



UNITED STATES
 NUCLEAR REGULATORY COMMISSION
 WASHINGTON, D.C. 20555-0001

April 15, 1996

Mr. Charles H. Cruse
 Vice-President - Nuclear Energy
 Baltimore Gas and Electric Company
 1560 Calvert Cliffs Parkway
 Lusby, MD 20657

SUBJECT: LICENSE RENEWAL DEMONSTRATION PROGRAM SITE VISIT, CALVERT
 CLIFFS NUCLEAR POWER PLANT TRIP REPORT

Dear Mr. Cruse:

A NRC team visited Calvert Cliffs Nuclear Power Plant from March 25 through March 29, 1996, to review the implementation of NEI 95-10, Revision 0, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule." Members of the visiting team included Dr. P.T. Kuo (Team Leader), Gary Hammer¹, Sam Lee, John Moulton, Robert Prato, Christopher Regan, and C. P. Tan.

The objectives of the license renewal demonstration program (LRDP) site visits were to 1) assess the effectiveness of NEI 95-10¹ to implement an effective license renewal (LR) program, 2) assess the participant's implementation process and supporting information for correct documentation, control, consistency, and completeness, 3) assess the level of detail used to describe aging management activities, time-limiting aging analyses (TLAAs) and Final Safety Analysis Report (FSAR) supplements, 4) assess the use and integration of topical reports, and 5) assess the need for improvements to NEI 95-10. The LRDP site visit did **NOT** include the review of any plant-specific program for the purpose of determining its adequacy or acceptability in fulfilling the requirements of the Rule. To accomplish these objectives the team performed a step-by-step review of the implementation of NEI 95-10 using the LRDP Generic Site Visit Plan.

The team reviewed BG&E's general LR process; the aging management review process for the Main Feedwater System, Radiation Monitoring System, Component Supports Commodity evaluation, fuel handling equipment and other heavy cranes, reactor vessel internals, Containment and Class 1 Structures, structural sealants and expansion joints; the time-limiting aging analyses for containment tendons and reactor vessel neutron embrittlement; and a sample FSAR Supplement.

The review team discussed their detailed observations daily with members of your staff. In addition, a summary of the team's observations was provided to

¹ Participate in a two day review of select topics.

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Baltimore Gas and Electric (BC&E) management during an exit meeting on March 29, 1996. The observations presented are provided below.

- The scoping methodology presented by the participant was consistent with the guidance and intent of NEI 95-10. Refer to NEI 95-10, Section 3.0 and § 4.1.
- The intended functions for the structures and components were identified on the structure and component level. Refer to NEI 95-10, § 4.1.
- The methodology for selecting aging effects appeared consistent with the guidance provided in NEI 95-10. Refer to NEI 95-10, § 4.2.1.1.
- The participant needs to provide a better description of the methodology, criteria, and corrective actions associated with aging management programs to meet the intent of NEI 95-10. Refer to NEI 95-10, § 4.2.1.2 and § 6.2.3.
- Some of the participant's program is based on the old Rule, Title 10 of the Code of Federal Regulations, Part 54 (10 CFR Part 54), or an earlier format utilized by the participant and needs to be updated.
- To date, the license renewal application (LRA) prepared by the participant falls short of the level of detail required by NEI 95-10 and needs more detail before submitting it for NRC staff review. Refer to NEI 95-10, § 6.2.
- The participant's FSAR Supplement presented to the staff during the site visit also needs more detail to meet the intent of NEI 95-10. Refer to NEI 95-10, § 6.3.
- A review of the participant's LR procedures did not clearly demonstrate that they met the quality control requirements intended by NEI 95-10. Refer to NEI 95-10, § 3.3, § 4.4, and § 5.3.
- The participant did not perform a separate search of NRC generic communications but used other industry documents to identify aging effects. This raised a concern that some industry experience may be missed and alerted the staff of the need to assess effective ways for identifying industry experience throughout the LRDP.
- The participant needs to provide more information that describes how their aging management programs will effectively manage the effects of aging for renewal. Refer to NEI 95-10, § 4.4 and § 6.2.
- The intent of NEI 95-10 is to have all TLAA's complete at the time of application with some potential for exceptions which is allowed by the guideline. The participant's handling of TLAA's led the staff to believe that they were planning to delay more of the TLAA's than intended by the guideline. Refer to NEI 95-10, § 5.1.4.

- Currently, the participant does not intend to address those generic safety issues (GSI) classified as low priority by the NRC GSI program. Refer to NEI 95-10, § 1.5.
- The participant's age-related degradation inspection program needs to specifically address the inspection of components in inaccessible areas. Refer to NEI 95-10, § 4.3.1.

In addition to observations of BG&E's LR program, some areas of NEI 95-10 that may need improvement were identified during the exit meeting. The staff will continue to assess the adequacy of the NEI guideline in these and other areas throughout the demonstration program. The areas of the guideline that potentially may require additional guidance are described below.

