Oyster Creek License Renewal Project
Project Level Instruction 1

Preparation of Project Level Instructions and Position Papers

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
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Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Update references and exhibits
2	Addition of PLI-16
3	Updated for formatting reasons.

1.0 Purpose

This instruction describes the format and content of Project Level Instructions and Position Papers that are prepared for the Oyster Creek License Renewal Project.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in preparing Oyster Creek License Renewal Project Level Instruction and Position Paper documents.

3.0 References

3.1 10 CFR Part 54 – The License Renewal Rule
3.2 NEI 95-10 Rev. 5 - Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule

4.0 Definitions

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.
Aging Management Review (AMR) – An engineering process that identifies aging effects that apply to passive and long lived components associated with the systems and structures falling within the scope of 10 CFR 54.4(a) (1) through (3), identifies those programs (existing, enhanced, or new) which detect, monitor, prevent, and mitigate the effects of aging, and demonstrates that through the use of such programs the effects of aging will be adequately managed during the license renewal term.

Component – A piece of equipment such as a vessel, pipe, pump, valve, relay, or pressure switch, etc. Components of a structure include clearly distinct features such as doors, walls and slabs. Components and materials collectively comprise a system or structure.
Component Type – Components of similar design and function are grouped together to perform aging management reviews based on similar materials, environment, and aging effects. Typically, these reviews are performed on a system or structure basis.
Component Intended Function - The component intended function is the specific function of the component that supports the system intended function.
Commodity – A grouping of like structures or components comprised of similar material and exposed to similar environments, that can be dispositioned with a single aging management review. The basis for grouping structures or components within a single commodity group can be characteristics such as similar design, similar materials of construction, similar aging management practices, similar environments, similar service time or similar operating history, e.g., cable, piping supports, concrete.
Functions – Functions are the specific processes, conditions, or actions that a system, structure or component was designed to perform.
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.
Intended Functions - define the plant process, condition or action that must be accomplished in order to perform or support 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).
License Renewal Boundary Drawing – A drawing which identifies major components of a system or structure which perform or support the identified Intended Function(s). A License Renewal Boundary Drawing can be a mark-up of an existing system drawing, electrical single line, or a simple structure location drawing.
License Renewal Data Base – An electronic data base that contains component information necessary to document and evaluate whether systems, structures, and components fall within the scope of 10 CFR 54.4(a) (1) through (3) and to identify those components subject to aging management review.
License Renewal Systems and Structures – Those plant systems and structures, listed in Position Paper-01, that are evaluated for License Renewal.
License Renewal System Boundary – That part of the license renewal system that is in the scope of License Renewal.
Long Lived – Those structures or components that are NOT subject to replacement based on a qualified life or specified time period and are anticipated to remain in service for the life of the plant.

Nuclear power plant - means a nuclear power facility of a type described in 10 CFR 50.21(b) or 50.22.
Passive Components – Passive components are those that perform their intended function(s) without moving parts or without a change in configuration or properties.
Scoping – The identification of systems, structures, and components that meet the criteria of 10 CFR 54.4(a)(1) through (3).
Screening – The process used to determine, for a system, structure or component within the scope of 10 CFR 54.4(a)(1) through (3), which structures and components require an aging management review.
Short Lived – Those components or structures subject to replacement based on a qualified life or specified time period.
Structure – An arrangement of interconnected members that is capable of supporting its own weight and externally applied loads. A structure supports, encloses and/or protects electrical and mechanical systems so that these systems can perform their intended functions(s).
Sub-component – A part or subassembly forming part of a component.
Support System - A system whose support is necessary for another system to perform its intended function(s).
System – A group of components united by some interaction or interdependence, performing many duties but functioning as an integrated unit.
Time-limited aging analyses - 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.

5.0 Prerequisites

None.

6.0 Instructions

This section outlines the content and format of the Project Level Instruction and Position Paper documents.

6.1

Project Level Instructions contain the guidance for performing the tasks required to develop the License Renewal Application (LRA) and administrative functions. The LRA satisfies the requirements of 10 CFR Part 54 and is consistent with NEI 95-10 (Industry Guidance for Implementation of 10 CFR 54 - The License Renewal Rule).

6.1.1

The Project Level Instruction document includes a cover page and is followed by tables for approvals and revision log. A table of contents may be provided. The following sections should be used:

1. Purpose
2. Applicability
3. References
4. Definitions
5. Prerequisites
6. Instructions
7. Exhibits

6.2

Position Papers contain the evaluation and basis for decisions made for adherence to the license renewal requirements.

6.2.1

The Position Paper document includes a cover page and is followed by tables for approvals and revision log. A table of contents may be provided. The following sections should be used:

1. Purpose
2. Scope
3. Methodology
4. References
5. Attachments

There may be an additional section for specific rule requirements.

6.3

The project level instructions for this project are listed in Exhibit 1. The position papers for this project are listed in Exhibit 2.

7.0 Exhibits

Exhibit 1 – List of Project Level Instructions

Exhibit 2 – List of Position Papers

Exhibit 1 - List of Project Level Instructions

PLI-01. Preparation of Project Level Instructions and Position Papers

PLI-02. Scoping of Systems and Structures

PLI-03. Screening of Systems, Structures and Commodities

PLI-04. Boundary Drawings

PLI-05Aging Management Reviews

PLI-06. Time Limited Aging Analyses

PLI-07. Not Used

PLI-08. Aging Management Program

PLI-09. Not Used

PLI-10. Not Used

PLI-11 License Renewal Document Control

PLI-12 Training of License Renewal Project Team and Site Personnel

PLI-13 Not Used

PLI-14 10 CFR 54.4(a)(2) Spatial and Structural Interaction

PLI-15 License Renewal Document Change Request Process

PLI-16 Plant Design and Licensing Basis Change Review

Exhibit 2 – List of Position Papers

PP-01. License Renewal Systems & Structures

PP-02. 10 CFR 54.4(a)(1) Safety Related Systems

PP-03. 10 CFR 54.4(a)(2) System Scoping Criteria

PP-04. 10 CFR 54.4(a)(3) Station Blackout Systems

PP-05. 10 CFR 54.4(a)(3) ATWS Systems

PP-06. 10 CFR 54.4(a)(3) EQ Systems

PP-07. 10 CFR 54.4(a)(3) Fire Protection Systems

PP-08. Structures, Component and Commodity Types, with Active, Passive Determinations and Intended Functions

PP-09. Not Used

PP-10. Not Used

PP-11. Not Used

PP-12. Not Used

PP-13. Abnormal Operational Transients

PP-14. Not Used

PP-15. Standard Materials, Aging Effects and Internal / External Environments

PP-16. Not Used

Oyster Creek License Renewal Project
Project Level Instruction 2

Scoping of Systems and Structures

Approvals

Rev. No.	*Prepared by:*	*Reviewed by:*	*Approved by:*	*Date*
0	H. D. Honan	K. P. Muggleston	D. B. Warfel	1/16/04
1	K. P. Muggleston	H. D. Honan	D. B. Warfel	1/28/04
2	H. D. Honan	K. P. Muggleston	D. B. Warfel	4/21/05
3	H.D. Honan	J. G. Hufnagel	A.A. Fulvio	8/16/05
4	S. B. Rafferty	J. G. Hufnagel	D. B. Warfel	9/8/05

Revision Log

Rev. No.	Description of the Change(s)
0	Initial issue.
1	Revised Section 6.7 to clarify identification of supporting systems.
2	Revised Section 3 to update reference documents; revised Section 4 to update prerequisites; revised Sections 6.4 & 6.5 to call out Exhibit 4; updated Exhibits 1, 2 & 3; added Exhibit 4
3	Revised Section 3 to update reference 3.3 to January 2005.
4	Minor Formatting Error.

1. Purpose

This instruction describes the process used to identify those systems and structures that fall within the scope of 10 CFR Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants (the Rule). This process is referred to as Scoping.

The Rule states:

§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 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 shutdown 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 those referred to in Sections 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 (10CFR 50.62), and station blackout (10 CFR 50.63).*

Design basis events are defined in §50.49(b)(1) as follows:

Design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (i) through (iii) of this paragraph [these functions are the same as 10CFR54.4(a)(1)(i) through (iii)].

2. Applicability

This instruction applies to Oyster Creek License Renewal engineers or subcontractors engaged in the preparation, checking, review or approval of scoping evaluations in support of license renewal activities for the Oyster Creek License Renewal Project.

3. References

3.1 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants"

3.2 NEI 95-10, "Industry Guideline on Implementing the Requirements of 10 CFR Part 54, Revision 5.

3.3 Draft NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", January 2005

3.4 PLI-04, Boundary Drawings

3.5 PLI-11, License Renewal Document Control

3.6 PLI-14, Identification of Non-Safety Related Systems and Components Which Spatially or Structurally Interact With Safety-Related Systems and Components 10CFR54.4(a)(2)

3.7 ANSI/ANS-52.1-1983, Nuclear Safety Criteria For The Design Of Stationary Boiling Water Reactor Plants

4. Definitions

Definitions are provided in PLI-01, Preparation of Project Level Instructions and Position Papers

5. Prerequisites

This instruction utilizes information contained in the following Oyster Creek License Renewal Position Papers:

(1) PP-01 License Renewal Systems & Structures

(2) PP-02 10CFR54.4(a)(1) Safety Related Systems & Structures

(3) PP-03 10CFR54.4(a)(2) System & Structure Scoping Criteria

(4) PP-04. 54.4(a)(3) Station Black Out Systems & Structures

(5) PP-05. 54.4(a)(3) ATWS Systems & Structures

(6) PP-06. 54.4(a)(3) EQ Systems & Structures

(7) PP-07. 54.4(a)(3) Fire Protection Systems & Structures

(8) PP-13. Abnormal Operational Transients

6. Instructions

This PLI provides direction on how the information needed to fill out System / Structure Scoping data fields in the Oyster Creek License Renewal Database (LR Database) should be developed. The

LR Database will be used to print out hard copy License Renewal System and Structure Scoping Forms for subsequent review, approval and retention.

Current licensing basis (CLB) documents must be utilized when determining whether a system, structure or component falls within the scope of 10 CFR 54.4(a)(1) through (3). The CLB includes documents such as the UFSAR, FDSAR; separate SBO, ATWS and Fire Protection submittals; Site Technical Specifications; Safety Evaluation Reports (SER's), the IPSAR and NRC orders. Other documents or databases such as the Component Record List (CRL), flow diagrams, electrical one lines, specifications, licensed operator training plans or Maintenance Rule Database may also be used to assist in system or structure scoping. However, reference documents or databases that are not CLB documents cannot be the sole basis for deciding whether a system or structure falls within the scope of 10 CFR 54.4(a)(1) through (3). In the event of differences between CLB documents and other documents, the CLB documents take precedence.

It is not necessary for the assigned license renewal engineer to follow the steps in this instruction in the order shown, as long as all steps are completed prior to approval of a System / Structure Scoping Form.

Exhibit 1 depicts the License Renewal Database Scoping Input Form

Exhibit 2 depicts a sample Scoping Form printed out from the database.

Exhibit 3 is a flow chart of the LR Scoping process.

6.1 Scoping of Systems & Structures

A License Renewal System and Structure Scoping Form (Exhibit 1 or comparable) is used to document the scoping of each license renewal system and structure listed in Position Paper PP-01 to determine whether each system and structure falls within the scope of the Rule.

Begin the scoping process by selecting a System and Structure Scoping Form for the license renewal system or structure to be evaluated from the LR Database.

6.2 Basic System / Structure Information

Enter (or confirm) the basic information found in the Position Papers, CLB, design documentation or other data sources into the LR Database Scoping Form. For each system or structure listed in Position Paper PP-01, complete the following fields of information in the License Renewal Data Base.

(1) **"License Renewal System Name"**, (pre-populated from PP-01)

(2) "**System Grouping**" (pre-populated from PP-01)

(3) **"DBD Number"**, if applicable (select from pull-down menu)

(4) Applicable "**UFSAR Sections**" (enter 2-digit section(s) numbers, e.g., 6.3, unless more pinpointed citations are appropriate)

(5) Applicable "**Drawing**" numbers (enter)

(6) "**Other Reference Documents**" (enter; applicable Position Papers are pre-populated, for printing in the hard copy scoping form)

6.3 10CFR54.4(a)(1) through (3) Scoping Criteria

Address the scoping criteria set forth in 10CFR54.4(a)(1) through (3). For each license renewal system or structure listed in Position Paper PP-01, fill in the following data fields in the License Renewal Database Scoping Form, as provided in the associated Position Papers or PLI-02 steps:

Note

The systems identified in Position Papers PP-02 through PP-07 and PP-13 are based on **ES-17 system** designations. When performing scoping, it is necessary to first refer to PP-01 to identify which ES-17 system(s) are included in the **license renewal system** being evaluated. If any of the ES-17 systems identified in Position Papers PP-02 through PP-07 and PP-13 are included in the license renewal system listed in PP-01, then the associated scoping criteria for that license renewal system must be answered "Yes" in the LR Data Base.

(1) **"Safety Related and ensures RCPB integrity, maintaining shutdown, prevent or mitigate potential offsite effects?"** Select Yes or No, per PP-02 & PP-13 (10CFR54.4(a)(1))

(2) **"If this is an NSR System, Does It Prevent SR System from Function?"** Select Yes or No, per Steps 6.5, 6.7, 6.11 and PP-03. (10CFR54.4(a)(2))

(3) **"Relied Upon for Compliance with 10CFR50.48 Fire Protection?"** Select Yes or No, per PP-07 (10CFR54.4(a)(3))

(4) **"Does SSC Demonstrate Compliance with EQ"?** Select Yes or No, per PP-06 (10CFR54.4(a)(3))

(5) **"Relied Upon for Compliance with 10CFR50.62 for ATWS?"** Select Yes or No, per PP-05 (10CFR54.4(a)(3))

(6) **"Relied Upon for Compliance with 10CFR50.63 for SBO"** Select Yes or No, per PP-04 10CFR54.4(a)(3)

(7) If the answer to one or more questions is unknown, set the corresponding fields to BLANK until the answer is established.

