety-related SSCs
- Subsection (3): SSCs relied on for meeting NRC regulations for fire protection (FP), equipment qualification (EQ), pressurized thermal shock (PTS), anticipated transient without scram (ATWS), and station black-out (SBO)
- Subsection (4): SSCs subject to operability requirements in technical specification limiting conditions for operation (LCO)

In the Volume 1 methodology, BG&E refers to the four subsections of the definition of SSCs ITLR in 10 CFR 54.3 as "criteria." However, for the purposes of this DSER, the subsections of the definition of SSCs ITLR in 10 CFR 54.3 will be referred to as Subsections (1) through (4) as shown above.

After completing an initial review of Volume 1, the NRC staff issued a request for additional information (RAI) on June 1, 1993, to BG&E transmitting questions concerning the Volume 1 methodology and attachments. By letter dated July 30, 1993, BG&E responded to each of the RAI questions. In the letter transmitting their responses to the RAI, BG&E redefined their request for review to cover only the Volume 1 methodology, specifically excluding the attachments to Volume 1. The responses to RAI questions applicable to the redefined scope are discussed in the body of this DSER.

The NRC staff held public meetings with BG&E on June 17, 22, and 23, 1993, to discuss the specifics of the Volume 1 methodology. BG&E provided further clarification of its screening methodology in a number of telephone conferences

conducted from July 1993 to February 1994. A listing of all correspondence including letters, meeting summaries, and telephone conference summaries is provided in Section 5 of this DSER.

The NRC staff will review the implementation of the SSC and SC screening methodology, and the results of the screening, should BG&E submit a license renewal application. At that time, the staff's review may involve audits and/or inspections in selected areas of interest.

2.0 SUMMARY OF BG&E's VOLUME 1 SCREENING METHODOLOGY

The objective of the Volume 1 screening methodology is to provide a documented basis to ensure that SSCs ITLR defined in 10 CFR 54.3 and SCs necessary for the performance of required functions will be identified in a license renewal application in accordance with the requirements of 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii).

Chapters 1 through 4 of Volume 1 contain BG&E's methodology for evaluating SSCs to determine those that are ITLR and SCs necessary for the performance of required functions as defined in 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2). The attachments to Volume 1 include ITLR screening procedures and results from implementing those procedures for four Calvert Cliffs systems: (1) reactor coolant, (2) compressed air, (3) salt water cooling, and (4) containment. Chapter 5 of Volume 1 contains BG&E's methodology for evaluating SSCs ITLR to determine if they could experience age-related degradation unique to license renewal. As discussed above in Section 1.2, Chapter 5 and the attachments to Volume 1 are not within the scope of this review, as requested by BG&E.

Basically, the Volume 1 methodology describes a process that (1) identifies all systems and structures (S/Ss) ITLR, (2) determines the ITLR functions associated with S/Ss ITLR, (3) identifies the components associated with the systems and S/Ss ITLR, and (4) identifies structures and components (SCs) that contribute to the ITLR function or whose failure could prevent the ITLR function. The result should be identification of all SSCs ITLR and SCs necessary for the performance of ITLR functions or whose failure could prevent an SSC ITLR from performing its ITLR function.

2.1 Levels of Screening

BG&E's Volume 1 screening methodology consists of two separate levels of screening: (1) system and structure level screening, and (2) component level screening.

2.2 System and Structure (S/S) Level Screening

Chapter 3 of Volume 1 provides a process for identifying those S/Ss ITLR which is built around the definition of SSCs ITLR in 10 CFR 54.3. The results of the S/S level screening methodology in Volume 1 are presented in the following tables and screening tools shown in the Volume 1 attachments.

- (1) Table 1, System/Structure Information consists of descriptions and general functional requirements of all S/Ss.

- (2) Design Basis Event (DBE) Screening Tool consists of DBE Flow Charts identifying the safety-related S/Ss (SSCs ITLR definition, Subsection 1) and non-safety-related S/Ss that directly affect performance of safety-related SSCs (SSCs ITLR definition, Subsection 2) for each DBE described in Chapter 14 of the Calvert Cliffs Updated Final Safety Analysis Report (UFSAR).
- (3) FP, EQ, PTS, SBO, and ATWS Screening Tools identify S/Ss and functions relied on for meeting NRC regulations for FP, EQ, PTS, ATWS, and SBO (SSCs ITLR definition, Subsection 3).
- (4) LCO Screening Tool lists the S/Ss subject to LCO requirements (SSCs ITLR definition, Subsection 4).
- (5) Table 2, ITLR S/S Level Screening Results is a summary of S/Ss that are ITLR and the particular subsections of the definition of SSCs ITLR that they meet.