- The current NEI 95-10 guidance that describes the "*demonstration*" of an effective aging management program may need more description to provide the necessary guidance to meet the intent of 10 CFR Part 54. Refer to NEI 95-10, § 4.2.1.3, § 4.2.2.1, § 4.2.2.2, and § 4.2.3.2.
- Determining the level of detail for many areas of the LR process was a primary objective of the LRDP. The team identified some concerns with the level of detail presented during the site visit and will continue to assess the level of detail presented throughout the LRDP. The staff will build on our observations from the site visit to determine the need for additional guidance in this area. Refer to NEI 95-10, § 6.0.
- The intent of NEI 95-10, § 5.1.4, in general, is to provide the necessary guidance to have applicants complete and submit all TLAAs at the time of application for LR. NEI 95-10 allows for delays under special instances with additional submittal requirements as provided by the guideline. Additional guidance may be needed to ensure that any delay of TLAAs after submittal of an LRA is the exception. Refer to NEI 95-10, § 5.1.4.
- The team found inconsistent guidance in NEI 95-10 with respect to the listing of structures and components within commodity groups. Refer to NEI 95-10, § 4.1, § 4.4.1, and Figure 4.1-1.

Additional details on the staff's observations are provided in Enclosure 1 to this site visit report. A list of those who attended the entrance meeting of March 25, 1996, and the exit meeting of March 29, 1996, are provided in Enclosure 2 of this report.

The team would like to note that your staff was very cooperative and open throughout the week long demonstration. This helped the team meet its objective and hopefully provided BG&E with some necessary feedback.

Sincerely,

Original signed by

Scott F. Newberry, Director
License Renewal and Environmental
Review Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Project No. 690
Docket Nos. 50-317 and 50-318

- Enclosures:
1. Staff's Observations from LRDP Site Visit at Calvert Cliffs Nuclear Power Station
 2. Entrance Meeting and Exit Meeting Attendance List

cc: See service lists

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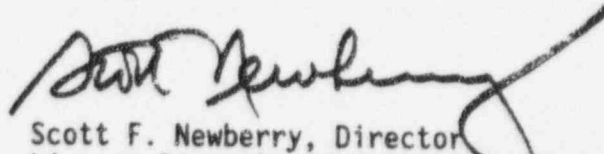
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* See previous concurrence

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cc: See service lists

BALTIMORE GAS AND ELECTRIC COMPANY

April 15, 1996

Calvert Cliffs Nuclear Power Plant

Unit 1 Docket No. 50-317

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April 15, 1996

Project No. 690

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PROCESS REVIEW

Material Reviewed

BG&E Preliminary Information

BG&E Life Cycle Management/License Renewal Program (LCM/LRP)

- System Level Scoping for Renewal, (LCM12)
- Component Level Scoping for Systems, (EN1302)
- Component Level Scoping for Structures, (EN1303)
- Component Pre-Evaluation (EN-1-304)
- Component Aging Management Review (EN-1-305)
- Component Aging Management Review (LCM-16)
- System Level Scoping Results
- MFW Component Level Screening Results
- DFO ITLR Screening Results
- Component Supports Commodity Evaluation, Rev. D
- BG&E QA Policy, Rev 45

Interviews - LCM Personnel
 - System Engineers

Observations

Scoping Process

- The participant's system level scoping results were reviewed. The participant's scoping was consistent with NEI 95-10, § 3.1 regarding systems, structures, and components within the scope of LR. The participant's system level scoping results included the documentation of the systems and structures that are within the scope of LR and their intended functions consistent with NEI 95-10, § 3.3.

- The Main Feedwater (MFW) component level scoping results were reviewed. It was determined that the component intended functions were well documented and consistent with NEI 95-10, § 3.3.

Components in the MFW System were reviewed on a sampling basis to determine if the component scoping was complete with no obvious omission. No omissions were noted.

- The information sources used for the system and structure scoping were documented and consistent with NEI 95-10, Table 3.1-1.

- The MFW evaluation boundary for scoping was reviewed and determined to be appropriate and consistent with NEI 95-10, § 4.1.1.
- Attachment 1 to the MFW component level scoping results and the Diesel Fuel Oil (DFO) System scoping results were reviewed to assess if the passive determinations for components were made consistent with the rule and NEI 95-10, § 4.1.2.

The explanation in the preevaluation table of Attachment 1 for the MFW Component Level Scoping results refers to the component function "requiring motion" rather than component function being performed by "moving parts." In the DFO System results, the criteria of "causes plant parameters to change in a measurable way" was applied. Additionally, some explanations simply state that the function "provides indication of plant condition" or "provides closure of MOVs" and therefore is not passive. While these criteria may lead to proper determinations of active/passive, they are not consistent with the criteria in the guideline.

- It was noted that MFW pressure and level transmitters were included as subject to an aging management review (AMR) although the NEI guideline considers them to be outside the scope of LR.
- The component pre-evaluation procedure was reviewed to determine if long-lived determinations are consistent with the NEI guideline. The procedure delineates the criteria for making "long-lived" determinations consistent with NEI 95-10.

The MFW component preevaluation results were reviewed to determine if the long-lived determinations were applied consistent with established procedures. All components not determined to be long-lived were subject to specified replacement intervals of 5 years and therefore met the intent of NEI 95-10.