Note

The NRC regulation for pressurized thermal shock (10CFR50.61) is not addressed because it is not applicable to boiling water reactors.

6.4 System / Structure Functions

Populate the "**System Functions**" field. Using CLB documents and other reference material, identify all of the functions that the system or structure is required to accomplish and enter into the LR Database Scoping Form "**System Functions**" field.

The functions associated with the system or structure being evaluated are identified by reviewing the UFSAR and other CLB documents. The preparer enters all functions found in the UFSAR, then supplement or clarify those functions by reviewing other applicable CLB and design basis documents.

(1) Obtain and/or access the following documents:

- Applicable UFSAR Section(s) – The part that provides a functional description of the system/structure(s)
- ATWS, SBO, Fire Protection, or other NRC submittals separate from the UFSAR
- Relevant Technical Specification or Bases Sections (if they contain information beyond what is included in the UFSAR Sections)
- Applicable Maintenance Rule File(s)
- Applicable Design Basis Documentation (DBD, drawings, specifications)
- Applicable Operator Lesson Plan(s) [System Descriptions]
- Other applicable documents or files

(2) Using the above documents and files, identify the system or structure drawings which will form the basis for the associated license renewal boundary drawing.

(3) Review the applicable UFSAR Section(s) and identify all functions included in the UFSAR. Enter the system functions into the database Scoping Form "**System Functions**" field. Use the standardized listing of system and structure functions in Exhibit 4 where possible. Enter the UFSAR reference for each function in the "System Functions" field following each function.

(4) Review other applicable NRC submittals on, e.g., SBO, ATWS, EQ and Fire Protection. Enter all of the system functions into the database Scoping Form "**System Functions**" field. Use the standardized listing of system and structure functions in Exhibit 4 where possible Enter a CLB reference for each function in the "System Functions" field following each function.

(5) Review the Maintenance Rule files and DBD (if any) and determine whether any system functions listed in the DBD or Maintenance Rule files were not previously listed. If so, add those additional functions to the "**System Functions**" field. Use the standardized listing of system and structure functions in Exhibit 4 where possible Add only the functions which are related to the license renewal system being evaluated. Enter a Maintenance Rule or DBD reference for each function listed.

(6) Clean up the functional descriptions collected above by editing and eliminating redundancy Identify the source of the functional descriptions by 1) listing one UFSAR section where it is contained (directly or indirectly), or 2) listing the source document for the function if the function is not described in the UFSAR.

6.5 System Intended Functions

(1) If any of the scoping questions from Step 6.3 are answered "YES", then populate the **"System Intended Functions"** field. From the set of functions identified in Step 6.4, identify the Intended Functions that are the basis for including the system or structure within the scope of the Rule. The "Intended Function(s)" are those system or structure functions that satisfy any of the scoping criteria listed in 10CFR54(a)(1) through (3). The listing of system- and structure-level intended function descriptions found in Exhibit 4 were standardized based on Reference 3.7.

Enter the intended functions into the **"System Intended Functions"** field . Add the scoping criteria that each "Intended Function" satisfies to the **"System Intended Functions"** field. In those situations where a function satisfies more than one scoping criteria, also list those additional scoping criteria. Ensure that each intended function includes a reference to the CLB source document for that function.

(2) Check the "Comments" field for indication left by others regarding the system's supporting functions. Add any supporting functions to the **"System Functions"** field, and to the **"System Intended Functions"** field. Set the 10CFR54.4(a)(2) NSR to SR scoping criteria field to "Yes".

6.6 In or Out Of Scope of the Rule

(1) Populate the **"In Scope of LR?"** field. Using the answers to the scoping questions from Step 6.3, determine whether the system or structure falls within the scope of 10 CFR 54.4(a)(1) through (3). If the answer to any of the questions is "Yes", then the system or structure falls within the scope of the Rule. Select "Yes" on the LR Database Scoping Form **"In scope of LR?"** field.

(2) If the answer to the 10CFR54.4(a)(1) through (a)(3) questions are "No", then the system or structure may not fall within the scope of the Rule, pending completion of the PLI-14 10CFR54.4(a)(2) evaluations addressed in Step 6.11.

(3) If, following completion of the 10CFR54.4(a)(2) evaluation, a license renewal system still has all "No" answer, then the system is not in scope of the Rule. Select "No" on the LR Database Scoping Form **"In scope of LR?"** field. Continue developing documentation for the out-of-scope system or structure by completing Steps 6.9, 6.10, 6.12 and 6.13.

(4) In the **"In / Out of Scope Because"** field of the LR Database, enter a summary rationale for concluding that the system or structure being evaluated is in or out of scope of the Rule, e.g.,

"The Core Spray System meets the scoping requirements of 10CFR 54.4(a)(1) because it is a safety-related system which is relied upon to remain functional during and following design basis events. It meets 10CFR54.4(a)(2) because failure of nonsafety-related portions of the system could prevent satisfactory accomplishment of function(s) identified for 10CFR54.4(a)(1). It also

meets 10CFR 54.4(a)(3) because it is relied upon in the safety analyses and plant evaluations to perform a function that demonstrates compliance with the Commissions regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49) and station blackout (10 CFR 50.63). The Core Spray System is not relied upon in any safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulation for ATWS (10CFR50.62)."

6.7 Supporting Systems

Note

The purpose of the identification of supporting systems on the scoping form is to meet the requirements of 10 CFR 54.4(a)(2) with respect to functional supporting systems. The license renewal rule requires that we identify any non safety-related systems, structures and components whose failure could prevent satisfactory accomplishment of any of the functions identified in 10 CFR 54.4(a)(1).

Supporting system review is not applicable to non-safety related 54.4(a)2 systems. For 54.4(a)(3) systems, supporting systems are identified in the associated position papers. As such, identification of supporting systems is NOT required for systems that are in scope of the Rule ONLY because they have a "YES" in the 54.4(a)(2) or (a)(3) scoping criteria fields. For those systems, proceed to Step 6.8

For each safety related [10CFR54.4(a)(1)] system in scope of the Rule, it is necessary to populate the "**Support Intended Functions**" fields in the LR Data Base Scoping Form. For each in-scope system, <u>other</u> license renewal systems or structures which provide the functional or physical support required to accomplish that system's safety-related (10CFR54.4(a)(1)) intended functions from Step 6.5 must be identified, where:

- FUNCTIONAL support includes, e.g., 480V power, instrument air, control air, cooling water, etc.

- PHYSICAL support includes, e.g., structures that provide shelter, etc.
- The identified supporting systems and structures may be safety related or non-safety related.
- Table 2 of Position Paper PP-13 may prove helpful in identifying supporting systems.

Populate the "Support Intended Functions" fields as follows:

(1) List supporting systems in the **"Support System"** field(s) in the LR Data Base Scoping Form.

(2) Identify the "Supporting Function(s)" performed by each supporting system and enter into the corresponding **"Supporting Function"** field. Enter "Yes" or "No" in the corresponding **"Does The Support System Support This System In Performing its 10CFR54.4(a)(1) Intended Function?"** field. For "Yes" answers, populate the corresponding **"How It Supports Intended Function"** field.

(3) All support systems with a "Yes" answer in the **"Does The Support System Support This System In Performing its 10CFR54.4(a)(1) Intended Function?"** field are within the scope of the Rule. Enter the following (or similar) into the **"Comments"** field of the LR Database Scoping Form for the supporting system:

"This system is required to support the <enter License Renewal System Name> system to perform its intended function(s)", followed by the initials and date of the commenter.

> Note
>
> If a review of the operator training aids, CRL, single line diagrams and flow diagrams do not readily identify the source of electrical power to system components, consult the Project Electrical Lead for guidance.

(4) The license renewal engineer assigned responsibility for scoping the supporting system will review the comments field and set a "Yes" or "No" in the 10CFR54.4(a)(2) scoping criteria box, as appropriate.

6.8 License Renewal Boundary Drawings

> Note
>
> LR Boundary Drawings are NOT required to be created for the following:
>
> - Those systems that are not within the scope of the Rule.
>
> - Those systems within the scope of the Rule that are primarily comprised of instrumentation and electrical components which will be analyzed using a commodities approach. An electrical single line diagram will be prepared per PLI-04.
>
> - Individual structures within the scope of the Rule. A single site plan drawing showing in-scope structures will be developed per PLI-04.

(1) Create **License Renewal Boundary Drawings** for mechanical systems. Boundary drawings identify the components that contribute to the system level functions identified during the scoping process. The license renewal system boundary may or may not match a normal system boundary.

(2) For each mechanical system that falls within the scope of the Rule, develop boundary drawings as follows:

- Review the "Intended Function(s)" of the system or structure and identify those portions that are necessary to accomplish the "Intended Function(s)".
- License Renewal System boundaries may not be defined by engineering (ES-17) system boundaries, safety class boundaries, flow diagrams or other drawings, or the CRL.
- The process of creating boundary drawings is iterative, starting with the flow diagram(s) for the license renewal system being evaluated:
    - o The initial license renewal system boundary is the mechanical process (flow diagram) boundary.
    - o Include all the components required to accomplish 10CFR54.4(a)(1) functions.
    - o If necessary, modify the boundary to include components required to accomplish 10CFR54.4(a)(3) functions.
    - o If necessary, expand the boundaries in accordance with the results of the 10CFR54.4(a)(2) evaluations performed under Step 6.11.
    - o Dialogue with license renewal engineers assigned responsibility for interfacing systems; agree on boundaries; use the "Comment" field to document decisions and rationale for designating interfacing components in or out of scope and adjust boundaries as appropriate.
- Assign unique license renewal drawing number(s) designated as LR-<ABCD>, where <ABCD> denotes the existing drawing numbers on which the LR Boundary Drawing is based. Existing sheet numbers will be retained.
- Record the license renewal boundary drawing number(s) in the **"System Boundary Drawings"** field in the LR Database Scoping Form.

(3) Coordinate boundary drawing markup activities with other LR Engineers who may be evaluating license renewal systems of which portions may be shown on the same drawing.

(4) Following initial preparation, all license renewal boundary drawings must be compared to interfacing system boundary drawings and any boundary differences reconciled.

(5) Follow the instructions in PLI-04 to produce final license renewal boundary drawings for review & approval.

(6)Review and approval of license renewal boundary drawings is accomplished in accordance with PLI-11.

6.9 System Description, Operation & Boundary Narratives

Note

Description, Operation and Boundary narratives do NOT need to address electrical / I&C parts of mechanical systems. These in-scope components are treated as commodities.

Based on the reference UFSAR sections, other applicable CLB references, and the system's or structure's Intended Function(s), develop narrative descriptions of the system or structure evaluated and its operation and what part (if any) falls within the scope of the Rule. These narrative descriptions are documented in the designated LR Database Scoping Form fields.

(1) **"System Description":** Purpose of the System or Structure, including a description of the part of the system or structure within the scope of the Rule. System descriptions for out-of-scope systems may be less rigorous than those for in-scope systems.

(2) **"System Operation":** Describe operation of the system. System operation narratives are NOT required for electrical systems, structures or out-of-scope systems.

(3) **"System Boundary":** Describe the boundary of the system or structure evaluated, based on the boundary drawing(s) for that system. Ensure that all mechanical "supporting system" boundaries are addressed. System boundary narratives should also explain why parts of this system may have been included within the boundaries of other systems, and vice-versa.

System boundary narratives are NOT required for electrical systems, structures and out-of-scope systems.

(4) Explanation of why parts of the system or structure are outside the scope of the Rule, if any.

6.10 Scoping Comments

Record any comments pertinent to the logic used in scoping a system or structure in the **"Comments"** field of the LR Database Scoping Form. These may include, but are not limited to notes indicating why parts of the system are not in scope of the Rule or that the system supports the performance of another system's intended functions.

6.11 10CFR54.4(a)(2) Evaluations

(1) Three types of interaction between non-safety related SSCs and safety related systems (NSR / SR) must be considered during the scoping process:

- The functional or physical support provided by non-safety related SSCs which enables a safety related system or structure to perform its intended function, e.g., 480V power, cooling water or shelter. Step 6.7 identifies this type of support.
- The interaction which occurs between non-safety related SSCs which are physically connected to a safety related system which could adversely impact the intended function(s) of the safety related system should they fail. PP-03 provides criteria for performing this evaluation.
- The interaction between a non-safety related SSCs which are NOT physically connected to a safety related system, but could adversely impact the intended function(s) of the

safety related system due to their physical proximity. PP-03 provides criteria for performing this evaluation.

(2) Following the guidance in PP-03, perform the 10CFR54.4(a)(2) evaluations for non-safety related systems connected to safety related systems and for non-safety related systems with potential spatial interaction with safety related systems.

(3) Factor the results of the evaluation into Steps 6.3 through 6.10 as appropriate.

6.12 Review & Approval

Once all fields of the LR Database Scoping Form have been populated, the responsible LR Engineer shall initiate the review and approval process defined in PLI-11.

6.13 Completion of Scoping

Scoping is complete when (1) all plant systems and structures have been subjected to the scoping process as described in this Instruction and hard copy scoping forms have been prepared, checked and approved in accordance with PLI-11, and (2) boundary drawings have been prepared for all systems in scope of the rule in accordance with this instruction and PLI-04.

