



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

February 27, 1997

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street, NW
Suite 300
Washington, DC 20585

SUBJECT: LICENSE RENEWAL REGULATORY GUIDE

Dear Mr. Walters:

The Nuclear Regulatory Commission (NRC) staff has initiated preparation of the final license renewal regulatory guide, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses." The draft version of the regulatory guide, DG-1047, proposed endorsement of the Nuclear Energy Institute's NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," Revision 0, as an acceptable method for implementing the license renewal rule. Based on the proposed NEI rewrite of NEI 95-10, Sections 4.2 and 6.0, received at a January 21, 1997, meeting (see summary dated January 31, 1997), and views presented by the industry, significant policy and implementation issues appear to exist between the NRC staff and the industry that require disposition if the staff is to proceed with review and endorsement of a revised NEI 95-10.

The NRC staff indicated in a January 30, 1997, meeting with NEI (see summary dated February 4, 1997), that it could not review the proposed rewrite of Sections 4.2 and 6.0 as it contains significant deviations from previous positions established during the development of NEI 95-10, Revision 0, and in staff positions established during review of plant-specific and owners group reports. The rewrite also eliminates detailed guidance previously incorporated into NEI 95-10, Revision 0. The staff committed at the January 30 meeting to provide NEI with positions on significant issues associated with the regulatory guide and NEI 95-10. Attached are the first set of staff positions. Additional staff positions will be issued in the future.

NEI is requested to review the attachments and inform the NRC staff of its plans regarding revision of NEI 95-10. Proposed revisions should retain and improve on the guidance currently contained in NEI 95-10, Revision 0. The staff will then determine whether to continue the process of interacting with

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D. Walters

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NEI to develop a version of NEI 95-10 that can be endorsed in a final regulatory guide or whether to proceed with development of its own stand-alone regulatory guide. A response from NEI is requested within two weeks of the date of this letter.

Sincerely,

Original signed by: P. T. Kuo for

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

Project No. 690

Enclosure: Issues and NRC Staff
Positions

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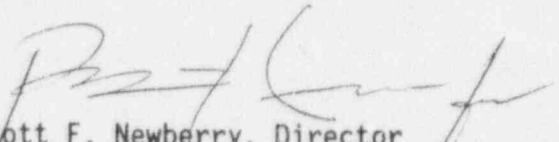
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D. Walters

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Scott F. Newberry, Director
License Renewal Project Directorate
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cc: w/encl: See next page

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Project No. 690

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ISSUES AND NRC STAFF POSITIONS

1. Crediting existing programs

Issue:

Crediting existing program to manage aging for renewal.

NRC staff position:

This issue relates to how existing aging management programs may be credited for renewal and the industry concern that some programs considered acceptable in the current term to manage a specific aging effect are not considered acceptable in the renewal term to manage that same aging effect. Although the renewal rule credited existing programs and the regulatory process, generic credit was provided for active components and not for the passive, long-lived structures and components for renewal.

The statement of considerations (SOC) accompanying the final rule states (60 FR at 22476): "Unlike the extensive experience associated with the performance and condition monitoring of the active functions of structures and components, little experience has been gained from the evaluation of long-term effects of aging on the passive functions of structures and components. The Commission considers that the detrimental effects of aging affecting passive functions of structures and components are less apparent than the detrimental effects of aging affecting the active functions of structures and components. Therefore, the Commission concludes that a generic exclusion for passive structures and components is inappropriate at this time. The Commission also concludes that an aging management review of the passive functions of structures and components is warranted to provide the reasonable assurance that their intended functions are adequately maintained during the period of extended operation." Thus, the final renewal rule focuses on the aging management review of long-lived, passive structures and components. The NRC staff believes that a renewal applicant must provide justification for the adequacy of any aging management programs for renewal, including existing programs, in this review.