- The MFW and DFO component scoping results were reviewed to determine if the structures, and components subject to an AMR were identified. The structures and components subject to an AMR are listed in Attachment 4 of the MFW and DFO component scoping results. The participant's preliminary information contained only a summary of structure and component types (i.e., piping, valves, etc.) for the DFO and MFW systems. Therefore the preliminary material did not meet the intent of NEI 95-10, however, the information on site did contain the necessary information.

- The preliminary information and in the life cycle management (LCM) evaluation did not contain a listing of the component supports within the scope of review. NEI 95-10, § 4.1 states that "Regardless of the method used it (the identification) must produce a listing of structures and components required by 54.21(a)(1)(I) and (ii)." 10 CFR 54.21(a)(1) states that "For those systems, structures, and components within the scope of this part, as delineated in § 54.4, identify and list those structures and components subject to an aging management review." Thus an application must contain a list of the component supports contained in each of the component supports commodity groups.

Although NEI 95-10 is specific about listing the structures and components, NEI 95-10, § 4.1 infers that a list of commodity groups may be an acceptable alternative to the list of all structures and components within scope of LR (the use of the term "or" in parenthesis) however in Figure 4.1-1 the list must include structures, components, and commodity groups which infer that lists of all three must be provided. NEI 95-10, § 4.4.1 states that only a listing of structures and components is required, there is no mention of commodity groups and therefore, NEI 95-10 may need some clarification.

Aging Management Process

- The MFW System, DFO System, and component supports aging management programs were reviewed to determine if the aging effects were identified consistent with NEI 95-10, § 4.4.2. Aging effects were identified in the on-site AMRs as well as the application example for these systems.
- The AMRs for DFO System, MFW System, and component supports were reviewed to determine if the aging effects were "assessed." These reports contained an assessment of all aging effects and a justification as to why they are or are not plausible. The application example for these systems did not contain an assessment of the aging effects contrary to NEI 95-10, § 6.2.3.
- The AMRs for DFO System, MFW System, and component supports and the respective example applications were reviewed to determine if programs/activities to manage the effects of aging are identified consistent with NEI 95-10, § 4.4.2. The AMRs and their respective applications identify programs to manage the effects of aging.
- DFO System Operating Experience Consideration - NEI 95-10, § 4.2.1.1, indicate that operating experience should be assessed. Discussions with the participant indicated that

similarly managed buried fuel oil piping has failed at their fossil units. This information affected their selection of aging management programs for LR. However, this operating experience information is not discussed in the AMR report.

- Attachment 8 to "Diesel Fuel Oil Aging Management Review" indicates that corrosion of buried piping is to be managed by cathodic protection. However, the draft LRA in the preliminary information indicated that corrosion of buried piping is also to be managed by an augmented inspection. The participant informed the staff that their management recommended augmented inspections after the AMR report was completed.
- The AMRs for DFO System, MFW System, and component supports and their respective sample applications were reviewed to assess if the participant's demonstration of aging-management programs were consistent with NEI 95-10, § 4.4.2.

The AMRs did not appear to contain an explanation of how the credited programs manage the effects of aging consistent with two key elements delineated in NEI 95-10, § 4.2.1.3. For example, the AMR for the MFW system states that chemistry control provided an environment that limits the rate of corrosion fatigue. While this may be a true statement, it does not demonstrate how corrosion fatigue can be detected "before there is a loss of the structure or component intended function" or how the program "contains acceptance criteria" for "timely corrective actions."

The AMR for the DFO System implies that general corrosion and pitting corrosion are managed by cathodic protection which minimizes corrosion effects. This description does not explain how the program will manage the effects of aging such that the intended function (pressure boundary) will be maintained during the extended period of operation (see previous MFW example).

Additionally, the MFW System, DFO System, and Component Supports AMRs and example applications contain an identification of aging management programs that are not yet developed. The MFW and DFO systems contain age-related degradation inspection programs that have yet to be developed. As well, the component support commodity group relies on system engineer walkdowns. Therefore, these programs have not been adequately developed such that the staff can judge the adequacy for managing the effects of aging during the period of extended operation.

- The component supports commodity evaluation was reviewed to assess whether the grouping of commodities was performed consistent with NEI 95-10, § 4.1.2. The participant's

component commodity evaluation states that design, environment, and loading are considered with no specific description of the types of environment and specific materials of construction. The remainder of the process for establishing the component support commodity groups appears to meet the guidance provided in NEI 95-10.

Details on the bounding environmental conditions, the specific materials of construction, the most severe loading conditions, or the similarities of design for each commodity group should be included. For example, the preliminary writeup for anchorage including elastomer vibration isolators states "... general corrosion, elastomer hardening and other loading are the age-related degradation mechanisms (ARDMs) considered to be plausible for these carbon steel equipment supports" but does not provide any discussion of the elastomer materials. The discussion in Section 2 of LCM evaluation 1657 states that the two design commodity groups considered under the piping support category was for supports that were noted as having threaded fasteners in the load path and those that did not; e.g., spring hangers, constant load supports, and rod hangers, and stanchions and frames. Discussion that clarifies details as described in the two examples should be included in the application.

Issues

The participant's procedures for scoping and their results were reviewed to determine consistency with NEI 95-10, § 3.3, which states that the results of the scoping process should be documented using the "quality assurance program in effect at the plant."