7. Exhibits

Exhibit 1 LR Database Scoping Input Form

Exhibit 2 Sample System / Structure Scoping Form

Exhibit 3 Scoping Process Flowchart

Exhibit 4 Standard Intended Functions

Oyster Creek License Renewal System Scoping Form

Safety-Related and ensures RCPB integrity, maintaining shutdown, prevent or mitigate potential offsite effects?: Yes (From PP-2 and PP-13)

In scope of LR?: Yes

If this is NSR System, Does it Prevent SR System from Function?: Yes (From PP-3)

Relied Upon for Compliance With 10CFR50.48 Fire Protection?: Yes (From PP-7)

Does SSC Demonstrate Compliance with EQ?: Yes (From PP-6)

Relied Upon for Compliance With 10CFR50.62 for ATWS?: No (From PP-5)

Relied Upon for Compliance With 10CFR50.63 for SBO?: Yes (From PP-4)

In/Out of scope because:

The Core Spray System meets the scoping requirements of 10CFR 54.4(a)(1) because it is a safety-related system which is relied upon to remain functional during and following design basis events. It meets 10CFR54.4(a)(2) because failure of nonsafety-related portions of the system could prevent satisfactory accomplishment of function(s) identified for 10CFR54.4(a)(1). It also meets 10CFR 54.4(a)(3) because it is relied upon in the safety analyses and plant evaluations to perform a function that demonstrates compliance with the Commissions regulations for fire protection (10 CFR 50.48), enviironmental qualification (10 CFR 50.49) and station blackout (10 CFR 50.63). The Core Spray System is not relied upon in any safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulation for ATWS (10CFR50.62).

System Description: The Core Spray System (CSS) is a low pressure Emergency Core Cooling System (ECCS) designed to provide cooling water for removal of decay heat from the reactor core following a postulated Loss-of-Coolant Accident (LOCA). Large-to-intermediate pipe breaks in the reactor coolant system result in a reactor pressure reduction sufficient to permit the CSS to achieve its rated injection flow prior to fuel cladding melt. To accommodate the remaining intermediate-to-small pipe breaks, the Automatic Depressurization System provides the initial controlled depressurization to reduce reactor pressure, and thus permit timely CSS injection. In this manner, the CSS provides core cooling such that fuel clad melting is prevented for the entire spectrum of postulated LOCAs. The CSS provides a supply of cooling water to the reactor core which is independent of the Feedwater System and which can be operated on emergency power

Oyster Creek License Renewal System Scoping Form

The purpose of the CSS is to provide for the post-LOCA removal of decay heat from the reactor core so that fuel clad melting is prevented for the entire spectrum of postulated LOCAs. The CSS system accomplishes this purpose by delivering a low-pressure spray pattern over the fuel following a LOCA, limiting peak clad temperature. The CSS operation is initiated automatically by either reactor low-low water level or high drywell pressure, or can be initiated manually.

System Operation: The CSS is comprised of two independent loops. Each loop consists of two main pumps, two booster pumps, and associated piping, valves, instrumentation, and controls. Main pump suction is through strainers located in the torus (evaluated with the Containment Spray System), and booster pump discharge is through the system isolation valves into spray spargers located inside the reactor shroud (evaluated with Reactor Internals). Each CSS loop contains full flow test, keep-fill, and minimum flow pump protection features. Flow and pressure instrumentation are provided in the control room for each loop. All motor operated valves in the main flowpath of each loop are normally open during system standby, with the exception of the parallel system isolation valves located outside the drywell. The core spray system piping and components in the pressure boundary are considered an extension of the primary containment boundary.

Initiation of both loops of the CSS occurs upon receipt of a high drywell pressure or low-low reactor vessel level signal. These signals also start both Emergency Diesel Generators (EDGs), in order to supply power to the Core Spray pumps in the event of loss of normal electric power supply. The CSS can also be initiated manually. If the suction and discharge valves of all five recirculation loops are closed, a level reduction in the core region will not result in a corresponding level reduction in the downcomer where the low-low reactor vessel level is measured. For this reason, the suction and discharge valves of at least one recirculation loop are required to be open when CSS is required to be operable as

System Boundary: The CSS scoping boundary begins with the attachment points of the main pump suction lines to the ring header common to the CSS and Containment Spray System suction piping. It continues through the main CSS pumps' suction lines, through the main pumps and booster pumps to the discharge piping, where each CSS loop attaches to a reactor vessel nozzle. Included in this boundary is a full flow test line on each loop from the common header downstream of the booster pumps to its attachment to the torus-to-drywell vacuum relief piping. Also included is each loop's keep-fill piping which takes suction from the discharge of a CSS main pump in each loop, continues through the fill pump back into the main pump discharge line, and exits the CSS main flowpath piping though the minimum flow return line attached to the full flow test line. The CSS boundary includes the parallel motor operated system isolation valves outside containment, the parallel testable check valves inside containment, and associated piping, components, and instrumentation on each of the main flowpath, test, fill, and minimum flow lines described above. The alternate water supply flow path boundary with the Condensate Storage and Transfer System is at the interface located on the CSS main pump common suction line. The alternate water supply boundary with the Fire Protection System is at the normally closed manual isolation valves where the piping connects to the suction of Loop I booster pumps and the discharge of Loop II booster pumps. The boundaries with the Post Accident Sampling System (PASS) extend to the first valve of the PASS downstream of each of the sampling

System Functions: 1. Provide emergency core cooling where the equipment provides coolant directly to the core. The CSS provides the ECCS function to limit peak clad temperatures below 2200 deg F, maintain local oxidization of clad to a thickness not exceeding 17% of unoxidized clad, limit hydrogen generation from the metal-water reaction to not greater than 1% of the calculated value for the total metal-water reaction hydrogen generation, maintain a coolable geometry, and provide long term cooling. Minimum flow capability provides pump protection to assure capability of ECCS function. (UFSAR 6.3.1.3) 10CFR54.4(a)(1)

Oyster Creek License Renewal System Scoping Form

System Intended Functions

1. Provide emergency core cooling where the equipment provides coolant directly to the core. Operates with ADS to accommodate entire spectrum of postulated LOCA breaks. Minimum flow capability provides pump protection to assure capability of ECCS function. 10CFR54.4(a)(1)
2. Provide primary containment boundary. 10CFR54.4(a)(1)
3. Provide reactor coolant pressure boundary. 10CFR54.4(a)(1)

Comments

1. CLOSED – The Core Spray/Automatic Depressurization System (ADS) has been separated into two separate systems for the purpose of License
Renewal Scoping. This Scoping Form covers the Core Spray System only. The Automatic Depressurization System will be covered under another Scoping Form. D. MacIsaac, 12/04/02.

2. CLOSED – The Torus, Torus strainers and ring header are not in the scope of the Core Spray System. D. MacIsaac, 12/04/02.

3. CLOSED – License Renewal Boundary for the interface between the Core Spray System and the Condensate Transfer System is located at the downstream face of valves V-11-111, V-11-109 (see drawing BR 2004 sht. 2) and the upstream face of V-20-1 (see drawing GE 885D781). D. MacIsaac, 12/05/02.

4. CLOSED – License Renewal Boundary for the interface between the Core Spray System and the Fire Protection system is located at the upstream face of valves V-9223 and V-9-232 (see drawing LR-GE 885D781 sht. 1). D. MacIsaac, 12/05/02.

5. CLOSED – License Renewal Boundary for the interface between the Core Spray System and the Post Accident Sampling System is located at the downstream face of valves V-11-104, V-20-28 and the upstream face of V-20-105 (see drawing GE 885D781 sht. 1). D. MacIsaac, 12/05/02.

6. CLOSED – Supports Intended Function: Provides alternate source of makeup water from torus to 211 isolation condensers. S. Getz 1/15/04.

7. CLOSED – Resolution required regarding nomenclature/definition for the parallel system isolation valves. Are these "Containment Isolation

Oyster Creek License Renewal System Scoping Form

1/15/04.

7. CLOSED – Resolution required regarding nomenclature/definition for the parallel system isolation valves. Are these "Containment Isolation

Support Intended Function

Support System	Supporting Function	Does the Support System support this system in performing its 10CFR 54.4(a)(1) Intended Function?	How It Supports Intended Function
Fire Protection System	Provides alternate source of water if torus is not	No	Backup source of injection water. Not
Condensate Transfer System	Provides means of transferring CSS water to	Yes	The Condensate Transfer System
480V AC System	Provides power to Booster Pumps, Fill Pumps and	Yes	Provides Booster Pump Motor, Fill
Primary Containment	Torus provides safety-related source of water for	Yes	Torus provides safety-related
4160V AC System	Provides power to Core Spray Main Pump Motors.	Yes	Provides Core Spray Main Pump

Record: 1 of 14

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Core Spray System

Part of Engineered Safety Features System Grouping

In Scope for License Renewal: Yes

Approvals:

Preparer: ____________________

Reviewer: ____________________

Site Reviewer: ____________________

LR Technical Lead: ____________________

System Description/Scoping Summary:

System Description:

The Core Spray System (CSS) is a lowpressure Emergency Core Cooling System (ECCS) designed to provide cooling water for removal of decay heat from the reactor core following a postulated Loss-of-Coolant Accident (LOCA). Large-to-intermediate pipe breaks in the reactor coolant system result in a reactor pressure reduction sufficient to permit the CSS to achieve its rated injection flowprior to fuel cladding melt. To accommodate the remaining intermediate-to-small pipe breaks, the Automatic Depressurization System provides the initial controlled depressurization to reduce reactor pressure, and thus permit timely CSS injection. In this manner, the CSS provides core cooling such that fuel clad melting is prevented for the entire spectrum of postulated LOCAs. The CSS provides a supply of cooling water to the reactor core which is independent of the Feedwater System and which can be operated on emergency power.

The purpose of the CSS is to provide for the post-LOCA removal of decay heat from the reactor core so that fuel clad melting is prevented for the entire spectrum of postulated LOCAs. The CSS system accomplishes this purpose by delivering a low-pressure spray pattern over the fuel following a LOCA, limiting peak clad temperature. The CSS operation is initiated automatically by either reactor low-low water level or high drywell pressure, or can be initiated manually.

The CSS is a two-loop system. No single failure in the CSS can cause both loops to malfunction. Operation of the CSS loops is credited in the 10CFR50 Appendix K evaluation.

System Operation:

The CSS is comprised of two independent loops. Each loop consists of two main pumps, two booster pumps, and associated piping, valves, instrumentation, and controls. Main pump suction is through strainers located in the torus (evaluated with the Containment Spray System), and booster pump discharge is through the system isolation valves into spray spargers located inside the reactor shroud (evaluated with Reactor Internals). Each CSS loop contains full flowtest, keep-fill, and minimum flowpump protection features. Flowand pressure instrumentation are provided in the control room for each loop. All motor operated valves in the main flowpath of each loop are normally open during system standby, with the exception of the parallel system isolation valves located outside the drywell. The core spray system piping and components in the pressure boundary are considered an extension of the primary containment boundary.

Initiation of both loops of the CSS occurs upon receipt of a high drywell pressure or low-lowreactor vessel level signal. These signals also start both Emergency Diesel Generators (EDGs), in order to supply power to the Core Spray pumps in the event of loss of normal electric power supply. The CSS can also be initiated manually. If the suction and discharge valves of all five recirculation loops are closed, a level reduction in the core region will not result in a corresponding level reduction in the downcomer where the low-lowreactor vessel level is measured. For this reason, the suction and discharge valves of at least one recirculation loop are required to be open when CSS is required to be operable as an ECCS system. Once the reactor pressure drops belowa preset value and the CSS actuation signal is present, the parallel motor operated system isolation valves receive a permissive signal to open. Opening of the parallel motor operated system isolation valves completes the flowpath, and injection water from the two loops enters the vessel through two penetrations. Inside the vessel, each line extends half way around the outside of the core shroud with one loop penetrating the shroud above the other. The core spray spargers inside the shroud (evaluated with Reactor

Internals) consist of two 180-degree segments. Thus each sparger forms a complete circle above the core.

The main flowpath for each CSS loop is suction from the torus through one of two main pumps, continuing through one of two booster pumps, through the outboard parallel system isolation valves, through the inboard parallel testable check valves, and into the reactor vessel for discharge onto the core through the associated spray sparger. Each of the parallel valves has 100% flow capacity, so active failure of one valve will not result in insufficient flow. Upon receipt of the initiation signal, one preferred main pump in each CSS loop starts. Should either of these main pumps fail to start, the second main pump in that loop will receive a signal to start. Upon sensing both an actuation signal and a discharge pressure signal of its associated main pump, the preferred booster pump will start. If the preferred booster pump in either loop fails to start, the alternate booster pump in that loop will receive a signal to start.

After CSS flow has been established into the vessel, the torus provides an essentially unlimited supply of cooling water. Water discharged from a pipe break inside the drywell will overflow through the drywell vents into the torus. An alternate supply of cooling water for the CSS is the Condensate Storage Tank through locked closed manual valves located at the suction of each CSS main pump. The Fire Protection System is also capable of delivering water to the reactor vessel using CSS piping. During CSS operation, the heat being absorbed by the water that flows back to the Torus is transferred to the Ultimate Heat Sink by the heat exchangers in the Containment Spray System.

The primary water supply piping for the CSS is attached to suction strainers in the torus (evaluated with the Containment Spray System). The water in the torus is drawn through three strainers into a common header. This header also feeds the Containment Spray System pumps. Each CSS corner room pump compartment is provided with coolers sized to extract the heat generated by pump operation. Cooling water supplied to these coolers is evaluated with the Reactor Building Closed Cooling Water System. Air flowpath for these coolers is evaluated with the Reactor Building Ventilation System. Operation of these coolers is not required to support the CSS safety-related function.

