NUCLEAR ENERGY INSTITUTE

Douglas J. Walters
SENIOR PROJECT MANAGER,
LICENSING
NUCLEAR GENERATION

April 16, 2001

Mr. Christopher I. Grimes
Chief, License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: NEI 95-10, *Industry Guideline for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule*

PROJECT NUMBER: 690

Dear Mr. Grimes:

Enclosed for NRC staff endorsement is Revision 3 to NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule." It is our understanding the NRC staff will endorse NEI 95-10, Revision 3 without exception in Regulatory Guide 1.188, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses."

We previously provided Revision 3 in our letter dated March 1, 2001. In that letter we noted our intention to conduct an industry review of the document and that additional changes may result. The industry review is complete and there are a few changes which are discussed in Enclosure 1. Also, we are providing a mark-up of the March 1 version as well as a clean copy.

We understand the NRC staff is preparing a paper in response to the Commission's Staff Requirements Memorandum on the subject of credit for existing programs for license renewal. It is our understanding that the staff's paper will transmit the Generic Aging Lessons Learned (GALL) Report, the Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants (SRP), Regulatory Guide 1.188 "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses," and NEI 95-10 to the Commission and recommend they approve the SRP and Regulatory Guide for publication. Although we have not had the opportunity to review these final regulatory documents, we have been afforded the opportunity to make significant comments on the draft versions. The staff has been open to and responsive to these comments. We support the staffs' recommendation that these documents be approved by Commission.

With the submittal of NEI 95-10, Revision 3 and the finalization of the GALL and the SRP, we now have a set of guidance documents that should result in a stable, predictable and efficient license renewal process. Both the NRC staff and the industry have expended significant resources get to this point and we appreciate the NRC staff's dedication, hard work and willingness to work through some very difficult issues.

We look forward to continuing our dialogue with the NRC staff on issues that we believe will further enhance the guidance documents and the license renewal process. One such issue is how GALL and the SRP are used by licensees in the preparation of a license renewal application. We are pleased that the NRC staff has agreed to participate in an industry demonstration project that will provide examples of how we intend to use the documents. Although the program is not scheduled for completion until later this year, we do not believe issuance of the guidance documents should be delayed.

Please call if you have any questions or desire to discuss Revision 3 in more detail.

Sincerely,

Douglas J. Walters

Enclosure

c: Mr. P.T. Kuo, NRC
Mr. David Solorio, NRC

Changes to March 1, 2001 Version of NEI 95-10, Revision 3

In addition to a few editorial changes the following are the changes in this version of NEI 95-10, Revision 3:

- Added Severe Accident Management Guidelines and Individual Plant Examination of External Events to Table 3.1-1 "SAMPLE LISTING OF POTENTIAL INFORMATION SOURCES" and the corresponding text in Section 3.0 that discusses how to use those documents in the license renewal scoping process.

- Incorporated guidance in Section 4.1.1 to clarify that color schemes on marked-up drawings should be such that when the drawing is printed in black and white there is no loss of meaning.

- Included the current version of 10CFR Part 54 into Appendix A.

- Added a note in the Appendix B table that references the NRC letter to NEI on the use of FERC required inspection and maintenance programs for dam aging management.

NEI 95-10 (REVISION 3)
INDUSTRY GUIDELINE FOR IMPLEMENTING THE REQUIREMENTS OF 10 CFR PART 54 – THE LICENSE RENEWAL RULE

MARCH 2001

NEI

NUCLEAR ENERGY INSTITUTE

1776 I STREET, NW SUITE 400 WASHINGTON, DC 20006-3708 PHONE 202.739.8000 FAX 202.785.4019 www.nei.org

NEI 95-10 (REVISION 3)

NUCLEAR ENERGY INSTITUTE

INDUSTRY GUIDELINE FOR IMPLEMENTING THE REQUIREMENTS OF 10 CFR PART 54 – THE LICENSE RENEWAL RULE

ACKNOWLEDGMENTS

This guidance document, Industry Guideline on Implementing the Requirements of 10 CFR Part 54, The License Renewal Rule, NEI 95-10, was developed by the Nuclear Energy Institute (NEI) License Renewal Implementation Guideline Task Force and the NEI License Renewal Working Group for the implementation of the license renewal rule. We appreciate the direct participation of the many utilities who contributed to the development of the guideline and the participation of the balance of the industry who reviewed and submitted comments to improve the document clarity and consistency. The dedicated and timely effort of the many Task Force participants, including their management's support of the effort, is greatly appreciated.

NEI also wishes to express its appreciation to the EPRI who devoted considerable time and resources to the development of this industry guideline.

NOTICE

Neither NEI, nor any of its employees, members, supporting organizations, contractors, or consultants make any warranty, expressed or implied, or assume any legal responsibility for the accuracy or completeness of, or assume any liability for damages resulting from any use of, any information apparatus, method, or process disclosed in this report or that such may not infringe privately owned rights.

INDUSTRY GUIDELINE FOR IMPLEMENTING THE LICENSE RENEWAL RULE

TABLE OF CONTENTS PAGE NO.

1.0	Introduction	1
	1.1 Background	1
	1.2 Purpose and Scope	1
	1.3 Applicability	2
	1.4 Utilization of Existing Programs	2
	1.5 Resolution of Current Safety Issues	3
	1.6 Organization of the Guideline	4
2.0	Overview of Part 54	6
3.0	Identify The SSCs Within The Scope Of License Renewal And Their Intended Functions	9
	3.1 Systems, Structures, and Components Within the Scope of License Renewal	11
	3.2 Intended Functions of SSCs Within the Scope of License Renewal	17
	3.3 Documenting The Scoping Process	19
4.0	Integrated Plant Assessment	20
	4.1 Identification of Structures and Components Subject to an Aging Management Review and Intended Functions	21
	4.2 Aging Management Reviews	29
	4.3 New Programs and Inspections for License Renewal	43
	4.4 Documenting The Integrated Plant Assessment	45
5.0	Time-Limited Aging Analyses Including Exemptions	47
	5.1 Time-Limited Aging Analyses	47
	5.2 Exemptions	55
	5.3 Documenting the Evaluation of the Time-Limited Aging Analyses and Exemptions	56
6.0	License Renewal Application Format and Content	57
	6.1 General Information	57
	6.2 Application Format and Content Guidance	57
	6.3 Identify CLB Changes	58
Appendix A	10 CFR Part 54	A-1
Appendix B	Typical Structure And Component Groupings And Active/Passive Determinations For The Integrated Plant Assessment	B-1
Appendix C	References	C-1

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
3.1-1	SAMPLE LISTING OF POTENTIAL INFORMATION SOURCES	16
4.1-1	TYPICAL PASSIVE STRUCTURE AND COMPONENT INTENDED FUNCTIONS	27
4.1-2	TREATMENT OF CONSUMABLES	28
5.1-1	DISPOSITION OF POTENTIAL TLAAs AND BASIS FOR DISPOSITION	53
5.1-2	POTENTIAL TLAAs	54
6.2-1	STANDARD LICENSE RENEWAL APPLICATION FORMAT	59
6.2-2	GUIDANCE FOR PREPARING THE STANDARD LICENSE RENEWAL APPLICATION	61

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
2.0-1	LICENSE RENEWAL IMPLEMENTATION PROCESS	8
3.0-1	A METHOD TO IDENTIFY SSCs AND INTENDED FUNCTIONS WITHIN THE SCOPE OF LICENSE RENEWAL [§54.4(a) & (b)]	12
4.1-1	IDENTIFICATION OF STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW [§54.21(a)(1)]	23
4.2-1	ASSURING THAT THE EFFECTS OF AGING WILL BE MANAGED [§54.21(a)(3)]	30
4.2-2	ASSURING THAT THE EFFECTS OF AGING WILL BE MANAGED [§54.21(a)(3)] USING A PREVIOUS REVIEW	38
4.2-3	ASSURING THAT THE EFFECTS OF AGING WILL BE MANAGED [§54.21(a)(3)] USING A MONITORING PROGRAM	40
5.0-1	EVALUATION OF TLAAs AND EXEMPTIONS [§54.21(c)]	48

GUIDELINE TO IMPLEMENT 10 CFR PART 54 THE LICENSE RENEWAL RULE

1.0 INTRODUCTION

This guideline provides an acceptable approach for implementing the requirements of 10 CFR Part 54, the license renewal rule, hereinafter referred to as the Rule. The process outlined in this guideline is founded on industry experience and expertise in implementing the license renewal rule. It is expected that following this guideline will offer a stable and efficient process, resulting in the issuance of a renewed license. However, applicants may elect to use other suitable methods or approaches for satisfying the Rule's requirements and completing a license renewal application.

This guideline uses terminology specific to the license renewal rule. A copy of 10 CFR Part 54 is provided as Appendix A and should be reviewed.

1.1 Background

In December 1991, the Nuclear Regulatory Commission (NRC) published 10 CFR Part 54 to establish the procedures, criteria, and standards governing nuclear plant license renewal. Since publishing the original rule, the NRC and the industry conducted various activities related to its implementation. In September 1994, the NRC proposed an amendment to the rule. The final amendment was published in May 1995. It focuses on the effects of aging on long-lived passive structures and components and time-limited aging analyses (TLAAs) as defined in 10 CFR 54.21(a)(1) and 54.3, respectively. In addition, the amendment allows greater reliance on the current licensing basis (CLB), the maintenance rule, and existing plant programs.

1.2 Purpose and Scope

The major elements of the guideline (with their respective guideline sections) include:

- Identifying the systems, structures, and components within the scope of license renewal (Section 3.1);
- Identifying the intended functions of systems, structures, and components within the scope of license renewal (Section 3.2);
- Identifying the structures and components subject to aging management review and intended functions (Section 4.1);
- Assuring that effects of aging are managed (Section 4.2);

- Application of new programs and inspections for license renewal (Section 4.3);
- Identifying and resolving time-limited aging analyses (Section 5.1);
- Identifying and evaluating exemptions containing time-limited aging analyses (Section 5.2); and
- Identifying a standard format and content of a license renewal application (Section 6.0).

Applicants interested in license renewal are responsible for preparing a plant-specific license renewal application. The license renewal application includes general information and technical information. The general information is much the same as that provided with the initial operating license application. The technical information includes an Integrated Plant Assessment (IPA), the CLB changes during the NRC review of the application, TLAAs, a supplement to the Final Safety Analysis Report (FSAR), any technical specification changes or additions necessary to manage the effects of aging during the period of extended operation, and a supplement to the plant's environmental report that complies with the requirements of Subpart A of 10 CFR Part 51.

1.3 Applicability

This document is applicable to any operating license for nuclear power plants licensed pursuant to Sections 103 or 104b of the Atomic Energy Act of 1954, as amended (68 Stat. 919), and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242).

1.4 Utilization of Existing Programs

This guideline is intended to maximize the use of existing industry programs, studies, initiatives and databases. Most utilities interested in renewing their operating licenses will prepare their license renewal application after the effective date of the maintenance rule (10 CFR 50.65), which is July 10, 1996. This guideline is written with the knowledge that some provisions of the license renewal rule may be satisfied with actions taken to comply with 10 CFR 50.65. Because of similarities between the two rules, implementation guidance for the maintenance rule[1] should be reviewed to determine if it can be found acceptable/credited for meeting the license renewal rule requirements. For example, the initial scoping of safety-related systems, structures, and components (SSCs) for license renewal is identical to the scoping of safety-related systems, structures, and components required by the maintenance rule. The license

[1] NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," to the extent endorsed by the NRC in Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

renewal scoping of nonsafety-related systems, structures, and components that support safety-related systems, structures, and components is similar to the maintenance rule. Applicants are cautioned, however, that there are differences. For instance, the maintenance rule excludes nonsafety-related systems, structures, and components based solely on seismic II/I interactions. This is not an exclusion under the license renewal rule.

The process used to determine the systems, structures, and components within the scope of the maintenance rule may have also identified the system, structure, and component functions necessary for license renewal implementation. In addition, many of the programs used for establishing performance criteria at the plant, system, or train level to meet the intent of the maintenance rule may be key elements of the license renewal aging management review process. Applicants are encouraged to carefully review and evaluate their maintenance rule documentation for applicability and ease of use in preparing a license renewal application.

Applicants need to also be aware of two regulatory documents: the Generic Aging Lessons Learned Report (GALL) and the License Renewal Standard Review Plan. The GALL report evaluates existing programs generically to document the basis for determining when such programs are adequate without change and when they should be augmented for license renewal. The GALL report is a basis document to the standard review plan for license renewal that provides NRC staff guidance in reviewing a license renewal application.

NEI 95-10 is written to be consistent with GALL and the standard review plan.

1.5 Resolution of Current Safety Issues (e.g. , GSIs and USIs)

Generic resolution of a generic safety issue (GSI) or unresolved safety issue (USI) is not necessary for the issuance of a renewed license. GSIs and USIs that do not contain issues related to the license renewal aging management review or time-limited aging evaluation need not be reviewed. However, designation of an issue as a GSI or USI does not exclude the issue from the scope of the aging management review or time-limited aging evaluation. (The current process for resolution of GSIs and USIs include evaluations based on a 40 year operating life and a 60-year operating life.)

Unresolved Safety Issues, HIGH, and MEDIUM priority issues described in Appendix B in NUREG-0933, that involve aging effects for structures and components subject to an aging management review or TLAAs, should be specifically addressed. The version of NUREG-0933 that is current on the date 6 months before the date of the license renewal application should be used to identify such issues. Prior to SER completion, any new issues contained in later versions of

NUREG-0933 must be reviewed and resolved if determined to be applicable to the applicant's plant.

For an issue that is both within the scope of the aging management review or time-limited aging evaluation and within the scope of a USI or GSI, there are several approaches that can be used to satisfy the finding required by §54.29.

- If resolution has been achieved before issuance of a renewed license, implementation of that resolution could be incorporated within the renewal application.

- An applicant may choose to submit a technical rationale which demonstrates that the CLB will be maintained until some later point in time in the period of extended operation, at which point one or more reasonable options (e.g., replacement, analytical evaluation, or a surveillance/maintenance program) would be available to adequately manage the effects of aging. The license renewal application would have to describe the basis for concluding that the CLB is maintained in the period of extended operation and briefly describe options that are technically feasible during the period of extended operation to manage the effects of aging, but it would not have to pre-select which option would be used.

- Another approach could be for an applicant to develop an aging management program, which, for that plant, incorporates a resolution to the aging effects issue.

- Another option could be to propose to amend the CLB (as a separate action outside the license renewal application) which, if approved, would remove the intended function(s) from the CLB.

During the preparation and review of a renewal application, an applicant or the NRC may become aware of an aging management or time-limited aging analysis issue that may be generically applicable (but are not yet part of the formal generic safety issue resolution process), an applicant must still address the issue in its application to demonstrate that the effects of aging are or will be adequately managed or that TLAAs have been evaluated for the period of extended operation.

1.6 Organization of the Guideline

Obtaining a renewed operating license is a three-phase approach. The first phase is the technical work that must be performed to generate the information that is included in the license renewal application. The second phase is the preparation of the license renewal application. Phase three is submitting the application and the NRC's review.

The technical work includes determining the systems, structures, and components within the scope of the Rule, identifying the structures and components subject to an aging management review, identifying aging effects requiring management, evaluating plant programs, and reviewing TLAAs and exemptions and justifying their applicability for license renewal. The technical phase produces results or information that is ultimately incorporated into the license renewal application, so it is important to maintain accurate and detailed supporting documentation. This supporting documentation is not required to be submitted as part of the application; however, it must be auditable and retrievable for NRC review. Sections 3.0, 4.0 and 5.0 of this document provide guidance on how to proceed through the technical phase. These sections explain what work needs to be done, how to do it, and the expected results.

Section 6.0 discusses the standard license renewal application format.

Earlier versions of NEI 95-10 included examples to illustrate the different steps involved in preparing a license renewal application. The examples are no longer included. Instead, applicants are encouraged to review applications that have been submitted and the resulting safety evaluation reports that are issued in the form of NUREGs.

2.0 OVERVIEW OF PART 54

The Rule contains the regulatory requirements that must be satisfied in order to obtain a renewed operating license, which allows continued operation of a nuclear power plant beyond its original license term. (Figure 2.0-1 reflects the license renewal implementation process.)

The Rule is founded on two principles. The first principle of license renewal is that with the possible exception of the detrimental effects of aging on the functionality of certain plant systems, structures, and components in the period of extended operation and possibly a few other issues related to safety only during the period of extended operation, the regulatory process is adequate to ensure that the licensing bases of all currently operating plants provides and maintains an acceptable level of safety so that operation will not be inimical to public health and safety or common defense and security. The second and equally important principle of license renewal holds that the plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term.

In addition to the identification and evaluation of TLAAs, the focus of the Rule is on providing reasonable assurance that the effects of aging on the functionality of long-lived passive structures and components are adequately managed in accordance with the plant- specific CLB design basis conditions such that the intended functions are maintained in the period of extended operation. This demonstration is documented in the license renewal application.

The license renewal application contains general information, technical information, information regarding technical specifications, and environmental information.

The general information concerns the plant site and the plant owner(s). The required information is specified in 10 CFR 50.33(a) through (e), (h), and (i). Additionally, the application must include conforming changes to the standard indemnity agreement, 10 CFR 140.92, Appendix B, to account for the expiration term of the proposed renewed license.

The technical information includes (1) the IPA, which is the demonstration that the effects of aging on long-lived, passive structures and components are being adequately managed such that the intended functions are maintained, consistent with the CLB, in the renewal period, (2) the listing and evaluation of TLAAs and any exemptions in effect which are based on TLAAs, and (3) a supplement to the plant's FSAR which contains a summary description of the programs and activities that are cited as managing the effects of aging and the evaluation of time-limited aging analyses.

The application also must include any changes or additions to the plant's technical specifications that are necessary to manage the effects of aging during the period of extended operation. Lastly, the application must contain a supplement to the plant's environmental report that complies with the requirements of 10 CFR Part 51.

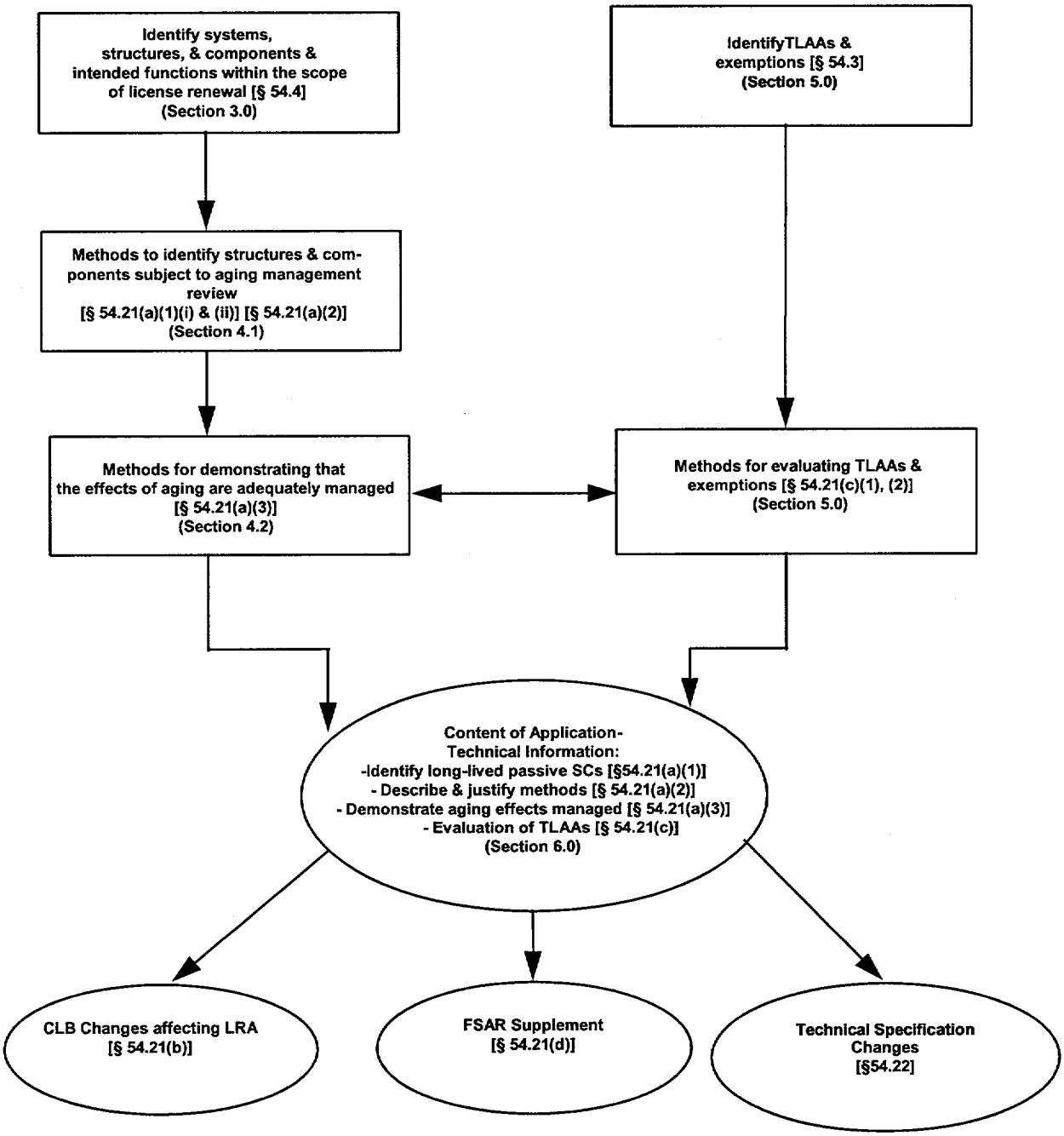
Once the application is submitted to the NRC, it must be amended each year to identify any changes to the CLB that materially affect the contents of the application, including the FSAR supplement.

Information and documentation required by, or otherwise necessary to document compliance with, the Rule must be maintained by the applicant in an auditable and retrievable form for the term of the renewed operating license. Additionally, after the renewed license is issued, the FSAR update required by 10 CFR 50.71(e) must include any systems, structures, or components newly identified that would have been subject to an aging management review or evaluation of time-limited aging analyses in accordance with §54.21.

The license renewal rule at 10 CFR 54.30 specifies matters that are not subject to NRC review and that may not be contested in a hearing for license renewal. The intent of the provision in 10 CFR 54.30 is to clarify that safety matters of noncompliance for the current operating term should not be the subject of the renewal application or the subject of a hearing in a renewal proceeding, absent specific Commission direction. Issues concerning operation during the currently authorized term of operation should be addressed as part of the current license in accordance with the Commission's current regulatory process rather than deferred until a renewal review (which will not occur if the licensee chooses not to renew its operating license). Furthermore, 10 CFR 54.30 is intended to make clear that aging issues discovered during the renewal review for the structures and components that are reviewed in 10 CFR 54.21(a)(3) or 54.21 (c)(1) and that raise questions about the capability of these structures and components to perform their intended function during the current term of operation must be addressed under the current license. However, an applicant for renewal is not relieved from addressing the issue relevant to the period of extended operation as part of its renewal application.

Section 54.30 does not require a general demonstration of compliance with the CLB as a prerequisite for issuing a renewed license. Section 54.30 discusses the applicant's responsibilities for addressing safety matters under its current license, which are not within the scope of the renewal review.