On completion of this step, all S/Ss that are ITLR and the corresponding subsection of the definition of SSCs ITLR that they fall within will have been identified. It should be noted that at Calvert Cliffs every component is assigned to a system or structure.

2.3 Component Level Screening

Section 4 of Volume 1 describes the methodology for meeting the requirement in 10 CFR 54.21(a)(2) to identify the SCs that contribute to the performance of a required ITLR function or could, if they fail, prevent an SSC ITLR from performing its required ITLR function.

The component level screening methodology consists of (1) component level screening for systems, (2) component level screening for structures, and (3) generic commodity component screening.

2.3.1 Component Level Screening for Systems

The component level screening methodology for systems uses the results of the S/S level screening step, specifically the systems that are ITLR, and provides a process to identify all components in each ITLR system and determine which are necessary for the systems to perform their ITLR functions or whose failure could prevent an ITLR function. Sample results of implementing the Volume 1 methodology for component level screening for systems are presented in the following tables and screening tools in the attachments to Volume 1.

- (1) Table 1, ITLR System Functions identifies specific ITLR functions for the system being screened.
- (2) Function Catalog lists each ITLR function and identifies the components in the system being screened required to perform that function.

- (3) Table 2, Component Level ITLR Screening Results lists, for every system determined to be ITLR, each component for each system that is ITLR and its associated ITLR functions.

On completion of component level screening for systems, all system components that are ITLR and their corresponding ITLR functions should have been identified and tabulated.

2.3.2 Component Level Screening for Structures

The component level screening methodology for structures takes the results of the S/S level screening step, specifically the structures that are ITLR, and applies a process to determine which structural components associated with those ITLR structures are necessary for the structures to perform their required ITLR functions, or whose failure could prevent an ITLR function. Sample results of implementing the Volume 1 methodology for component level screening for structures are presented in the following tables and screening tools in the attachments to Volume 1.

- (1) Table 1S, ITLR Structure Functions, identifies specific ITLR functions for the structure being screened.
- (2) Table 2S, Generic Component Level ITLR Structure Screening Results, is an equipment-type listing for structures that identifies generic structural components and structure-specific components in the structure being screened.
- (3) Table 3S, Results of ITLR Structure Screening - Structural Components with Specific ITLR Functions, identifies structural components of ITLR structures and the ITLR functions associated with each structural component.

On completion of component level screening for structures, all structural components that are ITLR and their corresponding ITLR functions, should have been identified and tabulated.

2.3.3 Generic Commodity Components Screening

The component level screening methodology in Volume 1 identifies generic commodity components that provide a support function, such as cables, cable trays, and pipe hangers. The ITLR determination depends on the components that are being supported by these generic commodity components. The licensee's purpose of identifying generic commodity components separately is to allow for aging evaluation and management as commodity groups.

3.0 NRC STAFF EVALUATION

The staff reviewed Chapters 1 through 4 of BG&E's Volume 1 to determine if it meets the requirements of 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii) to describe and justify a methodology that, when implemented, will produce results in accordance with 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2) for identifying SSCs ITLR and SCs required for the performance of an ITLR function.

3.1 Levels of Screening

The first two steps of the IPA described in Part 54 provide a process for determining the scope of SSCs that contribute to required ITLR functions by requiring an applicant for license renewal to (1) identify SSCs important to license renewal in accordance with 10 CFR 54.21(a)(1), and (2) from those, identify SCs necessary for the performance of required functions or whose failure could prevent the performance of a required function in accordance with 10 CFR 54.21(a)(2).

The process described in BG&E's Volume 1 screening methodology meets the combined requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2). The screening process described in Chapters 3 and 4 of Volume 1 proposes two levels of screening: (1) S/S level screening, including those S/Ss which contain ITLR components; and (2) ITLR component level screening. The first level requires that S/Ss ITLR be identified. In this step, an entire system or structure will be ITLR if it contains a component that is ITLR. The second level of screening specifically identifies components in the S/Ss ITLR. All components in those S/Ss will be analyzed to identify those that actually perform an ITLR function or whose failure could prevent an ITLR function, thereby eliminating those components that do not contribute to the performance of an ITLR function.