For more detailed information, see UFSAR sections 6.3.1 and 6.3.1.3.

System Boundary:

The CSS scoping boundary begins with the attachment points of the main pump suction lines to the ring header common to the CSS and Containment Spray System suction piping. It continues through the main CSS pumps' suction lines, through the main pumps and booster pumps to the discharge piping, where each CSS loop attaches to a reactor vessel nozzle. Included in this boundary is a full flow test line on each loop from the common header downstream of the booster pumps to its attachment to the torus-to-drywell vacuum relief piping. Also included is each loop's keep-fill piping which takes suction from the discharge of a CSS main pump in each loop, continues through the fill pump back into the main pump discharge line, and exits the CSS main flowpath piping though the minimum flow return line attached to the full flow test line. The CSS boundary includes the parallel motor operated system isolation valves outside containment, the parallel testable check valves inside containment, and associated piping, components, and instrumentation on each of the main flowpath, test, fill, and minimum flow lines described above. The alternate water supply flowpath boundary with the Condensate Storage and Transfer System is at the interface located on the CSS main pump common suction line. The alternate water supply boundary with the Fire Protection System is at the normally closed manual isolation valves where the piping connects to the suction of Loop I booster pumps and the discharge of

Loop II booster pumps. The boundaries with the Post Accident Sampling System (PASS) extend to the first valve of the PASS downstream of each of the sampling connections to the CSS at the suction of the Loop I main pumps suction header and on the discharge of the Loop I booster pumps.

Also included in the license renewal scoping boundary of the Core Spray System are those portions of nonsafety-related piping and equipment that extend beyond the safety-related/nonsafety-related interface up to the location of the first seismic anchor, or to a point no longer in proximity to equipment performing a safety-related function, whichever extends furthest. This includes the nonsafety-related portions of the system located within the Reactor Building and Primary Containment. Included in this boundary are pressure retaining components relied upon to preserve the leakage boundary intended function of this portion of the system. For more information, refer to the License Renewal Boundary Drawing for identification of this boundary, shown in red.

Not included in the scoping boundary of the CSS are the suction strainers and piping located inside the torus, and the ring (suction) header, which are included in the Containment Spray System scoping boundary. Also not included are the piping and spargers located inside the reactor vessel, which are included in the Reactor Internals scoping boundary. Not included in the CSS license renewal scoping boundary are the following interfacing systems, which are separately evaluated as license renewal systems:
Automatic Depressurization System
Primary Containment System
Condensate Storage and Transfer System
Fire Protection Systems
Reactor Internals
Post Accident Sampling System
Containment Spray System

Scoping Questions

1.) Is the system or structure safety related and relied upon to remain functional during and following design-basis events (as defined in 10CFR50.49(b)(1)) to ensure the following: **Yes**
The integrity of the reactor coolant pressure boundary 10CFR54.4(a)(1)(i);
The capability to shut down the reactor and maintain it in a safe shutdown condition 10CFR54.4(a)(1)(ii);
The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10CFR50.34(a)(1), 50.67(b)(2), or 100.11, as applicable?

2.) Is the system or structure non-safety related whose failure would prevent the satisfactory accomplishment of any of the three safety related functions listed in question 1? 10CFR54.4(a)(2) **Yes**

3.) Is the system or structure relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC's regulations for Fire Protection (10CFR50.48)? 10CFR54.4(a)(3) **Yes**

4.) Is the system or structure relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC's regulations for Environmental Qualification (10CFR50.49)? 10CFR54.4(a)(3) **Yes**

5.) Is the system or structure relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC's regulations for Anticipated Transients Without Scram (10CFR50.62)? 10CFR54.4(a)(3) **No**

6.) Is the system or structure relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with NRC's regulations for Station Blackout (10CFR50.63)? 10CFR54.4(a)(3) **Yes**

Scope Determination

Does the system or structure fall within the scope of 10CFR Part 54? **Yes**
(If the answer to any of the questions listed in (1-6) is "Yes" then the system or structure falls within the scope of 10CFR54.)

Reason for Scope Determination:

The Core Spray System meets the scoping requirements of 10CFR 54.4(a)(1) because it is a safety-related system which is relied upon to remain functional during and following design basis events. It meets 10CFR54.4(a)(2) because failure of nonsafety-related portions of the system could prevent satisfactory accomplishment of function(s) identified for 10CFR54.4(a)(1). It also meets 10CFR 54.4(a)(3) because it is relied upon in the safety analyses and plant evaluations to perform a function that demonstrates compliance with the Commissions regulations for fire protection (10 CFR 50.48), environmental qualification (10 CFR 50.49) and station blackout (10 CFR 50.63). The Core Spray System is not relied upon in any safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulation for ATWS (10CFR50.62).

System Functions:

1. Provide emergency core cooling where the equipment provides coolant directly to the core. The CSS provides the ECCS function to limit peak clad temperatures below 2200 deg F, maintain local oxidization of clad to a thickness not exceeding 17% of unoxidized clad, limit hydrogen generation from the metal-water reaction to not greater than 1% of the calculated value for the total metal-water reaction hydrogen generation, maintain a coolable geometry, and provide long term cooling. Minimum flow capability provides pump protection to assure capability of ECCS function. (UFSAR 6.3.1.3) 10CFR54.4(a)(1)
2. Provide primary containment boundary. (UFSAR 6.3.1.3) 10CFR54.4(a)(1)
3. Reactor Coolant Pressure Boundary (UFSAR 6.3.1.3.2) 10CFR54.4(a)(1)
4. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. (UFSAR 6.3.1) 10CFR54.4(a)(2)
5. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Station Blackout (10 CFR 50.63) 10CFR54.4(a)(3)
6. Relied upon 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) 10CFR54.4(a)(3)
7. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10 CFR 50.49) 10CFR54.4(a)(3)
8. Remove residual heat from the reactor coolant system. Provides a safety-related backup source of condensing (cooling) water to the Isolation Condensers -- credited during SBO and some external events. (UFSAR 6.3.1.1.2) 10CFR54.4(a)(1) and (a)(3)
9. Provides ability to test system function in accordance with Technical Specifications requirements. (UFSAR *Sections 6.3.1.3 and 16.2)*

System Intended Functions:

1. Provide emergency core cooling where the equipment provides coolant directly to the core. Operates with ADS to accommodate entire spectrum of postulated LOCA breaks. Minimum flow capability provides pump protection to assure capability of ECCS function. 10CFR54.4(a)(1)
2. Provide primary containment boundary. 10CFR54.4(a)(1)
3. Provide reactor coolant pressure boundary. 10CFR54.4(a)(1)
4. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. 10CFR54.4(a)(2)
5. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Station Blackout (10 CFR 50.63) 10CFR54.4(a)(3)
6. Relied upon 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) 10CFR54.4(a)(3)
7. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10 CFR 50.49) 10CFR54.4(a)(3)
8. Remove residual heat from the reactor coolant system. Provides a safety-related backup source of condensing (cooling) water to the Isolation Condensers. 10CFR54.4(a)(1) and 10CFR54.4(a)(3)

Identification of Supporting Systems:

Support System	Supporting Function	Does the Support System support this system in performing its 10CFR 54.4(a)(1) Intended Function?	How It Supports Intended Function
Fire Protection System	Provides alternate source of water if torus is not available	No	Backup source of injection water. Not credited for 10CFR54.4(a)(1) function.
Condensate Transfer System	Provides means of transferring CSS water to Iso Condenser. Also provides alternate source of CSS water if torus is not available.	Yes	The Condensate Transfer System provides a flowpath for transferring CSS water from the torus to the iso condensers as a backup safety-related water supply for IC, which is a 10CFR54.4(a)(1) function. In addition, the Condensate Transfer System also provides a backup source of injection water for CSS. This is not credited for CSS 10CFR54.4(a)(1) function.
480V AC System	Provides power to Booster Pumps, Fill Pumps and Motor Operated Valves.	Yes	Provides Booster Pump Motor, Fill Pump Motor and Motor operated Valves Motor Power. Loss prevents

			booster pump and fill pump operation and causes valves to fail in as-is position.
Primary Containment	Torus provides safety-related source of water for injection. Drywell provides housing and support for piping and components.	Yes	Torus provides safety-related source of water to perform Decay Heat Removal function. Drywell houses and supports piping and components located inside the drywell.
4160V AC System	Provides power to Core Spray Main Pump Motors.	Yes	Provides Core Spray Main Pump Motor Power. Loss results in failure of Core Spray Main Pumps to operate.
Reactor Protection System	Processes Containment Isolation signals.	Yes	Positions core spray system isolation valves and provides initiation signal to CSS logic. Loss results in failure of valves to open upon demand and loss of CSS function.
125V Station DC System	Provides CSS pump controls and logic	Yes	Provides power to initiation logic and to CSS pump controls. Loss results in failure of CSS function.
Reactor Building	Provides housing and support for piping and components.	Yes	Houses and supports piping and components located outside the primary containment in the reactor building.

Component Supports	Provides support for system piping and components.	Yes	Supports CSS piping and components.
Reactor Building Closed Cooling Water System	Provides cooling water to room coolers.	No	Provides cooling water to the corner room coolers. Not required for support of 10CFR54.4(a)(1) function.
Containment Spray System	Provides cooling of torus inventory.	Yes	Cools torus inventory. Core Spray removes decay heat from the reactor and transfers it to the torus water. Containment Spray cools the torus water by transferring heat to ESW and UHS. Containment Spray piping includes torus strainers and ring header which also provide suction source from torus for Core Spray pumps.
Automatic Depressurization System	Supports CSS in performing ECCS function.	Yes	ADS is required to depressurize the reactor for small break and some intermediate break LOCAs to permit CSS injection at rated flow before core melt.
Reactor Building Ventilation System	Provides cooling to corner rooms.	No	Unit coolers provide cooling to the corner rooms. Not required for support of 10CFR54.4(a)(1) function.

Containment Vacuum Breakers	Provides return path to torus for min-flow and full- flowtest line piping.	Yes	Full flowtest lines from each CS loop attach to vacuum breaker piping to complete return path to torus. Min-flow path also uses this return piping. The minimum flow function and greater flowthrough the full flowreturn piping during extended CSS pump operation while not injecting into the RPV is credited to support CSS operability.

References:

UFSAR Section: 6.3

DBD Number: SDBD-OC-212A (LowPressure Core Spray)

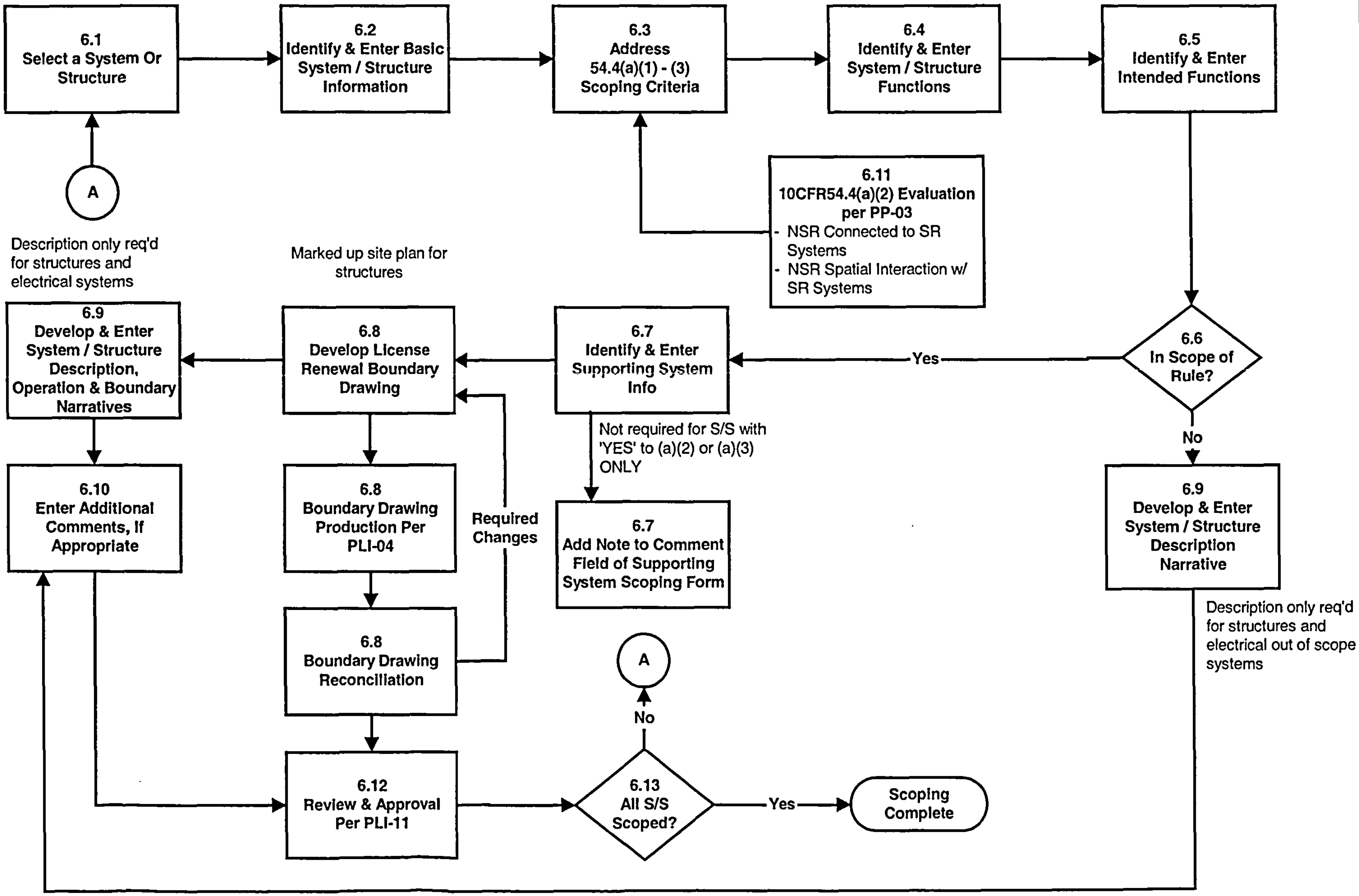
Boundary Drawings: LR-GE-855D781
LR-GU-3E-243-21-1000
LR-BR-2004 sheet 2