FIGURE 2.0 -1
LICENSE RENEWAL IMPLEMENTATION PROCESS



3.0 IDENTIFY THE SSCs WITHIN THE SCOPE OF LICENSE RENEWAL AND THEIR INTENDED FUNCTIONS

This section provides a process for determining which of the many systems, structures, and components that make up a commercial nuclear power plant are included within the scope of the Rule. The scoping process described in this guideline is at the system and structure level for the majority of the systems, structures, and components. In subsequent sections, it is assumed that scoping is performed at the system and structure level. This is not intended to imply that scoping at a component level is not allowed by the Rule. In fact, for some plants it may be easier to scope at the component level. In addition, it may be convenient for a plant to scope using more than one method. For instance, a system-based scoping approach may be used for mechanical systems and a component or commodity-based scoping approach used for electrical systems. (Figure 3.0-1 is a process diagram for this section.)

To assist the applicant in determining the systems, structures and components within the scope of license renewal a list of potential information sources is provided as Table 3.1.1. The table is not intended to be all encompassing nor is it intended to be a list of "must review" sources. During the development of this guidance document, there was significant interaction with the NRC staff regarding the inclusion of Probabilistic Risk Assessment summary report and Individual Plant Examination of External Events (IPEEE) in the table. Clearly, these two sources contain information that is beyond the plants licensing basis and if the applicant chooses to use them as information sources, ultimately, the provisions of § 54.4 prevail. This means that while the PRA summary report and the facility's IPEEE may mention systems structures, and components, only those that meet the criteria delineated in § 54.4 are considered in the license renewal scope.

The Commission was clear on this point in the Statements of Consideration for the 1995 license renewal rulemaking. In response to a comment from the state of Illinois, the Commission acknowledges the existence of the PRA and IPEEEs; however, the Commission also stated "The CLB for currently operating plants is largely based on deterministic engineering criteria. Consequently, there is considerable logic in establishing license renewal scoping criteria that recognize the deterministic nature of a plant's licensing basis. Without the necessary requirements and appropriate controls for plant-specific PRAs, the Commission concludes that it is inappropriate to establish a license renewal scoping criterion, as suggested by Illinois, that relies on plant-specific probabilistic analyses."

The table also identifies the Emergency Operating Procedures(EOPs) and Severe Accident Management Guidelines (SAMGs) as potential information sources. Like the PRA summary report and the IPEEE studies, the EOPs and SAMGs are beyond design basis. While the Commission did not speak to the use of these documents in

the Statements of Consideration, it is reasonable to extend the Commissions view on the use of PRA and IPEEEs as scoping criteria to the EOPs and SAMGs as well.

3.1 Systems, Structures, and Components Within the Scope of License Renewal

Part 54 Reference

§54.4

(a) Plant systems, structures, and components within the scope of this part are --

(1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined as in 10 CFR 50.49 (b)(1)) to ensure the following functions --

(i) The integrity of the reactor coolant pressure boundary;

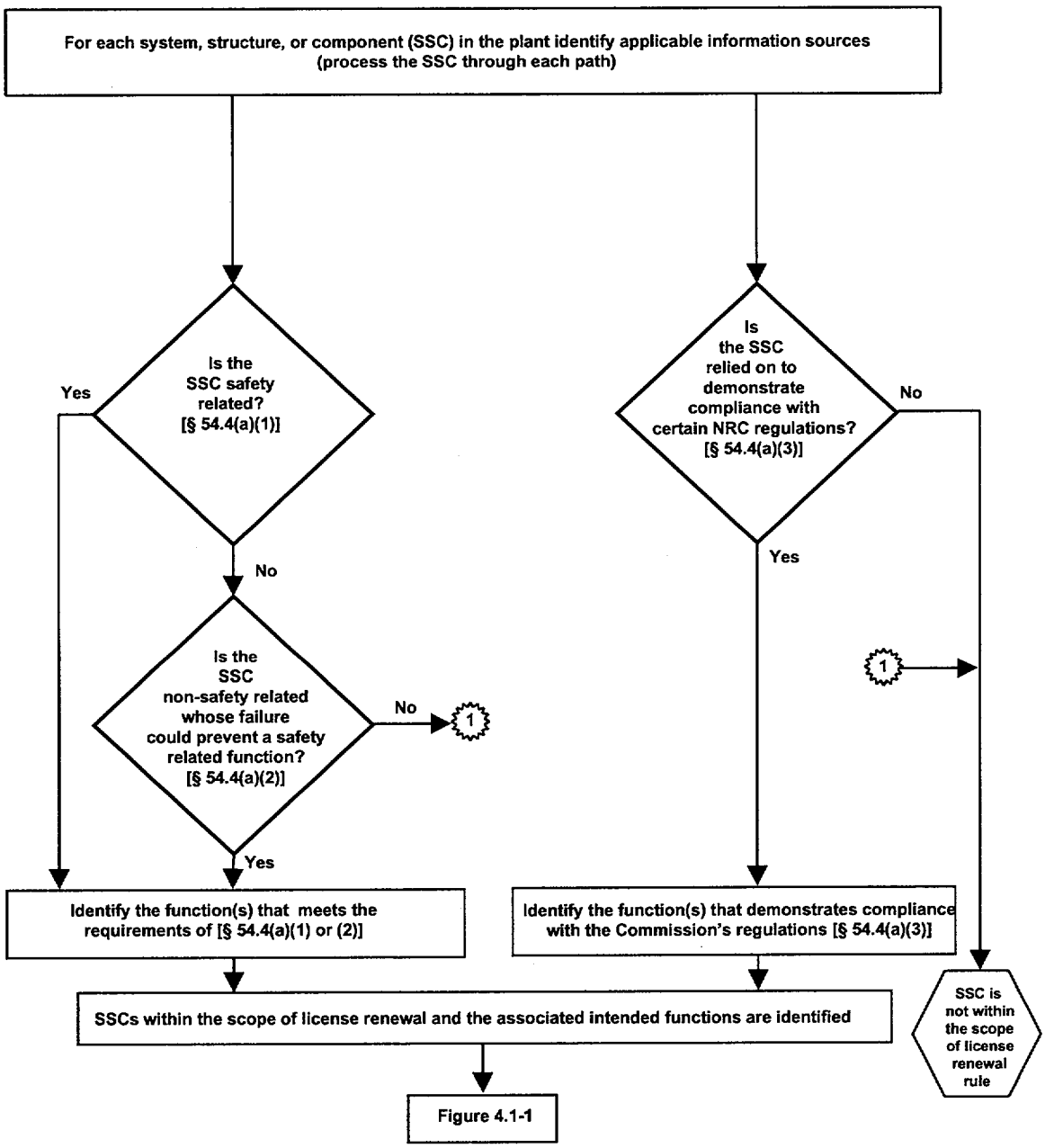
(ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or

(iii) The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in § 50.34(a)(1), 50.67(b)(2), or § 100.11 of this chapter, as applicable.

(2) All nonsafety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs (a)(1)(i), (ii), or (iii) of this section.

(3) All systems, structures, and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).

FIGURE 3.0-1
A METHOD TO IDENTIFY SSCs AND INTENDED FUNCTIONS WITHIN THE SCOPE OF LICENSE RENEWAL [§ 54.4(a) &(b)]



3.1.1 Safety-Related Systems, Structures and Components

There are a number of viable alternatives for identifying safety-related systems, structures, and components. Table 3.1-1 is a listing of information sources for consideration in this process. There may be information sources available to applicants that are not identified on Table 3.1-1. These sources may be considered as well.

Regardless of the approach used, a safety-related system, structure, or component is within the scope of license renewal if it is relied upon to remain functional during and following design basis events as defined in §50.49(b)(1) to ensure the following functions:

- The integrity of the reactor coolant pressure boundary;
- The capability to shut down the reactor and maintain it in a safe shutdown condition; or
- The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in § 50.34(a)(1) § 50.67(b)(2) or § 100.11 of this chapter, as applicable.

It is conceivable that, because of plant unique considerations and preferences, applicants may have previously elected to designate some systems, structures, and components as safety-related that do not perform any of the requirements of §54.4(a)(1). Therefore, a system, structure, or component may not meet the requirements of §54.4(a)(1) although it is designated as safety-related for plant-specific reasons. However, the systems, structures, and components would still need to be evaluated for inclusion into the scope of the Rule using the criteria in §54.4(a)(2) and §54.4(a)(3). For example, an applicant may have designated refueling equipment as safety-related even though it does not meet the criteria delineated above. In such cases, the applicant shall include a discussion of the process (in accordance with §54.21(a)(2) methodology) for making these determinations.

Similarly, an applicant's CLB definition of safety-related may not match the § 54.4(a)(1) definition. In these cases, the applicant should apply the § 54.4(a)(1) definition for purposes of identifying the systems, structures, and components that are in the scope of license renewal.

3.1.2 Nonsafety-Related SSCs Whose Failure Prevents Safety-Related SSCs From Fulfilling Their Safety-Related Function

There are a number of viable alternatives for identifying nonsafety-related systems, structures, and components that are within the scope of the Rule. Table 3.1-1 is a listing of information sources for consideration in this process. There may be information sources available to applicants that are not identified on Table 3.1-1. These sources may be considered as well.

Regardless of the approach used, the nonsafety-related systems, structures, and components considered to be in the scope of the Rule are those:

- Whose failure prevents a safety function from being fulfilled; or
- Whose failure as a support system, structure, or component prevents a safety function from being fulfilled.

(NOTE: "safety function" refers to the safety-related intended functions identified in §54.4(a)(1)(i), (ii) and (iii))

Examples of these types of systems, structures, and components include nonsafety-related instrument air systems that open containment isolation valves for purge and vent, a nonsafety-related fire damper whose failure would cause the loss of a safety function, or a nonsafety-related system fluid boundary whose failure would cause loss of a safety function.

An applicant should rely on the plant's CLB, actual plant-specific experience, industry-wide operating experience, as appropriate and existing plant-specific engineering evaluations to determine the appropriate systems, structures, and components in this category. Consideration of hypothetical failures that could result from system interdependencies that are not part of the CLB and that have not been previously experienced is not required. Hypothetical failures that are part of the CLB may require consideration of second- third- or fourth-level support systems.

3.1.3 SSCs Relied on to Demonstrate Compliance With Certain Specific Commission Regulations

Systems, structures, and components relied on to perform a function that demonstrates compliance with the following regulations are also in the scope of the Rule:

- Fire Protection (10 CFR 50.48)

- Environmental Qualification (10 CFR 50.49)[2]
- Pressurized Thermal Shock (10 CFR 50.61)
- Anticipated Transient Without Scram (10 CFR 50.62)
- Station Blackout (10 CFR 50.63)

The information sources in Table 3.1-1 could be considered for identifying the systems, structures, and components whose functions are relied on to demonstrate compliance with the regulatory requirements (i.e., whose functions were credited in the analysis or evaluation). Mere mention of a system, structure, or component in the analysis or evaluation does not constitute support of a specified regulatory function. An applicant should rely on the plant's CLB, plant-specific experience, industry-wide operating experience, as appropriate and existing plant-specific engineering evaluations to determine the appropriate systems, structures, and components in this category. Consideration of hypothetical failures that could result from system interdependencies that are not part of the plant's CLB and that have not been previously experienced is not required. Hypothetical failures that are part of the CLB may require consideration of second- third- or fourth-level support systems.

[2] The Statements of Consideration for the amendments to 10 CFR Part 54[60FR22466] states that "...the Commission agrees that for purposes of §54.4, the scope of §50.49 equipment to be included within §54.4 is that equipment already identified by licensees under 10 CFR 50.49(b). Licensees may rely upon their listing of 10 CFR 50.49 equipment, as required by 10 CFR Part 50.49(d), for purposes of satisfying §54.4 with respect to equipment within the scope of §50.49."

TABLE 3.1-1

SAMPLE LISTING OF POTENTIAL INFORMATION SOURCES

• Verified Databases (A database that is subject to administrative controls to assure and maintain the integrity of the stored data or information)
• Master Equipment Lists (including NSSS Vendor Listings)
• Q-Lists
• Updated Safety Analysis Reports
• Piping and Instrument Diagrams (P&IDs)
• Electrical One-Line or Schematic Drawings
• Operations and Training Handbooks
• Design Basis Documents
• General Arrangement or Structural Outline Drawings
• Quality Assurance Plan or Program
• Maintenance Rule Compliance Documentation
• Design Basis Event Evaluations
• Docketed Correspondence
• System Interaction Commitments
• Technical Specifications
• Environmental Qualification Program Documents
• Regulatory Compliance Reports (Including Safety Evaluation Reports)
• Probabilistic Risk Assessment summary report
• Emergency Operating Procedures
• Severe Accident Management Guidelines
• Individual Plant Examination of External Events

3.2 Intended Functions of SSCs Within the Scope of License Renewal

Part 54 Reference

§54.4

****

(b) The intended functions that these systems, structures, and components must be shown to fulfill in §54.21 are those functions that are the bases for including them within the scope of license renewal as specified in paragraphs (a)(1)-(3) of this section.

The intended functions define the plant process, condition, or action that must be accomplished in order to perform or support[3] a safety function for responding to a design basis event or to perform or support a specific requirement of one of the five regulated events in §54.4(a)(3). At a system level, the intended functions may be thought of as the functions of the system that are the bases for including this system within the scope of license renewal as specified in §54.4(a)(1)-(3). Where the plant's licensing basis includes requirements for redundancy, diversity, and defense-in-depth, the system intended functions include providing for the same redundancy, diversity and defense-in-depth during the period of extended operation. For example, a system with two independent trains, according to the plant's CLB, has to perform the intended functions by each independent train.

As noted in the above reference, §54.4(b) provides criteria that should be used to identify the "intended functions" of systems, structures, and components within the scope of the rule. Therefore, as part of the license renewal process, an applicant should establish a methodology that identifies systems, structures, and components within the scope of the rule and the intended functions that are the basis for their inclusion.

In identifying intended functions it is important to understand that the terms "systems, structures, and components" and "structures and components" are used differently throughout the Rule and statements of consideration (SOC). The SOC, in a footnote (60FR22462), clarifies why "systems, structures and components" is used in some sections of the SOC and Rule versus "structures and components (SCs)". This footnote clarifies that the scoping section (§54.4) includes systems, structures, and components rather than just structures and components to allow an applicant flexibility in how it develops and implements a methodology to identify those structures and components that are subject to an aging management review

[3]The term "support" here includes system, structure, and components whose failure could prevent other SSCs from performing their intended function.

for license renewal. Also, §54.4 and the associated SOC sections include systems, structures, and components to allow the applicant flexibility on how exemptions containing TLAAs can be evaluated for the period of extended operation (§54.21 (c)(2)) because exemptions might have been granted for a particular system.

The IPA required by §54.21(a) is performed at the structure and component level. Guidance on the IPA process is provided in Section 4.0 of this guideline. The Rule contains flexibility to permit an applicant to start the IPA process at either the system/structure or structure/component level as long as the passive, long-lived structures and components are identified. The intended functions of the structures and components are the same regardless of the starting point. If the starting point is the system level, the system intended functions are identified as previously discussed. However, the intended functions of the structures and components still have to be determined as discussed in Section 4.1. These functions are the specific functions of the structures and components that support the system/structure intended function(s). Similarly, if the starting point is the structure and component level, the intended functions are those that included these structures and components within the scope of license renewal. A structure or component may have multiple functions, but only the function(s) meeting the criteria of §54.4 are to be reviewed for license renewal. Intended functions need not be defined for component piece-parts.

The process leading to the maintenance rule scoping determinations may also have produced a listing of the system and structure functions. Although it is not a requirement of the maintenance rule, such a listing may be based on a documented procedure that ensures a comprehensive and consistent approach to defining the functions for all the systems within the scope of the maintenance rule. If this is the case, then the maintenance rule documentation can be used to help identify the functions of safety-related systems and nonsafety-related (affecting safety-related) systems within the scope of the license renewal rule. The information sources used to identify the systems required for compliance with the regulations in §54.4(a)(3) should be used to identify their associated functions. If the maintenance rule documentation does not define the system functions, does not rely on a procedure which uses a structured approach, or the applicant elects not to use this source, then alternative documentation such as a verified database or a safety analysis report, operations training manuals, etc., can be used to identify the functions of safety-related systems and nonsafety-related (affecting safety-related) systems. A sample listing of information sources that can be used to identify the functions of all systems (and structures and components) within the scope of the Rule is provided in Table 3.1-1.

3.3 Documenting the Scoping Process

Section 54.37(a) of the Rule requires applicants to retain in an auditable and retrievable form all information and documentation required by, or otherwise necessary to document compliance with, the provisions of the Rule.

The results of the scoping determination should be documented in a format consistent with other plant documentation practices. The information may be maintained in "hard-copy" or electronic format. If available and appropriate, the information may be incorporated into an existing plant database. The applicant should use the quality assurance program in effect at the plant when documenting the results of the scoping process.

The information to be documented by the applicant should include:

A designation of the plant systems, structures, and components that are safety-related (§54.4 (a)(1)), meet the requirements of §54.4(a)(2), or meet the requirements of §54.4(a)(3);

Identification of the systems', structures', and components' functions that meet the requirements of §54.4(b) and therefore are intended functions; and

The information sources, used to accomplish the above, and any discussion needed to clarify their use.

4.0 INTEGRATED PLANT ASSESSMENT

The Integrated Plant Assessment (IPA) is the core of the license renewal application. It is the transition from the scoping process to the screening process where the focus is on components and structures and their intended functions. Once the systems, structures, and components within the scope of license renewal are identified, the next step is to determine which structures and components are subject to an aging management review. Specifically, §54.21(a)(1) states that the aging management review for a structure or component is directly related to whether the structure or component performs an intended function without moving parts or without a change in configuration or properties (i.e., it is passive) and that is not subject to replacement based on a qualified life or specified time period (i.e, it is long-lived). The IPA also includes a description and justification of the methodology used to determine the "passive, long-lived" structures and components and a demonstration that the effects of aging on those structures and components will be adequately managed so that the intended function(s) will be maintained under all design conditions imposed by the plant specific CLB for the period of extended operation.

4.1 Identification of Structures and Components Subject to an Aging Management Review and Intended Functions

Part 54 Reference

§54.21(a)(1)(i) and (ii)

(1) 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. Structures and components subject to an aging management review shall encompass those structures and components --

(i) That perform an intended function, as described in §54.4, without moving parts or without a change in configuration or properties. These structures and components include, but are not limited to, the reactor vessel, the reactor coolant system pressure boundary, steam generators, the pressurizer, piping, pump casings, valve bodies, the core shroud, component supports, pressure retaining boundaries, heat exchangers, ventilation ducts, the containment, the containment liner, electrical and mechanical penetrations, equipment hatches, seismic Category I structures, electrical cables and connections, cable trays, and electrical cabinets, excluding, but not limited to, pumps (except casing), valves (except body), motors, diesel generators, air compressors, snubbers, the control rod drive, ventilation dampers, pressure transmitters, pressure indicators, water level indicators, switchgears, cooling fans, transistors, batteries, breakers, relays, switches, power inverters, circuit boards, battery chargers, and power supplies; and

(ii) That are not subject to replacement based on a qualified life or specified time period.

§54.21(a)(2)

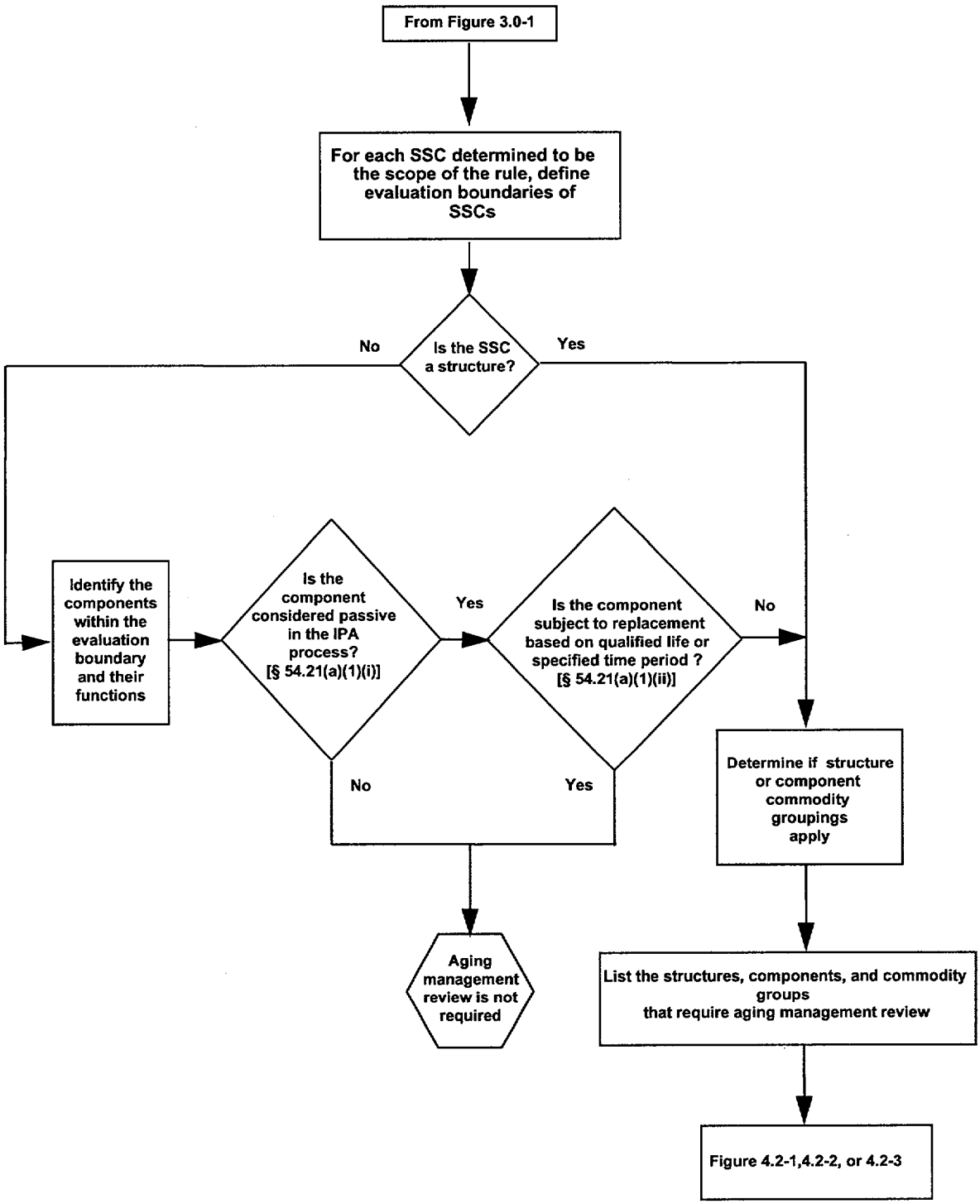
(2) Describe and justify the methods used in paragraph (a)(1) of this section.

There are a number of different methods that will accomplish the same objective of identifying structures and components subject to an aging management review. Regardless of the method used, it must produce the identification and listing of structures and components required by §54.21(a)(1)(i) and (ii). (Figure 4.1-1 reflects the method described in this section.)

Selection of an appropriate method is highly dependent on the applicant's information management system(s). For example, the availability of computer databases of plant equipment may result in a more efficient component-by-component review process. Absent such databases, an applicant may use a manual review process based on system piping and instrumentation drawings and electrical one-line diagrams supplemented by other available plant documentation as required.

As a minimum, the resulting list developed by the applicant must include all passive, long-lived structures and components (or commodity groupings) within the scope of license renewal. If an applicant chooses for its own reason, they can use a bounding approach and the list could be larger (e.g., all passive structures and components). Such a bounding approach may be more efficient, especially for the structures or components in areas that are known to be benign and not requiring aging management or when a program will cover all structures or components in an area whether or not all the structures or components in the area are in scope.

FIGURE 4.1-1
IDENTIFICATION OF STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW [§ 54.21(a)(1)]



4.1.1 Establishing Evaluation Boundaries

If the license renewal scoping was performed at the system/structure level, as discussed in Section 3.2, the identification of structures or components subject to aging management review begins by first determining the system or structure evaluation boundary. The evaluation boundary includes those portions of the system or structure that are necessary for ensuring that the intended functions of the system or structure will be performed. This step documents which portions of the system make up the evaluation boundary.