BG&E's methodology combines the requirements of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2), and describes a logical progression for identifying SCs that contribute to the performance of an ITLR function. Identification of such SCs is the intended result of 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2). Thus, the staff finds the Volume 1 methodology meets the basic intent of the requirements of the first two steps of the IPA described in 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2).

3.2 Source Documents

BG&E's Volume 1 methodology relies on documents containing portions of the current licensing basis (CLB) to support screening decisions. These documents include but are not limited to the following:

- (1) UFSAR
- (2) Technical Specifications
- (3) Q-list Manual
- (4) BG&E's responses to FP, EQ, PTS, ATWS, and SBO regulations

The staff finds the above list of documents acceptable for use in identifying SSCs ITLR. The staff notes that other references such as design drawings and vendor reports may be necessary for information.

In its RAI of June 1, 1993, Questions 6 and 7, the NRC staff inquired how the hierarchy of the source documents (discussed in Section 2.4 of Volume 1) is used, and if the source document list (in Table 2-1 of Volume 1) is comprehensive. In the responses to RAI Questions 6 and 7, BG&E stated that the source documents listed in Table 2-1 were used to develop the Volume 1 methodology, and proposed to delete the entire discussion on the hierarchy of source documents in Chapter 2.4 of Volume 1. This is Confirmatory Item 1.

In the response to RAI Questions 6 and 7, BG&E stated that Chapter 2.4 represented general guidance on source documents, and that a complete list of references used to perform each screening task is included with each screening result. In accordance with BG&E's request for review redefined in their letter of July 30, 1993, the NRC staff has not evaluated the screening results or the references listed as used to reach those results.

BG&E relies heavily on the use of the Calvert Cliffs Q-list Manual in implementing their Volume 1 screening methodology. On July 15, 1993, the NRC staff held a public meeting with BG&E staff to discuss the roles that ongoing plant programs, such as the Q-list Manual, play in the implementation of the BG&E Volume 1 screening process, and if review of these ongoing programs is necessary. The NRC staff questioned whether it was necessary to review the Calvert Cliffs Q-list Manual to be confident that it can be used to correctly identify the SSCs ITLR. Although the Q-List Manual is not docketed and has not been formally reviewed and approved by the NRC, it is, nonetheless, implemented through the Calvert Cliff's existing quality assurance program in accordance with Appendix B to 10 CFR Part 50, and is subject to the NRC's regulatory oversight process. Thus, the staff finds that a wholesale review of the Calvert Cliffs Q-List Manual is not necessary to have confidence that it can be used as described in the Volume 1 methodology to identify SSCs ITLR. However, should BG&E submit an application for license renewal, the NRC staff may choose to audit portions of the Q-list Manual as part of the application review.

3.3 System and Structure (S/S) Level Screening

Chapter 3 of Volume 1, S/S Level Screening, describes a process for applying each of the four classes of SSCs within the definition of SSCs ITLR in Part 54 to determine S/Ss that are ITLR. The NRC staff's evaluation of how BG&E addresses each subsection on the definition of SSCs ITLR is discussed below. Results of implementing the S/S level screening step are presented as "Screening Tools" in the attachments to Volume 1. Although not within the scope of this review, the NRC staff sampled the screening tools in the attachments for further understanding of the methodology. The NRC staff will review the results of the S/S level screening presented in the screening tools if an application for license renewal is tendered.

3.3.1 System and Structure Level Screening Using Subsections (1) and (2) of the Definition of SSCs ITLR

The Volume 1 methodology uses the DBE accident analyses described in Chapter 14 of the UFSAR and the Calvert Cliffs Q-list Manual to identify S/Ss falling within Subsections (1) and (2) in the definition of SSCs ITLR in 10 CFR 54.3. The Q-List Manual contains accident shutdown flow sheets which identify safety-related functions and systems required for the performance of safety-related functions for 17 of the accident analyses described in Chapter 14 of the UFSAR. The Volume 1 screening methodology requires that a DBE flowchart be prepared from each of the 17 accident shutdown flow sheets in the Q-list Manual to identify S/Ss falling within Subsections (1) and (2) of the definition of SSCs ITLR in 10 CFR 54.3. For the remaining accident analyses described in Chapter 14 of the UFSAR that do not have accident shutdown flow sheets in the

Q-list Manual, the Volume 1 methodology directs that DBE flowcharts be prepared from the UFSAR Chapter 14 description unless all S/Ss required to perform in the accident analysis already appear in another DBE flowchart or no S/Ss are required to perform. In addition, a vital auxiliaries flowchart is prepared to identify support equipment whose failure could prevent the performance of a safety-related function.