PID: GE885D781

Other References:
PP-01 License Renewal Systems and Structures
PP-02 54.4(a)(1) Safety Related Systems
PP-03 54.4(a)(2) System Scoping Criteria
PP-04 54.4(a)(3) Station Black Out Systems
PP-05 54.4(a)(3) ATWS Systems
PP-06 54.4(a)(3) EQ Systems
PP-07 54.4(a)(3) Fire Protection Systems
PP-11 Piping and Equipment Insulation
PP-13 Abnormal Operational Transients
Procedure PLI-02, Scoping of Systems and Structures
TDR-1099, Station Blackout Evaluation Report.
Procedure 2000-ABN-3200.37, Station Blackout
Drawing BR 2002
Drawing GE148F262

Exhibit 3

System/Structure Scoping Process



	System Function Description	ANSI/ANS-52.1 Discussion Paragraph	Notes	10CFR54.4 Criterion
1	Provide reactor coolant pressure boundary.	3.3.1.1 4.4.1		(a)1
2	Maintain reactor core assembly geometry.	3.3.1.3.g 4.1.1 4.4.1	Maintain geometry within the reactor to ensure core reactivity control and core cooling capability.	(a)1
3	Introduce negative reactivity to achieve or maintain subcritical reactor condition.	3.3.1.3.e 4.2.1		(a)1
4	Introduce emergency negative reactivity to make the reactor subcritical.	3.3.1.2.c 4.2.1	Functions include limiting the introduction of positive reactivity.	(a)1
5	Sense process conditions and generate signals for reactor trip or engineered safety features actuation.	3.3.1.3.l, m, n, o 4.3.1	Includes indication used for manual actuation of safety related equipment.	(a)1
6	Remove residual heat from the reactor coolant system.	4.5.1	Residual heat removal for any event (not including normal operation) when the reactor is shutdown that does not require emergency core cooling system operation.	(a)1
7	Provide emergency core cooling where the equipment provides coolant directly to the core.	3.3.1.2.d, e 4.8.1	Provide coolant to the reactor for any event that requires engineered safety features actuation when other means of providing coolant are not sufficient to adequately cool the reactor core. This function also addresses coolant inventory that is maintained for use by the emergency core cooling system.	(a)1

Exhibit 4

Standard Intended Functions

	System Function Description	**ANSI/ANS-52.1 Discussion Paragraph**	**Notes**	**10CFR54.4 Criterion**
8	Provide heat removal from safety related heat exchangers.	4.7.1	This function addresses heat removal as necessary to provide a nuclear safety function.	(a)1
9	Provide primary containment boundary.	3.3.1.2.a 4.9.1	This function addresses any primary containment fission product barrier or primary containment radioactive material holdup or isolation.	a(1)
10	Provide emergency heat removal from primary containment and provide containment pressure control.	3.3.1.2.b 4.11.1		a(1)
11	Provide emergency removal of radioactive material from the primary containment atmosphere.	3.3.1.2.b 4.11.1		a(1)
12	Control combustible gas mixtures in the primary containment atmosphere.	3.3.1.3.c 4.11.1		a(1)
13	Provide secondary containment boundary.	3.3.1.3.b 4.10.1		a(1)
14	Control and treat radioactive materials released to the secondary containment.	3.3.1.3.d, p 4.10.1 4.11.1	Includes function to confine and treat radioactive materials that may leak from or may be released outside of the primary containment, for controlled release to the environment.	a(1)
15	Maintain emergency temperature limits within areas containing safety related components.	3.3.1.3.b 4.12.1		a(1)

Exhibit 4

Standard Intended Functions

	System Function Description	ANSI/ANS-52.1 Discussion Paragraph	Notes	10CFR54.4 Criterion
16	Ensure adequate cooling in the spent fuel pool to maintain stored fuel within acceptable temperature limits.	3.3.1.3.j 4.13.1		a(1)
17	Provide motive power to safety related components.	3.3.1.3.l, n 4.14.1		a(1)
18	Provide centralized area for control and monitoring of nuclear safety related equipment.	3.3.1.3.p 4.16.1	Function includes providing an acceptable environment for operating personnel. Function also includes remote shutdown from outside the control room.	a(1)
19	Post accident containment holdup and plate out of MSIV bypass leakage.		The main condenser provides for post accident containment, holdup and plate out of MSIV bypass leakage.	a(2)
20	Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function.	3.3.1.3.k		a(2)
21	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48)	N/A	Includes fire detection, suppression and confinement function for protection of SSCs important to safety. Also includes fire safe shutdown functions, and functions associated with Appendix A to Branch Technical Position ASB 9.5-1.	a(3)

Exhibit 4

Standard Intended Functions

	System Function Description	ANSI/ANS-52.1 Discussion Paragraph	Notes	10CFR54.4 Criterion
22	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10CFR50.49)	N/A	Includes systems that contain electrical equipment subject to the requirements of 10CFR50.49, the EQ rule. Also includes structures that provide the physical boundaries of the postulated harsh environments and contain environmentally qualified electrical equipment.	a(3)
23	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Anticipated Transients without Scram (10CFR50.62)	N/A	Includes systems and equipment to reduce the risk from ATWS.	a(3)
24	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Station Blackout (10CFR50.63)	N/A		a(3)

Exhibit 4

Standard Intended Functions

No.	Structural Function Description	Notes	10CFR54.4 Criterion
1	Provides physical support, shelter, and protection for safety related systems, structures, and components (SSCs).		10CFR54.4(a)(1)
2	Provides physical support, shelter, and protection for nonsafety related systems, structures, and components (SSCs) whose failure could prevent satisfactory accomplishment of function(s) identified for 10CFR54.4 (a)(1)		10CFR54.4(a)(2)
3	Provides protection for safe storage of new and spent fuel.		10CFR54.4 (a)(1)
4	Controls the potential release of fission products to the external environment so that offsite consequences of design basis events are within acceptable limits.		10CFR54.4 (a)(1)
5	Provides for the discharge of treated gaseous waste to meet the requirements of 10CFR100.		10CFR54.4(a)(1)
6	Prevent liquid radioactive waste from being released to the environment in the event of a Safe Shutdown Earthquake (SSE).		10CFR54.4 (a)(2)
7	Provides Ultimate Heat Sink (UHS) during design basis events		10CFR54.4(a)(1)
8	Provides a source of cooling water for plant safe shutdown		10CFR54.4(a)(1)

No.	Structural Function Description	Notes	10CFR54.4 Criterion
9	Provides a source of water for emergency core cooling systems		10CFR54.4 (a)(1)
10	Provides sufficient air and water volumes to absorb the energy released to the containment in the event of design basis events so that the pressure is within acceptable limits		10CFR54.4(a)(1)
11	Controls the release of fission products to the secondary containment in the event of design basis loss-of-coolant accidents (LOCA) so that offsite consequences are within acceptable limits		10CFR54.4(a)(1)
12	Provides a safe means for handling safety related components and loads above or near safety related components		10CFR54.4(a)(2)
13	Prevents criticality of fuel assemblies stored in the spent fuel pool		10CFR54.4(a)(1)
14	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48)		10CFR54.4(a)(3)

No.	Structural Function Description	Notes	10CFR54.4 Criterion
15	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10CFR50.49)		10CFR54.4(a)(3)
16	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Anticipated Transient without Scram (10CFR50.62)		10CFR54.4(a)(3)
17	Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Station Blackout (10CFR50.63)		10CFR54.4(a)(3)
18	Provides structural support or restraint to SSCs in scope of license renewal.		10CFR54.4(a)(1) 10CFR54.4(a)(2) 10CFR54.4(a)(3)
19	Provides structural support or restraint to SSCs not in scope of license renewal to prevent interaction with safety related SSCs.		10CFR54.4(a)(2)

Exhibit 4

Standard Intended Functions

No.	Structural Function Description	Notes	10CFR54.4 Criterion
20	Provide centralized area for control and monitoring of nuclear safety related equipment.		10CFR54.4(a)(1)

Oyster Creek License Renewal Project
Project Level Instruction 3

Screening of Systems, Structures and Commodities

Approvals

Rev. No.	*Prepared by:*	*Reviewed by:*	*Approved by:*	*Date*
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Revision Log

Rev. No.	**Description of the Change(s)**
0	Initial issue.
1	Updated to correct references, minor editorial changes.
2	Updated for formatting reasons.

1. Purpose

This instruction describes the process used to identify those structures and components, including commodities, that are subject to aging management review in accordance with 10 CFR Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants (the Rule). This process is referred to as Screening.

The Rule states:

§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 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.

2. Applicability

This instruction applies to Oyster Creek License Renewal personnel engaged in the preparation, checking, review or approval of screening evaluations in support of license renewal activities for the Oyster Creek License Renewal Project.

3. References

3.1 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants"

3.2 NEI 95-10, "Industry Guideline on Implementing the Requirements of 10 CFR Part 54," Revision 5.

3.3 Draft NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, January 2005"

3.4 PLI-01, Preparation of Project Level Instructions and Position Papers

3.5 PLI-02, Scoping of Systems and Structures

3.6 PLI-04, Boundary Drawings

3.7 PLI-11, License Renewal Document Control

3.8 NSAC-202L-R2, "Recommendations for an Effective Flow-Accelerated Corrosion Program," April 1999.

3.9 Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001.1003056

3.10 Safety Evaluation Report Related to the License Renewal of Arkansas Nuclear One, Unit 1 (Docket No. 50-313), US NRC, April 2001

4. Definitions

Definitions are provided in PLI-01, Preparation of Project Level Instructions and Position Papers

5. Prerequisites

This instruction utilizes information contained in the following Oyster Creek License Renewal Position Papers:

(1) PP-01 License Renewal Systems & Structures

(2) PP-08 Structure, Component and Commodity Types With Active, Passive, Short Lived Determination and Intended Functions

(3) PP-15 Standard Materials, Aging Effects and Internal / External Environments

The system scoping package should be complete and the associated license renewal boundary drawing prepared before the system screening evaluation can be completed. The structure license renewal boundary drawing (plot plan drawing) need not be completed before structural screening can be performed.

6. Instructions

This PLI provides direction on how to complete System / Structure Screening forms in the Oyster Creek License Renewal Database (LR Database). The LR Database will be used to print out hard copy license renewal screening forms for subsequent review, approval and retention.

Screening will be performed for each mechanical system and structure previously determined to be in the scope of license renewal. Screening is not required for electrical systems as the electrical components that require an aging management review are determined by an industry accepted

commodity approach. Electrical systems are systems that do not contain passive long-lived mechanical components typically shown on a flow diagram. The passive, long-lived components in the electrical systems are electrical components included as electrical commodities.

Screening is performed on a system and structure (or commodity, as discussed below) basis, with one screening evaluation completed for each in-scope mechanical system and structure. The actual screening process (passive and long-lived determination) applies to the individual components, including structural components and commodities. In the screening process, the term "structure" refers to structural components and not the overall building structure.

Screening is applied to in-scope structures and components, to determine those structures and components that are subject to an aging management review in accordance with 10CFR54.21. Structures and components subject to an aging management review are those that perform an intended function, as described in §54.4, without moving parts or without a change in configuration or properties (passive), and that are not subject to replacement based on a qualified life or specified time period (long-lived).

Screening will be performed and documented on a screening form for each group of components addressed as a commodity. When a new commodity group is identified, it will be added to PP-01 and incorporated into the license renewal database menus. An identified commodity group is, by definition, passive and long-lived. Commodity groups are not established for active or short-lived component types. The screening of commodities will determine and document the intended functions, materials, environments and aging effects requiring management applicable to the commodity group. Reference to "components" throughout this instruction also includes components that are grouped and screened as a commodity.

During screening, information will be gathered to assist in the eventual aging management reviews and the preparation of the license renewal application (LRA). The information to be gathered includes structure or component type, internal and external environment, material, component intended function, and applicable aging effects.

Plant design documents will be utilized to identify information to be entered into the screening form. The needed information can generally be obtained from flow diagrams, specifications, the Component Record List (CRL), structural plan and elevation drawings, component drawings, system training materials, the UFSAR, or the Maintenance Rule Database. In some cases, a plant walkdown may be the most efficient or only way to obtain necessary screening information.

It is not necessary for the assigned license renewal engineer to follow the steps in this instruction in the order shown, as long as all steps are completed prior to approval of a System / Structure Screening Form.

Exhibit 1 depicts the License Renewal Database Screening Input Form

Exhibit 2 depicts a sample Screening Form printed out from the database.

Exhibit 3 is a flow chart of the LR Screening process.

A License Renewal System and Structure Screening Form (Exhibit 1 or comparable) is used to document the screening evaluations, to determine the structures and components subject to an aging management review.

Begin the screening process by selecting from the LR database, a screening form for the in-scope license renewal mechanical system, structure or commodity to be evaluated.