Documenting the system or structure evaluation boundary is critical and may vary depending on the applicant's method of managing information in the IPA process. One method is to "flag" components in an equipment database as being either inside or outside the evaluation boundary. Another method may be to mark up system drawings to clearly indicate which portions are inside and outside the evaluation boundary. Typically, the drawings are marked-up using different color schemes. When selecting the color scheme it is important to be mindful that the NRC will scan the application for inclusion in an electronic database. Alternatively, if the applicant submits the application electronically, that version of the application will be placed in the database. When printing from the database, the resulting copy is likely to be in black and white. Therefore, the color scheme for the drawings should be such that a black and white printed version will not lose meaning.

When identifying structures and components within an evaluation boundary, the applicant should rely on the plant's CLB, plant specific experience, industry-wide operating experience, as appropriate, and existing engineering evaluations. Consideration of hypothetical failures that could result from system interdependencies that are <u>not</u> part of the CLB and that have not been experienced previously is not required. The evaluation boundary may not be the normal system boundary as defined by existing plant documentation. However, it is not the intent of this guide to change or redefine the normal system boundaries as a result of license renewal.

There are some structures and components that, when combined, are considered a complex assembly (e.g., diesel generator starting air skids or heating, ventilating, and air conditioning refrigerant units). The Rule and associated SOC do not specifically discuss such assemblies. For purposes of performing an aging management review, it is important to clearly establish the boundaries for review. An applicant should establish the boundaries for such assemblies by identifying each structure and component that makes up the complex assembly and determining whether or not each structure and component is subject to an aging management review.

At the component level, it is important to define the component boundaries. This is needed whether a system or a component approach is used. The purpose is to clearly define the component boundaries that will be used when reviewing a component (i.e., what is considered part of the component). Whereas the system evaluation boundary is described in relation to neighboring systems, component boundaries are described in relation to neighboring components.

Structures are long-lived and passive, but just like systems, there may be portions that are excluded from the license renewal aging management review because those portions do not have an intended function. A building, for example, with several rooms may be in the scope of renewal because one of those rooms performs an intended function. The building may be in the scope of renewal but only that one room needs to be identified as requiring an aging management review.

4.1.2 Determining Structures and Components Subject to Aging Management Review and Their Intended Functions

All long-lived passive structures and components that perform or support an intended function without moving parts or a change in configuration or properties are subject to aging management review. For all such structures or components, the structure or component intended function is documented for use during the aging management review steps of the IPA. The structure or component intended function(s) is the specific function of the structure or component that supports the system intended function. Plant specific CLBs require intended functions to be performed under a variety of design conditions. (Table 4.1-1 is a listing of typical passive structure and component intended functions.)

In making the determinations that a structure's or component's intended function is performed without moving parts or a change in configuration or properties, it is not necessary to consider the piece parts of the structure or component. However, in the case of valves and pumps, the valve bodies and pump casings may perform an intended function by maintaining the pressure-retaining boundary and therefore would be subject to an aging management review.

If the structure or component is not subject to replacement based on a qualified life or specified time period, then it is considered long-lived pursuant to §54.21(a)(1)(ii) of the Rule. Replacement programs may be based on vendor recommendations, plant experience, or any means that establishes a specific service life, qualified life or replacement frequency under a controlled program. Structures and components that are <u>not long-lived</u> should not be included in the aging management review.

It may be beneficial to create commodity groupings of like structures or components, including those that are active and passive, to disposition the entire

group with a single aging management review. The basis for grouping structures or components can be determined by such characteristics as similar design, similar materials of construction, similar aging management practices, and similar environments. If the environment in which the structure or component operate suggests potential different environmental stressors, then the commodity grouping determination also could consider service time, operational transients, previous failures, and any other conditions that would suggest different results. Appendix B of this guideline is a listing, although not all-inclusive, of typical plant components, structures, and commodity groupings, along with a determination of whether the group is active or passive. Applicants are encouraged to use this appendix in determining structures and components subject to an aging management review.

Structures within the scope of license renewal are long-lived and passive and will require an aging management review. It may be useful, however, to categorize structures by type (e.g., poured concrete, block concrete, structural steel, shield walls, metal siding, foundation on piles, etc.) in preparation for the aging management review. Subdividing complex structures into discrete elements (e.g., walls, floors, slabs, doors, penetrations, foundations, etc.) may be useful because some elements may not have intended functions as defined in the Rule and, therefore, are not subject to an aging management review. It may also be useful to individually identify spill containment, flood control and fire barrier structural components where applicable and appropriate.

Structural supports either support or restrain mechanical and electrical equipment (e.g., hangers, pipe whip restraints, cable trays, and supports). Structural supports can be considered part of or separate from the applicable structure. This guideline assumes that structural support commodity groupings will be addressed separately from the applicable structure.

Also, there may be piping segments that provide structural support. For example, the safety-related/nonsafety-related boundary along a pipe run may occur at a valve location. The piping segment between this valve and the next seismic anchor provides structural support in a seismic event. This piping segment is within the scope of license renewal.

Consumables also need to be considered in the process for determining the structures and components subject to an aging management review. Consumables, as used in this guideline, means packing, gaskets, component seals, O-rings, structural sealants, oil, grease, component filters, system filters, fire extinguishers, fire hoses, and air packs. Table 4.1-2 provides a method to disposition these consumables.: Although not a requirement of the rule, it will be helpful if the application includes a summary of how consumables were considered in the aging management review process.

TABLE 4.1-1
TYPICAL PASSIVE STRUCTURE AND COMPONENT INTENDED FUNCTIONS

Components
Provide pressure-retaining boundary so that sufficient flow at adequate pressure is delivered
Provide filtration
Provide flow restriction (throttle)
Provide structural support to safety-related components
Provide electrical connections to specified sections of an electrical circuit to deliver voltage, current, or signals
Provide heat transfer (See Appendix C, Reference 1)
Structures
Provide rated fire barrier to confine or retard a fire from spreading to or from adjacent areas of the plant
Provide shelter/protection to safety-related components
Provide structural and / or functional support to safety-related equipment
Provide flood protection barrier (internal and external flooding event)
Provide pressure boundary or essentially leak tight barrier to protect public health and safety in the event of any postulated design basis events.
Provide spray shield or curbs for directing flow (e.g. safety injection flow to containment sump)
Provide shielding against radiation
Provide missile barrier (internally or externally generated)
Provide shielding against high energy line breaks
Provide structural support to nonsafety-related components whose failure could prevent satisfactory accomplishment of any of the required safety-related functions
Provide pipe whip restraint
Provide path for release of filtered and unfiltered gaseous discharge
Provide source of cooling water for plant shutdown.
Provide heat sink during SBO or design basis accidents.

TABLE 4.1-2
TREATMENT OF CONSUMABLES

Consumable	Disposition
Packing, Gaskets, Components Seals, and O-rings	These would not necessarily be called out explicitly in the scoping and screening procedures. Instead they would be implicitly addressed at the component level. The applicant will be able to exclude these utilizing a clear basis such as the example of ASME Section III not being relied upon for pressure boundary.
Structural Sealants	Structural sealants would not necessarily be called out explicitly in the scoping and screening procedures. Instead they would be implicitly addressed at the component level. Structural sealants may perform functions without moving parts or change in configuration and they are not typically replaced. It is expected that the applicant's structural aging management program will address these items with respect to an aging management review program on a plant specific basis.
Oil, Grease, and Component Filters	For these commodities, the screening process would be expected to exclude these materials because they are short-lived and are periodically replaced.
System Filters, Fire Extinguishers, Fire Hoses, and Air Packs	These may be excluded, on a plant-specific basis, from an aging management review under 10 CFR 54.21(a)(1)(ii) in that they are replaced on condition. The application should identify the standards that are relied on for replacement as part of the methodology description, for example, NFPA standards for fire protection equipment.

4.2 Aging Management Reviews

Part 54 Reference

§54.21(a)(3)

(3) For each structure and component identified in paragraph (a)(1) of this section, demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

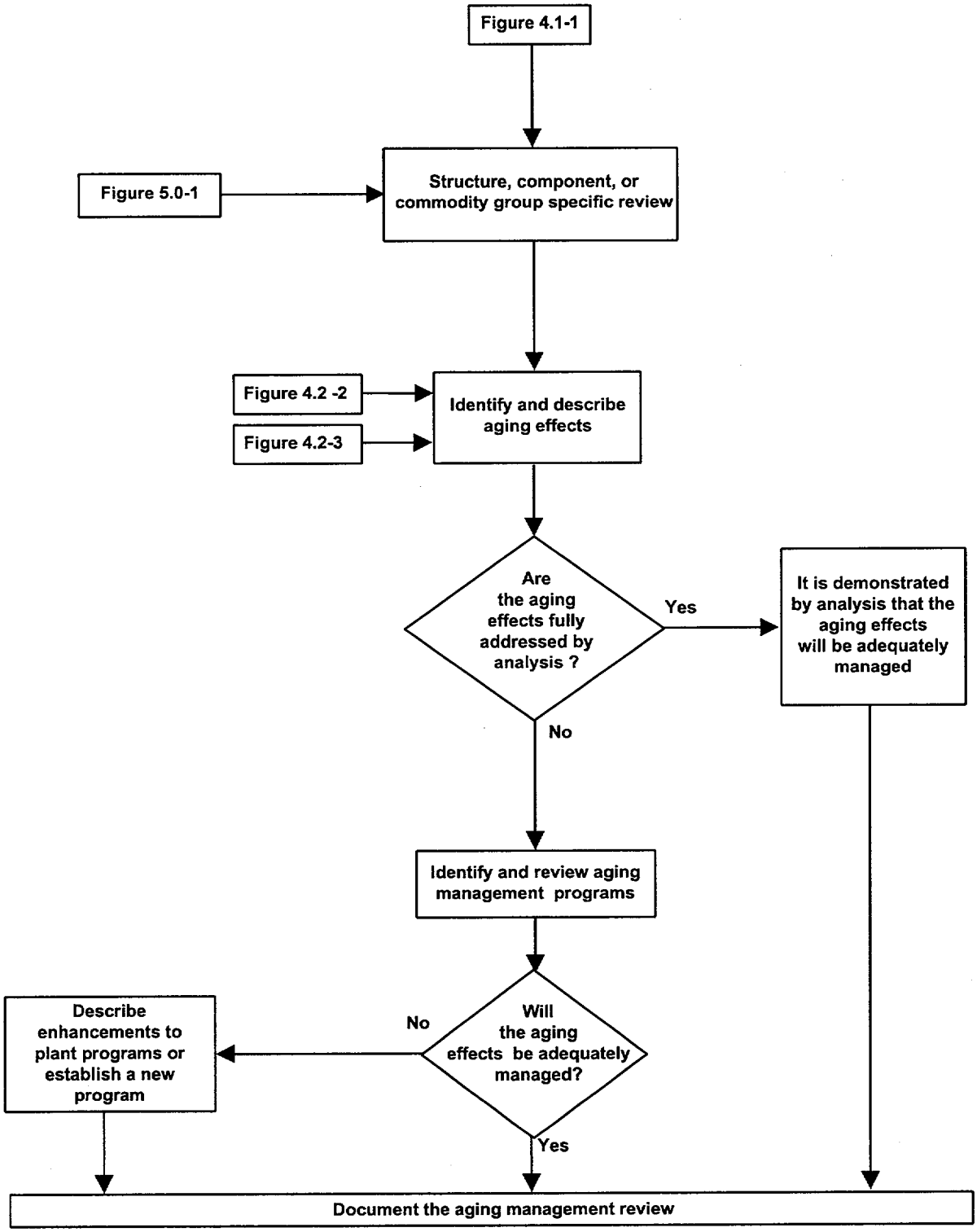
Although there are several approaches to performing an aging management review, three methods are described in this guideline to demonstrate that the effects of aging are being managed such that the intended structure or component function is maintained consistent with the CLB for the period of extended operation. Each method in this section is applicable to evaluations of individual structures, components or commodity groupings.

The first method is a specific review of a structure, component, or commodity grouping. The second method references the results of previous reviews of a similar structures or components which have been found acceptable by the NRC. Examples include the license renewal topical reports developed by the Nuclear Steam Supply System (NSSS) Owners' Groups and previous plant-specific applications. The third method recognizes an applicant's existing performance and condition monitoring programs. However, other methods may be acceptable provided that the demonstration required by §54.21(a)(3) is accomplished.

4.2.1 Specific Structure and Component or Commodity Grouping Demonstration

This demonstration is developed by first understanding how the structure, component, or commodity grouping performs its intended function(s). Next, the aging effects requiring management are identified. Finally, the applicable plant programs are identified, and the ability to detect and mitigate the aging effects is reviewed. The assembled information is then used to demonstrate either that the effects of aging will be managed by existing programs so that the structure or component intended function(s) will be maintained for the period of extended operation or that additional aging management activities are necessary. (Figure 4.2-1 depicts this process.)

FIGURE 4.2-1
ASSURING THAT THE EFFECTS OF AGING WILL BE MANAGED
[§ 54.21(a)(3)]



4.2.1.1 Identify and Assess Aging Effects

In Section 3.2 of the guideline, the system, structure, and component intended functions were identified, and in Section 4.1 the structure's or component's intended function(s) was determined. There are various techniques used to identify and assess aging effects. For some structures and components, design margins and/or material properties are known and can be reviewed. In such cases, an analysis may be sufficient to demonstrate that the effects of aging are managed. For other structures and components, performance or maintenance history is available and can be reviewed to assist in demonstrating that the effects of aging are managed. These and other considerations point to the need to determine the appropriate level of review for the type of structure, component, or commodity grouping and plant-unique conditions.

Assessing the appropriate level of review involves examining information from various investigations and developing a scope statement to describe the depth of review that is needed for the structure, component, or commodity grouping. As appropriate, the assessment should include the following activities:

- Assemble information relative to the structure or component material properties and design margins. If the components are made from different materials or are subject to distinctly different aging effects, a separate review of each may be needed.

- Identify the aging effects potentially affecting the structures' and components' ability to perform their intended function(s).

- Review the design or material properties to determine if certain aging effects can be shown by analysis not to affect the capability of the structure or component to perform its intended function during the period of extended operation. Of particular interest are parameters such as corrosion allowance, fatigue cycles, loading conditions, fracture toughness, tensile strength, dielectric strength, radiation exposure, and environmental exposure.

- Review and assess the operating and maintenance history for the structure or component. The focus of the review may include the service duty, operational transients, past failures, or unusual conditions that affected the performance or condition of the structure or component. Of particular interest is how the performance or degraded condition of the structure or component has affected the capability of the structure or component to perform its intended function and its risk significance. The review also may include an examination of repairs, modifications, or replacements for relevance to aging considerations.

- Assess industry operating experience and its applicability to determine whether it changes plant-specific determinations.

To determine the aging effects requiring management, the applicant should consider and address the materials, environment, and stressors that are associated with each structure, component or commodity grouping under review. In many instances, the proper selection of materials for the operating environment results in few, if any, aging effects requiring management. For example, erosion/corrosion has very little or no aging effects on stainless steel piping. Conversely, carbon steel is subject to erosion/corrosion in a raw water environment. However, there should be various programs and activities available to manage the effects of erosion/corrosion on carbon steel piping.

In addition to the consideration of materials, environment, and stressors, the applicant should consider and address the plant-specific CLB, plant and industry operating experience, and existing engineering evaluations in order to identify the aging effects requiring management for the structure or component subject to an aging management review. The aging effects requiring management are those that have been identified using the considerations described above, and that adversely affects the structure and component such that the intended function(s) may not be maintained consistent with the CLB for the period of extended operation.

The aging management review can also be performed using a "spaces" approach. In the spaces approach, the plant is segregated into areas where common, bounding environmental parameters can be assigned. These areas can be of any size such as a specific area in a room, an entire room, a floor of a building, or even all inside areas of an entire building. A bounding environmental parameter, such as temperature, would be the highest average temperature present around the subject components in the defined area.

When used to perform an aging management review of a component or commodity group for a specific environmental stressor, the process would be as follows:

- Identify all component or commodity group materials of construction that have potential aging effects when exposed to the environmental stressor.

- Determine the value of the bounding environmental parameter to which the components in the area to be reviewed are exposed.

- Compare the aging characteristics of the identified materials to the bounding environment and determine if the components will be able to maintain their intended function through the period of extended operation.

By analysis, an applicant may be able to demonstrate that it is not possible for an aging effect to result in a loss of the structure or component's intended function(s) under design basis conditions. The demonstration ultimately should conclude that there is reasonable assurance that the CLB will be maintained for the period of extended operation and therefore that the effects of aging need not be managed. A commitment to an inspection for license renewal, as discussed in Section 4.3, may be needed to verify specific design values, demonstrate that an aging effect is occurring as anticipated, or that an aging effect is not significant. Monitoring industry experience such as the results of inspections for license renewal at other plants may also contribute to the demonstration in these cases.

4.2.1.2 Demonstrate that the Effects of Aging are Managed

The Rule requires an applicant to demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

In performing the demonstration, an applicant should consider all programs and activities associated with the structure or component. Plant programs and activities that apply to the structures, components, or commodity groupings should be reviewed to determine if they include actions to detect and mitigate the effects of aging.

Aging management programs are generally of four types: prevention, mitigation, condition monitoring, and performance monitoring. Prevention programs preclude the aging effect from occurring, for example, coating programs to prevent external corrosion of a tank. Mitigation programs attempt to slow the effects of aging, for example, chemistry programs to mitigate internal corrosion of piping. Condition monitoring programs inspect and examine for the presence of 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 tests the ability of the a structure or component to perform its intended function(s), for example, heat balances on heat exchangers for the heat transfer intended function of the tubes (see Appendix C, Reference 1).

In some instances, more than one type of aging management programs may be implemented to ensure that the aging effects are adequately managed to ensure the intended function is maintained in the period of extended operation. For example, managing the internal corrosion of piping may rely on a mitigation program (water chemistry) to minimize susceptibility to corrosion and a condition monitoring program (ultrasonic inspection) to verify that the corrosion is insignificant.

The demonstration is not intended to be a reverification of the structure or component design basis. However, in some cases, verification of a specific design

basis parameter may be necessary if that parameter or condition is affected by an aging effect and potentially results in a loss of structure or component intended function. This verification may consist of a physical measurement at susceptible locations or on a sampling basis, as justified, or an evaluation that demonstrates that the aging effect will be at a sufficiently slow rate such that the design basis parameter will not be reduced below a value necessary to assure that the intended function(s) will be maintained during the period of extended operation. For example, a safety-related piping component is designed to have structural integrity under design loads, such as normal, upset, emergency, and faulted conditions, in accordance with the plant's CLB. An aging effect that should be evaluated for piping is loss of material due to erosion/corrosion. A loss of material could result in pipe wall thinning below design values rendering the pipe unable to sustain its design loads. However, erosion/corrosion affects piping differently depending on the material of construction. Carbon steel piping may be susceptible to loss of material due to erosion/corrosion and it would be appropriate to evaluate the pipe wall thickness to verify that this design value remains acceptable. Conversely, stainless steel piping is resistant to loss of material from erosion/corrosion and this aging effect normally would not be significant and thus, it would not be necessary to evaluate the pipe wall thickness to verify this design value.

To make the required demonstration, an applicant may elect to rely on a single program/activity or a combination of aging management programs/activities. Once the applicant has determined the approach for making the demonstration (i.e. singe program/activity, multiple programs/activities) a review checklist should be constructed. The checklist should be thought of as a logical presentation of the review that leads to the required conclusion. The following attributes are considered to be elements that may be used to construct an appropriate review checklist.

- The scope of the program/activity should include the specific structures and components subject to an aging management review for license renewal.

- Preventive actions are in effect that mitigate or prevent the onset of degradation or aging effects, and their effectiveness is periodically verified.

- Parameters are monitored, inspected, and/or tested, that provide direct information about the relevant aging effect(s), and their impact on intended functions.

- The aging effect(s) are detected by one or more of the credited programs before there is a loss of the structure's or component's intended function.

- Monitoring and trending provides an adequate predictability and timely corrective or mitigative actions.

- The program(s) contains acceptance criteria against which the need for corrective action will be evaluated, and ensures that timely corrective action will be taken when these acceptance criteria are not met.

- There is a confirmation process that ensures that the corrective action was taken and was effective.

- Corrective actions are taken (this includes root cause determinations and prevention of recurrence where appropriate) in a timely manner or an alternative action is identified.

- The program(s) is subject to administrative controls

- Operating experience of the program/activity, including past corrective actions resulting in program enhancements, should be considered. It provides objective evidence that the effects of aging have and will continue to be adequately managed.

Not all attributes need to exist in order to make the required demonstration. An applicant should be able to demonstrate with objective evidence that an existing program or activity is effective in managing the effects of aging.

However, there may be existing programs or activities where all the elements of the checklist constructed by the applicant cannot be satisfied and appropriate enhancements to existing programs/activities or new programs/activities may be needed. Enhancements may include, but are not limited to, verification of specific design values by inspection(s), adding steps to a procedure for specific aging effects, changing the frequency of the required task, adding specific aging effects mitigation procedures, and/or changing the record-keeping requirements. The factors that should be considered when selecting an appropriate enhancement from acceptable alternatives include:

- The risk significance of the structure or component.

- The nature of the aging effect (i.e., is it readily apparent/easily detected?).

- The feasibility of repair/replacement of the affected component or structure.

- The compatibility/adaptability of existing programs to detect and manage the aging effect(s).

- The existence of technology to detect and manage the aging effect(s).

- The estimated cost, personnel radiation exposure, and impact on normally scheduled outage duration for determining the enhancement.

If existing programs/activities, with or without enhancements, are not adequate for managing the effects of aging, new programs or other actions shall be developed as appropriate. One action an applicant should consider is an inspection as discussed in Section 4.3. It is possible that an applicant is already performing a relevant inspection or has previously performed an inspection that produced appropriate data for license renewal. Other actions for consideration are refurbishment[4] or replacement.

4.2.2 Reference Previous Reviews

The evaluation of the effects of aging on the performance and reliability of plant systems, structures, and components has been and continues to be an ongoing activity of the industry. Considerable effort already has been applied to examining the effects of aging on those components and structures that are long-lived and passive. Several NSSS Owners Groups are preparing generic reports (topical) that address the requirements of the Rule. These reports also will be submitted to the NRC for review and acceptance. Additional material will become available when applicants prepare and submit their license renewal applications.

This progress of events is producing a growing "library" of reports which document aging management reviews of a variety of structures, components, or commodity groupings. This library will afford license renewal applicants the option of relying on referenceable results of a previous aging management review. If such an option is selected, the elements of the aging management review should include identifying and demonstrating the applicability of a previous review and then demonstrating that the results and conclusions are in effect at the plant.

Guidance is provided below for each element of the review. Figure 4.2-2 is a diagram that depicts this process. The applicant also may elect to perform a specific (or plant-unique) aging management review of the structure or component as described in guideline Section 4.2.1.

4.2.2.1 Identify and Demonstrate Applicability of the Selected Reference

Plant and generic industry references that provide an aging management review of the same type of structure or component should be reviewed. A search of the public

[4] Refurbishment, for purposes of this guideline, means planned actions, short of full replacement, to provide reasonable assurance that the effects of aging are adequately managed such that the intended functions are maintained in accordance with the CLB for the period of extended operation.

document room indices may be performed to identify any such reports. References that have been reviewed and approved by the NRC provide an acceptable approach.

In the selected reference, identify the scope, assumptions, and limitations affecting the results and conclusions of the analysis. Other characteristics that may need to be identified include the configuration, functions, materials, service conditions, and the original design parameters (corrosion allowance, loading cycles, etc.) and protective measures (coatings, cathodic protection, etc.) affecting the expected service life of the structure or component.