LCM-12 states that work products from the scoping procedure "are reviewed and approved in accordance with established QA Review and Approval Processes." No QA Review and Approval Process reference was identified in this procedure or in the corresponding scoping results. In addition, EN-1-302 did not reference any QA Review and Approval Process. However, EN-1-303 did reference the participant's QA Policy.

The participant's QA Policy, Revision 45, dated January 6, 1996, was reviewed. This QA policy identifies the documents that are "QA Program Controlled" (Section 1B.6). This section does not list the participant's License Renewal Scoping Results as QA Controlled documents.

The QA Policy, Revision 45, 1B.6, page 24 states that the Quality Assurance organization performs compliance reviews on "Directives" and "Control Procedures." It does not appear that

the site QA organization has performed any reviews of the LCM procedures or results.

AGING MANAGEMENT REVIEW

MAIN FEEDWATER SYSTEM

Material Reviewed

BG&E Preliminary Information
Updated FSAR - UFSAR, § 10.2
Paddies - Condensate and Feedwater System
BG&E LCM/LRP - System and Structure ITLR Screening Results
- Component Level ITLR Screen Results for
Feedwater System
- Feedwater Aging Management Review
Interviews - MFW System Engineer, BG&E
- LCM/LR Staff, BG&E

Observations

Scoping

- The inclusion of the MFW System within the scope of LR meets the selection criteria set forth in NEI 95-10, § 3.1, the evaluation boundaries are consistent with the system safety related pressure boundary, no obvious omissions with respect to the structures, and components selected were observed, and the structure and component level intended function(s) were identified. The participant did include the seat and disc from the MFW isolation valve which is discussed later in this trip report.

Aging Management Program

- The participant provided a process methodology for determining component level intended function and the plausible aging effects associated with each component group. The identification of aging effects presented by the participant appeared generally consistent with NEI 95-10, § 4.4.2.
- The sample LRA failed to provide any details on the aging management programs and the demonstration of how the aging effects will be managed during the period of extended operation.

The MFW AMR was also lacking in similar detail. For example, the "Feedwater Aging Management Review," Attachment 8, provides the rationale for selecting aging management alternatives. Attachment 8 indicated that chemistry control is relied on extensively for aging management but did not provide a description of the chemistry control program or the basis that would demonstrate how the program will manage the associated aging effects as required by NEI 95-10, § 4.2.1.3.

- Based on discussion with the participant and review of documents outside their LR program, the aging management programs presented/intended appeared consistent with NEI 95-10, § 4.2.1.2.
- The participant included the seat and disc for the isolation valve (along with the valve body) within the scope of LR based on an intended function of pressure boundary. Including the seat and disc within the scope of LR in pressure boundary application is not inconsistent with the guideline or the Rule.

Issues

1. Level of Detail - determining the level of detail for an application for LR is a key objective for the LRDP. The participant's sample LRA is lacking in detail.

The NEI 95-10, § 6.2.3 states that the following information on the AMR should be included in the LRA:

- A description of the structures and components that are being evaluated.
- The identification of the systems, structures, and components intended functions, as appropriate.
- The identification and an assessment of the aging effects (or mechanisms, if appropriate), including a description of materials of construction and service environment.
- The consideration of operating experience in order to identify applicable aging effects for the structures and components.
- The identification and description of aging management programs necessary for renewal.
- The demonstration that aging management programs, either new, existing, or enhanced will adequately manage the effects of aging such that the intended functions will be maintained consistent with the current licensing basis (CLB) for the period of extended operation."

The current level of detail for the MFW intended by the participant does not contain the following information:

- An adequate description of the structures and components being evaluated.
- An adequate identification and assessment of the aging effect including a description of materials of construction and service environment.
- A review of NRC generic communication operating experience was not specifically considered for LR in order to identify applicable aging effects for the structures and components (reference discussion below).
- An adequate identification and description of aging management programs necessary for renewal.
- An adequate demonstration that aging management programs, either new, existing or enhanced, will adequately manage the effects of aging such that the intended function will be maintained consistent with the CLB for the period of extended operation.

In addition, the level of detail presented in the Attachment 8 to the "Feedwater Aging Management Review" provides the rationale for selecting aging management alternatives. The chemistry control program is relied upon extensively. However, no description of the chemistry control program or the basis why the program would manage the specific aging effects is provided.

2. Generic Communication - The participant's LR program does not include a separate search of NRC generic communications to identify LR concerns. They currently review higher tier documents such as Electric Power Research Institute, Institute of Nuclear Power Operations, topical and other industry reports which are relied on to contain those generic communications relating to aging effects and other aging effects not included in NRC generic communications.

It was the staff's expectation that applicants would review generic communications as well as other sources of industry information to meet the intent of NEI 95-10, § 4.2.1.1 with respect to industry experience. Although NEI 95-10 does not specifically call for a review of generic communications, reviewing generic communications is a normal approach of examining industry experience. Because of the lack of a specific requirement and the apparent logical approach presented by the participant, the staff will continue (throughout the demonstration program) to assess the need for a specific generic communication review.

3. GSI and Unresolved Safety Issues - GSI 35, "Degradation of Internal Appurtenances in LWRs," was not included within the scope of the LR because it is a "low priority" issue under the NRC GSI program. The staff will further assess this GSI and the low priority GSIs in general to determine their consideration with respect to LR.