6.1 Component Selection

Using information from the completed scoping evaluations and/or associated drawings for the system, structure or commodity being evaluated, identify the passive, long-lived components types. Select the identified passive, long-lived component from the screening form "Structural and/or Component/Commodity" pull-down menu. The component types listed in the pull-down menu are those identified in PP-08, "Structure, Component and Commodity Types With Active, Passive, Short Lived Determination and Intended Functions." If a structure, component or commodity type is identified during screening that is not on the pull-down menu and not identified in PP-08, then initiate a change to PP-08 to add the new structure, component or commodity type.

For mechanical systems, a listing of system components should be downloaded from the CRL to assist in identifying all passive, long-lived component types in the system. Review of boundary drawings and the CRL component listing provides reasonable assurance that all system components are reviewed. For mechanical systems, the boundary drawing should be marked up to help track the review and confirm that all the components were addressed. The marked up boundary drawing will be retained with the screening file to facilitate subsequent checks and reviews. The following guidelines should be used for marking the system boundary drawings during screening:

- Use of colored highlighters can help facilitate tracking the long-lived, passive components as they are added to the license renewal database screening form.
- The review should include all of the in scope portions of the system, as identified by the green and red color-coding previously established during system scoping.
- It is not necessary to review or annotate components located within areas of the flow diagram that are not included within the in scope boundary flowpath. This includes electrical control schemes or background reference information such as structural or building location or interface information.

The mechanical system component CRL listing may include certain structural commodity type components such as pipe supports, panels or cabinets. These items are screened with the structures or structural commodities, and as such should not be included with the mechanical system screening. Most electrical components that may be identified within a mechanical system boundary are active components. As discussed previously, passive electrical components are addressed as electrical commodities and should not be included in the mechanical system screening.

Closure bolting must be included in the screening database for each mechanical system, unless it is confirmed that the system does not utilize closure bolting. The intended function for closure bolting is Mechanical Closure (PP-08). An internal environment is not applicable, and the external environment will be the same as the external environment of the associated component(s) based on their location within the plant.

Only passive, long-lived structure, component or commodity types are included on the screening form. Active or short-lived components are not included on the screening form and are not included in the pull-down menu. Refer to PP-08 to determine if the component, structure or commodity being evaluated is classified as active or short-lived.

Short-lived components are not common, and when identified, the rationale for the short-lived determination must be documented on the screening form in the Comments field.

In general, a Component Type should be entered only once for a given system or structure. The subsequent columns for Intended Function, Material and Environment may require multiple entries to address all of the components in the system or structure for the given Component Type. There are specific exceptions to this general rule, as described below:

- Major components types should be uniquely identified, by typing in the commonly used name of the component (or group of components). For example, major heat exchangers and coolers should be uniquely identified, by typing in the name of the heat exchanger in parenthesis after the Component Type label. Note that the unique name does not need to apply to individual heat exchangers. The name can apply to groups of similar heat exchangers such as room coolers, seal coolers or Containment Spray heat exchangers. This is especially applicable when a system includes several heat exchangers of different design. It is appropriate to differentiate between a major process heat exchanger and a component or seal cooling heat exchanger. Heat exchangers in the same system with different intended functions, materials or environments should also be uniquely identified. Major components that may also be listed separately include pumps, tanks, and nozzles.

- Any other situation where it is appropriate for clarity or accuracy to identify an additional unique line item for a component type.

6.2 Intended Functions

The next column on the screening form is the "Intended Function" column. Using information from the completed scoping evaluations and/or associated drawings, identify the applicable intended function or functions for the selected structure, component or commodity. The list of potential intended functions is identified in PP-08 and is also included as a pull-down menu for the "Intended Functions" database field. For some components, such as a restricting orifice or heat exchanger, the appropriate intended function will depend on the specific application within the system or structure. For example, in-scope heat exchanger will always have a pressure boundary intended function, but the tubes may also have a heat transfer intended function if the heat transfer function of the heat exchanger is required to support a system intended function.

All in-scope passive, long-lived structures, components or commodities will have at least one component intended function. In some cases, the structure, component or commodity being evaluated will have more than one intended function. All applicable intended functions must be included for the item being evaluated.

In cases where a component type has more than one intended function, each intended function is entered into the nested data entry table under the component type. Note that it will be necessary to enter material, environment and aging effect data for the component type, for each of the intended functions entered into the nested table.

A restricting orifice and a flow element will always have a Pressure Boundary intended function, but may or may not have a Throttle intended function, depending on the application within the CLB. However, experience with license renewal indicates no significant benefit in making this distinction. Therefore, it is acceptable and simplifies the results to conservatively include both the Pressure Boundary and the Throttle intended function for all of these component types.

Heat exchangers will always have a Pressure Boundary intended function, but may or may not have a Heat Transfer intended function, depending on the application within the CLB. It is beneficial to make the determination if Heat Transfer is an applicable intended function in the CLB, as it introduces additional aging effects, e.g., Loss of Heat Transfer. For heat exchangers with both a Pressure Boundary and a Heat Transfer intended function, each intended function is entered separately into the nested data entry table. As stated above, it will be necessary to enter material, environment and aging effect data for each of the intended functions, for each component type, entered into the nested table.

Non-safety related components in scope of license renewal for physical or spatial interaction, in accordance with 10 CFR 54.4(a)(2) and NRC Interim Staff Guidance ISG-09, are identified with red highlighting on the mechanical system boundary drawings. These components fall into one or both of the following two categories:

- Spatial interaction – applies to non-safety related components spatially located in the vicinity of safety related equipment, such that there is the potential for failure of the non-safety related component to cause failure of safety related equipment.
- Physical interaction - applies to non-safety related components attached to safety related equipment, such that the non-safety related component provides structural support to attached safety related equipment.

As identified in position paper PP-08, the appropriate component intended function for the "spatial interaction" category is "Leakage Boundary" and the appropriate component intended function for the "physical interaction" category is "Structural Support".

In cases of (a)(2), the throttle intended functions of restriction orifices and heat transfer intended function of heat exchangers are not applicable.

6.3 Material

6.3.1 Overview

The next column on the screening form is the "Material" column. Using information from the completed scoping evaluations, associated drawings or additional references, identify the applicable material for the selected structure, component or commodity. The list of potential materials is identified in PP-15 and is also included as a pull-down menu for the "Material" database field.

Sources for material information include the following:

(1) Flow Diagrams

(2) Vendor Drawings

(3) SYS-LL-OC-1, <u>OCNGS Line List & Specification</u>

(4) Component Specifications

(5) Field Walkdowns

(6) Component Record List (CRL)

There can be more than one material for a given component type and intended function entry. In some cases, the component may be constructed of more than one material. For example, a heat

exchanger will generally include different materials for the shell and tubes, and possibly other internal components such as tube sheets.

In the case of a heat exchanger with a Heat Transfer intended function, the tube material must be identified as such by adding "(tubes)" after the material identification. Note that this tube material will then be identified with both the Heat Transfer and the Pressure Boundary intended functions. Heat exchanger materials that do not have a Heat Transfer intended function are listed only under the Pressure Boundary intended function.

In some cases, the given component type and intended function row may include different groups of components made of different materials. For example, a system may include both carbon steel and stainless steel valves, all with a Pressure Boundary intended function. As discussed in Section 6.1, a component type is only entered once for a given system, unless the component type is a major component type such as heat exchanger that requires unique identification for clarity. The components constructed of different materials are added under the same component type and, if applicable, under the same intended function, but then broken out by the different applicable materials.

6.3.2 Sources of Material Information

The following specific sources of material information are available for the identified component types:

<u>Piping</u>

The Oyster Creek Line List SYS-LL-OC-1 provides material information for the piping classes shown on many flow diagrams. This is the primary source for identifying piping material. Some flow diagrams identify piping material information directly on the flow diagram.

<u>Instrument Tubing</u>

Based on field walkdowns and interviews with plant personnel, instrument tubing is stainless steel for all water and steam systems. For oil, gas or ventilation systems, the instrument tubing may be copper or other materials and should be confirmed.

<u>Valves</u>

The line list references two primary specifications for valves: S-2299-55 and S-2299-61. These specifications address multiple materials. The specifications include a list of system valve numbers with valve "Group" numbers identified. The Group number can be used to determine the material, as defined in the specifications. These specifications identify a significant but limited number of the valves in the plant. The valve numbering system in the specifications do not always directly match the flow diagrams. It may be necessary to utilize the 2-letter system designator codes (from the line list) and also the original vendor assigned component numbers (often indicated in parenthesis on the flow diagrams) to correlate the specification component to the flow diagram component.

<u>Bolting</u>

The line list provides a specification reference for the pressure bolting used in the system, from which material can be determined. Fittings are made from essentially the same material as the pipe, as indicated on the line list.

<u>Ductwork</u>

In accordance with specification S-2299-59 the ductwork material at Oyster Creek is aluminum and galvanized carbon steel. When screening HVAC systems, it should be confirmed if one or both of these materials are installed within the in-scope portions of the system.

Restricting Orifice

A search of EDMS for "orifice" identified numerous documents and drawings that were reviewed to determine the orifice material. A number of drawings and documents identified the restricting orifice material, and in all cases where the material was identified, the material was stainless steel. It is, therefore, reasonable to assume identified restricting orifices are stainless steel unless otherwise identified.

Gauge Snubbers

Based on field walkdowns and interviews with plant personnel, gauge snubbers are stainless steel.

Other Components

Materials are identified from sources such as the CRL, vendor drawings, vendor manuals, modification packages, specifications or plant walkdowns as described below.

6.3.3 Material Research Process Guidance

Piping materials are identified from flow diagrams and the line list. If the system does not include stainless piping in the line list, review the system instrumentation and add stainless piping if the system includes stainless instrumentation tubing. If the piping materials cannot be determined from the flow diagrams or line list or specification, then a walkdown may be required.

Valve materials are identified from the applicable valve specification, for those valves that are listed in the specifications. If the specifications do not identify any stainless steel valves in the system, it is necessary to research valves associated with system instrumentation (see CRL guidance, below) to determine if stainless steel valves should be included in the system.

It is not necessary to research the material for every valve in the system. It would be expected that there would be valves of the same material/environment combination as the piping in the system. After reviewing the valve specifications and the system instrument valves as described above, review the results to determine if the identified valve material and environment combinations are the same as those identified for the system piping. If so, then it is likely that all appropriate valve materials and environments have been identified. If not, additional research may be appropriate to confirm all the valve materials and environments have been properly identified.

Flow elements are usually stainless steel. If the material cannot be confirmed for a specific flow element, but the system contains others that have been confirmed as stainless steel, then it is reasonable to assume the unknown flow element is also stainless steel.

The CRL provides material information for some components. On Page 1, there are a few fields that may contain material information. For some instrumentation valves, the Manufacturer Field may indicate Whitey or Swagelok or Cajon, and if the Model Number starts with "SS-" then it is a reasonable assumption that the valve material is stainless steel. Depending on the type of component, CRL Page 2 may have a field for material information. CRL Page 5 is a common location for material information. CRL Page 3 has drawing references, which may identify a vendor print or a vendor manual. If the drawing title looks promising, try getting the print from EDMS. EDMS also contains some vendor manuals. If the references either are not in EDMS or do not identify the materials, this component should be flagged as an unknown and go on to the next component. If

needed, the appropriate references can be obtained from site, or a walkdown will be required to identify the material.

Walkdowns may be the easiest way to determine some component materials. Pictures can also be used in some cases. For example, a heat exchanger shell that is painted is assumed to be carbon steel. A stainless steel or rubber flex hose can usually be determined from a picture.

Some components require determination of internal materials, such as heat exchangers or filters. Research through design information, procurement files or maintenance histories will be required to determine the internal materials.

6.3.4 Material Reference Documentation

This instruction provides a number of specific sources of information for material identification, such as the line list, CRL and valve specifications. These references need not be identified on the individual system or structure screening form, because they apply generically as documented in this instruction. Other references, such as specific vendor drawings, vendor manuals, maintenance records or field walkdown, should be documented in the Comments field of the screening form or marked-up flow diagram. The applicable license renewal boundary drawing is referenced in the "Boundary Drawings" field.

Any additional assumptions or rationalizations for material determinations should be documented in the Comments field of the screening form.

6.4 Environment

The next column on the screening form is the "Environment" column. Using information from the completed scoping evaluations, associated drawings or additional references, identify the applicable environments for the selected structure, component or commodity. Both the internal and the external environment must be identified. The list of potential environments is identified in PP-15 and is also included as a pull-down menu for the "Environment" database field.

For mechanical system components, a minimum of two environments should be entered for each material, to account for both the internal and the external environment. Each environment entered should be identified as either internal or external. An exception is for mechanical components where an internal environment is not applicable, such as for Closure Bolting. In such cases, only the applicable (external) environment(s) need be listed.

For heat exchangers, the material representing the tubes will have an internal environment based on the fluid inside the tubes, and an external environment based on the fluid outside the tubes, i.e., the same as the environment inside the heat exchanger shell.

Operating environments are defined by the fluid medium and chemistry, such as treated water, raw water, or lubricating oil. For some materials, the applicability of certain aging effects can also depend on the service temperature or condition of fluid flow. For example:

1. Flow Accelerated Corrosion (FAC) is not an applicable aging mechanism for Loss of Material when there is normally very low or no flow, such as in the steam supply line to the Isolation Condenser. (Reference 3.8, Section 4.2.2)
2. Stress corrosion cracking is not a significant aging mechanism for Cracking of stainless steel when the service temperature is normally below 200°F. (Reference 3.10, Section 3.3.5.2.1.1.1)

3. Thermal Aging Embrittlement is a potential aging mechanism that can result in Loss of Fracture Toughness for cast austenitic stainless steel. However, this aging mechanism is not a concern if the normal service environment is below 482°F. (Reference 3.9, Appendix A, Section 3.3.1)
4. Stagnant conditions can result in higher concentrations of corrosive contaminants.