The elements of an aging management program and the demonstration identified in Section 4.2.1, "Specific Structure and Component or Commodity Grouping Demonstration," of NEI 95-10, Rev. 0, are applicable to existing programs. However, if an applicant, through their aging management review, concludes that these elements have been previously addressed by the licensee and the NRC for a specific program in documents, such as the plant's final safety analysis report (FSAR), technical specifications, NRC generic communications, previously issued NRC staff safety evaluation reports, and licensee submittals supporting NRC staff safety determinations, the applicant may reference these documents in their renewal application to show that this specific program meets these elements. The reference should identify specific sections of the documents that address these elements.

The NRC staff recognizes that existing programs may be found acceptable to

manage the effects of aging if continued into the renewal term. Taking advantage of previous NRC reviews of programs can limit the depth of NRC review necessary. Moreover, if a licensee submits for NRC review and approval an aging management program to address an aging management issue for the current term of operation, the licensee has the option to also explain why this program will also be adequate to address aging during the period of extended operation (that is, the renewal period) and request the NRC staff to approve the program for both the current term and the extended term. If the licensee's request results in an NRC approval for the extended term, no additional NRC staff review is necessary at the time of the renewal application.

NRC staff recommendations:

No significant change is necessary to NEI 95-10, Rev. 0, regarding the elements of the demonstration, however, the staff recommends that additional discussion be added regarding previous staff reviews that have addressed aging.

2. Design loads and aging management program "alert values"

Issue:

Relating design loads to aging management program acceptance criteria ("alert values") for corrective actions.

NRC staff position:

The NRC staff recognizes that there are aging management programs that are based on monitoring a certain parameter and taking corrective action when this measured parameter does not meet a specified acceptance criterion ("alert value"). This acceptance criterion must be appropriate and ensures that the structure and component intended functions are maintained under all current licensing basis (CLB) design conditions during the period of extended operation. For example, carbon steel pipe wall thinning may occur under certain conditions due to erosion/corrosion. An aging management program for erosion/corrosion may consist of periodically measuring the pipe wall thickness and comparing that to a specific minimum wall acceptance criterion. Corrective action is taken, such as piping replacement, prior to reaching this acceptance criterion. This piping may be designed for thermal, pressure, deadweight, seismic, and other loads, and this acceptance criterion must be appropriate to ensure that the thinned piping would be able to carry these CLB design loads. This acceptance criterion should provide for timely corrective action before loss of intended function under these CLB design loads.

Thus, the NRC staff is requesting information in the renewal application to provide justification for program acceptance criteria to ensure the structure and component intended function is maintained under all CLB design conditions. Supporting information may be maintained on site. Acceptance criteria need not be numerical values for each and every component in all cases. If references are available, this information may be referenced. If an applicant, through their aging management review, concludes that the program acceptance criteria have been previously reviewed and accepted by the NRC staff, the applicant may reference specific sections of previously issued NRC

staff safety evaluation reports or inspection reports in their renewal application.

A renewal applicant does not need to justify any acceptance criteria taken directly from the design basis information that is included in the FSAR.

NRC staff recommendations:

The NRC staff recommends revising Section 4.2.1.2, "Identify Plant Aging Management Programs," of NEI 95-10, Rev. 0, to address that the acceptance criterion ("alert value") must be appropriate and ensures that the structure and component intended functions are maintained under all CLB design conditions during the period of extended operation. Similar changes should also be made in Section 6 of NEI 95-10, Rev. 0.

Insert the following sentence to the end of line 43 on page 28 of NEI 95-10, Rev. 0:

"The acceptance criterion ("alert value") must ensure that the structure and component intended functions are maintained under all CLB design conditions during the period of extended operation."

Similar changes to clarify this issue consistent with the above discussion should also be made in Section 6 of NEI 95-10, Rev. 0.

3. Crediting performance monitoring programs

Issue:

Crediting performance monitoring programs and providing additional guidance in NEI 95-10.