The identified characteristics of the structure or component in the selected reference should be compared to the plant specific structure or component. The objective is to demonstrate that the plant characteristics are the same as, or are bounded by, the reference and therefore, it may be concluded that the selected report is applicable and may be used as a basis for the aging management review of the plant structure or component. Any outlier conditions should be identified and reviewed to show that they are not significant with respect to the results or conclusions of the selected reference. Otherwise, a structure or component-specific aging management review (guideline Section 4.2.1) of the outlier condition should be performed.

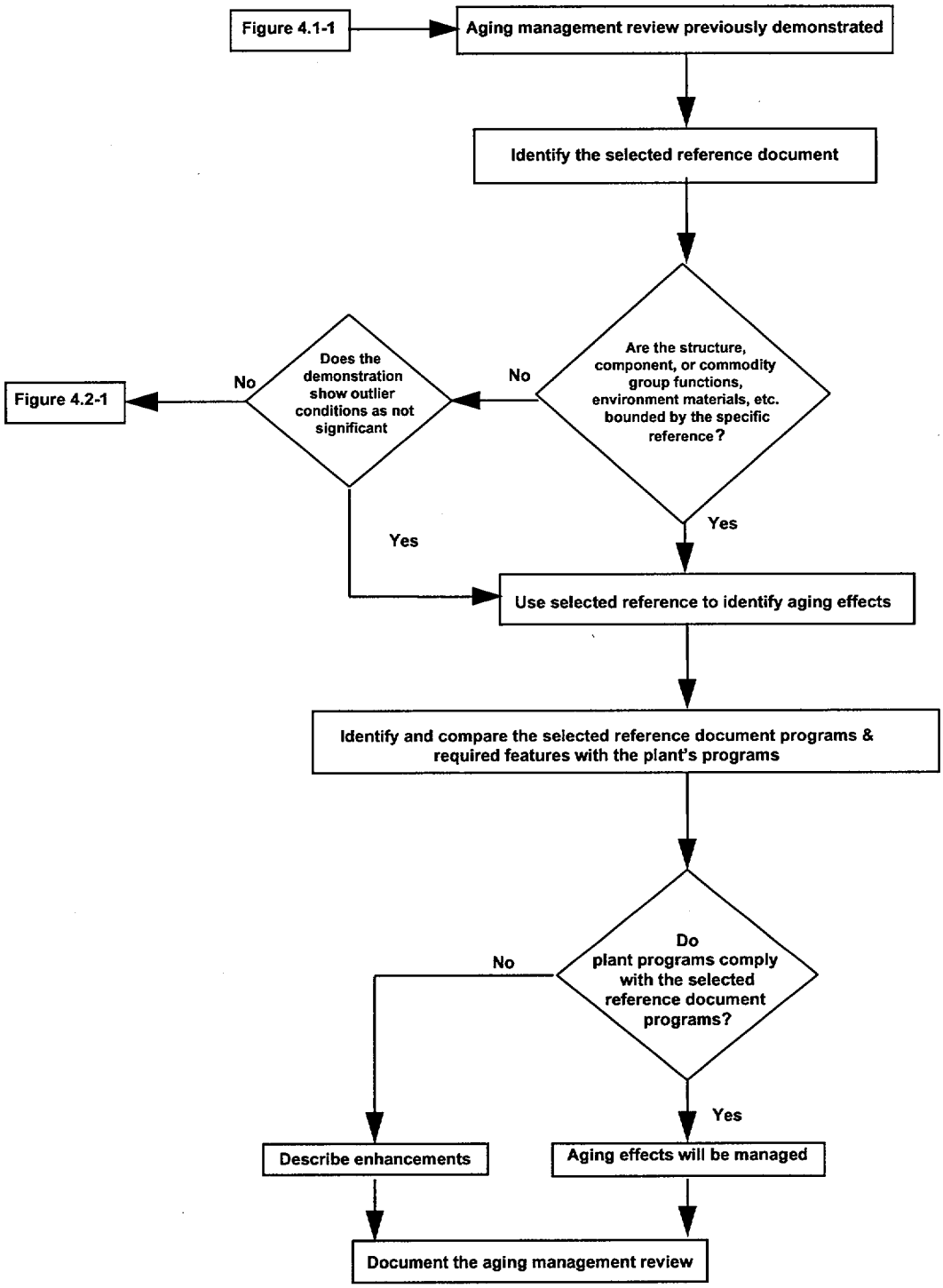
4.2.2.2 Demonstrate That The Effects of Aging are Managed

The selected reference should be used to identify the aging effects requiring management. It also should be demonstrated that the assumptions and basis used for determining the aging effects are applicable to the plant. To do this, a review of the plant operating and maintenance history should be performed to confirm that all aging effects apply. Adjustments to the referenced aging effects due to plant-specific conditions may be required. The results may be factored into the description of the aging effects.

The selected reference should be used to identify the programs and features of the programs credited in the review. The comparable plant programs should be identified, and their features should be compared to the programs in the selected reference. Any differences should be identified, and it should be justified that conclusions of the selected reference still apply. The justification may be based on plant-unique features, plant operating and maintenance history, and/or industry developments since the selected reference was issued and reviewed by the NRC.

Any enhancements to current programs or new programs that are cited in the selected reference should be identified. The enhancement(s) that will be implemented for the plant structure or component should be described.

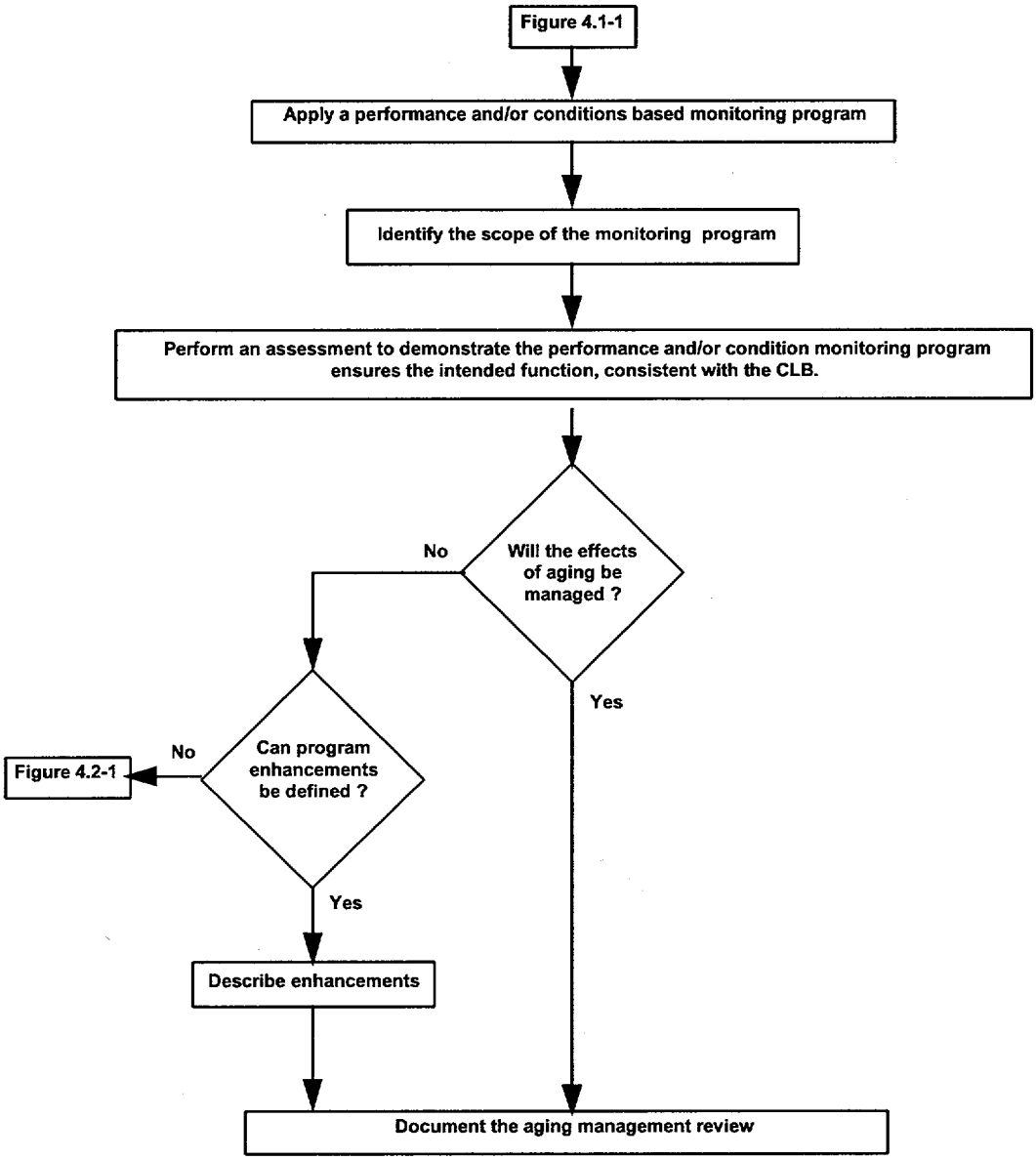
FIGURE 4.2-2
ASSURING THAT THE EFFECTS OF AGING WILL BE MANAGED [§ 54.21(a)(3)] USING A PREVIOUS REVIEW



4.2.3 Application of Existing Performance and/or Condition Monitoring Programs

The Rule does not prescribe the explicit types of programs and activities that are necessary to demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained for the period of extended operation. Because of this, there is sufficient flexibility for an applicant to determine what types of programs and activities fit the needs of the structure or component for that facility. This includes the use of performance and/or condition monitoring programs to demonstrate that for long-lived, passive structures or components, the effects of aging will be adequately managed so that the intended function(s) will be maintained for the period of extended operation. Condition monitoring programs generally assess passive aspects of structures and components based on inspection activities. Performance monitoring programs generally assess active functions of components based on testing activities. However, it may be possible to use the results of performance monitoring programs to assess the passive aspects of structures, components, or commodity groupings. (Figure 4.2-3 shows the process for using these programs.)

FIGURE 4.2-3
ASSURING THAT THE EFFECTS OF AGING WILL BE MANAGED USING A MONITORING PROGRAM [§54.21(a)(3)]



4.2.3.1 Establishing the Relationship Between Degradation and Active Performance

The degradation of many passive structures and components may not be as readily apparent through performance and condition monitoring as degradation of active structures and components. This is the reason the Rule requires an aging management review of such passive structures and components and a demonstration that the effects of aging are adequately managed.

Some passive structures and components may have degradation characteristics that can be monitored through changes in active performance of associated structures and components. In turn, these changes in active performance generally are readily detectable through existing performance and conditioning monitoring programs. The aging management review for these passive structures and components could focus on demonstrating the relationship between passive degradation and active performance. Whatever the aging management review approach, including performance or condition monitoring, the applicant must demonstrate that the aging effects of the structure or component will be adequately managed so that the intended function(s) will be maintained consistent with the CLB during the period of extended operation.

4.2.3.2 Demonstrating the Effectiveness of the Performance and Condition Monitoring Programs

Once the link is established between degradation of passive functions and the active performance of the component or commodity grouping, the next step is to demonstrate that the component or commodity grouping is subject to a performance and condition monitoring program. By using the above process the applicant should be able to demonstrate that these comprehensive performance and condition monitoring programs provide reasonable assurance that the aging effects on the intended functions of the components or commodity groupings are adequately managed in accordance with the plant-specific CLB.

If existing performance/condition monitoring programs, with or without enhancements, are not adequate for managing the effects of aging, new programs or other actions shall be developed as appropriate. For example, a particular performance or condition monitoring program may only provide reasonable assurance that the intended function can be performed under normal loading conditions. Additional evaluation and/or inspection may be required to provide reasonable assurance that the component or commodity grouping will perform its intended function(s) under CLB design conditions. Guidance on inspections is provided in Section 4.3. It is possible that an applicant is already performing a relevant inspection or previously has performed an inspection that produced

appropriate data for license renewal. Other actions for consideration are refurbishment[5] or replacement.

4.2.3.3 Guidelines for Use of Performance and Condition Monitoring Programs

Because only a select set of plant equipment has the characteristic that degradation of passive functions will be readily apparent in the active performance of associated components, this approach has limited application in the IPA. The following guidelines should be used to determine when this approach may be appropriate:

- The intended function is a pressure-retaining function which directly supports the performance of an active component. This will increase the likelihood that the demonstration that degradation directly affects active performance will be successful;

- The pressure-retaining function is not a fission product boundary function. It is not likely that an applicant will be able to link degradation of the fission product boundary to the active performance of any structure or component which is subject to a performance and condition monitoring program;

- The system intended functions are performed by redundant trains. This will ensure that sufficient opportunity exists to conduct comprehensive performance and condition monitoring of the equipment;

- Performance testing is well documented with verification that corrective actions assure the continued performance of all intended functions. This will ensure there is sufficient history with the performance and condition monitoring program to correct any inadequacies in the program's ability to detect degraded performance or condition; AND

- The complex assembly is covered by the maintenance rule. This will ensure that a regulated mechanism is in place for incorporating any adverse experience with the program (either at the utility or in the industry) into appropriate enhancements to the program.

If these guidelines are met, then an applicant should consider use of this approach to provide the §54.21.(a)(3) demonstration rather than the techniques described in previous sections. However, meeting these criteria should not be interpreted as any part of the demonstration. The criteria are provided here merely as an aid to the applicant in determining when to attempt this approach.

[5] Refurbishment, for purposes of this guideline, means planned actions, short of full replacement, to provide reasonable assurance that the effects of aging are adequately managed such that the intended functions are maintained in accordance with the CLB for the period of extended operation.

4.3 New Programs and Inspections for License Renewal

Section 4.2 discusses options for performing an aging management review. If the applicant concludes, after reviewing the options or implementing the option, that the demonstration has not achieved reasonable assurance, a new program or inspection for license renewal may be appropriate. This section provides guidance on the elements of a new program or inspection including the use of sampling and the timing of such inspections.

The elements of a new program or inspection may vary depending on the specific structure, component, or commodity grouping. However, features to consider are:

- Scope: The scope of a new program or inspection may be a specific component, structure, or commodity grouping. The scope is the collection of the structures or components to be inspected under a sampling plan. Selection of the scope demands attention to similarity of materials of construction, fabrication, procurement, design, installation, operating environments, and aging effects.

- Preventive Actions: A new program or inspection is not intended to mitigate degradation; therefore, this attribute is not applicable.

- Parameters Monitored/Inspected: This attribute describes what is being monitored or inspected. These descriptions include observable parameters or indicators to be monitored or inspected for each aging effect managed. The observable parameters should be linked to the degradation of the structure or component intended functions in the period of extended operation.

- Detection of Aging Effects: By performing the Monitoring and Trending as described below, the new program will detect the aging effects prior to the loss of structure or component functions.

- Monitoring and Trending: The new program or inspection should describe a method that is capable of either (1) detecting the effects of aging before the structure or component would lose the ability to perform its intended function under design conditions, or (2) demonstrate that the structure or component intended function will be maintained during the period of extended operation without the need for an aging management program.

  The new program or inspection should include a methodology for analyzing the results of the inspection against applicable acceptance criteria. The methodology should be capable of determining the ability of the structure or

component to perform its intended function for the period of extended operation under design conditions required by the plant-specific CLB.

When an inspection is necessary, sampling may be used to evaluate a group of structures or components. If sampling is used, a program should be developed which describes and justifies the methods used for selecting the population and the sample size. A sample consists of one or more structures or components drawn from the scope. The applicant must determine a sample size that is adequate to provide reasonable assurance that the effects of aging on the structure or component will not prevent the performance of its intended function during the period of extended operation. The size of the sample should include consideration of the specific aging effect(s), location, existing technical information, materials of construction, service environment, previous failure history, etc. The sample should be biased towards locations most susceptible to the specific aging effect(s) of concern. The results of the inspection also should be evaluated to assess whether the sample size is adequate or if it needs to be expanded.

An inspection for license renewal may be performed at various times. It may be performed prior to submittal of the license renewal application. The license renewal application may include a commitment to perform an inspection prior to the commencement of the period of extended operation. There also maybe justification for performing the inspection during the period of extended operation.

Trending is the comparison of the current monitoring results with previous monitoring results in order to make predictions for the future. Trending is not applicable for one-time new inspections.

- Acceptance Criteria: The acceptance criteria for the new program or inspection may be based on design or current licensing basis information as well as established industry codes and standards. The acceptance criteria should be sufficient to ensure maintenance of the structure or component intended function in the period of extended operation.

- Corrective Actions/Confirmation Process: The new program or inspection should discuss corrective actions and/or follow-up activities to be implemented in the event the acceptance criteria are not satisfied. As appropriate, consideration should be given to root cause analysis, actions to prevent recurrence and repair/replacement. Corrective actions and confirmation do not need to be implemented under 10 CFR Part 50, Appendix B.

- Administrative Controls: The new program or inspection should be implemented by administrative controls. These controls do not need to be implemented under a 10 CFR Part 50, Appendix B program.

- Operating Experience: Operating experience should be considered when developing the inspection program. A review of previous applications and NRC Safety Evaluation Reports issued in support of renewed licenses, may provide supporting experience for new programs or inspections.

4.4 Documenting the Integrated Plant Assessment

Section 54.37(a) of the Rule requires applicants to retain in an auditable and retrievable form all information and documentation required by, or otherwise necessary to document compliance with the provisions of the Rule.

The results of the IPA should be documented in a format consistent with other plant documentation practices. The information may be maintained in "hard-copy" or electronic format. It may be appropriate to incorporate the information into an existing plant database if available. The applicant should use the quality assurance program in effect at the plant when documenting the results of the IPA.

4.4.1 Documenting the Identification of SCs Subject to an Aging Management Review

The information to be documented and retained by the applicant should include:

- An identification and listing of structures and components subject to an aging management review and the intended functions.

- A description and justification of the methods used to determine the structures and components that are subject to an aging management review.

- The information sources used to accomplish the above, and any discussion needed to clarify their use.

The information documented and retained by the applicant will form the bases of the information contained in the Application as further discussed in Section 6.0.

4.4.2 Documenting the Aging Management Review

The information to be documented by the applicant should include:

- An identification of the aging effects requiring management.

- An identification of the specific programs or activities which will manage the effects of aging for each structure, component, or commodity grouping listed.
- A description of how the programs and activities will manage the effects of aging.
- A discussion of how the determinations were made.
- A list of substantiating references and source documents.
- A discussion of any assumptions or special conditions used in applying or interpreting the source documents.
- A description of inspection programs for license renewal.

The information documented and retained by the applicant will form the bases of the information contained in the Application as further discussed in Section 6.0.

5.0 TIME-LIMITED AGING ANALYSES INCLUDING EXEMPTIONS

The Rule requires Time-Limited Aging Analyses (TLAA) be evaluated. It is intended that TLAAs will capture certain plant-specific aging analyses that are explicitly based on the current operating term of the plant. In addition, the Rule requires exemptions, based on TLAAs, to be identified and analyzed to justify continuation into the period of extended operation. (Figure 5.0-1 outlines the process for evaluating TLAAs and exemptions.)

5.1 Time-Limited Aging Analyses

Part 54 Reference

§54.3

****

Time-limited aging analyses, for the purposes of this part, are those licensee calculations and analyses that:

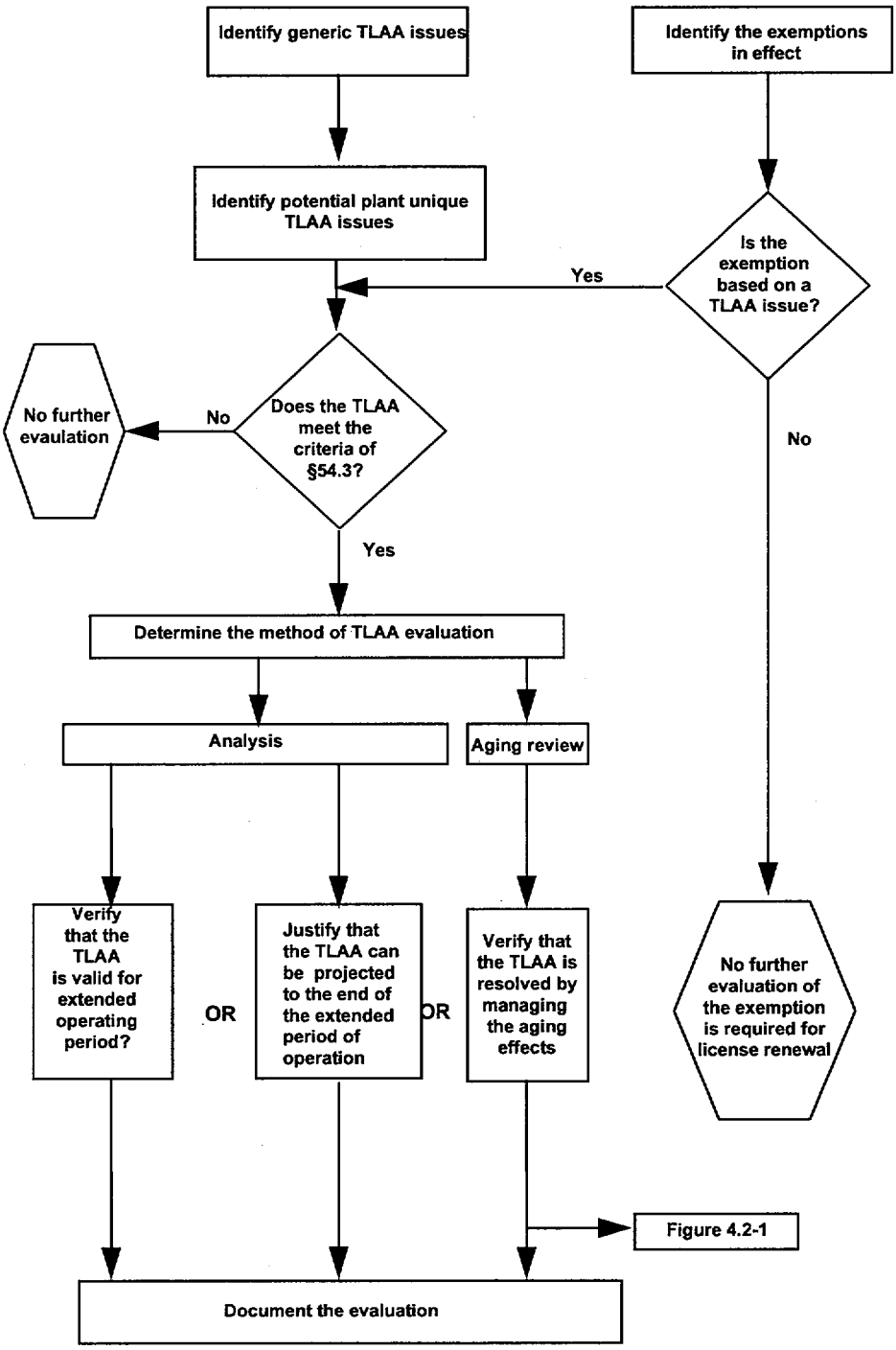
(1) Involve systems, structures, and components within the scope of license renewal, as delineated in §54.4(a);
(2) Consider the effects of aging;
(3) Involve time-limited assumptions defined by the current operating term, for example, 40 years;
(4) Were determined to be relevant by the licensee in making a safety determination;
(5) Involve conclusions or provide the basis for conclusions related to the capability of the system, structure, and component to perform its intended functions, as delineated in §54.4(b); and
(6) Are contained or incorporated by reference in the CLB.