In RAI Question 17, the NRC staff asked for clarification concerning the term "credited" used in the Volume 1 methodology. BG&E responded by stating that a system or structure is "credited" if it is called upon to operate to mitigate the consequences of the event. Whereas, a system or structure may be "mentioned" because its operation or failure is assumed to be the initiator of the event or is assumed to make the event more severe. The staff agrees with this clarification when used in the Volume 1 methodology to identify systems and structures that are relied on in an accident analysis to operate, or relied on by BG&E in an analysis or evaluation to demonstrate compliance with the PTS, FP, SBO, ATWS, and EQ rules.

In order to ensure that structures falling within Subsections (1) and (2) of the definition of SSCs ITLR are identified, the Volume 1 screening methodology includes reviewing Chapter 5 of the UFSAR and the Q-List Manual to determine those structures or portions thereof that are Class 1. In their July 30, 1993, response to RAI Question 40 inquiring about the relationship between Class 1 and safety-related, BG&E proposed to revise Section 3.4.1.2 of Volume 1 to clarify that in the Q-list Manual all Class 1 structures are safety-related, therefore ITLR. This is Confirmatory Item 2.

In RAI Question 3, the NRC staff challenged the configuration of the flowchart in Figure 2-1 that appeared to indicate that only Class 1 structures are ITLR. In their response, BG&E stated that structures falling within Subsection (2) of the definition of SSCs ITLR are all located within Class 1 structures, and committed to modifying Figure 2-1 to more accurately represent the structures screening process. This is Confirmatory Item 3. BG&E further stated that the component level screening in Volume 1 requires identification of equipment within Class 1 structures that are mounted in accordance with seismic Class II/I criteria. See Section 3.4.2 of this DSER for discussion of component level screening of structures.

In RAI Question 27, the NRC staff asked how the Volume 1 methodology will treat a non-safety-related S/S that provides supporting functions to another non-safety-related S/S that is ITLR. In response, BG&E stated that the Volume 1 screening methodology will identify as ITLR a non-safety-related S/S whose failure could directly prevent the function of a safety-related S/S, but will not identify as ITLR a non-safety-related S/S supporting another non-safety-related S/S that is required for a safety-related S/S to perform its function. The staff regards the BG&E methodology as taking too narrow a view of the intent of the license renewal rule. While the BG&E approach has merit in its clarity, and the scope of SSCs affected may be quite small, the staff's position remains that an SSC should be ITLR if its failure could prevent another SSC from performing any of the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. The intent of this position is not to search for hidden or unanticipated failures, but to include

SSCs which have a direct bearing on the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. Since the staff's position has generic implications, rulemaking is underway, and the NRC Regulatory Guidance has yet to be developed, the issue is considered open at this time. This is Open Item 1.

Additionally, the staff reviewed BG&E's methodology for screening of non-safety-related S/Ss that have been identified as ITLR using Subsection (4) of the definition of ITLR in 10 CFR 54.3. BG&E's methodology requires that non-safety-related S/Ss be ITLR if they directly support SSCs ITLR under Subsection (4) of the definition of ITLR in 10 CFR 54.3. The staff finds that the BG&E position and methodology are again at odds with the intent of the rule. Specifically, the staff's position for the current rule is that an SSC should be ITLR if it is necessary for an SSC with operability requirements contained in the technical specifications LCOs, to be operable. Therefore, the staff cannot accept BG&E's methodology for screening non-safety-related S/Ss under Subsection (4) of the definition of ITLR at this time. Because this issue is closely related to Open Item 1 discussed above, and is being reconsidered in the rulemaking underway, the staff has expanded the scope of Open Item 1 to include both of the staff's concerns.

With the exception of Open Item 1 discussed above, the NRC staff finds that the process described in Section 3.4.1 of BG&E's Volume 1 screening methodology is acceptable for use in identifying S/Ss that fall within Subsections (1) and (2) of the definition of SSCs ITLR in 10 CFR 54.3.