AREA AND PROCESS RADIATION MONITORING SYSTEM**Material Reviewed**

BG&E Preliminary Information
 Updated FSAR - UFSAR, § 11.2.3.3
 P&IDs - Radiation Monitoring System
 BG&E LCM/LRP - Area and Process Radiation Monitoring Aging
 Management Review
 Interview - LCM/LR Staff, BG&E

ObservationsScoping

The Area and Process Radiation Monitoring System meets the selection criteria set forth in NEI 95-10 for inclusion in LR: the evaluation boundaries are consistent with the system safety related pressure boundaries; no obvious omissions with respect to the selected structures and components were observed; and the structure and component level intended function(s) were identified. The participant did include the seats and discs for the system containment isolation valves.

Aging Management Program

- The participant provided a detailed process methodology for determining the plausible aging effects based on first identifying all potential aging effects and evaluating them for each component group.
- The identification of aging effects presented by the participant appeared generally consistent with NEI 95-10, § 4.4.2. However, the aging management program did not appear to address the necessary management of the aging effects for the structure and component intended function(s) and the associated design conditions.

Issues

The basis for demonstrating that the aging effects will be adequately managed during the period of extended operation relied on existing surveillance and inspection programs. The participant methodology for managing aging effects for the Radiation Monitoring System components involves taking credit for existing surveillance and inspection programs which involve periodic pressure testing and/or leakage detection.

The existing pressure testing and/or leakage detection programs would not appear to provide assurance that components would continue to meet the CLB loading conditions since they involve only pressure loading. The concern is that affected components could presumably degrade and be unable to sustain CLB loads, yet continue to meet the existing periodic pressure testing and leakage detection criteria. NEI 95-10, § 4.2.1.3 and § 4.2.3.2, states that the aging management should be in accordance with the CLB. This is not consistent with the guideline.

Toward the end of the site visit review, the participant LCM/LR personnel initiated some changes to address this concern. These changes were not fully developed and therefore could not be reviewed by the staff.

COMPONENT SUPPORTS COMMODITY EVALUATION

Material Reviewed

Component Supports Commodity Evaluation Application for License Renewal, Revision D

Report No. MPR-1657, "Calvert Cliffs Nuclear Power Plant Units 1 and 2 Aging Management Review of Component Supports," Revision 1, September 1995

EPRI NP-5769, "Degradation and Failure of Bolting in Nuclear Power Plants," Volume 1, April 1988

PEG-7, (Plant Engineering Guideline), "Plant Engineering Section System Walkdown Procedure," Revision 4, November 30, 1995

EPRI TR-100844, "Nuclear Power Plant Common Aging Terminology," November 1992

Interview with LCM/LR Lead Evaluation Engineer, BG&E

Observations

Scoping

The evaluation of component supports passive classification appears to be in accordance with Appendix B of the NEI guideline. The intended function evaluation and description follow the guidance provided in NEI 95-10, § 3.2. The guideline specifically discusses structural supports and the participant's evaluation is consistent with NEI 95-10.

Aging Management Review

The participant's evaluation recognized that additional programs for certain commodity groups and/or specific component supports within a commodity group may be necessary for both the baselining activity and for aging management of those commodity groups subject to an aging mechanism/effect. These new programs although included in the LCM evaluation, the application material did not contain the level of detail necessary for the staff to perform an adequate review. The participant informed the staff that these programs were currently under development and acceptance criteria were yet to be determined.

The evaluation includes a discussion of industry experience, and specific plant experience in determining applicable aging effects.

Issues

1. The Seismic Verification Project (SVP) at Calvert Cliffs and the NRC approved Generic Implementation Procedure (GIP) use the Seismic Qualification Utility Group (SQUG) methodology which delineates acceptance criteria used to evaluate the as-found conditions of component supports. The SVP writeup in the preliminary information did not include a discussion and "level of detail" of the program elements and acceptance criteria as was shown in the writeup for the ASME Code Section XI ISI program description, Table 5-2 of LCM evaluation 1657, which the staff feels would be an acceptable level of detail necessary for making a finding.

The level of detail question can also be asked of the system engineer walkdown. PEG-7, Attachment D, contains guidelines for performing an evaluation of supports. This attachment contains acceptance criteria.

2. Additional description and justification of why visual inspection during system walkdown or SVP walkdown is adequate to assess/determine integrity of component support is needed. The SVP followed the GIP which the NRC has approved. However, additional discussion should be provided to explain how visual inspections will address the aging effect for the structure and component intended function(s) during the period of extended operation.

The preliminary information in many cases concluded that the SVP is sufficient to provide a baseline activity that identifies all the aging effects or the integrity of the applicable component support integrity. Page 7.6-7 of the preliminary information states that "...the SVP inspections would discover any plausible aging effects..." for those supports within that commodity grouping, yet the justification for this conclusion does not contain the level of detail necessary to demonstrate that the effects of aging will be adequately managed. LCM evaluation 1657 does not contain a level of detail necessary to demonstrate that the effects of aging will be adequately managed.