Unique environmental conditions such as those identified above should be noted in the Environment column. Note that it is not necessary to identify stainless steel below 140°F in systems subject to water chemistry controls, as in accordance with NUREG-1801 (GALL), cracking will be managed by the GALL Water Chemistry Programs (including One-Time Inspections as required). This approach is consistent with previous applicants, appears to be an accepted approach by the NRC, and will be documented in the Oyster Creek LRA.

6.5 Aging Effects Requiring Management

The next column on the screening form is the "Aging Effect Requiring Management" column. The list of potential aging effects is identified in PP-15 and is also included as a pull-down menu for the "Aging Effects Requiring Management" database field. The applicable aging effects are a function of the material and environment being evaluated, and possibly other factors such as temperature or flow conditions as described above in Section 6.4. The variety of applicable aging effects for the material and environment combinations found in a nuclear power plant has been well established in previous license renewal evaluations. The applicable aging effects can be identified from the following sources:

(1) The Dresden and Quad Cities Aging Effects Topical Report

(2) Previous License Renewal Applications

(3) NUREG-1801, Generic Aging Lessons Learned (GALL) Report

(4) Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3, EPRI, Palo Alto, CA: 2001.1003056

(5) Aging Effects for Structures and Structural Components (Structural Tools), Revision 1

At least one entry must be provided for each material-environment combination. Enter the applicable aging effect(s) or enter "None" if there are no significant aging effects for the material-environment combination. If no aging effects are identified, provide a justification for the conclusion of no aging effects by use of a plant specific note.

6.6 Completion of Screening

Screening is complete when all plant systems and structures have been subjected to the screening process as described in this Instruction and hard copy screening forms have been prepared, checked and approved in accordance with PLI-11. The remaining fields in the database will be completed during the Aging Management Review process.

7. Exhibits

Exhibit 1 LR Database Screening Input Form

Exhibit 2 Sample System / Structure Screening Form

Exhibit 3 Screening Process Flowchart

Oyster Creek License Renewal System Screening Form

System Grouping: Auxiliary Systems

License Renewal System Name: Control Rod Drive System (From PP-1)

Screening Comments:
CRD Pump Casing material from GE Specification 21A5351 Revision 2.
Y-Strainers NC51 and NC07 body and strainer materials from GE Specification 21A5304 Revision 1.
Temporary Strainers S-102A, S-102B and S-103 do not have strainers installed. (Tom Quintenz e-mail 5/6/2004)
CRD Temperature Element shown on 197E871 is part of the Position Indication Probe, located inside the CRD Dry Tube, and does not involve a thermowell. The "Dry Tube" is an integral part (subcomponent) of the CRD mechanism.

Boundary Drawings:
LR-GE-237E487
LR-GE-197E871

Screening Engineer: 05/14/2004 KPM

Checker of Screening:

Screening Complete: No

Screening Revision No:

Approval of Screening:

Report Preview

Record: 1 of 1 (Filtered)

Form View

NUM

Oyster Creek License Renewal System Screening Form

Tiered Component Type subform

Component Type
Valve Body

Intended Function
Pressure Boundary

Material
Carbon and low alloy steel

Environment
Treated Water (Internal)

Aging Effect
Loss of Material

Vol #2	Aging Program	Notes
*		

*

Inside Air (Internal & Exterr

Aging Effect
None ???

Vol #2	Aging Program	Notes
*		

*

*

Brass

Environment
Treated Water (Internal)

Aging Effect
Loss of Material

Vol #2	Aging Program	Notes

*

Screening Engineer: 05/14/2004 KPM

Checker of Screening:

Screening Complete: No

Screening Revision No:

Approval of Screening:

Report Preview

Record: 1 of 1 (Filtered)

Oyster Creek Nuclear Generating Station

System and Structure Screening Form

Control Rod Drive System

Screening Engineer: 05/14/2004 KPM

Checker:

Site Reviewer: ______________________

Approval of Screening:

Component Type	***Intended Function***	***Material***	***Environment***	***Aging Effect Requiring Management***
Accumulators	Pressure Boundary	Carbon and low alloy steel	Nitrogen	None
			Treated Water	Loss of Material
		Stainless Steel and Nickel Alloy	Nitrogen	None
Closure bolting	Mechanical Closure	Carbon and low alloy steel	Inside Air (External)	Loss of Bolting Function
Filter	Filter (element)	Stainless Steel and Nickel Alloy	Treated Water (Internal and External)	Cracking Initiation and Growth
				Loss of Material
	Pressure Boundary (Shell and Flange)	Carbon and low alloy steel (Closure Flange)	Inside Air (External)	None ???
			Treated Water (Internal)	Loss of Material
		Stainless Steel and Nickel Alloy (Shell)	Inside Air (External)	None
			Treated Water (Internal)	Loss of Material
				Cracking Initiation and Growth

Component Type	*Intended Function*	*Material*	*Environment*	*Aging Effect Requiring Management*
Flowelements	Pressure Boundary, Throttle	?? Unknown ??	Inside Air (External)	None
			Treated Water (Internal)	Loss of Material
				??? Cracking ???
Gauge Snubber	Pressure Boundary, Throttle	Stainless Steel and Nickel Alloy	Inside Air (External)	None
			Treated Water (Internal)	Loss of Material
				Cracking Initiation and Growth
Heat Exchangers	Heat Transfer	?? (Shell)	Lubricating Oil (Internal or External???)	???
			Treated Water (Internal or External???)	
	Pressure Boundary	??? (Shell)	Inside Air (External)	None ???
			Lubricating Oil or Treated Water ??? (Internal)	??????
Piping and fittings	Pressure Boundary	Carbon and lowalloy steel	Inside Air (Internal & External)	None ???

Exhibit 2 Sample System / Structure Screening Form

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management
Piping and fittings	Pressure Boundary	Carbon and low alloy steel	Treated Water (Internal)	Loss of Material
		Stainless Steel and Nickel Alloy	Inside Air (External)	None
			Treated Water (Internal)	Loss of Material
				Cracking Initiation and Growth

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management
Pump Casing	Pressure Boundary	Carbon and low alloy steel ??? (Gear box oil pump)	Inside Air (External)	None ???
			Lubricating Oil (Internal)	Loss of Material
		Stainless Steel and Nickel Alloy	Inside Air (External)	None
			Treated Water (Internal)	Cracking Initiation and Growth
				Loss of Material

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management
Restricting Orifice	Pressure Boundary, Throttle	Stainless Steel and Nickel Alloy	Inside Air (External)	None
			Treated Water (Internal)	Cracking Initiation and Growth
				Loss of Material

Exhibit 2 Sample System / Structure Screening Form

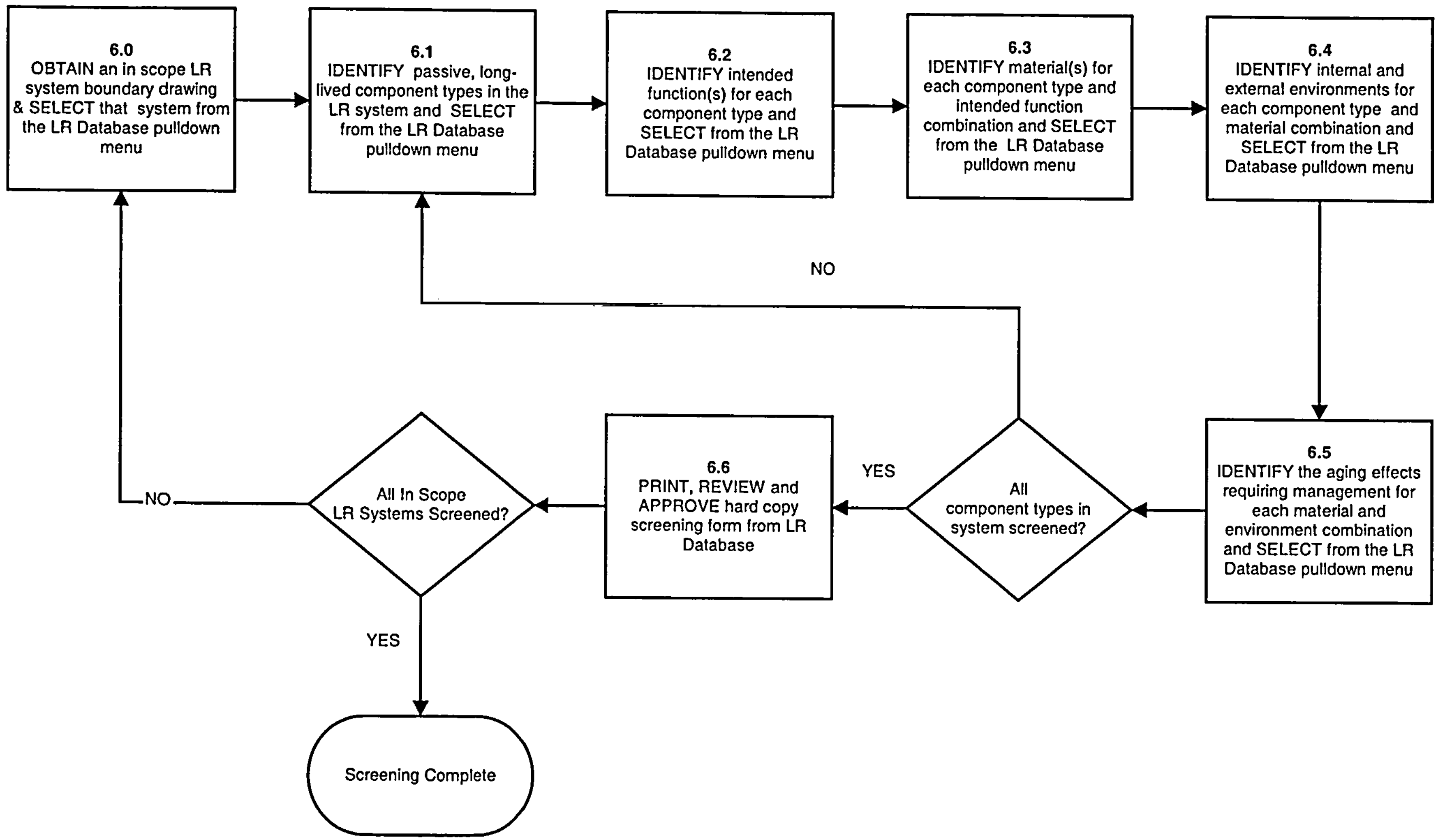
Component Type	*Intended Function*	*Material*	*Environment*	*Aging Effect Requiring Management*
Strainer	Filter	Stainless Steel and Nickel Alloy	Treated Water (Internal and External)	Loss of Material
				Cracking Initiation and Growth
Strainer Body	Pressure Boundary	Carbon and low alloy steel	Inside Air (External)	None ???
			Treated Water (Internal)	Loss of Material
		Stainless Steel and Nickel Alloy	Inside Air (External)	None
			Treated Water (Internal)	Cracking Initiation and Growth
				Loss of Material
Valve Body	Pressure Boundary	Brass	Inside Air (External)	None
			Treated Water (Internal)	Loss of Material
		Carbon and low alloy steel	Inside Air (Internal & External)	None ???
			Treated Water (Internal)	Loss of Material

Control Rod Drive System

Page 3 of 6

Component Type	*Intended Function*	*Material*	*Environment*	*Aging Effect Requiring Management*
Valve Body	Pressure Boundary	Stainless Steel and Nickel Alloy	Inside Air (External)	None
			Treated Water (Internal)	Loss of Material
				Cracking Initiation and Growth

Oyster Creek License Renewal Project
Project Level Instruction 3
Exhibit 3 Screening Process Flowchart



Project Level Instruction 4

Boundary Drawings

Oyster Creek Nuclear Generating Station

License Renewal

APPROVAL PAGE

Revision	*Prepared by:*	*Checked by:*	*Approved by:*
00	*Kevin Muggleston*	*Al Fulvio*	*Don Warfel*
Date	*1/13/04*	*1/13/04*	*1/13/04*
01	*Kevin Muggleston*	*Stu Getz*	*Al Fulvio*
Date	*8/16/05*	*8/16/2005*	*8/16/05*
02	*Shannon Rafferty*	*John Hufnagel*	*Don Warfel*
Date	*9/8/05*	*9/8/05*	*9/8/05*

REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Updated references, added new system flags, clarified boundary flag use.
2	Updated for formatting reasons.
3	
4	
5	

TABLE OF CONTENTS

1.0 Purpose

The purpose of this project level instruction is to provide guidelines for preparation of License Renewal Drawings for Oyster Creek. This instruction documents a number of standards and conventions to be followed when preparing boundary drawings. This instruction is intended to assure consistency in quality and appearance of license renewal boundary drawings for Oyster Creek.

> Note
>
> Additional issues may be identified during the development of the boundary drawings, where decisions are made that impact drawing content, format or appearance. If appropriate, this instruction should be revised to reflect new or changed conventions or standards.

Although not a requirement of the rule, the development of boundary drawings provides additional confirmation of correct system and structure scoping.

2.0 Applicability

This instruction is for the use of personnel engaged in the preparation of boundary drawings in support of license renewal activities for Oyster Creek. This instruction does not apply to the review and approval or revision control process. Review, approval and revision control are addressed in reference 3.8.