3.3.2 System and Structure Level Screening Using Subsection (3) of the Definition of SSCs ITLR

The Volume 1 methodology requires BG&E to review their evaluations for meeting the requirements of the FP, EQ, PTS, ATWS, and SBO rules and various CLB documents to identify the S/Ss falling within Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3. In Subsection (3) of the definition of ITLR in 10 CFR Part 54.3, SSCs relied on in safety analyses or plant evaluations to demonstrate compliance with the requirements of the FP, EQ, PTS, SBO, and ATWS rules are ITLR. The Volume 1 screening methodology states that S/Ss will be identified as ITLR if they are "credited" in the analysis or evaluation that demonstrates compliance with the regulation listed in Subsection (3). As discussed above in Section 3.3.1, BG&E's response to RAI Question 17 clarified the term "credited" used in the Volume 1 methodology by stating that a system or structure is "credited" if it is called upon to operate to mitigate the consequences of the event; whereas, a system or structure may be "mentioned" because its operation or failure is assumed to be the initiator of the event or is assumed to make the event more severe, i.e., used in establishing the worst case scenario. Based on this clarification of the term "credited," the staff finds that identifying S/Ss that are credited in an analysis or evaluation that demonstrates compliance with the FP, EQ, PTS, SBO or ATWS rules as ITLR meets the Subsection (3) definition of SSCs ITLR in 10 CFR 54.3.

FP, EQ, ATWS: Chapter 3 of the Volume 1 screening methodology basically echoes the provisions of 10 CFR 54.3 by stating that all S/Ss that are relied on to demonstrate compliance with the FP, EQ, and ATWS rules, will be ITLR. The

methodology further states that evaluations performed to demonstrate compliance, CLB documents, the Calvert Cliffs Q-list Manual, and BG&E submittals to the NRC are some of the documents that will be reviewed to identify S/Ss that meet Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3. The complete list of documents reviewed to identify these S/Ss is included with each of the screening tools in the attachments to Volume 1. Because the screening tools are not within the scope of this DSER, the NRC staff chooses not to judge whether the lists of documents reviewed are comprehensive enough to capture all S/Ss relied on to comply with the FP, EQ, and ATWS rules.

Because the methodology essentially restates Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3, the NRC staff finds that the Volume 1 methodology requirement to identify as ITLR all S/Ss that are relied on to demonstrate compliance with the FP, EQ, and ATWS rules is acceptable for meeting the FP, EQ, and ATWS requirements in Subsection (3) in the definition of SSCs ITLR in 10 CFR 54.3.

SBO: In Chapter 3.3.2.5 of the Volume 1 methodology, BG&E will review their SBO analysis to identify all S/Ss that are relied upon during an SBO event, specifically excluding those S/Ss relied on for power restoration of an SBO event. In RAI Question 20, the NRC staff stated that equipment necessary for power restoration after an SBO event falls within the scope of the SBO rule (10 CFR 50.63), thus should be considered ITLR. In their response to RAI Question 20, BG&E proposed a revision to the Volume 1 methodology stating that SSCs relied on for power restoration following an SBO event were considered in developing the Volume 1 methodology. This is Confirmatory Item 4. BG&E concluded that all SSCs relied on for power restoration will fall within the other subsections in the definition of SSCs ITLR in 10 CFR 54.3, therefore a separate step in the methodology to look at SSCs relied on for power restoration is not necessary. Upon satisfactory resolution of Confirmatory Item 4, the NRC staff will find that the Volume 1 methodology requirement to identify as ITLR all S/Ss that are relied on during an SBO event is acceptable for meeting the SBO provision in Subsection (3) of the definition of SSCs ITLR in 10 CFR 54.3.

The complete list of reference documents to be used to identify these S/Ss is included in the SBO screening tool in Attachment C to Volume 1. Because the screening tools are not within the scope of this DSER, the NRC staff chooses not to judge whether the list of documents reviewed are comprehensive enough to capture all S/Ss relied on to comply with the SBO rule.