3. Additional guidance may be needed in NEI 95-10 that explains why, in some circumstances, the sampling proposed for baselining is an acceptable approach for determining the aging effect, and is not applicable or is adequately addressed by current programs. NEI 95-10, § 4.3, identifies more

description elements than what is provided in the participant's preliminary information and LCM evaluation 1657. The preliminary information page 7.6-13 baseline activities for heating, ventilation, and air conditioning Rod Hanger Trapeze Supports Inside Containment notes the performance of sampling baseline walkdowns yet there is no discussion of the sampling criteria.

The participant's methodology recognized the need for developing specific elements, however, it should be noted that additional discussion is needed in the application writeup.

4. Intended functions of nonsafety systems, structures, and components that affect safety related systems, structures and components are included in preliminary information, yet are missing from LCM Evaluation 1657. This apparent inconsistency was addressed in discussions with the participant whereby it was stated, in LCM evaluation 1657, that nonsafety related equipment, which can affect safety related equipment, was not omitted from the scoping process but was incorporated through other documentation. The participant referenced plant specific analyses that were used for scoping the aforementioned nonsafety related equipment. Notwithstanding this observation, the preliminary information does clearly state the three categories required to be evaluated by NEI 95-10, § 3.1.
5. LCM evaluation 1657, Page 1 states that there are 21 component support types, the preliminary information states there are only 20. LCM evaluation 1657 concludes that there are no Category E-1-B, "Equipment with Elastomer Isolators Inside Containment Components," therefore the preliminary information only addresses 20 component support commodity groups and not 21 as originally described. This is an example where the LCM evaluation 1657 needs to be updated or made consistent with the preliminary information.
6. The LCM evaluation 1657 describes support (clips) for tubing (e.g., air lines) as not within the scope because they are not long-lived; i.e., they are replaced periodically. Page 4-3 describes replacement only when the support "clip" breaks after being discovered during walkdown inspection. This evaluation does not meet the intent of NEI 95-10 which states that short-lived items must be categorized based on replacement requirements. The participant acknowledged that this is an apparent omission in the evaluation and that support "clips" will be described and evaluated in greater detail in another commodity evaluation report.
7. The participant's aging effect categorized as "Other" (abuse, impacts, accidents) has not been assessed by the staff for

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inclusion within the scope of LR. The kinds of initiators included in this aging effect type can accelerate or lead to premature failure due to induced degradation but may not meet the intent of NEI 95-10 as an aging effect. EPRI report TR-100844 states that "the root cause of error-induced aging degradation and failure is not aging, but human error."

FUEL HANDLING EQUIPMENT AND OTHER HEAVY LOAD HANDLING CRANES

Materials Reviewed

LCM Fuel Handling Equipment and Other Heavy Load Handling Cranes Commodity Evaluation, Revision 1

Aging Management Review Summary, Commodity Name: Cranes and Fuel Handling Equipment, undated

IPA Procedure for the Fuel Handling Equipment and Other Heavy Load Handling Cranes, Revision 1

Observations

Based on a limited review the reviewer made the observations discussed below. The preliminary information provided by the participant is a summary of the aging management review only and does not contain the level of detail that would be contained in an application. The preliminary information appears to contain the necessary elements described in the guideline with the exception of the demonstration that the aging effects would be adequately managed for the period of extended operation. In addition the following observation was made of the material reviewed.

Issues

Attachments 7 and 8 of the LCM taken from the IPA, do not have a sufficient description of the programs necessary for making a finding on whether the program will adequately manage the effects of aging. The IPA and the preliminary information state only the program number and in some cases a brief statement of what kind of inspection is intended (i.e., visual inspection). NEI 95-10, § 6.2.3, states that the IPA (the attachment contained in the LCM) should provide an identification and description of the aging management programs necessary for license renewal. For example, the information provided does not appear to contain acceptance criteria or a description of the corrective measures to be taken if acceptance criteria are not met and a description of followup actions to ensure the corrective actions were adequate.

REACTOR VESSEL INTERNALS**Material Reviewed**

BG&E Preliminary Information
BG&E LCM/LRP - Reactor Vessel Internals Aging Management
Review, Rev. 1, 2/96
Interview - Reactor Vessel System Engineer
- LCM personnel

ObservationsScoping

Reactor Vessel Internals meet the guidance in NEI 95-10 for inclusion in LR. The evaluation boundary was identified and documented. Scoping at the structure and component level was not performed because the participant indicated that all reactor vessel internal components contribute to the intended function. The only exception is the thimble tubes which are screened out because the participant determine that they do not perform a safety-related intended function.

Aging Management Program

The reactor vessel internals AMR process meets the guidance in NEI 95-10. Aging effects were assessed to identify "plausible" aging effects. The aging effect assessments are documented in the "Matrix Code" table, of the Reactor Vessel Internals Aging Management Review, Attachment 3. Plant programs were reviewed to assess specific elements in the reactor vessel internals plant program, for example, ASME Section XI examination program was given credit for aging management. The rationale for selecting the specific aging management program to manage aging effects is documented in the "Development of Aging Management Alternatives" in Attachment 8.

Issues

No issues relating to reactor vessel internals were identified.