NRC staff position:

The NRC staff believes that if a performance monitoring program can be shown to readily reveal aging effects, such that there is timely corrective action to ensure that the structure and component intended function will be maintained for renewal under CLB design conditions, the performance monitoring program could be acceptable for renewal. The NRC staff believes that a performance program for renewal should link the degradation of passive structure and component intended functions with the performance being monitored. A similar statement appears in Section 4.2.3.2, "Demonstrating the Effectiveness of the Performance and Condition Monitoring Programs," of NEI 95-10, Rev. 0. However, the NRC staff recommends revising that statement in NEI 95-10, Rev. 0, to clarify that the link is not limited to "active performance" and to emphasize "structure and component intended functions." Similar changes should also be made in Section 4.2.3.1, "Establishing the Relationship Between Degradation and Active Performance," of NEI 95-10, Rev. 0.

An example of performance monitoring program that could link the degradation of passive component intended functions with the performance being monitored is heat balances on heat exchangers to ensure the heat transfer intended function of tubes. Fouling of the heat exchanger tubes affects the heat

transfer intended function and could be monitored by periodic heat balances. While this example only deals with one intended function of the tubes, which is heat transfer, additional programs may be necessary to manage other intended functions of the tubes, such as pressure boundary.

However, a performance monitoring program may not assure the component intended function without linking the degradation of passive intended functions with the performance being monitored. For example, a periodic diesel generator test alone would not provide assurance that the diesel will start and run properly under all applicable design conditions. While the test verifies that the diesel will perform if all the support systems function, it provides little information related to the material condition of the support components and their ability to withstand design basis event loads. Thus, a design basis event, such as a seismic event, could cause the diesel supports, such as the diesel embedment plate anchors or the fuel oil tank, to fail if the effects of aging on these components are not managed during the period of extended operation. Similarly, the example of ventilation testing programs alone may not provide assurance that the ventilation system will meet all requirements, for example, air flow and allowed leakage, under all applicable design conditions, such as a seismic event.

Further, the NRC staff does not believe that performance monitoring programs are necessarily "qualitative" or based on "engineering judgement" and need not consider design parameters. For example, the SOC accompanying the final rule (60 FR at 22475) describes a performance monitoring program to ensure functionality of a system relating to an active component and states: "Design-basis values that can only be measured during this testing, such as load sequence times and emergency bus voltage response to the sequenced loads, are directly verified. Between integrated tests, monthly and quarterly surveillance verify specific component performance criteria such as emergency diesel generator start times or pump flow values. The acceptance criteria stated in the surveillance requirements are derived from design-basis values with appropriate conservatism built in to account for any uncertainties or measurement tolerances. Satisfactory accomplishment and periodic repetition of these types of surveillance provide reasonable assurance that system, structure, and component functions will be performed as designed." Thus, performance monitoring programs may contain quantitative acceptance criteria derived from the design basis. As another example, the performance monitoring program example of heat balances on heat exchangers to ensure the heat transfer intended function of tubes needs to be evaluated against quantitative acceptance criteria in the design basis.

As discussed earlier, the NRC staff believes the key is that a performance program for renewal should link the degradation of passive structure and component intended functions with the performance being monitored. The NRC staff finds that additional guidance applicable to a performance or condition monitoring program is already contained in NEI 95-10, Rev. 0. Specifically, the elements of an aging management program and the demonstration identified in Section 4.2.1, "Specific Structure and Component or Commodity Grouping Demonstration," of NEI 95-10, Rev. 0, are applicable to a performance or condition monitoring program and should be addressed. Also, the NRC staff is recommending repeating the above key link information in Section 4.2.1.2,

"Identify Plant Aging Management Programs," of NEI 95-10, Rev. 0.