PTS: In RAI Question 19, the NRC staff questioned the scope of what is to be included in the Volume 1 screening methodology for PTS, described in Chapter 3.3.2.3. In the response to RAI Question 19, BG&E proposed a change to the Volume 1 methodology that will provide a PTS screening process only if the PTS criteria in 10 CFR 50.61 are exceeded. This is Confirmatory Item 5. If the PTS criteria are exceeded, BG&E will perform a Regulatory Guide 1.154 ("Format and Content of Plant-Specific Pressurized Thermal Shock Safety Analysis Reports for Pressurized Water Reactors") analysis to satisfy the requirements of 10 CFR 50.61 which will, in turn, trigger an update to the system level and component level screening results to identify SSCs that are relied on to meet the PTS rule. Upon resolution of Confirmatory Item 5, the NRC staff will find that the Volume 1 methodology requirement to identify all S/Ss in a Regulatory

Guide 1.154 analysis that are relied on to comply with the PTS rule, meets the PTS provision of Subsection (3) in the definition of SSCs ITLR in 10 CFR 54.3.

3.3.3 System and Structure Level Screening Using Subsection (4) of the Definition of SSCs ITLR

The Volume 1 screening methodology will identify S/Ss which are specifically required to be operable by an LCO in the technical specifications and all supporting systems necessary for their operation. In RAI Question 21, the NRC staff questioned the use of technical specification improvement criteria to eliminate certain S/Ss from being identified as ITLR. The NRC staff further stated that this is not consistent with 10 CFR Part 54. In their response, BG&E stated that S/Ss that have operability requirements in the version of the technical specifications at the time of application should be identified as ITLR. Therefore, BG&E agrees with the NRC staff that S/Ss with operability requirements written expressly into the technical specifications are ITLR.

The BG&E methodology also requires S/Ss to be ITLR if they are necessary to support S/Ss with operability requirements in technical specifications LCOs. However, the methodology is such that non-safety-related S/Ss will be identified as ITLR only if they directly support an SSC that is ITLR under Subsection (4) of the definition of ITLR in 10 CFR 54.3. Consequently, a non-safety-related S/S that supports another non-safety-related S/S that supports an S/S that is ITLR under Subsection (4) will not be identified as ITLR. The staff disagrees with the BG&E methodology on this point. The staff position concerning the identification of non-safety-related S/Ss as ITLR is discussed as Open Item 1 in Section 3.3.1 of this report.

3.4 Component Level Screening

Section 4 of the Volume 1 methodology instructs that components of S/Ss be identified as ITLR if they are required for a system or structure to perform its required ITLR function or, if they fail, could prevent a system or structure from performing its required ITLR function, in accordance with 10 CFR 54.21(a)(2). All components are parts of systems and structures. Component level screening described in the Volume 1 methodology is divided into three areas: (1) component level screening for systems, (2) component level screening for structures, and (3) screening of generic commodity components. The NRC staff's evaluation of BG&E's component level screening methodology which is discussed below follows this format.

3.4.1 Component Level Screening for Systems

The component level screening for systems described in the Volume 1 methodology starts with the systematic review of all systems determined to be ITLR in the S/S level screening steps discussed above to identify the associated ITLR functions that these systems perform. The results of this step are compiled in the ITLR System Function Table, with each ITLR function assigned an identification number. The plant's Master Equipment List provides a listing of all components for each ITLR system. For each function in the ITLR System Function Table a list of the components required to perform that function is identified and compiled in the Function Catalog. The Function Catalog is used

to produce the Component Level Screening Results Table which lists the components of each ITLR system, designates whether they are ITLR, and provides the ITLR function(s). A component that does not perform an ITLR function will be listed in the component level screening results, but designated as not ITLR.

The NRC staff finds the component level screening process for systems described in Chapter 4.1 of Volume 1 acceptable for use in identifying components of systems that contribute to the performance of a required ITLR function or whose failure could prevent an SSC ITLR from performing its ITLR function in accordance with the requirements of 10 CFR 54.21(a)(2).

3.4.2 Component Level Screening for Structures

The Volume 1 methodology consists of reviewing the structures determined to be ITLR in the S/S level screening steps to identify the structural components that contribute to the performance of an ITLR function, or whose failure could prevent an SSC from performing its ITLR function. To do this, BG&E has identified a generic list of structural components and a generic list of ITLR functions that structures or structural components perform. For certain structures that are also part of a system, such as the containment, the system components will also be screened in the component level screening process for systems described above.