§54.21(c)(1)

(1) A list of time-limited aging analyses, as defined in §54.3, must be provided. The applicant shall demonstrate that --

(i) The analyses remain valid for the period of extended operation;
(ii) The analyses have been projected to the end of the period of extended operation; or
(iii) The effects of aging on the intended function(s) will be adequately managed for the period of extended operation.

FIGURE 5.0-1
EVALUATION OF TLAAs AND EXEMPTIONS [§ 54.21(c)]



The applicant must identify the plant-specific TLAA by applying the six criteria delineated in §54.3. The criteria may be applied in any order depending on plant specific document search capabilities that exist. Guidance for applying the six criteria is provided below.

1. Involve systems, structures, and components within the scope of license renewal as delineated in §54.4(a). The system, structure, and component scoping step of the IPA (Section 3.0) should be performed prior to or concurrent with the TLAA identification.

2. Consider the effects of aging. The effects of aging include but are not limited to: loss of material, loss of toughness, loss of prestress, settlement, cracking, and loss of dielectric properties.

3. Involve time-limited assumptions defined by the current operating term, for example 40 years. The defined operating term should be explicit in the analysis. Simply asserting that a component is designed for a service life or plant life is not sufficient. A calculation or analysis that explicitly includes a time limit must support the assertion.

4. Were determined relevant by the licensee in making a safety determination. Relevancy is a determination that the licensee must make based on a review of the information available. A calculation or analysis is relevant if it can be shown to have direct bearing on the action taken as a result of the analysis performed. Analyses are also relevant if they provide the basis for the licensee's safety determination and, in the absence of the analyses, the licensee may have reached a different safety conclusion.

5. Involve conclusions or provide the basis for conclusions related to the capability of the system, structure, or component to perform its intended functions as delineated in §54.4(b). As stated in the first criterion, the intended functions must be identified prior to or concurrent with the TLAA identification. Analyses that do not affect the intended functions of the system, structure, or components are not TLAAs.

6. Are contained or incorporated by reference in the CLB. Plant specific documents contained or incorporated by reference in the CLB include the FSAR, SERs, Technical Specifications, the fire protection plan/hazards analyses, correspondence to and from the NRC, QA plan, topical reports included as reference to the FSAR or correspondence to the NRC. Calculations and analyses that are not in the CLB or not incorporated by reference are not TLAAs. When the Code of record is mentioned in the FSAR, for particular groups of structures or components, referenced material

includes all calculations required by that Code of record for those structures and components.

All six criteria must be satisfied to conclude that a calculation or analysis is a TLAA. As an aide to applicants, Table 5.1-1 provides examples of how the six criteria may be applied and Table 5.1-2 lists potential TLAA's that have been identified from the industry's review of plant-specific CLB documents, various codes, standards, and regulatory documents. The table also identifies TLAAs that are specifically identified in the SOC for the Rule.

Identified plant-specific TLAAs must be evaluated using one of three different approaches. These approaches are described in §54.21(c)(1) of the Rule. One approach is to verify that the analysis remains valid for the period of extended operation. Guidance for this approach is provided under Section 5.1.1. Another approach is to verify that the analysis can be projected to the end of the period of extended operation. Guidance for this approach is provided in Section 5.1.2. A third approach is to show that the effects of aging on the intended function(s) will be adequately managed for the period of extended operation. Guidance for this approach is provided in Section 5.1.3.

5.1.1 Verify that the TLAA is Valid for the Period of Extended Operation

Typically, the existing TLAAs are based on the current operating term (e.g., 40 years). Therefore, the approach outlined in this section may not be applied for the extended operating term and one of the other approaches (see Sections 5.1.2 and 5.1.3) should be utilized. However, there may be cases where the original analysis or efforts to address new issues during plant operation have resulted in an analysis that can be demonstrated to remain valid for the period of extended operation. A structure or component may have been qualified for at least 40 years. A detailed review of the analysis may demonstrate that the qualification is valid for the period of extended operation and no reanalysis is required. An acceptable approach for verifying that the TLAA remains valid is described in the following paragraphs.

The TLAA issue should be described with respect to the objective(s) of the analysis, conditions and assumptions used in the analysis, acceptance criteria, aging effects requiring management, and intended function(s). It should be demonstrated that (1) the conditions and assumptions used in the analysis already address the aging effect(s) requiring management for the period of extended operation, and (2) acceptance criteria are maintained to provide reasonable assurance that the intended function(s) is maintained.

Any actions and an associated implementation plan, for reconciling the affected TLAA source documents should be identified.

5.1.2 Justifying the TLAA can be Projected to the End of the Period of Extended Operation

The current TLAA may not be valid for the period of extended operation; however, it may be possible to revise the TLAA by recognizing and re-evaluating any conservative conditions and assumptions. Examples include relaxing overly conservative assumptions in the original analysis, using new or refined analytical techniques, and/or performing the analysis using a 60-year life. The TLAA may then be shown to be valid for the period of extended operation.

5.1.3 Verify that the TLAA is Resolved by Managing the Aging Effects

The structure(s) or component(s) associated with the TLAA issue should be identified. The TLAA issue should be described with respect to the objectives of the analysis, conditions, and assumptions used in the analysis, acceptance criteria, aging effect(s) requiring management and intended function(s). The guidance provided in Section 4.2 may be used to demonstrate that the effects of aging on the intended function are adequately managed for the period of extended operation. Also, the monitoring of the aging effect analyzed in the TLAA may include future inspection/examination of the aging effect.

5.1.4 Timing for Evaluation of TLAA

In general, the evaluation of TLAAs should be completed and submitted at the time of renewal application. However, there may be instances when the completion of the evaluation of TLAAs can be deferred to a time after the issuance of the renewal license.

When an applicant elects to defer completing the evaluation of a TLAA at the time of renewal application, the applicant should submit the following details in the renewal application to support a conclusion that the effects of aging addressed by that TLAA will be managed for a specific structure or component:

- Details concerning the methodology which will be used for TLAA evaluation,
- Acceptance criteria that will be used to judge the adequacy of the structure or component, consistent with the CLB, when the TLAA evaluation or analysis is performed,
- Corrective actions that the applicant could perform to provide reasonable assurance that the component in question will perform its intended function when called upon or will not be outside of its design basis established by the plant's CLB, and

- Identification of when the completed TLAA evaluation will be submitted to ensure that the necessary evaluation will be performed before the structure or component in question would not be able to perform its intended functions established by the CLB.

TABLE 5.1-1
DISPOSITION OF POTENTIAL TLAAs AND BASIS FOR DISPOSITION

EXAMPLE	DISPOSITION
NRC correspondence requests a utility to justify that unacceptable cumulative wear did not occur during the design life of control rods.	Does not qualify as a TLAA because the design life of control rods is less than 40 years. Therefore does not meet criterion (3) of the TLAA definition in § 54.3.
Maximum wind speed of 100 mph is expected to occur once per 50 years	Not a TLAA. Does not involve an aging effect.
Correspondence from the utility to the NRC states that the membrane on the containment basemat is certified by the vendor to last for 40 years.	This example does not meet criterion (4) of the TLAA definition in § 54.3 and therefore is not considered a TLAA. The membrane was not credited in any safety evaluation.
Fatigue usage factor for the pressurizer surge line was determined not to be an issue for the current license period in response to NRC Bulletin 88-11.	This example is a TLAA because it meets all 6 criteria in the definition of TLAA in § 54.3. The utility's fatigue design basis relies on assumptions related to 40 year operating life for this component. Plant specific data could be used but is more difficult due to thermal stratification.
Containment tendon lift off forces are calculated for the 40 year life of the plant. This data is used during Technical Specification surveillance for comparing measured to predicted lift off forces.	This example is a TLAA because it meets all 6 criteria of the TLAA definition in § 54.3. The lift off force curves are limited to 40 year values currently and are needed to perform a required Technical Specification surveillance.

TABLE 5.1-2
POTENTIAL TLAAs

FATIGUE
REACTOR VESSEL NEUTRON EMBRITTLEMENT
ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT
LOSS OF PRESTRESS IN CONCRETE CONTAINMENT TENDONS
CONTAINMENT LINER PLATE AND PENETRATION FATIGUE ANALYSIS
INSERVICE FLAW GROWTH ANALYSES THAT DEMONSTRATE STRUCTURE SUITABILITY FOR 40 YEARS

5.2 Exemptions

Part 54 Reference

§54.21(c)(2)

(2) A list must be provided of all plant-specific exemptions granted pursuant to 10 CFR 50.12 and in effect that are based on time-limited aging analyses as defined in §54.3. The applicant shall provide an evaluation that justifies the continuation of these exemptions for the period of extended operation

Section 54.21(c)(2) of the Rule requires that a list of all exemptions granted under 10 CFR 50.12 that are in effect and based on a TLAA be provided along with the evaluation of time-limited aging analyses.

Identification of an exemption may require the review of a series of correspondence between the NRC and plant to trace the resolution of the exemption. Many plants have licensing commitment tracking systems or databases of information on licensing documents available. As an alternate method or as verification to the search, the NRC docket file in the Public Document Room (PDR) may be utilized to search for licensing correspondence and, thus, exemptions granted.

It should be determined that the exemption granted pursuant to 10 CFR 50.12 will be in effect during the period of extended operation, involves a system, structure, or component within the scope of the Rule, and involves a time-limited aging analysis issue. If all of these conditions apply, then an evaluation of the exemption must be performed. The TLAA within the exemption is reevaluated using the guidance in Section 5.1

The scope of the exemption, the analysis that forms the basis for the exemption, and the affected structure(s) or component(s) and/or the time-limited aging analysis issue should be identified. The analysis that forms the basis for the exemption may have been identified during the evaluation of the TLAAs.

The exemption should be evaluated to determine its affect on the capability of the associated plant programs to detect or mitigate the effects of aging or on the conditions and assumptions used in the time-limited aging analysis for the period of extended operation. The evaluation of the associated TLAA issue may provide sufficient justification to continue the exemption.

5.3 Documenting the Evaluation of the Time Limited Aging Analyses and Exemptions

Section 54.37(a) of the Rule requires applicants to retain in an auditable and retrievable form all information and documentation required by, or otherwise necessary to document compliance with the provisions of the Rule.

The results of the time-limited aging analyses and exemptions evaluation should be documented in a format consistent with other plant documentation practices. The information may be maintained in "hard-copy" or electronic format. If available and appropriate, the information may be incorporated into an existing plant database. The applicant should use the quality assurance program in effect at the plant when documenting the results of the time-limited aging analyses and exemptions evaluation.

The information to be documented by the applicant should include:

- A list of the time-limited aging analyses and exemptions applicable to the plant.
- A description of the evaluation performed or to be performed on each plant specific TLAA and exemption.
- A general discussion of how the determinations were made.
- A list of substantiating references and source documents.
- A discussion of any assumptions or special conditions used in applying or interpreting the source documents.

The information documented and retained by the applicant will form the bases of the information contained in the Application as further discussed in Chapter 6.0.

6.0 LICENSE RENEWAL APPLICATION FORMAT AND CONTENT

The standard license renewal application format is presented in Table 6.2-1. Table 6.2-2 provides guidance for preparing the standard license renewal application. Contents of the application are general information required by §54.17 and §54.19 and technical information required by §54.21, §54.22, and §54.23.

6.1 General Information

The renewal application contains the technical information that the NRC staff will review to determine if the effects of aging on certain long-lived passive structures and components are being managed such that the associated intended function(s) is maintained consistent with the CLB in the period of extended operation. The technical information must be of sufficient detail in order that the NRC may make the finding that there is reasonable assurance that the activities authorized by the renewal license will continue to be in accordance with the CLB (§54.29(b)).

The application should contain clear and concise presentations of the required information. Confusing or ambiguous statements and unnecessarily verbose descriptions do not contribute to expeditious technical review. Claims of adequacy in the aging management review should be supported by technical bases. The level of detail contained in the application should be commensurate with the level of detail typically contained in responses to regulations, license amendment requests, and NRC generic communications submitted on the licensee docket.

The information contained in the application is based on the information contained in plant specific documentation as previously described in Sections 3.3, 4.3, and 5.3 of this guideline. However, detailed procedures/calculations need not be included in the license renewal application. Once the license is issued the application is a licensing historical document and is not required to be updated.

6.2 Application Format and Content Guidance

This section provides the standard license renewal application format. Table 6.2-1 is the application table of contents. Guidance for preparing the information for each section of the application is provided in Table 6.2-2.

Applicants may elect to prepare the application using a systems based approach or a commodity based approached. The systems based approach means identifying aging management programs and activities for long-lived passive structures and components associated with a specific system. In the standard application format, the demonstration of the adequacy of each program would be discussed in the section associated with each system.

The commodity based approach means identifying aging management programs and activities for long-lived passive structures and components associated with a specific commodity group. In the standard application format, the demonstration of the adequacy of each program would be discussed in the section associated with each commodity group.

The standard application format will accommodate either approach. Tables 6.2-1 and 6.2-2 reflect both the systems based approach and the commodity based approach. Appendices B and C to the application can be used with either approach.

6.3 Identify CLB Changes

Part 54 Reference

§54.21(b)
CLB changes during NRC review of application. Each year following submittal of the license renewal application and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the CLB of the facility that materially affects the contents of the license renewal application, including the FSAR supplement.

The Rule requires that the application be updated yearly and at least three months before scheduled completion of the NRC review, to identify any changes to the facility's current licensing basis that materially affect the application. These changes are provided to the NRC in the form of an amendment to the license renewal application. For the initial renewal application submittal, this provision does not apply. It is a placeholder.

CLB changes that occur during NRC review of the application that materially affect the contents of the license renewal application including the FSAR supplement need to be provided to the NRC in an amendment to the application.

TABLE 6.2-1
STANDARD LICENSE RENEWAL APPLICATION FORMAT

1.0	**ADMINISTRATIVE INFORMATION**
2.0	**SCOPING AND SCREENING METHODOLOGY FOR IDENTIFYING STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW AND IMPLEMENTATION RESULTS**
2.1	Scoping and Screening Methodology
2.2	Plant Level Scoping Results
2.3	Scoping and Screening Results: Mechanical Systems
2.3.1	Reactor Coolant System
2.3.2	Engineered Safety Features
2.3.3	Auxiliary Systems
2.3.4	Steam and Power Conversion System
2.4	Scoping and Screening Results: Structures
2.5	Scoping and Screening Results: Electrical and Instrumentation and Controls Systems
3.0	**AGING MANAGEMENT REVIEW RESULTS**
3.1	Aging Management of Reactor Vessel, Internals and Reactor Coolant System
3.2	Aging Management of Engineered Safety Features
3.3	Aging Management of Auxiliary Systems
3.4	Aging Management of Steam and Power Conversion Systems
3.5	Aging Management of Containment, Structures, and Component Supports
3.6	Aging Management of Electrical and Instrumentation and Controls
4.0	**TIME-LIMITED AGING ANALYSES**
4.1	Identification of TLAAs
4.2	Reactor Vessel Neutron Embrittlement
4.3	Metal Fatigue
4.4	Environmental Qualification (EQ) of Electric Equipment
4.5	Concrete Containment Tendon Prestress

4.6	Containment Liner Plate, Metal Containment, and Penetrations Fatigue Analysis
4.7	Other Plant-Specific TLAAs
APPENDIX A: FINAL SAFETY ANALYSIS REPORT (FSAR) SUPPLEMENT	
APPENDIX B: AGING MANAGEMENT PROGRAMS AND ACTIVITIES (OPTIONAL)	
APPENDIX C: COMMODITY GROUPS (OPTIONAL)	
APPENDIX D: TECHNICAL SPECIFICATION CHANGES	
APPENDIX E: ENVIRONMENTAL INFORMATION	

1.0 ADMINISTRATIVE INFORMATION

The following information, required by §54.17 and §54.19 is consistent with the information contained in the facility's original operating license application as delineated in 10 CFR 50.33(a) through (e), (h), and (i):

1. Name of Applicant
2. Address of Applicant
3. Description of Business or Occupation of Applicant
4. Organization and Management of Applicant

Note that the license renewal rule prohibits any person who is a citizen, national, or agent of a foreign country, or any corporation, or other entity which the Commission knows or has reason to know is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government, from applying for and obtaining a renewed license.

5. Class of License, the Use of the Facility and the Period of Time for which the License is Sought.
6. Earliest and latest dates for alterations, if proposed
7. Listing of regulatory agencies having jurisdiction and appropriate news publications (if applicable)
8. Conforming changes to the standard indemnity agreement
9. Restricted data agreement

Pursuant to §54.17 (f) and (g): If the application contains Restricted Data or other defense information, it must be prepared in such a manner that all Restricted Data and other defense information are separated from unclassified information in accordance with 10 CFR 50.33(j). As part of its application and in any event prior to the receipt of Restricted Data or the issuance of a renewed license, the applicant shall agree in writing that it will not permit any individual to have access to Restricted Data until an investigation is made and reported to the Commission on the character, association, and loyalty of the individual and the Commission shall have determined that permitting such persons to have access to Restricted Data will not endanger the common defense and security. The agreement of the applicant in this regard is part of the renewed license, whether so stated or not.

The contents specified for the application are the minimum set required by the regulations. Upon issuance of the renewal operating license, this part of the application becomes an historical document with no further revisions.

2.0 SCOPING AND SCREENING METHODOLOGY FOR IDENTIFYING STRUCTURES AND COMPONENTS SUBJECT TO AGING MANAGEMENT REVIEW AND IMPLEMENTATION RESULTS

Guidance:

- Empty heading or at most, it could be a one-paragraph introduction for the section.

2.1 Scoping and Screening Methodology

Guidance:

- Describe and justify the methodology used to determine the systems, structures, and components within the scope of license renewal and the structures and component subject to an aging management review. [Ref .§54.21(a)(2)]
- The scoping and screening method for mechanical, electrical, and civil/structural disciplines may vary. In such cases each method should be described and justified.
- Identify the set of plant-specific design basis events, and corresponding set of plant-specific nomenclature, that the applicant relied on, or which form the basis, to determine the scope of systems, structures, and components required in §54.4, consistent with the plant's current licensing basis. Presenting this information in a table or matrix may make the NRC's review more efficient.
- To the extent the Maintenance Rule scoping criteria are the same for the license renewal rule, licensees may use the same methodology.

2.2 Plant Level Scoping Results

Guidance:

- Provide a list of all the plant systems and structures identifying those that are within scope of license renewal. For example, a list may contain 135 plant systems and structures, identifying only 37 that are within the scope of license renewal. If the list exists elsewhere, such as in the FSAR, it is acceptable to merely identify that linkage.
- The license renewal rule does not require the identification of all plant systems and structures. However, providing such a list may make the NRC's review more efficient.

2.3 System Scoping and Screening Results: Mechanical Systems

Guidance:

- Empty heading or at most, it could be a one-paragraph introduction for the section.

2.3.1 Reactor Coolant System *Guidance:* • For each system, provide the following information: system description, intended functions, interface/boundaries, environment, and components/commodities that make up the system. Identify mechanical components subject to aging management review and their intended functions [Ref. §54.21(a)(1)]. • Information concerning interface/boundaries and components/commodities can be provided in the form of drawings provided as part of the application or under separate cover.
2.3.2 Engineered Safety Features *Guidance:* • For each system, provide the following information: system description, intended functions, interface/boundaries, environment, and components/commodities that make up the system. Identify mechanical components subject to aging management review and their intended functions [Ref. §54.21(a)(1)]. • Information concerning interface/boundaries and components/commodities can be provided in the form of drawings provided as part of the application or under separate cover.
2.3.3 Auxiliary Systems *Guidance:* • For each system, provide the following information: system description, intended functions, interface/boundaries, environment, and components/commodities that make up the system. Identify mechanical components subject to aging management review and their intended functions [Ref. §54.21(a)(1)]. • Information concerning interface/boundaries and components/commodities can be provided in the form of drawings provided as part of the application or under separate cover.
2.3.4 Steam and Power Conversion System *Guidance:* • For each system, provide the following information: system description, intended functions, interface/boundaries, environment, and components/commodities that make up the system. Identify mechanical components subject to aging management review and their intended functions [Ref. §54.21(a)(1)]. • Information concerning interface/boundaries and components/commodities can be provided in the form of drawings provided as part of the application or under separate cover.
2.4 Scoping and Screening Results: Structures *Guidance:* • Identify containment, buildings, other civil structures, and component supports, subject to aging management review [Ref. §54.21(a)(1)]. For each, the following information is provided: a description, intended functions, interface/boundaries, environment, and structural components/commodities. • Information concerning interface/boundaries and components/commodities can be

provided in the form of drawings provided as part of the application or under separate cover.

2.5 Scoping and Screening Results: Electrical and Instrumentation and Controls Systems

Guidance:

- Identify electrical and instrumentation and control components subject to an aging management review. [Ref. § 54.21(a)(1)]. For each electrical and instrumentation and control component provide the following information: description, intended functions, interface/boundaries, environment, and components/commodities.
- Information concerning interface/boundaries and components/commodities can be provided in the form of drawings provided as part of the application or under separate cover.

3.0 AGING MANAGEMENT REVIEW RESULTS

Guidance:

- Empty heading or at most, it could be a one-paragraph introduction for the section.
- Licensees have the option to include a discussion of their aging management review process (including their process for identifying aging effects) in this section. We understand the NRC staff is not asking for such information and that the Standard Review Plan For License Renewal will not include a section to review this information.

•

3.1 Aging Management of Reactor Vessel, Internals, and Reactor Coolant System

Guidance

- Briefly describe the system, components, materials, and environment (set the stage for aging management review). Identify the aging effects requiring management, identify the aging management program relied upon to manage certain aging effects for particular components, and describe how the program will manage those aging effects. Also provide a reference to the associated summary description of programs relevant to the system in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. (May reference aging management programs in optional Appendix B. Use hypertext for electronic submittals.) (May discuss aging management of the system as commodity groups and reference optional Appendix C. Use hypertext for electronic submittals.) (Also, note that the staff reviewers for Section 3 are different than for Section 2.) [§54.21(a)(3) and §54.21(d)]
- If the commodity approach is used, this section will contain the same information as in section 2.3.1, with reference to the associated commodities in Appendix C. This section is only a link between 2.3.1 and the aging management reviews for the commodity groups in Appendix C. (Use hypertext for electronic submittals.)
- The phrase "Briefly describe the system" means a licensee can provide a reference to a location, such as the FSAR, where the system is described. It also means the licensee can provide a link to another place in the application where the system is described.

3.2 Aging Management of Engineered Safety Features

Guidance:

- Briefly describe the system, components, materials, and environment (set the stage for aging management review). Identify the aging effects requiring management, identify the aging management program relied upon to manage certain aging effects for particular components, and describe how the program will manage those aging effects. Also provide a reference to the associated summary description of programs relevant to the system in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. (May reference aging management programs in optional Appendix B. Use hypertext for electronic submittals.) (May discuss aging management of the system as commodity groups and reference optional Appendix C. Use hypertext for electronic submittals.) (Also, note that the staff reviewers for Section 3 are different than for Section 2.) [§54.21(a)(3) and §54.21(d)]
- If the commodity approach is used, this section will contain the same information as in section 2.3.2, with reference to the associated commodities in Appendix C. This section is only a link between 2.3.2 and the aging management reviews for the commodity groups in Appendix C. (Use hypertext for electronic submittals.)
- The phrase "Briefly describe the system" means a licensee can provide a reference to a location, such as the FSAR, where the system is described. It also means the licensee can provide a link to another place in the application where the system is described.