The NRC staff believes that any additional "criteria" could become too restrictive or confusing. For example, Section 4.2.3.3, "Guidelines for Use of Performance and Condition Monitoring Programs," of NEI 95-10, Rev. 0, contains guidelines to determine when performance monitoring programs should be considered for renewal. However, the NRC staff finds that the example of performance monitoring program, that is, heat balances on heat exchangers to ensure the heat transfer intended function of tubes, does not meet the guidelines for performance monitoring programs in Section 4.2.3.3 of NEI 95-10, Rev. 0. Thus, the NRC staff considers these guidelines too restrictive and unnecessary.

NRC staff recommendations:

The NRC staff recommends changes to NEI 95-10, Rev. 0, as discussed above to address this issue.

Insert the word "structure and component intended" before "functions" in line 22 on page 36 of NEI 95-10, Rev. 0. Delete the word "active" from the same line. Insert the words "being monitored" after the word "performance" in the same line.

Delete the word "active" from lines 1, 10, 11, and 14 on page 36.

Insert the following new paragraph in line 39 on page 34 of NEI 95-10, Rev. 0:

"The elements of an aging management program and the demonstration identified in Section 4.2.1 are applicable to a performance or condition monitoring program and should be addressed."

Insert the following new bullet in line 9 on page 29 of NEI 95-10, Rev. 0:

"• For a performance monitoring program, a link is established between the degradation of the particular structure and component intended functions and the parameter(s) being monitored."

Delete Section 4.2.3.3, "Guidelines for Use of Performance and Condition Monitoring Programs," of NEI 95-10, Rev. 0.

4. "System" versus "component" level intended function

Issue:

Maintaining the "system" level intended function with degraded components.

NRC staff position:

Nuclear power plants are licensed based on redundancy, diversity, and defense-in-depth principles. Components are designed to be available when called upon to provide the redundancy, diversity, and defense-in-depth consistent with the plant's CLB. A degraded or failed component reduces the reliability of the system, challenges safety systems, and contributes to plant risk. Also, aging could be a common failure mode and if unmanaged, could potentially result in a

loss of system intended function under a design basis event, such as a seismic event. For license renewal, the effects of aging on a component must be managed to ensure its availability to perform the component intended function as designed when called upon. In this way, all system level intended functions, including redundancy, diversity, and defense-in-depth consistent with the plant's CLB, would be maintained for renewal.

A licensee always has the option to submit analysis to the NRC to request changing their plant's CLB such that a particular component function is no longer necessary. If the CLB change is approved by the NRC, this particular component would have no intended function and need not be subject to an aging management review for renewal. Further, as part of the aging management review for renewal, an applicant could provide justification that even if a certain component may experience a particular aging effect, this does not prevent that component from performing a certain component intended function for renewal.

NRC staff recommendations:

No change is necessary to NEI 95-10, Rev. 0.

5. "Objective evidence" from operating experience

Issue:

The use of operating experience as "objective evidence" to provide confidence in existing programs.

NRC staff position:

The NRC staff believes that operating experience information is useful in providing "objective evidence" on the effectiveness of aging management programs. This information can show where an existing program has succeeded and where it has failed, if any, in intercepting aging degradation in a timely manner. This information provides confidence in the existing programs.

The Commission addressed the need to review plant operating experience when responding to public comments to the renewal rule regarding the 20-year time limit for filing renewal applications. The SOC accompanying the renewal rule states (56 FR at 64963): "A nuclear power plant will undergo a significant number of fuel cycles over 20 years, and plant and utility personnel will have a substantial number of hours of operational experience with every system, structure, and component. The NRC believes that the history of operation over the minimum 20-year period provides a licensee with substantial amounts of information and would disclose any plant-specific concerns with regard to age-related degradation." Then, the SOC includes the industry wide operating experience and states: "All of this experience would be considered by the NRC in evaluating the adequacy of licensee-proposed activities to address age-related degradation in connection with a renewal application."