CONTAINMENT SYSTEM AND CLASS 1 STRUCTURES**Materials Reviewed**

BG&E Preliminary Information

- Updated FSAR - UFSAR, Section 5.0
- BG&E LCM/LRP - Component Aging Management Review (EN-1-305)
- Component Aging Management Review (LCM-16)
- Component Level Scoping Results for four structures, Auxiliary Building, and Primary Containment Structure
- Containment System Aging Management Review Report
- Intake Structure, Turbine Building, Fuel Oil Storage Tank Enclosure, and Condensate Storage Tank Enclosure Reports

ObservationsContainment System

- The participant's "Containment System Aging Management Review Report" provided information regarding identification of aging effects. Specifically, it contains a table of plausible and non-plausible ARDMs. The NEI industry reports on pressurized water reactor Containment Structure is used extensively as the basis for such determination.
- Aging management programs, on the other hand, lack specificity as required by the NEI guideline. For example, it references subsections IWE and IWL of ASME Section XI without citing a specific edition. It references Type A testing of Appendix J to 10 CFR Part 50 without a demonstration as to what and how the aging effects on the containment system may be managed by the Appendix A, Type A testing. Further, the report references an on-site procedure, LCM-16, which contains information inconsistent with the guidance provided by NEI 95-10, Section 4.0. For example, it cites only system intended functions and isolability determination (AKA, failure tolerance determination) as the criteria for aging management. This report needs to be updated to incorporate the latest guidance provided by NEI 95-10.
- As for the draft LRA, it provides a list of structural components requiring AMR and a list of plausible ARDMs, all without description and justification. The LRA references Section 2.0 of the IPA methodology for its age-related degradation inspection program. However, there is

no such inspection procedure in Section 2.0 of the IPA methodology.

- Both the Containment System Aging Management Review Report and the LRA provide a limited description regarding aging management programs.

Class I Structures

- The participant's "Containment Structure Aging Management Review Report" and the Intake Structure, Turbine Building, Fuel Oil Storage Tank and Condensate Storage Tank Enclosure AMR Programs provide descriptions of the bases for inclusion or exclusion of certain ARDMs. New, modified, or existing program activities are summarized in a reasonable detail. However, there is no demonstration that a program(s) containing the identified attributes has been or will be established to manage the aging effects.
- While the reports provide a comprehensive list of the structures and components, and their intended functions as well as justification for exclusion or inclusion of certain ARDMs, the LRA has only limited description and justification for the information presented. It is largely inconsistent with the guidance provided in NEI 95-10, § 6.2.
- Both the reports and the LRA do not contain information required by the NEI Guideline to demonstrate that aging effects are adequately managed and that component intended function are properly maintained. Neither the reports nor the LRA contains any information regarding age-related operating experience or NRC generic communications pertinent to the containment structure or other Class I Structures. For example, the Information Notice on Farley Nuclear Power Plant tendon anchor head failure and NUREG 1522 on structural degradation were not discussed.

Issues

1. Level of detail on aging management programs in LRA and AMRs is not consistent with NEI 95-10, § 6.2.
2. Aging management inspections in inaccessible areas is not addressed or justified.
3. The AMRs need to be updated to incorporate the latest guidance provided by the NEI 95-10, Section 4.0.
4. The IPA methodology, Section 2.0, does not contain age-related degradation inspection program should not be referenced for such purpose.

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5. Level of Detail regarding post-tensioning tendon system inspection is not consistent with NEI 95-10.
6. There is insufficient information regarding aging management in the FSAR Supplement.

STRUCTURAL SEALANTS/EXPANSION JOINTS

Material Reviewed

- BG&E LCM/LRP - Adequate Program Evaluation, Attachment 8
- Attribute in New Programs, Attachment 10
- Weathering, Appendix O

- Interview - Design Engineer
- LCM/L.P. personnel

Observations

Scoping

Structural sealants meets the selection criteria set forth in NEI 95-10 for inclusion in LR and the structure and component level intended functions were correctly identified.

Aging Management Program

In general, the participant presented information at an appropriate level of detail with respect to the aging management program process relating to structural sealants. The aging management program appears consistent with the guidance of the guideline. Aging effects and related aging management programs were identified. The aging management program includes condition monitoring at a frequency consistent with industry practices for monitoring fire barrier structural sealants.

Issues

No issues relating to structural sealants or expansion joints were identified.

CONSUMABLES

The participant provided some discussion regarding their general methodology relating to consumables; i.e., seals, packing, gaskets, O'rings, and filters. The participant includes all safety related equipment including their associated consumables on the Q-list which are considered within the scope of LR during the initial scoping. The participant, in general, does not consider consumables within the scope of LR beyond the initial scoping step because the participant determined them to be "*short-lived.*"

Consumables, although beyond the LRDP scope, are being discussed with the participants for information gathering purposes.

TLAAsCONTAINMENT TENDON PRESTRESS**Material Reviewed**

BG&E Preliminary Information
 LCM/LRP - NEI Pilot Demonstration, TLAA
 - Technical Specifications, Section 3/4.6.1
 Interview - Design Engineer
 - LCM personnel

ObservationsScoping

Containment tendon prestress was identified as an TLAA and meets the selection criteria set forth in NEI 95-10 § 5.1.

TLAA

The documentation is presented in a format consistent with NEI 95-10, § 5.1.4, for deferring the TLAA evaluation.