3.3 Aging Management of Auxiliary Systems

Guidance:

- Briefly describe the system, components, materials, and environment (set the stage for aging management review). Identify applicable aging effects, identify the aging management program relied upon to manage certain aging effects for particular components, and describe how the program will manage those aging effects. Also provide a reference to the associated summary description of programs relevant to the system in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. (May reference aging management programs in optional Appendix B. Use hypertext for electronic submittals.) (May discuss aging management of the system as commodity groups and reference optional Appendix C. Use hypertext for electronic submittals.) (Also, note that the staff reviewers for Section 3 are different than for Section 2.) [§54.21(a)(3) and §54.21(d)]
- If the commodity approach is used, this section will contain the same information as in section 2.3.3, with reference to the associated commodities in Appendix C. This section is only a link between 2.3.3 and the aging management reviews for the commodity groups in Appendix C. (Use hypertext for electronic submittals.)
- The phrase "Briefly describe the system" means a licensee can provide a reference to a location, such as the FSAR, where the system is described. It also means the licensee can provide a link to another place in the application where the system is described.

3.4 Aging Management of Steam and Power Conversion Systems

Guidance:

- Briefly describe the system, components, materials, and environment (set the stage for aging management review). Identify the aging effects requiring management, identify the aging management program relied upon to manage certain aging effects for particular components, and describe how the program will manage those aging effects. Also provide a reference to the associated summary description of programs relevant to the system in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. (May reference aging management programs in optional Appendix B. Use hypertext for electronic submittals.) (May discuss aging management of the system as commodity groups and reference optional Appendix C. Use hypertext for electronic submittals.) (Also, note that the staff reviewers for Section 3 are different than for Section 2.) [§54.21(a)(3) and §54.21(d)]
- If the commodity approach is used, this section will contain the same information as in section 2.3.4, with reference to the associated commodities in Appendix C. This section is only a link between 2.3.4 and the aging management reviews for the commodity groups in Appendix C. (Use hypertext for electronic submittals.)
- The phrase "Briefly describe the system" means a licensee can provide a reference to a location, such as the FSAR, where the system is described. It also means the licensee can provide a link to another place in the application where the system is described.

3.5 Aging Management of Containments, Structures and Component Supports

Guidance:

- Briefly describe the structures and structural components, materials, and environment (set the stage for aging management review). Identify the aging effects requiring management, identify the aging management program relied upon to manage certain aging effects for particular components, and describe how the program will manage those aging effects. Also provide a reference to the associated summary description of programs relevant to the system in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. (May reference aging management programs in optional Appendix B. Use hypertext for electronic submittals.) (May discuss aging management of the system as commodity groups and reference optional Appendix C. Use hypertext for electronic submittals.) (Also, note that the staff reviewers for Section 3 are different than for Section 2.) [§54.21(a)(3) and §54.21(d)]
- If the commodity approach is used, this section will contain the same information as in section 2.4, with reference to the associated commodities in Appendix C. This section is only a link between 2.4 and the aging management reviews for the commodity groups in Appendix C. (Use hypertext for electronic submittals.)
- The phrase "Briefly describe the system" means a licensee can provide a reference to a location, such as the FSAR, where the system is described. It also means the

licensee can provide a link to another place in the application where the system is described.
3.6 Aging Management of Electrical and Instrumentation and Controls *Guidance:* • Briefly describe the electrical and I&C components, materials, and environment (set the stage for aging management review). Identify the aging effects requiring management, identify the aging management program relied upon to manage certain aging effects for particular components, and describe how the program will manage those aging effects. Also provide a reference to the associated summary description of programs relevant to the system in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. (May reference aging management programs in optional Appendix B. Use hypertext for electronic submittals.) (May discuss aging management of the system as commodity groups and reference optional Appendix C. Use hypertext for electronic submittals.) (Also, note that the staff reviewers for Section 3 are different than for Section 2.) [§54.21(a)(3) and §54.21(d)] • If the commodity approach is used, this section will contain the same information as in section 2.5, with reference to the associated commodities in Appendix C. This section is only a link between 2.5 and the aging management reviews for the commodity groups in Appendix C. (Use hypertext for electronic submittals.) • The phrase "Briefly describe the system" means a licensee can provide a reference to a location, such as the FSAR, where the system is described. It also means the licensee can provide a link to another place in the application where the system is described.

4.0 TIME-LIMITED AGING ANALYSES

Guidance:

- Empty heading or at most, it could be a one-paragraph introduction for the section. The Standard Review Plan For License Renewal will not provide a section to review this information.
- Not all of the TLAAs identified below will apply to all licensees. If a TLAA listed below is not applicable, the applicant need only state that it does not apply. It is not necessary to justify why it does not apply.

4.1 Identification of TLAAs

Guidance:

- The application shall include a list of time-limited aging analyses, as defined by §54.3. The application should include the identification of the affected systems, structures, and components, an explanation of the time dependent aspects of the calculation or analysis, and a discussion of the TLAAs impact on the associated aging effect. The identification of the results of the time limited aging analysis review, which may be provided in tabular form, may reference the section in the Integrated Plant Assessment - Aging Management Review chapter where more details of the actual review and disposition (as required by §54.21(c)(1)(i)-(iii)) are located.
- The application shall include a demonstration that (1) the analyses remain valid for the period of extended operation, (2) the analyses have been projected to the end of the period of extended operation, or (3) the effects of aging on the intended function(s) will be adequately managed for the period of extended operation.
- The application shall include a list of plant specific exemptions granted pursuant to §50.12 and in effect that are based on TLAAs as defined in §54.3. The application shall include an evaluation that justifies the continuation of these exemptions for the period of extended operation.
- Summary descriptions of the evaluations of TLAAs for the period of extended operation shall be included in the FSAR supplement (Appendix A).

4.2 Reactor Vessel Neutron Embrittlement

Guidance:

- Evaluation of each of the identified TLAAs. Also, provide a reference to the summary description of TLAA evaluations in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. [§54.21(c)(1) and §54.21(d)]

4.3 Metal Fatigue

Guidance:

- Evaluation of each of the identified TLAAs. Also, provide a reference to the summary description of TLAA evaluations in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. [§54.21(c)(1) and §54.21(d)]

4.4 Environmental Qualification (EQ) of Electric Equipment

Guidance:

- Evaluation of each of the identified TLAAs. Also, provide a reference to the summary description of TLAA evaluations in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. [§54.21(c)(1) and §54.21(d)]

4.5 Concrete Containment Tendon Prestress

Guidance:

- Evaluation of each of the identified TLAAs. Also, provide a reference to the summary description of TLAA evaluations in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. [§54.21(c)(1) and §54.21(d)]

4.6 Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis

Guidance:

- Evaluation of each of the identified TLAAs. Also, provide a reference to the summary description of TLAA evaluations in the FSAR supplement (Appendix A). Use hypertext to link to the appropriate location in the appendix for electronic submittals. [§54.21(c)(1) and §54.21(d)]

4.7 Other Plant-Specific TLAAs

Guidance:

- Identify and evaluate any plant specific TLAAs.

APPENDIX A: FINAL SAFETY ANALYSIS REPORT(FSAR) SUPPLEMENT

Guidance:

- The contents of the FSAR supplement will be based on the technical information provided in the application. Section 54.21(d) of the Rule requires that a summary description of the programs and activities for managing the effects of aging for the period of extended operation as determined by the IPA review. A summary description of the evaluation of time limited aging analyses for the period of extended operation must also be included in the FSAR supplement.
- Guidance contained in NEI 98-03, "Guidelines For Updating Final Safety Analysis Reports" and NEI 96-07, "Guidelines For 10 CFR 50.59 Evaluations" should be considered in the preparation of the FSAR Supplement.
- In some instances, summary descriptions of programs and activities already exist in the plant FSAR. The applicant may choose to incorporate these existing pages of the FSAR by reference or may choose to include them in the application.
- The process to review and approve this change to the plant FSAR should be the same as that which the applicant presently utilizes.
- Once the renewed license is issued, the material contained in this Appendix A should be incorporated into the FSAR.

APPENDIX B: AGING MANAGEMENT PROGRAMS AND ACTIVITIES (OPTIONAL)

Guidance:

- Lists and describes the aging management programs and activities referenced in the text. The program attributes will be discussed, as appropriate.

APPENDIX C: COMMODITY GROUPS (OPTIONAL)

Guidance:

- For each commodity, describe the commodity. This will include the type of components, material, and environment. Identify the aging effects requiring management, identify the aging management program(s) relied upon to manage the aging effects, and describe how the program(s) will manage these aging effects. The program attributes,as appropriate, will be discussed for the commodity and the aggregate of the aging management programs credited. Also provide a reference to the associated summary description of the aging management programs (Appendix A).

APPENDIX D: TECHNICAL SPECIFICATION CHANGES

Guidance:

- Appendix D includes appropriate technical specification changes prepared and presented in a manner consistent with the way the applicant normally submits proposed technical specification revisions. Justification may be included herein, or may reference other parts of the license renewal application. Appendix D meets the requirements of §54.22.
- Once the renewed license is issued, the proposed changes to technical specifications will be incorporated and issued along with the renewal license. The technical specifications are in a living document and should be maintained in accordance with applicable regulations and plant procedures

APPENDIX E: ENVIRONMENTAL INFORMATION

Guidance:

- 10 CFR 51.53(c) requires a renewal applicant to address certain environmental impacts in a supplement to the plant's Environmental Report. This supplement is provided as Appendix E to the renewal application.
- The format and content of Appendix E should be based on Supplement 1 to Regulatory Guide 4.2, "Preparation of Supplemental Environmental Reports for Applications to Renew Nuclear Power Plant Operating Licenses".
- Once the renewed license is issued, the environmental information contained in Appendix E will be maintained in accordance with applicable regulations and plant procedures.

APPENDIX A

10 CFR PART 54
THE LICENSE RENEWAL RULE

PART 54—REQUIREMENTS FOR RENEWAL OF OPERATING LICENSES FOR NUCLEAR POWER PLANTS

GENERAL PROVISIONS

Sec.
54.1 Purpose.
54.3 Definitions.
54.4 Scope.
54.5 Interpretations.
54.7 Written communications.
54.9 Information collection requirements: OMB approval.
54.11 Public inspection of applications.
54.13 Completeness and accuracy of information.
54.15 Specific exemptions.
54.17 Filing of application.
54.19 Contents of application—general information.
54.21 Contents of application—technical in-formation.
54.22 Contents of application—technical specifications.
54.23 Contents of application—environmental information.
54.25 Report of the Advisory Committee on Reactor Safeguards.
54.27 Hearings.
54.29 Standards for issuance of a renewed license.
54.30 Matters not subject to a renewal review.
54.31 Issuance of a renewed license.
54.33 Continuation of CLB and conditions of renewed license.
54.35 Requirements during term of renewed license.
54.37 Additional records and recordkeeping requirements.
54.41 Violations.
54.43 Criminal penalties.

AUTHORITY: Secs. 102, 103, 104, 161, 181, 182, 183, 186, 189, 68 Stat. 936, 937, 938, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 1244, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2236, 2239, 2282); secs 201, 202, 206, 88 Stat. 1242, 1244, as amended (42 U.S.C. 5841, 5842), E.O. 12829, 3 CFR, 1993 Comp., p. 570; E.O. 12958, as amended, 3 CFR, 1995 Comp., p. 333; E.O. 12968, 3 CFR, 1995 Comp., p. 391.

SOURCE: 60 FR 22491, May 8, 1995, unless otherwise noted.

GENERAL PROVISIONS

§ 54.1 Purpose.
This part governs the issuance of renewed operating licenses for nuclear power plants licensed pursuant to Sections 103 or 104b of the Atomic Energy

Act of 1954, as amended (68 Stat. 919), and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242).

§ 54.3 Definitions.

(a) As used in this part,

Current licensing basis (CLB) is the set of NRC requirements applicable to a specific plant and a licensee's written commitments for ensuring compliance with and operation within applicable NRC requirements and the plant-specific design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and in effect. The CLB includes the NRC regulations contained in 10 CFR parts 2, 19, 20, 21, 26, 30, 40, 50, 51, 54, 55, 70, 72, 73, 100 and appendices thereto; orders; license conditions; exemptions; and technical specifications. It also includes the plant-specific design-basis information de-fined in 10 CFR 50.2 as documented in the most recent final safety analysis report (FSAR) as required by 10 CFR 50.71 and the licensee's commitments remaining in effect that were made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.

Integrated plant assessment (IPA) is a licensee assessment that demonstrates that a nuclear power plant facility's structures and components requiring aging management review in accordance with § 54.21(a) for license renewal have been identified and that the effects of aging on the functionality of such structures and components will be managed to maintain the CLB such that there is an acceptable level of safety during the period of extended operation.

Nuclear power plant means a nuclear power facility of a type described in 10 CFR 50.21(b) or 50.22.

Time-limited aging analyses, for the purposes of this part, are those licensee calculations and analyses that:

(1) Involve systems, structures, and components within the scope of license renewal, as delineated in § 54.4(a);

(2) Consider the effects of aging;

(3) Involve time-limited assumptions defined by the current operating term, for example, 40 years;

(4) Were determined to be relevant by the licensee in making a safety determination;

(5) Involve conclusions or provide the basis for conclusions related to the capability of the system, structure, and component to perform its intended functions, as delineated in §54.4(b); and

(6) Are contained or incorporated by reference in the CLB.

(b) All other terms in this part have the same meanings as set out in 10 CFR50.2 or Section 11 of the Atomic Energy Act, as applicable.

§ 54.4 Scope.

(a) Plant systems, structures, and components within the scope of this part are—

(1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49 (b)(1)) to ensure the following functions—

(i) The integrity of the reactor coolant pressure boundary;

(ii) The capability to shut down the reactor and maintain it in a safe shut-down condition; or

(iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in § 50.34(a)(1), § 50.67(b)(2), or § 100.11 of this chapter, as applicable.

(2) All nonsafety-related systems, structures, and components whose failure could prevent satisfactory accomplishment of any of the functions identified in paragraphs (a)(1) (i), (ii), or (iii) of this section.

(3) All systems, structures, and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49), pressurized thermal shock (10 CFR 50.61), anticipated transients without scram (10 CFR 50.62), and station blackout (10 CFR 50.63).

(b) The intended functions that these systems, structures, and components must be shown to fulfill in § 54.21 are those functions that are the bases for including them within the scope of licensee renewal as specified in paragraphs (a) (1)–(3) of this section.

[60 FR 22491, May 8, 1995, as amended at 61 FR 65175, Dec. 11, 1996; 64 FR 72002, Dec. 23, 1999]

EFFECTIVE DATE NOTE: At 64 FR 72002, Dec. 23, 1999, § 54.4 was amended by revising paragraph (a)(1)(iii), effective Jan. 24, 2000. For the convenience of the user, the superseded text is set forth as follows:

§ 54.4 Scope.
(a) * * *
(1) * * *
(iii) The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in § 50.34(a)(1) or § 100.11 of this chapter, as applicable.

* * * * *

§ 54.5 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the

Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

§ 54.7 Written communications.

All applications, correspondence, re-ports, and other written communications shall be filed in accordance with applicable portions of 10 CFR 50.4.

§ 54.9 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collection requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act (44 U.S.C. 3501, et seq.). The NRC may not conduct or sponsor, and a per-son is not required to respond to, a collection of information unless it displays a currently valid OMB control number. OMB has approved the information collection requirements contained in this part under control number 3150–0155.

(b) The approved information collection requirements contained in this part appear in §§ 54.13, 54.17, 54.19, 54.21, 54.22, 54.23, 54.33, and 54.37.

[60 FR 22491, May 8, 1995, as amended at 62 FR 52188, Oct. 6, 1997]

§ 54.11 Public inspection of applications.

Applications and documents submitted to the Commission in connection with renewal applications may be made available for public inspection in accordance with the provisions of the regulations contained in 10 CFR part 2.

§ 54.13 Completeness and accuracy of information.

(a) Information provided to the Commission by an applicant for a renewed license or information required by statute or by the Commission's regulations, orders, or license conditions to be maintained by the applicant must be complete and accurate in all material
respects.

(b) Each applicant shall notify the Commission of information identified by the applicant as having, for the regulated activity, a significant implication for public health and safety or common defense and security. An applicant violates this paragraph only if the applicant fails to notify the Com-mission of information that the applicant has identified as having a significant implication for public health and safety or common defense and security. Notification must be provided to the Administrator of the appropriate regional office within 2 working days of identifying the information. This requirement is not applicable to information that is already required to be pro-vided to the Commission by other re-porting or updating requirements.

§ 54.15 Specific exemptions.

Exemptions from the requirements of this part may be granted by the Commission in accordance with 10 CFR 50.12.

§ 54.17 Filing of application.

(a) The filing of an application for a renewed license must be in accordance with subpart A of 10 CFR part 2 and 10 CFR 50.4 and 50.30.

(b) Any person who is a citizen, national, or agent of a foreign country, or any corporation, or other entity which the Commission knows or has reason to know is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government, is ineligible to apply for and obtain a renewed license.

(c) An application for a renewed license may not be submitted to the Commission earlier than 20 years be-fore the expiration of the operating licensee currently in effect.

(d) An applicant may combine an application for a renewed license with applications for other kinds of licenses.

(e) An application may incorporate by reference information contained in previous applications for licenses or license amendments, statements, correspondence, or reports filed with the Commission, provided that the references are clear and specific.

(f) If the application contains Restricted Data or other defense information, it must be prepared in such a manner that all Restricted Data and other defense information are separated from unclassified information in accordance with 10 CFR 50.33(j).

(g) As part of its application, and in any event before the receipt of Restricted Data or classified National Security Information or the issuance of a renewed license, the applicant shall agree in writing that it will not permit any individual to have access to or any facility to possess Restricted Data or classified National Security Information until the individual and/or facility has been approved for such access under the provisions of 10 CFR parts 25 and/or 95. The agreement of the applicant in this regard shall be deemed part of the renewed license, whether so stated therein or not.

[60 FR 22491, May 8, 1995, as amended at 62 FR 17690, Apr. 11, 1997]

§ 54.19 Contents of application—general information.

(a) Each application must provide the information specified in 10 CFR 50.33 (a) through (e), (h), and (i). Alter-natively, the application may incorporate by reference other documents that provide the information required by this section.

(b) Each application must include conforming changes to the standard indemnity agreement, 10 CFR 140.92, Appendix B, to account for the expiration term of the proposed renewed license.

§ 54.21 Contents of application—technical information.

Each application must contain the following information:

(a) An integrated plant assessment (IPA). The IPA must—

(1) 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. Structures and components subject to an aging management re-view shall encompass those structures and components—

(i)That perform an intended function, as described in § 54.4, without moving parts or without a change in configuration or properties. These structures and components include, but are not limited to, the reactor vessel, the reactor coolant system pressure boundary, steam generators, the pressurizer, piping, pump casings, valve bodies, the core shroud, component supports, pressure retaining boundaries, heat exchangers, ventilation ducts, the containment, the containment liner, electrical and mechanical penetrations, equipment hatches, seismic Category I structures, electrical cables and connections, cable trays, and electrical cabinets, excluding, but not limited to, pumps (except casing), valves (except body), motors, diesel generators, air compressors, snubbers, the control rod drive, ventilation dampers, pressure transmitters, pressure indicators, water level indicators, switchgears, cooling fans, transistors, batteries, breakers, relays, switches, power inverters, circuit boards, battery chargers, and power supplies; and

(ii) That are not subject to replacement based on a qualified life or specified time period.

(2) Describe and justify the methods used in paragraph (a)(1) of this section.

(3) For each structure and component identified in paragraph (a)(1) of this section, demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

(b) CLB changes during NRC review of the application. Each year following submittal of the license renewal application and at least 3 months before scheduled completion of the NRC re-view, an amendment to the renewal application must be submitted that identifies any change to the CLB of the facility that materially affects the con-tents of the license renewal application, including the FSAR supplement.

(c) An evaluation of time-limited aging analyses.

(1) A list of time-limited aging analyses, as defined in § 54.3, must be provided. The applicant shall demonstrate that—

(i) The analyses remain valid for the period of extended operation;

(ii) The analyses have been projected to the end of the period of extended operation; or

(iii) The effects of aging on the intended function(s) will be adequately managed for the period of extended operation.

(2) A list must be provided of plant-specific exemptions granted pursuant to 10 CFR 50.12 and in effect that are based on time-limited aging analyses as defined in § 54.3. The applicant shall provide an evaluation that justifies the continuation of these exemptions for the period of extended operation.

(d) An FSAR supplement. The FSAR supplement for the facility must contain a summary description of the programs and activities for managing the effects of aging and the evaluation of time-limited aging analyses for the period of extended operation determined by paragraphs (a) and (c) of this section, respectively.

§ 54.22 Contents of application—technical specifications.

Each application must include any technical specification changes or additions necessary to manage the effects of aging during the period of extended operation as part of the renewal application. The justification for changes or additions to the technical specifications must be contained in the license renewal application.

§ 54.23 Contents of application—environmental information.

Each application must include a supplement to the environmental report that complies with the requirements of subpart A of 10 CFR part 51.

§ 54.25 Report of the Advisory Committee on Reactor Safeguards.

Each renewal application will be referred to the Advisory Committee on Reactor Safeguards for a review and re-port. Any report will be made part of the record of the application and made available to the public, except to the extent that security classification prevents disclosure.

§ 54.27 Hearings.

A notice of an opportunity for a hearing will be published in the FEDERAL REGISTER in accordance with 10 CFR 2.105. In the absence of a request for a hearing filed within 30 days by a person whose interest may be affected, the Commission may issue a renewed operating license without a hearing upon 30-day notice and publication once in the FEDERAL REGISTER of its intent to do so.

§ 54.29 Standards for issuance of a renewed license.

A renewed license may be issued by the Commission up to the full term authorized by §54.31 if the Commission finds that:

(a) Actions have been identified and have been or will be taken with respect to the matters identified in paragraphs (a)(1) and (a)(2) of this section, such that there is reasonable assurance that the activities authorized by the renewed license will

continue to be conducted in accordance with the CLB, and that any changes made to the plant's CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations. These matters are:

(1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under § 54.21(a)(1); and

(2) time-limited aging analyses that have been identified to require review under §54.21(c).

(b) Any applicable requirements of subpart A of 10 CFR part 51 have been satisfied.

(c) Any matters raised under § 2.758 have been addressed.

§ 54.30 Matters not subject to a renewal review.

(a) If the reviews required by § 54.21 (a) or (c) show that there is not reason-able assurance during the current licensee term that licensed activities will be conducted in accordance with the CLB, then the licensee shall take measures under its current license, as appropriate, to ensure that the intended function of those systems, structures or components will be maintained in accordance with the CLB throughout the term of its current license.

(b) The licensee's compliance with the obligation under Paragraph (a) of this section to take measures under its current license is not within the scope of the license renewal review.

§ 54.31 Issuance of a renewed license.

(a) A renewed license will be of the class for which the operating license currently in effect was issued.

(b) A renewed license will be issued for a fixed period of time, which is the sum of the additional amount of time beyond the expiration of the operating license (not to exceed 20 years) that is requested in a renewal application plus the remaining number of years on the
operating license currently in effect. The term of any renewed license may not exceed 40 years.

(c) A renewed license will become effective immediately upon its issuance, thereby superseding the operating license previously in effect. If a renewed license is subsequently set aside upon further administrative or judicial appeal, the operating license previously in effect will be reinstated unless its term has expired and the renewal application was not filed in a timely manner.

(d) A renewed license may be subsequently renewed in accordance with all applicable requirements.

§ 54.33 Continuation of CLB and conditions of renewed license.

(a) Whether stated therein or not, each renewed license will contain and otherwise be subject to the conditions set forth in 10 CFR 50.54.

(b) Each renewed license will be issued in such form and contain such conditions and limitations, including technical specifications, as the Commission deems appropriate and necessary to help ensure that systems, structures, and components subject to review in accordance with § 54.21 will continue to perform their intended functions for the period of extended operation. In addition, the renewed licensee will be issued in such form and contain such conditions and limitations as the Commission deems appropriate and necessary to help ensure that systems, structures, and components associated with any time-limited aging analyses will continue to per-form their intended functions for the period of extended operation.