The NRC staff believes that aging management programs are developed based on engineering assumptions and judgement. However, a renewal applicant should provide factual information on how these programs have performed under actual plant conditions. "Objective evidence" through plant-specific and/or industry

operating experience should confirm that the programs are in fact effective in maintaining the intended functions of structures and components. For existing programs, this "objective evidence" may be obtained from reviewing plant operating and maintenance records and industry information.

The NRC staff recognizes the regulatory process and a renewal applicant's continual feedback to their programs. A past failure would not necessarily invalidate an aging management program because both the regulatory process and the feedback from operating experience should have resulted in appropriate program enhancements or new programs. Thus, the NRC staff is requesting information on the operating experience, including past corrective actions that have provided feedback as program enhancements or new programs, as "objective evidence" to be considered in evaluating the effectiveness of the aging management programs for renewal.

NRC staff recommendations:

The NRC staff recommends revising Section 4.2.1.2, "Identify Plant Aging Management Programs," of NEI 95-10, Rev. 0, to further address the need for "objective evidence."

Insert the following new paragraph in line 13 on page 29 of NEI 95-10, Rev. 0:

"The operating experience of aging management programs, including past corrective actions resulting in program enhancements or additional programs, should be reviewed. This information should provide objective evidence to support that the effects of aging will be adequately managed so that the structure and component intended functions will be maintained during the period of extended operation."

6. Types of aging management programs

Issue:

Aging management programs other than condition monitoring and performance monitoring programs.

NRC staff position:

NEI 95-10, Rev. 0, discusses condition and performance monitoring programs. However, there are two other types of programs which could have the capability of preventing or mitigating the effects of aging. They are:

Prevention programs preclude the effects of aging from occurring, for example, coating programs to prevent external corrosion of a tank.

Mitigation programs attempt to slow the effects of aging, for example, water chemistry programs to mitigate internal corrosion of piping.

Condition monitoring programs inspect and examine for the presence and extent of aging effects, for example, visual inspection of concrete structures for cracking and ultrasonic measurement of pipe wall for erosion-corrosion induced wall thinning.

Performance monitoring programs test the ability of a structure or component to perform its intended function, for example, heat balances on heat exchangers for the heat transfer intended function of the tubes.

The NRC staff believes that, in many instances, it may be necessary to implement more than one type of aging management program to ensure that aging effects are adequately managed. For example, in managing internal corrosion of piping, a mitigation program (water chemistry) may be used to minimize susceptibility to corrosion. However, it may also be necessary to have a condition monitoring program (ultrasonic inspection) to verify that corrosion is indeed insignificant.

NRC staff recommendations:

The NRC staff recommends that NEI 95-10, Rev. 0, should be revised to provide additional clarification on types of programs and examples.

Insert the following new paragraph in line 29 of page 28 of NEI 95-10, Rev. 0:

"Aging management programs are generally of four types: prevention, mitigation, condition monitoring, and performance monitoring. Prevention programs preclude the effects of aging from occurring, for example, coating programs to prevent external corrosion of a tank. Mitigation programs attempt to slow the effects of aging, for example, water chemistry programs to mitigate internal corrosion of piping. Condition monitoring programs inspect and nondestructively examine for the presence and extent of aging effects, for example, visual inspection of concrete structures for cracking and ultrasonic measurement of pipe wall for erosion-corrosion induced wall thinning. Performance monitoring programs test the ability of a structure or component to perform its intended function, for example, heat balances on heat exchangers for the heat transfer intended function of the tubes. In many instances, more than one type of aging management programs are implemented to ensure that aging effects are managed. For example, in managing internal corrosion of piping, a mitigation program (water chemistry) may be used to minimize susceptibility to corrosion. However, it may also be necessary to have a condition monitoring program (ultrasonic inspection) to verify that corrosion is indeed insignificant."

The staff would entertain other text to clearly spell out prevention and mitigation programs. These programs would have the same demonstration elements.

7. Non-applicable aging effects based on a program

Issue:

Applicability of an aging effect that has a prevention or mitigation program to manage that particular aging effect.