The Volume 1 methodology requires that each ITLR structure be reviewed against the generic list of structural ITLR functions to determine the ITLR function(s) that each ITLR structure performs. The ITLR structure is then reviewed against the generic list of structural components to list the structural components actually contained in the ITLR structure. Any structure-specific components in the ITLR structures, such as prestressed tendons in the containment, will be added to this listing. The last step is to combine the structural component listing with the ITLR structural functions. The results will be presented in Table 3S, Results of ITLR Structure Screening - Structural Components with Specific ITLR Functions, which identifies each ITLR structural component and its ITLR function(s) for the ITLR structure being screened.

The NRC staff finds the component level screening process for structures described in Chapter 4.2 of Volume 1 acceptable for use in identifying components of structures that contribute to the performance of a required ITLR function or whose failure could prevent an SSC ITLR from performing its ITLR function in accordance with the requirements of 10 CFR 54.21(a)(2).

3.4.3 Generic Commodity Components Screening

Chapter 4.3 of the Volume 1 methodology provides for screening generic commodity components such as cables, snubbers, and pipe hangers to determine if they are ITLR. These commodity components provide a support function for other SSCs and their ITLR determination will be based on Subsection (2) of the SSCs ITLR definition, therefore a commodity component will be ITLR if it supports a safety-related S/S. The purpose stated in the Volume 1 methodology for such grouping of components is to allow for aging evaluation and management of these components generically as groups rather than individually. The staff's position concerning identification of SSCs meeting Subsection (2) of the definition of

ITLR in 10 CFR 54.3 is discussed as open Item 1 in Section 3.3.1 of this report. Upon resolution of Open Item 1, the staff will conclude that a separate screening for commodity components ITLR is acceptable for identifying items within Subsection (2) of the definition of SSCs ITLR in 10 CFR 54.3.

4.0 CONCLUSIONS

Based on the evaluation of BG&E's Volume 1 screening methodology as discussed above, and upon satisfactory resolution of the open and confirmatory items noted in the foregoing text of this DSER, the NRC will conclude that the BG&E methodology is acceptable for meeting the requirements of 10 CFR 54.21(a)(4)(i) and 10 CFR 54.21(a)(4)(ii), in that it describes and justifies a process to be used to meet the requirements of paragraphs 10 CFR 54.21(a)(1) and 10 CFR 54.21(a)(2) including specific criteria for determining whether an SSC is important to license renewal and criteria for determining whether a system or structure is necessary for the performance of a required function.

Listed in Table 1 of this report is a short description of each open and confirmatory item discussed in the text of this DSER. Open and confirmatory items are referred to by number in the body of this DSER and in Table 1. The section of this safety evaluation where the item is discussed is referenced in the description. Confirmatory Items are those issues for which the NRC staff and BG&E have reached agreement on the resolution, but the appropriate documentation has not been formally submitted to the NRC. Open Items are those issues for which an agreement has not been reached.

5.0 CORRESPONDENCE

1. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated December 21, 1992, prepared by R. Anand of the NRC for a meeting between the NRC and BG&E held on November 19, 1992.
2. Letter to U.S. Nuclear Regulatory Commission, Attention Dr. T. E. Murley, from Robert E. Denton of Baltimore Gas and Electric Company dated December 15, 1992.
3. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated February 24, 1993, prepared by R. Anand of the NRC for a meeting between the NRC and BG&E held on February 4, 1993.
4. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated February 25, 1993.

5. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated March 2, 1993. This letter transmitted the following portions of the "Calvert Cliffs Nuclear Power Plant Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening:"
 - Systems, Structures and Components Screening Methodology
 - Systems and Structures Screening Procedure
 - Systems and Structures Screening Results
6. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated March 12, 1993. This letter transmitted the remaining portions of the "Calvert Cliffs Nuclear Power Plant Integrated Plant Assessment Methodology Volume 1: Systems, Structures and Components Screening:"
 - Component Level ITLR Screening Procedure for Systems
 - Component Level ITLR Screening Procedure for Structures
 - Component Level ITLR Screening Results for the Reactor Coolant, Compressed Air, Saltwater, and Containment Systems
7. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated May 3, 1993, prepared by R. Anand of the NRC for a meeting between the NRC and BG&E held on April 14, 1993.
8. Letter to Robert E. Denton of Baltimore Gas and Electric Company from Rebecca L. Nease of the NRC dated June 1, 1993. This letter was a request for additional information that transmitted 42 questions to BG&E concerning their "Calvert Cliffs Nuclear Power Plant Integrated Plant Assessment Methodology: Systems, Structures and Components Screening."
9. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated July 15, 1993, prepared by R. L. Nease of the NRC for a meeting between the NRC and BG&E held on June 17, 1993.
10. "Summary of Meeting with Baltimore Gas and Electric Company (BG&E) Concerning Life Cycle Management and License Renewal Issues" dated July 15, 1993, prepared by R. L. Nease of the NRC for a meeting between NRC and BG&E held on June 22 and 23, 1993.
11. Summary of conference call held on July 28, 1993, between NRC, PNL, and BG&E staff to discuss PNL's comments on the Volume 1 methodology.
12. Letter to U.S. Nuclear Regulatory Commission from Robert E. Denton of Baltimore Gas and Electric Company dated July 30, 1993. This letter transmitted BG&E's responses to the NRC's RAI of June 1, 1993.
13. Summary of conference call held on August 18, 1993, between NRC staff and BG&E staff to discuss specific examples of implementing the Volume 1 methodology.

14. Summary of conference call held on August 26, 1993, between NRC staff and BG&E staff to discuss how the polar crane will be handled in the Volume 1 methodology.
15. Summary of conference call held on December 9, 1993, between NRC staff and BG&E staff to discuss points of clarification concerning BG&E's RAI responses.
16. Summary of conference call held on December 21, 1993, between NRC staff and BG&E staff to discuss points of clarification concerning the difference between source documents used to develop the methodology and source documents used to perform the screening for SSCs ITLR.
17. Summary of conference call held on February 4, 1994, between NRC staff and BG&E staff to discuss points of clarification concerning the screening of generic commodity components for identifying SSCs ITLR.
18. Summary of conference call held on February 15, 1994, between NRC staff and BG&E staff to discuss points of clarification concerning the screening of generic commodity components for identifying SSCs ITLR.

TABLE 1 - OPEN AND CONFIRMATORY ITEMS

<u>OPEN ITEM NUMBER</u>	<u>DESCRIPTION</u>
1.	<p>S/S Level Screening Using Subsections (2) and (4) - Sections 3.3.1 and 3.3.3: The staff views the BG&E identification of non-safety-related S/Ss as ITLR under Subsection (2) of the definition of SSCs ITLR in 10 CFR 54.3 as taking too narrow a view of the Commission's intent under the rule. The staff's position is that an SSC should be ITLR if its failure could prevent another SSC from performing any of the required functions identified in paragraphs (1)(i), (ii), or (iii) of the definition of SSCs ITLR in 10 CFR 54.3. Additionally, the staff has concluded that the BG&E methodology for identifying non-safety-related S/Ss using Subsection (4) of the definition of SSCs ITLR in 10 CFR 54.3 is also at odds with the intent of the rule. Specifically, for Subsection (4), the staff's position is that an SSC is ITLR if it must be operable in order for an SSC subject to operability statements in the technical specifications LCOs to be operable.</p>

<u>CONFIRMATORY ITEM NUMBER</u>	<u>DESCRIPTION</u>
1.	<p>Source Documents, Section 3.2: BG&E has agreed to delete the discussion of hierarchy of source documents in Chapter 2.4 of Volume 1.</p>
2.	<p>System and Structure Level Screening Using Subsections (1) and (2), Section 3.3.1: BG&E agreed to clarify the terms "Class 1" and "safety-related" with respect to structures screening.</p>
3.	<p>System and Structure Level Screening Using Subsections (1) and (2), Section 3.3.1: BG&E agreed to revise Figure 2-1 to clarify that structures meeting both Subsections (1) and (2) are ITLR.</p>
4.	<p>System and Structure Level Screening Using Subsection (4) - SBO, Section 3.3.3: BG&E proposed a revision to the Volume 1 methodology stating that SSCs relied on for power restoration following an SBO event were considered in developing the Volume 1 methodology.</p>
5.	<p>System and Structure Level Screening Using Subsection (4) - PTS, Section 3.3.3: In the response to RAI Question 19, BG&E proposed a change to the Volume 1 methodology that will provide a PTS screening process only if the PTS criteria in 10 CFR 50.61 is exceeded.</p>