(c) Each renewed license will include those conditions to protect the environment that were imposed pursuant to 10 CFR 50.36b and that are part of the CLB for the facility at the time of issuance of the renewed license. These conditions may be supplemented or amended as necessary to protect the environment during the term of the renewed license and will be derived from information contained in the supplement to the environmental report submitted pursuant to 10 CFR part 51, as analyzed and evaluated in the NRC record of decision. The conditions will identify the obligations of the licensee in the environmental area, including, as appropriate, requirements for re-porting and recordkeeping of environ- mental data and any conditions and monitoring requirements for the protection of the nonaquatic environment.

(d) The licensing basis for the renewed license includes the CLB, as de-fined in §54.3(a); the inclusion in the licensing basis of matters such as licensee commitments does not change the legal status of those matters unless specifically so ordered pursuant to paragraphs (b) or (c) of this section.

§ 54.35 Requirements during term of renewed license.

During the term of a renewed license, licensees shall be subject to and shall continue to comply with all Commission regulations contained in 10 CFR parts 2, 19, 20, 21, 26, 30, 40, 50, 51, 54, 55, 70, 72, 73, and 100, and the appendices to these parts that are applicable to holders of operating licenses.

§ 54.37 Additional records and record-keeping requirements.

(a) The licensee shall retain in an auditable and retrievable form for the term of the renewed operating license all information and documentation required by, or otherwise necessary to document compliance with, the provisions of this part.

(b) After the renewed license is issued, the FSAR update required by 10 CFR 50.71(e) must include any systems, structures, and components newly identified that would have been subject to an aging management review or evaluation of time-limited aging analyses in accordance with § 54.21. This FSAR update must

describe how the effects of aging will be managed such that the intended function(s) in § 54.4(b) will be effectively maintained during the period of extended operation.

§ 54.41 Violations.

(a) The Commission may obtain an injunction or other court order to pre-vent a violation of the provisions of the following acts—

(1) The Atomic Energy Act of 1954, as amended.

(2) Title II of the Energy Reorganization Act of 1974, as amended or

(3) A regulation or order issued pursuant to those acts.

(b) The Commission may obtain a court order for the payment of a civil penalty imposed under Section 234 of the Atomic Energy Act—

(1) For violations of the following—

(i) Sections 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Atomic Energy Act of 1954, as amended;

(ii) Section 206 of the Energy Reorganization Act;

(iii) Any rule, regulation, or order issued pursuant to the sections specified in paragraph (b)(1)(i) of this section;

(iv) Any term, condition, or limitation of any license issued under the sections specified in paragraph (b)(1)(i) of this section.

(2) For any violation for which a license may be revoked under Section 186 of the Atomic Energy Act of 1954, as amended.

§ 54.43 Criminal penalties.

(a) Section 223 of the Atomic Energy Act of 1954, as amended, provides for criminal sanctions for willful violations of, attempted violation of, or conspiracy to violate, any regulation issued under sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in part 54 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in part 54 that are not issued under Sections 161b, 161i, or 161o for the purposes of Section 223 are as follows: §§ 54.1, 54.3, 54.4, 54.5, 54.7, 54.9, 54.11, 54.15, 54.17, 54.19, 54.21, 54.22, 54.23, 54.25, 54.27, 54.29, 54.31, 54.41, and 54.43.

APPENDIX B

TYPICAL STRUCTURE, COMPONENT, AND COMMODITY GROUPINGS AND ACTIVE/PASSIVE DETERMINATIONS FOR THE INTEGRATED PLANT ASSESSMENT

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
1	Structures	Category I Structures Note: If a dam is included in this category – see Appendix C, Reference 4 for guidance on an acceptable aging management program	Yes
2	Structures	Primary Containment Structure	Yes
3	Structures	Intake Structures	Yes
4	Structures	Intake Canal	Yes
5	Structures	Other Non-Category I Structures Within the Scope of License Renewal Note: If a dam is included in this category – see Appendix C, Reference 4 for guidance on an acceptable aging management program	Yes
6	Structures	Equipment Supports and Foundations	Yes
7	Structures	Structural Bellows	Yes
8	Structures	Controlled Leakage Doors	Yes
9	Structures	Penetration Seals	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
10	Structures	Compressible Joints and Seals	Yes
11	Structures	Fuel Pool and Sump Liners	Yes
12	Structures	Concrete Curbs	Yes
13	Structures	Offgas Stack and Flue	Yes
14	Structures	Fire Barriers	Yes
15	Structures	Pipe Whip Restraints and Jet Impingement Shields	Yes
16	Structures	Electrical and Instrumentation and Control Penetration Assemblies	Yes
17	Structures	Instrumentation Racks, Frames, Panels, and Enclosures	Yes
18	Structures	Electrical Panels, Racks, Cabinets, and Other Enclosures	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
19	Structures	Cable Trays and Supports	Yes
20	Structures	Conduit	Yes
21	Structures	Tube Track	Yes
22	Structures	Reactor Vessel Internals	Yes
23	Structures	ASME Class 1 Hangers and Supports	Yes
24	Structures	Non-ASME Class 1 Hangers and Supports	Yes
25	Structures	Snubbers	No
26	Reactor Coolant Pressure Boundary Components (Note: the components of the RCPB are defined by each plant's CLB and site specific documentation	ASME Class 1 Piping	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
27	Reactor Coolant Pressure Boundary Components	Reactor Vessel	Yes
28	Reactor Coolant Pressure Boundary Components	Reactor Coolant Pumps	Yes (Casing)
29	Reactor Coolant Pressure Boundary Components	Control Rod Drives	No
30	Reactor Coolant Pressure Boundary Components	Control Rod Drive Housing	Yes
31	Reactor Coolant Pressure Boundary Components	Steam Generators	Yes
32	Reactor Coolant Pressure Boundary Components	Pressurizers	Yes
33	Non-Class I Piping Components	Underground Piping	Yes
34	Non-Class I Piping Components	Piping in Low Temperature Demineralized Water Service	Yes
35	Non-Class I Piping Components	Piping in High Temperature Single Phase Service	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
36	Non-Class I Piping Components	Piping in Multiple Phase Service	Yes
37	Non-Class I Piping Components	Service Water Piping	Yes
38	Non-Class I Piping Components	Low Temperature Gas Transport Piping	Yes
39	Non-Class I Piping Components	Stainless Steel Tubing	Yes
40	Non-Class I Piping Components	Instrument Tubing	Yes
41	Non-Class I Piping Components	Expansion Joints	Yes
42	Non-Class I Piping Components	Ductwork	Yes
43	Non-Class I Piping Components	Sprinklers Heads	Yes
44	Non-Class I Piping Components	Miscellaneous Appurtenances (Includes fittings, couplings, reducers, elbows, thermowells, flanges, fasteners, welded attachments, etc.)	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
45	Pumps	ECCS Pumps	Yes (Casing)
46	Pumps	Service Water and Fire Pumps	Yes (Casing)
47	Pumps	Lube Oil and Closed Cooling Water Pumps	Yes (Casing)
48	Pumps	Condensate Pumps	Yes (Casing)
49	Pumps	Borated Water Pumps	Yes (Casing)
50	Pumps	Emergency Service Water Pumps	Yes (Casing)
51	Pumps	Submersible Pumps	Yes (Casing)
52	Turbines	Turbine Pump Drives (excluding pumps)	Yes (Casing)
53	Turbines	Gas Turbines	Yes (Casing)

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
54	Turbines	Controls (Actuator and Overspeed Trip)	No
55	Engines	Fire Pump Diesel Engines	No
56	Emergency Diesel Generators	Emergency Diesel Generators	No
57	Heat Exchangers	Condensers	Yes
58	Heat Exchangers	HVAC Coolers	Yes
59	Heat Exchangers	Primary Water System Heat Exchangers	Yes
60	Heat Exchangers	Treated Water System Heat Exchangers	Yes
61	Heat Exchangers	Closed Cooling Water System Heat Exchangers	Yes
62	Heat Exchangers	Lubricating Oil System Heat Exchangers	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
63	Heat Exchangers	Raw Water System Heat Exchangers	Yes
64	Heat Exchangers	Containment Atmospheric System Heat Exchangers	Yes
65	Miscellaneous Process Components	Gland Seal Blower	No
66	Miscellaneous Process Components	Recombiners	The applicant shall identify the intended function and apply the IPA process to determine if the grouping is active or passive.
67	Miscellaneous Process Components	Flexible Connectors	Yes
68	Miscellaneous Process Components	Strainers	Yes
69	Miscellaneous Process Components	Rupture Disks	Yes
70	Miscellaneous Process Components	Steam Traps	Yes
71	Miscellaneous Process Components	Restricting Orifices	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
72	Miscellaneous Process Components	Air Compressor	No
73	Electrical and I&C	Alarm Unit (e.g., fire detection devices)	No
74	Electrical and I&C	Analyzers (e.g., gas analyzers, conductivity analyzers)	No
75	Electrical and I&C	Annunciators (e.g., lights, buzzers, alarms)	No
76	Electrical and I&C	Batteries	No
77	Electrical and I&C	Cables and Connections, Bus, electrical portions of Electrical and I&C Penetration Assemblies (e.g., electrical penetration assembly cables and connections, connectors, electrical splices, terminal blocks, power cables, control cables, instrument cables, insulated cables, communication cables, uninsulated ground conductors, transmission conductors, isolated-phase bus, nonsegregated-phase bus, segregated-phase bus, switchyard bus)	Yes
78	Electrical and I&C	Chargers, Converters, Inverters (e.g., converters-voltage/current, converters-voltage/pneumatic, battery chargers/inverters, motor-generator sets)	No
79	Electrical and I&C	Circuit Breakers (e.g., air circuit breakers, molded case circuit breakers, oil-filled circuit breakers)	No

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
80	Electrical and I&C	Communication Equipment (e.g., telephones, video or audio recording or playback equipment, intercoms, computer terminals, electronic messaging, radios, transmission line traps and other power-line carrier equipment)	No
81	Electrical and I&C	Electric Heaters,	No, Yes for a Pressure Boundary if applicable, See Appendix C Reference 2
82	Electrical and I&C	Heat Tracing	No See Appendix C Reference 2
83	Electrical and I&C	Electrical Controls and Panel Internal Component Assemblies (may include internal devices such as, but not limited to, switches, breakers, indicating lights, etc.) (e.g., main control board, HVAC control board)	No
84	Electrical and I&C	Elements, RTDs, Sensors, Thermocouples, Transducers (e.g., conductivity elements, flow elements, temperature sensors, radiation sensors,watt transducers, thermocouples, RTDs, vibration probes, amp transducers, frequency transducers, power factor transducers, speed transducers, var. transducers, vibration transducers, voltage transducers)	No Yes for a Pressure Boundary if applicable
85	Electrical and I&C	Fuses	No See Appendix C Reference 3
86	Electrical and I&C	Generators, Motors (e.g., emergency diesel generators, ECCS and emergency service water pump motors, small motors, motor-generator sets, steam turbine generators, combustion turbine generators, fan motors, pump motors, valve motors, air compressor motors)	No

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
87	Electrical and I&C	High-voltage Insulators (e.g., porcelain switchyard insulators, transmission line insulators)	Yes
88	Electrical and I&C	Surge Arresters (e.g., switchyard surge arresters, lightning arresters, surge suppressers, surge capacitors, protective capacitors)	No
89	Electrical and I&C	Indicators (e.g., differential pressure indicators, pressure indicators, flow indicators, level indicators, speed indicators, temperature indicators, analog indicators, digital indicators, LED bar graph indicators, LCD indicators)	No
90	Electrical and I&C	Isolators (e.g., transformer isolators, optical isolators, isolation relays, isolating transfer diodes)	No
91	Electrical and I&C	Light Bulbs (e.g., indicating lights, emergency lighting, incandescent light bulbs, fluorescent light bulbs)	No See Appendix C Reference 2
92	Electrical and I&C	Loop Controllers (e.g., differential pressure indicating controllers, flow indicating controllers, temperature controllers, controllers, speed controllers, programmable logic controller, single loop digital controller, process controllers, manual loader, selector station, hand/auto station, auto/manual station)	No
93	Electrical and I&C	Meters (e.g., ammeters, volt meters, frequency meters, var meters, watt meters, power factor meters, watt-hour meters)	No
94	Electrical and I&C	Power Supplies	No

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
95	Electrical and I&C	Radiation Monitors (e.g., area radiation monitors, process radiation monitors)	No
96	Electrical and I&C	Recorders (e.g., chart recorders, digital recorders, events recorders)	No
97	Electrical and I&C	Regulators (e.g., voltage regulators)	No
98	Electrical and I&C	Relays (e.g., protective relays, control/logic relays, auxiliary relays)	No
99	Electrical and I&C	Signal Conditioners	No
100	Electrical and I&C	Solenoid Operators	No
101	Electrical and I&C	Solid-State Devices (e.g., transistors, circuit boards, computers)	No
102	Electrical and I&C	Switches (e.g., differential pressure indicating switches, differential pressure switches, pressure indicator switches, pressure switches, flow switches, conductivity switches, level indicating switches, temperature indicating switches, temperature switches, moisture switches, position switches, vibration switches, level switches, control switches, automatic transfer switches, manual transfer switches, manual disconnect switches, current switches, limit switches, knife switches)	No

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
103	Electrical and I&C	Switchgear, Load Centers, Motor Control Centers, Distribution Panel Internal Component Assemblies (may include internal devices such as, but not limited to, switches, breakers, indicating lights, etc.) (e.g., 4.16 kV switchgear, 480V load centers, 480V motor control centers, 250 VDC motor control centers, 6.9 kV switchgear units, 240/125V power distribution panels)	No
104	Electrical and I&C	Transformers (e.g., instrument transformers, load center transformers, small distribution transformers, large power transformers, isolation transformers, coupling capacitor voltage transformers)	No See Appendix C Reference 2
105	Electrical and I&C	Transmitters (e.g., differential pressure transmitters, pressure transmitters, flow transmitters, level transmitters, radiation transmitters, static pressure transmitters)	No
106	Valves	Hydraulic Operated Valves	Yes (Bodies)
107	Valves	Explosive Valves	Yes (Bodies)
108	Valves	Manual Valves	Yes (Bodies)
109	Valves	Small Valves	Yes (Bodies)

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
110	Valves	Motor-Operated Valves	Yes (Bodies)
111	Valves	Air-Operated Valves	Yes (Bodies)
112	Valves	Main Steam Isolation Valves	Yes (Bodies)
113	Valves	Small Relief Valves	Yes (Bodies)
114	Valves	Check Valves	Yes (Bodies)
115	Valves	Safety Relief Valves	Yes (Bodies)
116	Valves	Dampers	No
117	Tanks	Air Accumulators	Yes
118	Tanks	Discharge Accumulators (Dampers)	Yes

ITEM	CATEGORY	STRUCTURE, COMPONENT, OR COMMODITY GROUPING	STRUCTURE, COMPONENT, OR COMMODITY GROUPING MEETS 10CFR54.21(a)(1)(i) (YES/NO)
119	Tanks	Boron Acid Storage Tanks	Yes
120	Tanks	Above Ground Oil Tanks	Yes
121	Tanks	Underground Oil Tanks	Yes
122	Tanks	Demineralized Water Tanks	Yes
123	Tanks	Neutron Shield Tank	Yes
124	Fans	Ventilation Fans	No
125	Fans	Other Fans	No
126	Miscellaneous	Emergency Lighting	No
127	Miscellaneous	Hose Stations	Yes

APPENDIX C

REFERENCES

Appendix C

References

- Reference 1: *LICENSE RENEWAL ISSUE NO. 98-0105, "HEAT EXCHANGERS HEAT TRANSFER FUNCTION,"* Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I, Grimes, NRC dated November 19, 1999,

- Reference 2: *DETERMINATION OF AGING MANAGEMENT REVIEW FOR ELECTRICAL COMPONENTS*, Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I. Grimes, NRC, dated September 19, 1997

- Reference 3: *LICENSE RENEWAL ISSUE NO. 98-0016, "AGING MANAGEMENT REVIEW OF FUSES,"* Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I. Grimes, NRC, dated April 27, 1999

- Reference 4: *LICENSE RENEWAL ISSUE NO. 98-0100, "CREDITING FERC-REQUIRED INSPECTION AND MAINTENANCE PROGRAMS FOR DAM AGING MANAGEMENT,"* Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I. Grimes, NRC, dated May 5, 1999

REFERENCE 1

LICENSE RENEWAL ISSUE NO. 98-0105, "HEAT EXCHANGERS HEAT TRANSFER FUNCTION," Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I, Grimes, NRC dated November 19, 1999,

November 19, 1999

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street, NW., Suite 400
Washington, DC 20006-3708

SUBJECT: LICENSE RENEWAL ISSUE NO. 98-0105, "HEAT EXCHANGERS HEAT TRANSFER FUNCTION"

Dear Mr. Walters:

Enclosed is the staff's evaluation and proposed resolution of the subject issue. The staff found that a clarification should be added to the Standard Review Plan for License Renewal and NEI 95-10. Accordingly, if there are any industry comments on the evaluation basis or the proposed resolution, we request that you document those comments within 30 days following your receipt of this letter to ensure a timely resolution of this issue. If you have any questions regarding this matter, please contact Hai-Boh Wang at 301-415-2958.

Sincerely,

/Signed/

Christopher I. Grimes, Chief
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project 690

Enclosure: As stated

cc w/encl: See next page

LICENSE RENEWAL ISSUE NO. 98-0105
HEAT EXCHANGERS HEAT TRANSFER FUNCTION

BACKGROUND

Section 54.21(a)(1)(i) of Title 10 of the Code of Federal Regulations specifies that heat exchangers are components that are subject to an aging management review and that perform an intended function without moving parts or without a change in configuration or properties.

Section 3.0.III.C of the draft Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants (SRP-LR) states, in part: "Performance monitoring programs test the ability of a structure or component to perform its intended function(s), for example, heat balances on heat exchangers for the heat transfer intended function of the tubes."

Experience from the first two renewal applications and industry comments on the generic renewal guidance has demonstrated that, while it is generally understood that the pressure boundary function of the heat exchanger is within the scope of license renewal, some believe that heat exchangers are active with respect to the heat transfer function, and that the heat transfer intended function need not be subject to a separate aging management review.

2. EVALUATION

In 10 CFR 54.21, the following requirement is stated: "Each application must contain the following information: (a) An integrated plant assessment (IPA). The IPA must—

> (1) 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. Structures and components subject to an aging management review shall encompass those structures and components -
>
> (i) That perform an intended function, as described in §54.4, without moving parts or without a change in configuration or properties. These structures and components include, but are not limited to... steam generators... heat exchangers, ventilation ducts... the containment, the containment liner...."

As stated in 10 CFR 54.21(a)(1)(i), heat exchangers perform their intended function(s) without moving parts or without a change in configuration or properties. The staff believes that the Commission intended to include the pressure boundary function and the heat transfer function. The pressure boundary is maintained by the shell and other parts of the heat exchangers. Heat transfer is conducted through the tube wall, which may be made from different materials. Although the cooling fluid is moving and may involve local boiling (a change of state), heat exchangers do not have any moving parts. Therefore, the staff does not believe that the heat transfer function could be reasonably described as "active."

Furthermore, the Statement of Consideration (SOC) (60 FR 22469) states the following:

> "The Commission believes that regardless of the specific aging mechanism, only aging degradation that leads to degraded performance or condition (i.e., detrimental effects) during the period of extended operation is of principal concern for license renewal. Because the detrimental effects of aging are manifested in degraded performance or condition, an appropriate license renewal review would ensure that licensee programs adequately monitor performance or condition in a manner that allows for the timely identification and correction of degraded conditions. The Commission concludes that a shift in focus to managing the detrimental effects of aging for license renewal review is appropriate and will provide reasonable assurance that systems, structures, and components are capable of performing their intended function during the period of extended operation."

This objective can be best achieved by considering both the pressure boundary and heat transfer functions for heat exchangers, because heat transfer is a primary safety function of these components. There may be a unique aging effect associated with different materials in the heat exchanger parts that are associated with the heat transfer function and not the pressure boundary function. The staff would expect that the programs that effectively manage aging effects of the pressure boundary function can, in conjunction with the procedures for monitoring heat exchanger performance, effectively manage aging effects applicable to the heat transfer function.

Heat transfer is also a parameter considered in the design of most of the other safety-related structures and components, but not as a primary safety function like that associated with steam generators and heat exchangers. For example,

while the heat capacity of the containment and interior structures is included in the modeling of the pressure and temperature transient for loss-of-coolant accidents, these secondary heat-transfer functions of safety-related structures and components need not be a specific focus of the aging management review for license renewal.

1. RESOLUTION

On the basis of the preceding evaluation, the staff has determined that its proposed position as stated in SRP-LR Section 3.0.III.C is consistent with the rule. However, the clarification of the distinction between the pressure boundary and heat transfer functions, as well and the distinction between the primary and secondary heat transfer functions should be added to the SRP-LR as well as NEI 95-10.

REFERENCE 2

DETERMINATION OF AGING MANAGEMENT REVIEW FOR ELECTRICAL COMPONENTS, Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I. Grimes, NRC, dated September 19, 1997

UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C 20555-0001

September 19, 1997

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

SUBJECT: DETERMINATION OF AGING MANAGEMENT REVIEW FOR ELECTRICAL COMPONENTS

Dear Mr. Walters:

During the Nuclear Regulatory Commission staff's review of the Nuclear Energy Institute's NEI 95-10. "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," the need was identified for guidance on whether selected electrical components are subject to an aging management review. NEI addressed a number of the components in its letter dated December 24, 1996. Consistent with the staff's approach in its February 27. 1997, letter to provide positions on significant issues associated with the license renewal regulatory guide and NEI 95-10, enclosed please find the staff's position on the aging management review requirements for selected electrical components. The recommendations in the enclosed position should be considered when revising NEI 95-10.

Sincerely,

Christopher I. Crimes. Director
License Renewal Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Project 690

Enclosure: As stated

cc: w/encl: See next page

Determination of aping management review for electrical components

Issue:

Determining if transformers, fuses, indicating lights9 heat tracing, electric heaters, and recombiners are subject to an aging management review.

NRC staff position:

This issue relates to the guidance provided in the Statements of Consideration (SOC) in which the Commission concluded that an aging management review is required for passive, long-lived structures and components within the scope of the license renewal rule. Appendix B of NE! 95-10 addresses this requirement by identifying typical structure, component, and commodity groupings and a determination as to whether they require an aging management review. Several electrical components, as identified above, were not classified in Appendix B. The rule in §54.21(a)(1), states that "structures and components subject to an aging management review shall encompass those structures and components (i) [t]hat perform an intended function as described in §54.4, without moving parts or without a change In configuration or properties." The SOC uses the term "passive" to represent these characteristics for convenience. The description of "passive" structures and components incorporated into §54.21(a)(1)(i) is used only In conjunction with the IPA review in the license renewal process. The SOC accompanying the renewal rule states: "The Commission has determined that passive structures and components for which aging degradation is not readily monitored are those that perform an intended function without moving parts or a change in configuration or properties." (60 FR 22477). The SOC also states: "[T]he commission has concluded that "a change in configuration or properties should be interpreted to include "a change in state," which is a term sometimes found in the literature relating to "passive."