NRC staff position:

Some utility participants in the NEI License Renewal Demonstration Program

determined an aging effect is "not plausible" if there is a prevention or mitigation program that attempts to preclude or mitigate an aging effect. An example is the claim that corrosion is not applicable for renewal because of water chemistry, coating, or cathodic protection.

The NRC staff disagrees with the approach that calls an aging effect not applicable because of a prevention or mitigation program. The NRC staff considers that the aging effect, such as corrosion based on this example, is applicable and needs to be managed for renewal. However, the prevention or mitigation program, such as water chemistry, coating, or cathodic protection could be the aging management program.

The NRC staff believes that (1) the continued effectiveness of the prevention or mitigation program to prevent or mitigate the aging effect for renewal needs to be evaluated and (2) the prevention or mitigation program needs to be identified as necessary for renewal with the associated regulatory and administrative controls. If the aging effect is called not applicable because of a prevention or mitigation program, there may not be the necessary administrative controls on this prevention or mitigation program for the renewal term and there would be inadequate assurance that the specific aging effect would be adequately managed to ensure that the structure and component intended function will be maintained for renewal.

NRC staff recommendations:

The NRC staff recommends changes to NEI 95-10, Rev. 0, to address this issue.

Add the following new paragraph to line 28 on page 28 of NEI 95-10, Rev. 0:

"An aging effect should be identified as applicable for renewal even if there is a prevention or mitigation program associated with that aging effect. For example, water chemistry, a coating, or use of cathodic protection could prevent or mitigate corrosion, but corrosion should be identified as applicable for renewal and the aging management review should consider the adequacy of the water chemistry, coating, or cathodic protection."

8. Appendix C examples

Issue:

Industry would like to include acceptable and technically adequate examples in Appendix C to NEI 95-10.

NRC staff position:

The NRC staff does not believe that Appendix C should contain specific acceptable and technically adequate aging management reviews and programs. This is not consistent with the purpose of the Regulatory Guide for License Renewal. The title of Draft Regulatory Guide DG-1047 is, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses." Specific technical acceptance criteria for aging management reviews and programs for specific structures and components will be documented in the Standard Review Plan for License Renewal (SRP-LR). A working draft copy of

the SRP-LR was placed in the NRC Public Document Room (PDR) in December of 1995. The NRC staff will place an updated version of the working draft SRP-LR in the PDR by September of 1997.

Also, the NRC staff has issued the following safety evaluation reports specifically addressing license renewal:

Letter to Mr. Don Croneberger of the B&W Owners Group from Mr. Dennis M. Crutchfield of the NRC, dated March 21, 1996.

Letter to Mr. Charles H. Cruse of the Baltimore Gas and Electric Company from Mr. Dennis M. Crutchfield of the NRC, dated April 4, 1996.

Letter to Mr. Don Croneberger of the B&W Owners Group from Mr. Thomas T. Martin of the NRC, dated September 13, 1996.

These NRC staff safety evaluation reports contain specific examples of aging management reviews, and acceptable and technically adequate aging management programs for specific components.

The NRC staff believes the five examples in Appendix C to NEI 95-10, Rev. 0, were sufficient "to illustrate the implementation of the various steps delineated in NEI 95-10" during the NEI License Renewal Demonstration Program. However, these examples have the potential to create confusion in the future. The industry should consult the working draft SRP-LR and the NRC staff safety evaluation reports for information on examples.

NRC staff recommendations:

The NRC staff recommends either removing Appendix C from NEI 95-10, Rev. 0, or retaining Appendix C with the existing caveats on the purpose of the examples to address this issue.

Either delete Appendix C from NEI 95-10, Rev. 0, or retain Appendix C with existing caveats.

9. Information for existing and new programs

Issue:

Consistency of information regarding existing and new aging management programs.