Issues

1. Corrective Actions - NEI 95-10, § 5.1.4, indicates that if a TLAA evaluation is to be deferred, corrective actions, as well as methodology, criteria, and schedule, are to be discussed. The draft example indicates that technical specification (TS) surveillance will continue and the existing prestress-loss curve will be extended as corrective actions. However, the TS surveillance and extending the curve are not corrective actions. Corrective actions should be feasible options that ensure the acceptance criteria would be met. For example, retensioning the tendon to meet Regulatory Guide 1.35, "Inservice Inspection of Underground Tendons in Prestressed Concrete Containments," Rev. 2 or tendon replacement are potential corrective actions.
2. Methodology - the draft example merely indicates under "Methodology" that the prestress-loss curve will be extended. No methodology was described as discussed in NEI 95-10, § 5.1.4.

REACTOR VESSEL NEUTRON EMBRITTLEMENT**Material Reviewed**

- BG&E Preliminary Information
 LCM/LRP - NEI Pilot Demonstration, TLAA
 - Comprehensive Reactor Vessel Surveillance
 Technical Specification Section 3/4.4.9
 Letter from D. G. McDonald of NRC, to
 Mr. Denton of BG&E on Pressurized Thermal
 Shock, dated January 2, 1996.
 Interview - LCM personnel

Observations -Scoping

- Reactor vessel pressurized thermal shock (10 CFR 50.61) upper shelf energy (Appendix G to 10 CFR Part 50) and surveillance program (Appendix H to 10 CFR Part 50) were identified as TLAA's. This meets the selection criteria set forth in NEI 95-10, § 5.1.
- In accordance with selection criteria set forth in NEI 95-10, participant also identified the pressure/temperature limits as a TLAA. This is because the participant has pressure/temperature limits in the TS intended to cover the duration of the current license term.

TLAA

Pressurized thermal shock, upper shelf energy, and pressure/temperature limits are examples of neutron embrittlement discussed in "NEI Pilot Demonstrating, TLAA." The documentation is presented in a format consistent with NEI 95-10, § 5.1.4, for deferring the TLAA evaluation.

Issues

1. Deferring in TLAA evaluations - NEI 95-10, § 5.1.4, indicates that, in general, TLAA's should be completed and submitted at the time of LRA. However, the draft examples give the impression that TLAA evaluations are to be deferred in general because the examples were formatted to provide the information in accordance with NEI 95-10 for deferring the TLAA evaluation. For example, even though the participant has an approved pressurized thermal shock analysis for 60 years, the draft

example presents the information for pressurized thermal shock in a format consistent with deferring the TLAA evaluation.

2. Corrective Actions - Similar to the discussion with the containment tendon TLAA, the statement that, "Technical Specification restriction will prohibit the startup Unit 2 without valid pressure/temperature limits" is not appropriate under "corrective actions."

ADMINISTRATIVE REVIEW

Material Reviewed

Draft Updated FSAR License Renewal Supplement

FSAR Update

The draft supplement was not dated. The level of detail was not consistent with NEI 95-10, § 6.3.

Issues

Level of Detail - determining the level of detail for an application for license renewal is a key objective of the LRDP. The draft FSAR Supplement examples do not contain a sufficient level of detail to provide continuing regulatory assurance of actions to be taken under 10 CFR 54.29, and 54.37. For example, under the heading "Reactor Coolant Water Chemistry Control," there is no specific description of what the chemistry control program is or what component and aging effects are being managed. Similar concerns exist under "Inservice Inspections (ASME XI)." Based on the staff's review of the example FSAR updates and NEI 95-10, § 6.3, additional guidance is needed for the Updated FSAR LR Supplement.

Entrance Meeting - March 25, 1996

Douglas Walters	NEI	John Rycyna	BG&E
David Lewis	Shaw Pittman	Bart Doroshuk	BG&E
James Bennett	BG&E	D.L. Shaw	BG&E
Peter Katz	BG&E	Fred Lyon	NRC
Marv Bowman	BG&E	John Moulton	NRC
Carl Yoder	BG&E	Robert Prato	NRC
Chris Haidin	BG&E	Christopher Regan	NRC
Paul Manbeck	BG&E	P.T. Kuo	NRC
Barry Tilden	BG&E	Samson Lee	NRC
John Osborn	BG&E		

Exit Meeting - March 29, 1996

Douglas Walters	NEI	John Rycyna	BG&E
Peter Penn	BG&E	Bart Doroshuk	BG&E
James Bennett	BG&E	D.L. Shaw	BG&E
Peter Katz	BG&E	Fred Lyon	NRC
Marv Bowman	BG&E	John Moulton	NRC
Carl Yoder	BG&E	Robert Prato	NRC
Chris Haidin	BG&E	Christopher Regan	NRC
Paul Manbeck	BG&E	P.T. Kuo	NRC
Barry Tilden	BG&E	Samson Lee	NRC
John Osborn	BG&E	Scott Stewart	NRC
Jim Lippold	BG&E	Scott Newberry	NRC
Peter Chabot	BG&E	Steve Reynolds	NRC
Ray Baker	Southern Nuclear	Mark Hotchkiss	ABB
Ernie Taormina	SET	Donna Scoggin	FTI