§54.21(a)(1)(i) excludes a variety of electrical and instrumentation and control (I&C) structures and components from an aging management review for renewal such as motors, diesel generators, air compressors, pressure transmitters, pressure indicators, water level indicators, switchgear, cooling fans, transistors, batteries, breakers, relays, switches, power inverters, circuit boards, battery chargers, and power supplies. The SOC provides the following discussion as the basis for excluding several electrical and !&C devices from an aging management review: "an electrical relay can change its configuration, and a battery changes its electrolyte properties when discharging" and "a transistor can 'change its state'." The SOC also provides the following discussion as the basis to include electrical cables in an aging management review: "they perform their intended function without moving parts or without a change in configuration or properties and the effects of aging degradation for these components are not readily monitorable." (60 FR 22477)

While §54.21(a)(1)(i) excludes many electrical and I&C components from an aging management review for renewal, It also states that the exclusion is "not limited to" only these components. The staff has considered the aging

Attachment

management review requirements for transformers, fuses, indicating lights, heat tracing, electric heaters, and recombiners with respect to the definitions, background, and specific electrical examples in the license renewal rule (circuit breakers, relays, motors, circuit boards, etc.). Based on the considerable discussion provided in the rule and SOC, the staff compared the electrical components identified above with the examples explicitly provided in the rule in terms of how the performance of their intended functions would be achieved and whether aging degradation of these components would be readily monitored using currently available techniques, in a similar way by which the examples in the rule (circuit breakers, relays, switches, etc.) would be monitored. These techniques include performance or condition monitoring by testing and maintenance/surveillance programs that include instrument checks, functional tests, calibration functional tests, and response time verification tests. The results of these tests and performance monitoring programs can be analyzed and trended to provide an Indication of aging degradation for these electrical components as discussed below:

* Transformers perform their intended function through a change in state by stepping down voltage from a higher to a lower value, stepping up voltage to a higher value, or providing
isolation to a load. Transformers perform their intended function through a change in state similar to switchgear, power supplies, battery chargers, and power inverters, which have been excluded in §54.21(a)(1)(i) from an aging management review. Any degradation of the transformer's ability to perform its intended function is readily monitorable by a change in the electrical performance of the transformer and the associated circuits. Trending electrical parameters measured during transformer surveillance and maintenance such as Doble test results, and advanced monitoring methods such as infrared thermography, and electrical circuit characterization and diagnosis provide a direct indication of the performance of the transformer. Therefore, transformers are not subject to an aging management review.

* Indicating lights (dual filament) perform their intended function through a change in state by displaying readily monitorable visible light when energized with sufficient voltage. Indicating lights perform their intended function through a change in state similar to transistors and circuit boards, which have been excluded in §54.21(a)(1)(i) from an aging management review. Any degradation of the indicating lights ability to perform its intended function is readily monitorable since the lights (e.g., control room and local panel annunciators) typically have both a visual and audio test capability that is initiated on a periodic basis by the operator. This self-test capability is relied upon to provide a direct indication of the performance of the indicating lights. Therefore, indicating lights are not subject to an aging management review.

* Heat tracing performs its intended function through a change in state by supplying heat when energized, for example, to a boric acid system or a

refueling water storage tank/piping in order to maintain a minimum solution temperature to prevent boron from precipitating out or water from freezing in an outside pipe. Heat tracing performs its intended function through a change in state when energized similar to a power supply, battery charger, power inverter9 etc., which have been excluded in §54.21(a)(1)(i) from an aging management review. Any degradation of the heat tracing to perform its intended function is readily monitored by alarm circuitry (control room and local panel annunciators) or by surveillance requirements that monitor solution temperature on a periodic basis which provides a direct indication of the performance of the heat tracing. Therefore, heat tracing is not subject to an aging management review.

* Electric heaters perform their intended function through a change in state by supplying heat when energized, for example, to a pressurizer water volume for reactor coolant system pressure control. Electric heaters perform their intended function through a change in state similar to a battery charger, power inverter9 power supply, etc., that change state when energized and which have been excluded in §54.Z1(a)(1)(i) from an aging management review. Any degradation of the electric heaters' ability to perform their Intended function due to aging will be readily monitorable from existing monitoring equipment (voltmeters and active performance of the equipment in the circuit) and surveillance requirements by verifying that the heaters are energized and by measuring circuit current on a periodic basis. Therefore, electric heaters are not subject to an aging management review for the intended function of supplying heat. The pressure boundary intended function would still be subject to an aging management review.

The staff has also considered the aging management review requirements for fuses and hydrogen recombiners as discussed below:

* Fuses perform one of their two intended functions through a change in configuration dr state of the fuse by interrupting power In the case of a fault or overload in a load in order to provide protection to the rest of the electrical circuit. Fuses also perform a second intended function which is to maintain electrical continuity during non-faulted conditions. Unlike other electrical components which have simliar continuity functions such as breakers, switches, and relays which have been excluded in § 54.21 (a)(1)(i) from an aging management review, degradation of the fuse's ability to perform this intended function due aging Is not readily monitorable. Degradation of the fuse's intended continuity function may not result in detectable losses in associated system safety functions until degradation becomes unacceptable. Therefore, the staff believes that fuses are subject to an aging management review.

* Recombiners remove gaseous hydrogen from the containment atmosphere by combining hydrogen with oxygen to form water. This intended function is accomplished with several component types such as electric heater

banks, cabling, connections, etc. As such, recombiners should be considered as complex assemblies and should be evaluated on a plant specific basis to determine If they are subject to an aging management review for renewal.

Based on the above assessment, the staff concluded that these components, with the exception of fuses and recombiners, perform their intended function(s) with a change in configuration/state and the effects of aging are readily monitored and therefore. are not subject to an aging management review. Electrical and I&C structures and components that are subject to an aging management review for renewal include, but may not be limited to: electrical cables and connections, fuses, electrical and I&C penetration assemblies, cable trays, and electrical and I&C cabinets, panels, racks, frames, enclosures, and other similar component supports.

NRC staff recommendations:

The NRC staff recommends revising Appendix B of NEI 95-10 to indicate that transformers, indicating lights, heat tracing, and electric heaters do not require an aging management review (recombiners should remain plant specific) and to state that electrical and I&C structures and components subject to an aging management review *for* renewal should include: electrical cables and connections, fuses, electrical and I&C penetration assemblies, cable trays, and electrical and I&C cabinets, panels, racks, frames, enclosures, and other similar component supports.

REFERENCE 3

LICENSE RENEWAL ISSUE NO. 98-0016, "AGING MANAGEMENT REVIEW OF FUSES," Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I. Grimes, NRC, dated April 27, 1999

April 27, 1999

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street, N.W, Suite 400
Washington, DC 20006-3708

SUBJECT: LICENSE RENEWAL ISSUE NO. 98-0016, "AGING MANAGEMENT REVIEW OF FUSES"

Dear Mr. Walters:

Enclosed is the staff's evaluation and proposed resolution for the subject issue. The staff plans to implement the recommended resolution as part of the next revision to the " Standard Review Plan for License Renewal." We also expect NEI 95-10, "Industry Guideline for Implementating the Requirements of 10 CFR Part 54 - The License Renewal Rule," to be revised to reflect the guidance provided in that attached staff position. Accordingly, if there are any industry comments on the evaluation basis or the proposed resolution, we request that you document those comments within 30 days following your receipt of this letter, to ensure a timely resolution of this issue. If you have any questions regarding this matter, please contact Robert Prato at 301-415-1147.

Sincerely,

/Signed/

Christopher I. Grimes, Chief
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project: 690

Enclosure: As stated

cc w/enclosure: See next page

NCLEAR ENERGY INSTITUTE
(License Renewal Steering Committee)

Project No. 690

cc:

Mr. Dennis Harrison
U.S. Department of Energy
NE-42
Washington, D.C. 20585

Mr. Ricard P. Sedano, Commissioner
State Liaison Officer
Department of Public Service
112 State Street
Drawer 20
Montipelier, Vermont 05620-2601

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street, N.W.
Washington, DC 20006
DJW@NEI.ORG

National Whistleblower Center
3233 P Street, N.W.
Washington, DC 20007

Mr. William H. Mackay
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333 GSB-2E
Russellville, Arkansas 72802

Mr. Robert Gill
Duke Energy Corporation
Mail Stop EC-12R
P.O. Box 1006
Charlotte, NC 28201-1006

Mr. Charles R. Pierce
Southern Nuclear Operating Co.
40 Inverness Center Parkway
BIN B064
Birmingham, AL 35242

Mr. Barth Doroshuk
Baltimore Gas & Electric Company
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-47027

Chattooga River Watershed Coalition
P. O. Box 2006
Clayton, GA 30525

Background

On September 19, 1997, the staff issued a position (Attachment 1) on five electrical components including fuses. On April 10, 1998, NEI issued a response (Attachment 2) to this position. In this letter, NEI agreed with the staff's positions with the exception of the staff's determination that fuses require an aging management review. In response to NEI's position, the staff reviewed its determination that fuses are passive, long-lived components requiring an aging management review. The following are the results of the staff's review and its current position on the matter of fuses.

Evaluation

The April 10, 1998, letter, contains the following conclusions:

1. "Table 4.1-1in NEI 95-10 is entitled "Typical Passive Structure and Component Intended Functions." The purpose of this table is to identify typical intended functions for long-lived passive structures and components. As a result of discussions between NEI and the NRC staff we specifically included the intended function, "Provide insulation resistance to preclude shorts, grounds and unacceptable leakage current," to address electrical cables and connections. Electrical cables and connections are the only two items identified in §54.21(a)(1)(i) that require an aging management review because they are "passive" components. Electrical continuity is not included as an intended function of electrical cables and connections. Therefore, it is our view that "electrical continuity" is not an intended function of other components identified."

2. "It is our position that electrical continuity is not an intended function" of fuses.

The staff disagrees with the general conclusion that "electrical continuity" is not an intended function of electrical components as is stated in item 1. In its April 10, 1998 letter, NEI stated that *"continuity during non-fault conditions is a function of all electrical components."* The staff agrees that continuity is a function of most electrical components, including fuses, that should be assessed for its importance to license renewal prior to making a determination that an aging management review is not required. The following is the basis for the staff's conclusion:

- Table 4.1-1 is a list of typical intended functions and was never intended to be all inclusive.

- The list of structures and components requiring an aging management review under §54.21(a)(1)(i) is also not intended to be a complete list of "passive" structures and components. The rule clearly states that the list in question *"include, but are not limited to"* the structures and components contained in that list.

Enclosure

- Finally, the Statements of Consideration contains the following discussion:

> *The previous license renewal rule required an applicant for license renewal to identify, from systems, structures, and components important to license renewal, those structures and components that contribute to the performance of a "required function" or could, if they fail, prevent systems, structures, and components from performing a "required function." This requirement initially posed some difficulty in conducting pre-application reviews of proposed scoping methodologies because it was not clear what was meant by "required function." Most systems, structures, and components have more than one function and each could be regarded as "required." Although the Commission could have required a licensee to ensure all functions of a system, structure, or component as part of the aging management review, the Commission concluded that this requirement would be unreasonable and inconsistent with the Commission's original intent to focus only on those systems, structures, and components of primary importance to safety. Consideration of ancillary functions would expand the scope of the license renewal review beyond the Commission's intent. Therefore, the Commission determined that "required function" in the previous license renewal rule refers to those functions that are responsible for causing the systems, structures, and components to be considered important to license renewal.*

In the SOC, the Commission distinguished between functions that are of primary importance to safety and those that may be ancillary. Fuses may perform both kinds of functions. The staff has evaluated whether fuses require an aging management review, based on its applications in Nuclear Power Plant electrical systems and the two distinct functions they may perform.

1. A fuse can be included in an electrical system to provide a function directly related to nuclear power plant safety such as containment integrity protection (*i.e.* to limit fault damage to a containment electrical penetration) or to provide isolation protection for the Class 1E portion of the electrical system (*i.e.* to protect Class 1E electric equipment from faults originating in non-Class 1E equipment). Fuses included in nuclear power plant systems to perform such functions are intended to prevent or mitigate the consequences of accidents that could result in potential exposure comparable to the guidelines in § 50.34(a)(1) or § 100.11 of the Commission's regulations. Such fuses perform functions that are defined as "safety-related" in 10 CFR § 54.4(a)(1), and are, therefore, within the scope of license renewal.

Fuses having the intended safety-related functions identified above perform those functions with a change in configuration and, pursuant to 10 CFR 54.21(a)(1)(i), are not subject to an aging management review. The continuity function of such fuses, however, is not the reason

for their inclusion in nuclear power plant systems. Rather, the isolation function of these fuses is of primary importance to safety and the reason for their inclusion in systems. Continuity is merely an ancillary function in these applications. Accordingly, such fuses do not require an aging management review.

It should be noted that the staff also considered potential aging mechanisms that may prevent a fuse from completing its safety-related fault protection function. Because of the fact that a change in configuration is required in the performance of this function, the staff will not pursue this concern under 10 CFR Part 54. However, because of its potential safety significance, and the fact that this concern may be equally important to current licensing terms, the staff intends to assess this issue to determine if it should be a Generic Safety Issue under 10 CFR Part 50.

(2) A fuse may also be included in an electrical system solely to limit the potential extent of fault damage (*e.g.* branch circuit protection) and thus increase the availability or reliability of the overall electrical system. Such fuses are installed essentially as equipment protection devices. Such fuses perform this function with a change in configuration as in (1) above and are not subject to an aging management review.

In addition, the continuity function of such fuses is not the reason for their inclusion in nuclear power plant systems. As such, the continuity function is merely an ancillary function in these applications. Accordingly, such fuses do not require an aging management review.

Conclusion

As set forth above, the staff has concluded that fuses do not require an aging management review under 10 CFR 54.21(a)(1). This item is considered resolved.

REFERENCE 4

LICENSE RENEWAL ISSUE NO. 98-0100, "CREDITING FERC-REQUIRED INSPECTION AND MAINTENANCE PROGRAMS FOR DAM AGING MANAGEMENT," Letter to Douglas J. Walters, Nuclear Energy Institute, from Christopher I. Grimes, NRC, dated May 5, 1999

May 5, 1999

Mr. Douglas J. Walter
Nuclear Energy Institute
1776 I Street, NW., Suite 400
Washington, DC 20006-3708

SUBJECT: LICENSE RENEWAL ISSUE NO. 98-0100, "CREDITING FERC-REQUIRED INSPECTION AND MAINTENANCE PROGRAMS FOR DAM AGING MANAGEMENT"

Dear Mr. Walters:

Enclosed is the staff's evaluation and proposed resolution for the subject issue. The staff plans to implement the recommended resolution as part of the next revision to the draft Regulatory Guide entitled "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses." We also expect NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - The License Renewal Rule," to include the necessary changes to reflect the enclosed guidance. Accordingly, if there are any industry comments on the evaluation basis or the proposed resolution, we request that you provide those comments to us in writing within 30 days following your receipt of this letter, to ensure a timely resolution of this issue. If you have any questions regarding this matter, please contact Samson Lee at 301-415-3109.

Sincerely,

/Signed/

Christopher I. Grimes, Chief
License Renewal & Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No. 690

Enclosure: As Stated

cc w/encl: See next page

NUCLEAR ENERGY INSTITUTE
(License Renewal Steering Committee)

Project No. 690

Mr. Dennis Harrison
U.S. Department of Energy
NE-42
Washington, D.C. 20585

Mr. Ricard P. Sedano, Commissioner
State Liaison Officer
Department of Public Service
112 State Street
Drawer 20
Montipelier, Vermont 05620-2601

Mr. Douglas J. Walters
Nuclear Energy Institute
1776 I Street, N.W.
Washington, DC 20006
DJW@NEI.ORG

National Whistleblower Center
3233 P Street, N.W.
Washington, DC 20007

Mr. William H. Mackay
Entergy Operations, Inc.
Arkansas Nuclear One
1448 SR 333 GSB-2E
Russellville, Arkansas 72802

Mr. Robert Gill
Duke Energy Corporation
Mail Stop EC-12R P.O.
Box 1006
Charlotte, NC 28201-1006

Mr. Charles R. Pierce
Southern Nuclear Operating Co.
40 Inverness Center Parkway
BIN B064
Birmingham, AL 35242

Mr. Barth Doroshuk
Baltimore Gas & Electric Company
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-47027

Chattooga River Watershed Coalition
P. O. Box 2006
Clayton, GA 30525

LICENSE RENEWAL ISSUE NO. 98-0100
CREDITING FERC-REQUIRED INSPECTION AND MAINTENANCE PROGRAMS FOR DAM AGING MANAGEMENT

1. Introduction

The issue arose as to what type of program could be credited as a dam aging management program for the purposes of license renewal. Industry has asked whether simply citing an inspection program performed to meet Federal Energy Regulatory Commission (FERC) or other regulatory agency requirements would be adequate to demonstrate that dams will be maintained in accordance with the Current Licensing Basis (CLB) and therefore satisfy the requirements under Title 10 of the Code of Federal Regulations (10 CFR), Section 54.21.

2. Background

As a part of the Integrated Plant Assessment performed for the license renewal application of the Oconee Nuclear Station, Duke Energy Corporation identified earthen embankments, dams, and related structures as being subject to Aging Management Review (AMR). They also identified a series of potential aging effects for those structures and claimed existing inspection programs, either the FERC required Five-Year Inspection or the Duke Power Five-Year Underwater Inspection of Hydroelectric Dams and Appurtenances, manage those effects. The application stated that a regular program of inspections, coupled with planned corrective actions, to be implemented should any deficiencies be discovered, should be adequate to safely maintain a dam and its appurtenances indefinitely.

Many dams on nuclear sites are already subject to periodic inspection due to the Federal Dam Safety Program which was initiated in 1977. This program, developed in response to several fatal dam failures in the 1970's, encourages strict safety standards in the practices and procedures employed by Federal agencies or by dam owners regulated by Federal agencies with regard to dam design, construction, inspection, maintenance, and management. The NRC relies on FERC to perform safety inspections of dams for which the NRC is responsible under this Federal dam safety program.

3. Discussion

Dam Aging Management

The requirements for an application for license renewal for a nuclear power plant are specified in 10 CFR Part 54, specifically, Section 54.21(a)(3):

> *For each structure and component identified...[in the Integrated Plant Assessment in the application, the applicant must] demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.*

Enclosure

Since dam aging effects are related to material loss, damage, or movement due to erosion, corrosion, settlement, leakage, internal stresses, and other sources, a visual inspection of the external surfaces of a dam above and below water lines should detect any significant aging effects. Once detected, corrective actions can generally be taken to rectify the problem and minimize further degradation. Continued regular inspections coupled with a maintenance/corrective action program would be expected to keep a dam functioning safely during the period of extended operation associated with license renewal.

To that end, the continuation of a proper inspection program into the period of license extension should be adequate for dam aging management. What constitutes a proper inspection program and the crediting of programs under regulatory jurisdiction are discussed below.

Aging Management Programs For Dams Under FERC Oversight

In May of 1997, the NRC staff issued a Commission paper (SECY-97-110) discussing the status of development of its own Dam Safety Program Plan for dams that fall under NRC jurisdiction. Currently, only 19 of the dozens of dams and related structures associated with, or located near, nuclear power or uranium mine facilities are under NRC purview. In this paper, the NRC stated it had undertaken activities to fully implement a formal dam safety program plan in compliance with the Federal Guidelines on Dam Safety.

Under this program, independent reviews, at various stages in the life cycle of an NRC jurisdictional dam are required. As stated in the Plan:

> *By nature, the concept of the owner performing the major functions of, and addressing the elements of, a dam-safety program, with regulatory agency overview, will meet the goal of the Federal Guidelines. For existing dams, the Federal Guidelines prescribe formal inspections at intervals not to exceed five years. For this program, owners will have to have such reviews and inspections conducted by a team of qualified individuals, with a majority of the members being independent of the owner's organization.*

The Plan also says:

> *The inspection criteria, frequency, and scope of the inspections shall, as a minimum, meet the Federal Guidelines. The frequency and scope of the inspections will be the resultant of those inspections conducted by the dam owners, combined with those of NRC, as the regulatory agency and those conducted by a State, if conducted under an acceptable dam-safety program. Recognition of State dam-safety programs as the regulatory control will only be made after a formal Memorandum of Understanding (MOU) has been executed between a specific State and NRC.*

In SECY-97-110, the NRC staff describes an agreement established between the NRC and FERC that provides for FERC assistance in inspecting dams under NRC jurisdiction. The dam safety strategy set forth in SECY-97-110 applies only to those 19 dams and structures under the jurisdiction of the NRC, and not to the many dams associated with nuclear power plants under the purview of other agencies. However, this NRC dam policy does recognize the expertise of FERC in the dam safety, inspection, and maintenance field.

In addition, as stated before, inspections, coupled with a maintenance/corrective action program, are an acceptable manner of managing degradation of dams. Therefore, for earthen embankments, dams, and related structures identified as being subject to AMR, the staff concludes that continued compliance with the requirements of FERC into the license renewal period, by virtue of that agency's authority and responsibility for ensuring that its regulated projects are constructed, operated, and maintained to protect life, health, and property, will constitute an acceptable dam aging management program for the purposes of license renewal.

In order to credit the inspection programs performed under FERC oversight, and to provide the demonstration required by §54.21(a)(3), a license renewal applicant should idicate that its dam is under FERC jurisdiction and that its inspection and maintenance probram is in conformance with FERC requirements.

Aging Management Programs For Dams Under Other Regulatory Agencies

In addition to FERC, there are several possible government entities (Federal, state, local) that may have regulatory authority over dams and government entity-approved private firms that may perform inspections. SECY-97-110 and the Dam Safety Program Plan generally conclude that programs under the direct supervision of FERC are assumed to be acceptable while programs implemented by other agencies (including the utility itself, a state regulatory agency, etc.) must be demonstrated to meet particular requirements.

The Army Corps of Engineers, by virtue of its extensive experience in the field of dam construction, maintenance, inspection, and regulation, is also recognized as expert in the field of dam safety. Inspection and maintenance programs under the purview of the Army Corps of Engineers, continued into the period of license renewal, would constitute an acceptable dam aging management program. Therefore, a license renewal application can similarly credit an inspection program under the Army Corps of Engineers to satisfy the demonstration required by §54.21(a)(3), by stating that the Corps has jurisdiction over the dam, and that the applicant's program is in conformance with Corps requirements.

While dams, embankment, and appurtenance inspection and maintenance programs that fall under a regulatory agency other than FERC or the Corps, may be comparably acceptable, they are not as well recognized, understood and documented. Therefore, these programs need to be described in the application and evaluated like the general (non-regulatory) aging management programs described below.

Not all dams at nuclear power plants fall under the jurisdiction of a regulatory or independent entity. Many dam inspection and maintenance programs administered by licensees are modeled after Federal agency programs, but are completely controlled and administered by the licensee.

Programs that are not conducted under the direct supervision of FERC or the Army Corps of Engineers will be evaluated for the attributes of effective aging management in accordance with the guidelines developed for implementing the license renewal review.

Specifically, the staff will review these programs in accordance with §54.21(a)(3) to determine whether they contain the essential elements needed to provide adequate aging management for dams. The dam programs and procedures will be evaluated against the following elements: (1) scope of program; (2) preventive actions; (3) monitoring, detecting, and trending; (4) acceptance criteria; and (5) administrative controls. Applicants will be expected to provide an appropriate program description to address these attributes. Inspection and maintenance programs similar to those under the jurisdiction of FERC or the Army Corps of Engineers are likely to satisfy the elements.

4. Resolution

It is the staff's opinion that dam inspection and maintenance programs under the jurisdiction of FERC or the Army Corps of Engineers, continued through the period of the license renewal, will be adequate for the purpose of aging management. For programs not falling under the regulatory jurisdiction of FERC or the Army Corps of Engineers, the staff will evaluate the effectiveness of the aging management program based on comparability to the common practices of the FERC and Corps programs.

In addition, the applicant must include a description of its dam inspection program in its Final Safety Analysis Report supplement pursuant to §54.21(d), if it does not already exist.

The staff recommends that NEI 95-10 be revised to reflect this guidance, and the staff will include comparable guidance in the appropriate draft Standard Review Plan section.