NRC staff position:

The NRC staff believes an applicant needs to provide justification for existing, modified, and new programs to demonstrate that the effects of aging will be adequately managed so that the structure and component intended function will be maintained for the period of extended operation. The NRC staff does not believe that the need for information in the application is different between existing, modified, or new programs.

The NRC staff recognizes that information available for existing and new programs may be different. Existing programs may have established documents

that could be referenced, such as FSAR, technical specifications, NRC generic communications, previously issued NRC staff safety evaluation reports, and licensee submittals supporting NRC staff safety determinations, regarding program description and technical basis. New programs may need to be described and justified in detail if reference documents are not available. Also, existing programs have extensive operating experience, including past corrective actions that enhanced these programs, that can be described to help justify the adequacy of these programs. New programs may have to rely more on engineering assumptions and judgement if industry operating experience is limited or not available. Also, an applicant may have to commit to providing operating experience in the future for new programs to confirm their effectiveness.

NRC staff recommendations:

The NRC staff recommends that NEI 95-10, Rev. 0, should be clarified to indicate that a need exists for technical information to demonstrate the adequacy of existing, modified, and new programs for renewal. The NRC staff also recommends clarifying Section 4.2.1.2, "Identify Plant Aging Management Programs," to indicate that existing, modified, or new programs should be considered similarly.

Insert the following new paragraph at line 15 of page 31 of NEI 95-10, Rev. 0:

"Regardless of whether existing, modified, or new programs are to be relied on for renewal, a demonstration is needed regarding the adequacy of these programs for managing the aging effects so that the structure and component intended function will be maintained for the period of extended operation."

Delete "features to consider are" in line 34 on page 28 of NEI 95-10, Rev. 0, and replace it with "for existing, modified, or existing programs, determine that:"

10. Component failure detection programs

Issue:

Consideration of component failure detection programs as aging management programs for renewal.

NRC staff position:

Some utility participants in the NEI License Renewal Demonstration Program relied on the detection of a component failure to manage some aging effects. For example, some utilities contended that an aging management program for loss of material of piping could be a program to monitor for through wall leakage. In addition, plants have leakage detection systems in their CLB to monitor reactor coolant leakage.

In general, the NRC staff believes that a program to detect component failure, without more information, should not be considered as an effective aging management program for renewal. An applicant must show that the effects of aging would be managed to ensure that the structure and component intended

function is maintained for renewal. The NRC staff believes an applicant should evaluate aging management program acceptance criteria to ensure that corrective actions would be taken in a timely manner such that the structure and component intended function will be maintained for renewal under CLB design conditions. Unless the CLB specifically permits failure in the manner contemplated, a program to detect failure cannot be considered to be an acceptable aging management program because it does not assure compliance with the CLB.

For example, a program to detect leakage in the reactor coolant system would not, by itself be considered an acceptable aging management program because it does not ensure compliance with all CLB requirements for the reactor coolant system. General Design Criterion (GDC) 14 states: "The reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture." Permitting degradation to allow leakage is "abnormal leakage," and does not meet the requirements of GDC 14. Leakage is not an acceptable acceptance criterion for assuring seismic capability because the piping may be degraded prior to having detectable leakage and may not be able to withstand the CLB design loads, such as seismic loads. There is no assurance that the acceptance criterion, that is, detectable through wall leakage for this example, would ensure that the piping would perform its intended function under CLB design conditions. Additionally, redundant components could experience aging resulting in common mode failure if the design loading event occurs. Although plants have leakage detection systems to monitor reactor coolant system leakage, the plant technical specifications disallow any leakage from the reactor coolant pressure boundary. The reactor coolant system leakage monitoring system provides defense-in-depth and cannot be considered by itself as evidence that leakage is permitted by the CLB, or that the program is an acceptable aging management program for the reactor coolant system for renewal. In general, it is difficult to rely solely on leakage detection to manage aging effects to ensure the component intended function for renewal.

NRC staff recommendations:

Since this issue is discussed already, no change is necessary to NEI 95-10, Rev. 0.