3.0 References

3.1 10CFR54.4 Requirements for Renewal of Operating Licenses for Nuclear Power Plants
3.2 NEI 95-10, "Industry Guideline for Implementing The Requirements of 10 CFR Part 54 – The License Renewal Rule," Revision 5
3.3 NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants"
3.4 PLI-02, Scoping of Systems and Structures
3.5 ISG-9, "Guidance on the Identification and Treatment of Structures, Systems and Components which meet 10CFR54.4(a)(2)"
3.6 PLI-01, Preparation of Project Level Instructions and Position Papers
3.7 ISG-2, "Scoping of Equipment Relied on to Meet the Requirements of the Station Blackout (SBO) Rule (10 CFR Part 50.63) for License Renewal (10 CFR 54.4(a)(3))"
3.8 PLI-11, License Renewal Document Control
3.9 PP-03, 54.4(a)(2) Scoping Criteria
3.10 PP-04, 10CFR54.4(a)(3) Station Blackout Systems
3.11 PP-07, 10CFR54.4(a)(3) Fire Protection Systems

4.0 Definitions

Definitions are provided in reference 3.6.

5.0 Prerequisites

This instruction provides guidance to be followed when preparing license renewal boundary drawings for Oyster Creek. Boundary drawings are prepared during the scoping process under PLI-02 (reference 3.4), which includes appropriate prerequisites. Additional prerequisites are not applicable for this instruction.

6.0 Instructions

The numbered steps in this instruction document concepts, conventions, standards and expectations associated with license renewal boundary drawings. Step numbers are not intended to indicate a specific sequence of actions.

6.1 Mechanical Systems

Note

Each license renewal boundary drawing will have a license renewal engineer assigned primary responsibility. The responsible engineer will coordinate with others as needed if the drawing includes multiple in-scope systems.

6.1.1 The license renewal boundary drawings are prepared from existing flow diagrams. The layout and level of detail of the drawings will remain essentially as shown on the flow diagrams.

6.1.2 Boundary drawings are assigned unique license renewal drawing numbers. The drawing numbers reflect existing flow diagram numbers (i.e., LR-BR-2001), as described in PLI-02 (reference 3.4).

6.1.3 As with the current flow diagrams, multiple systems may be shown on an individual boundary drawing.

6.1.4 The boundary drawings are intended to assist LRA reviewers in understanding the scope of systems, structures and components included in the license renewal application. For mechanical systems, the boundary drawings are intended to clearly show the system flow paths, system boundaries, branches and mechanical components that are included in scope. Mechanical system boundary drawings are not intended to show electrical or structural scoping.

6.1.5 Mechanical boundary drawings indicate in-scope piping and components by showing the schematic flow paths and component symbols in color. Systems or portions of systems that are required to perform process functions to meet the intended function requirements under 10CFR54.4(a)(1) and (a)(3) are colored green. Systems or portions of systems with supporting process functions under 10CFR54.4(a)(2) are also colored green. Systems or portions of systems that are included in scope only due to spatial or physical interactions under

10CFR54.4(a)(2), as described in PP-03 (reference 3.9) and ISG-9 (reference 3.5), are colored red.

6.1.6 Supplemental drawing information such as component identification names or numbers, line numbers or line specifications, class breaks, instrument location information, etc, will not be colored.

6.1.7 Existing revision ballooning will be removed from the drawings.

6.1.8 Existing equipment identified as "abandoned in place" may be deleted from the drawings if the equipment is not in scope for potential physical or spatial interaction.

6.1.9 System interfaces between in-scope systems will be identified with boundary flags on the license renewal boundary drawings when appropriate for clarification purposes. Interface boundary flags are not required where boundaries are obvious or are adequately understood with the existing flow diagram format, such as at an interface with the reactor pressure vessel or at interfaces between instrument air supplies and supplied components.

6.1.10 System boundaries must reflect the system scoping and screening results in Chapter 2 of the LRA. For example, if ECCS suction strainers are scoped and screened as part of the containment structure or torus, then the ECCS piping system boundary should stop at the connection to the torus, and be identified with a boundary flag. Note that if the strainers are scoped and screened with the ECCS system, then no boundary flag is required as the existing flow diagrams adequately show the piping interface with the torus.

6.1.11 When system boundary identifications are needed, system flag symbols are used. The system flag symbol is a 2 to 4 character code to identify the system in the boundary flags. Exhibit 1 is a list of system flag symbols. Exhibit 1 includes only mechanical license renewal systems that are anticipated to be in-scope and to appear on a license renewal boundary drawing. The table of system flag symbols will be included on Legend Drawing LR-BR-2001.

6.1.12 Instrument lines that connect to in-scope pressure boundary piping also provide a pressure boundary intended function, and will be shown as in-scope with green or red as appropriate.

6.1.13 Instrumentation connected to the in-scope pressure boundary will be colored in-scope for clarity, even though instrumentation is active and therefore does not require an aging management review.

6.1.14 Control scheme representations on the flow diagrams will not be colored as in-scope, regardless of the functions of the control scheme components. Any control scheme components in the scope of license renewal are either active or are addressed by the electrical commodities approach.

6.1.15 Existing drawing continuation arrows will not be revised to indicate the license renewal drawing number convention. A general note will be provided on the license renewal Legend Drawing LR-BR-2001 to explain the correlation between existing flow diagram drawing numbers and license renewal drawing numbers.

6.1.16 Some flow diagrams show interfacing systems and equipment not directly related to the system shown on the flow diagram. This information is provided to make the drawings easier to use and understand. The interfacing systems and equipment are provided as background information because they also appear on their own respective drawings. These interfacing

systems are sometimes shown with dashed or faint lines on the existing drawings. For license renewal, this background information will be colored as in-scope when appropriate for clarity. A general note will be provided on the license renewal Legend Drawing LR-BR-2001 to explain how background interfacing systems and equipment are handled on the license renewal drawings.

6.1.17 There are cases where the LR boundary is either at a normally open valve or at no valve at all. This is considered acceptable. The reasoning in each case must be understood and documented in an appropriate position paper, in the system scoping package, or with a note on the boundary drawing.

6.1.18 Existing flow diagram notes will be reviewed for applicability to the license renewal drawings. For notes that are not directly applicable to license renewal review (e.g., in-scope material information), the note and note references will be deleted from the drawing. Any clarifying notes appropriate for license renewal will be added to the drawings.

6.1.19 Each license renewal drawing will include a note that references the drawing revision that it was created from, e.g., "This drawing is based on BR-2002 sheet 1 revision 58."

6.1.20 No attempt will be made to explicitly identify in-scope versus out-of-scope insulation on the license renewal drawings. This issue will be handled in the LRA text as appropriate, and with a general explanatory note on LR-BR-2001.

6.1.21 Electric solenoid operated valves are often used to vent compressed air, such that a required safety function (such as closing an air operated isolation valve) is accomplished by venting. The solenoid valve may be classified safety related to perform this active vent function. Such a safety related solenoid valve is in the scope of license renewal, but it has no passive intended function since the only safety function is to vent pressure. The interconnecting tubing in these applications is usually not safety related and not in scope. Solenoid valves that only have an active intended function will not be shown in-scope on the boundary drawings.

6.1.22 Oyster Creek flow diagrams typically do not explicitly identify interfacing cooling water systems at process heat exchangers. Reference to the appropriate cooling water system may be added if appropriate for additional drawing clarity.

6.2 Electrical Systems

6.2.1 Aging management reviews and aging management programs for electrical systems are handled by a commodities approach. Electrical systems and boundaries are not described in the LRA. Established practice has been to include a high level single line diagram, showing the primary electrical distribution layout to the 4KV emergency bus level. It has also become necessary to show the appropriate power paths anticipated to be used during restoration from a station blackout event (PP-04, reference 3.10), as discussed in ISG-2 (reference 3.7), and the off site power sources credited as part of the Fire Protection Plan (as applicable)(PP-07, reference 3.11).

6.2.2 A simplified electrical drawing will be prepared to show the arrangement of the electrical distribution system, including interfaces with external power systems. This drawing will clearly show that power distribution systems needed for compliance with the Station Blackout regulation and Fire Protection Plan are included in scope. (See reference 3.3, Section 2.2.3.1, Example 4).

6.2.3 The electrical single-line paths and associated components in the scope of license renewal will be colored green to indicate in-scope.

6.2.4 Supplemental drawing information such as component identification names or numbers, wire or terminal numbers, location information, etc, will not be colored.

6.3 Structures

The boundary drawing for structures will be prepared by highlighting the boundaries of the structures that are in-scope. The current site plan drawing will be used as the boundary drawing for structures.

7.0 Review and Approval

The license renewal engineer will determine when all scoping is complete for the assigned boundary drawing. When scoping is complete, the license renewal engineer will initiate the boundary drawing review and approval process as defined in PLI-11, License Renewal Document Control (reference 3.8).

Exhibit 1 – System Boundary Flag Designations	
System Name	**Boundary Flag**
"C" Battery Room Heating & Ventilation	CBRV
4160V Switchgear Room Ventilation	4KVV
480V Switchgear Room Ventilation	SGRV
Battery and MG Set Room Ventilation	BMGV
Chlorination System	CL2
Circulating Water System	CW
Condensate System	CND
Condensate Transfer System	CT
Containment Inerting System	CI
Containment Spray System	CS
Containment Vacuum Breakers	CVB
Control Rod Drive System	CRD
Control Room HVAC	CRV
Core Spray System	CSS
Drywell Floor and Equipment Drains	DFED
Emergency Diesel Generator and Auxiliary System	EDG
Emergency Service Water System	ESW
Feedwater System	FW
Fire Protection System	FP
Hardened Vent System	HV
Heating & Process Steam System	HPS
Hydrogen & Oxygen Monitoring System	HOM
Instrument (Control) Air System	IA
Isolation Condenser System	IC
Main Condenser	MC
Main Fuel Oil Storage & Transfer	FO
Main Generator and Auxiliary Systems	MGA
Main Steam System	MS
Main Turbine and Auxiliary Systems	MTA
Miscellaneous Floor and Equipment Drain System	MFED
Nitrogen Supply System	NS
Noble Metals Monitoring System	NMM
Nuclear Boiler Instrumentation	NBI
Post-Accident Sampling System	PASS
Process Sampling System	PS
Radiation Monitoring System	RMS
Radwaste Area Heating and Ventilation System	RV
Reactor Building Closed Cooling Water System	RBCW
Reactor Building Floor and Equipment Drains	RFED
Reactor Building Ventilation System	RBV
Reactor Head Cooling System	RHC
Reactor Pressure Vessel	RPV
Reactor Recirculation System	RR
Reactor Water Cleanup System	RWCU
Roof Drains and Overboard Discharge System	RDOD
Service Water System	SW
Shutdown Cooling System	SDC
Spent Fuel Pool Cooling System	SFPC

Exhibit 1 – System Boundary Flag Designations	
System Name	**Boundary Flag**
Standby Gas Treatment System	SGTS
Standby Liquid Control System	SLC
Traveling In-Core Probe System	TIP
Turbine Building Closed Cooling Water System	TBCW
Water Treatment & Distribution System	WT

Oyster Creek License Renewal Project
Project Level Instruction 5

Aging Management Reviews

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Mark Miller	Don Warfel	11-16-04
1	Kevin Muggleston	Mark Miller	Al Fulvio	8-17-05
2	Shannon Rafferty	John Hufnagel	Don Warfel	9-08-05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Updated references, Database details and Table Description exhibit
2	Updated for formatting reasons.

1.0 Purpose

This instruction describes the procedural requirements for Aging Management Reviews that are prepared for the Oyster Creek License Renewal Project.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in preparing Oyster Creek License Renewal Aging Management Review documents.

3.0 References

3.1 10 CFR Part 54 – The License Renewal Rule
3.2 NEI 95-10 Rev. 5 - Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule
3.3 ER-AA-1100 "Implementing and Managing Engineering Programs"
3.4 PLI-1 "Preparation of Project Level Instructions and Position Papers"
3.5 PLI-8 "Aging Management Program Reviews"
3.6 PLI-11 "License Renewal Document Control"
3.7 RM-AA-101 "Records Management Program"
3.8 Draft NUREG-1800 Rev. 1, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", January 2005
3.9 Draft NUREG-1801 Rev. 1, "Generic Aging Lessons Learned (GALL) Report", January 2005

4.0 Definitions

None.

5.0 Prerequisites

None.

6.0 Instructions

The Aging Management Review demonstrates that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation. To accomplish this demonstration, tables are created which summarize the results of the review. Refer to Exhibit 3, Aging Management Review Table Descriptions, for a description of the table contents and format.

6.1 Begin the Aging Management review process by selecting an in scope system from the OCLR Database.

6.2 Select a component type from the OCLR Database pulldown.

6.3 Each component type has one or more combinations of material, environment and aging effect. For each combination, identify a corresponding combination from NUREG-1801 Volume 2. If there is no match, then leave this column blank.

6.4 For each combination, select the appropriate Aging Management Program(s) from the OCLR Database pulldown.

6.5 For each combination, identify the corresponding NUREG-1801 Volume 1 Item Number. If there is no match, then leave this column blank.

6.6 For each combination, identify applicable standard or plant specific notes. A list of the standard notes is given in Exhibit 2. Plant specific notes are manually typed into the field. The plant specific notes are sequentially numbered to differentiate them from the alphabetized standard notes.

6.7 Continue the above steps for each component type in the system.

6.8 When all of the component types for a given system are completed, then the "Discussion" section of Table 1 is completed for that system.

6.9 When all of the systems are completed for a system grouping, then the "Discussion" section of Table 1 is revised to integrate the individual system discussions.

6.10 Print the Aging Management Review results for each system and complete the approvals in accordance with PLI-11.

7.0 Exhibits

Exhibit 1 - Aging Management Review Process
Exhibit 2 – NUREG-1801 Consistency Notes for Aging Management Review Results
Exhibit 3 – Aging Management Review Table Descriptions

Exhibit 1 – Aging Management Review Process

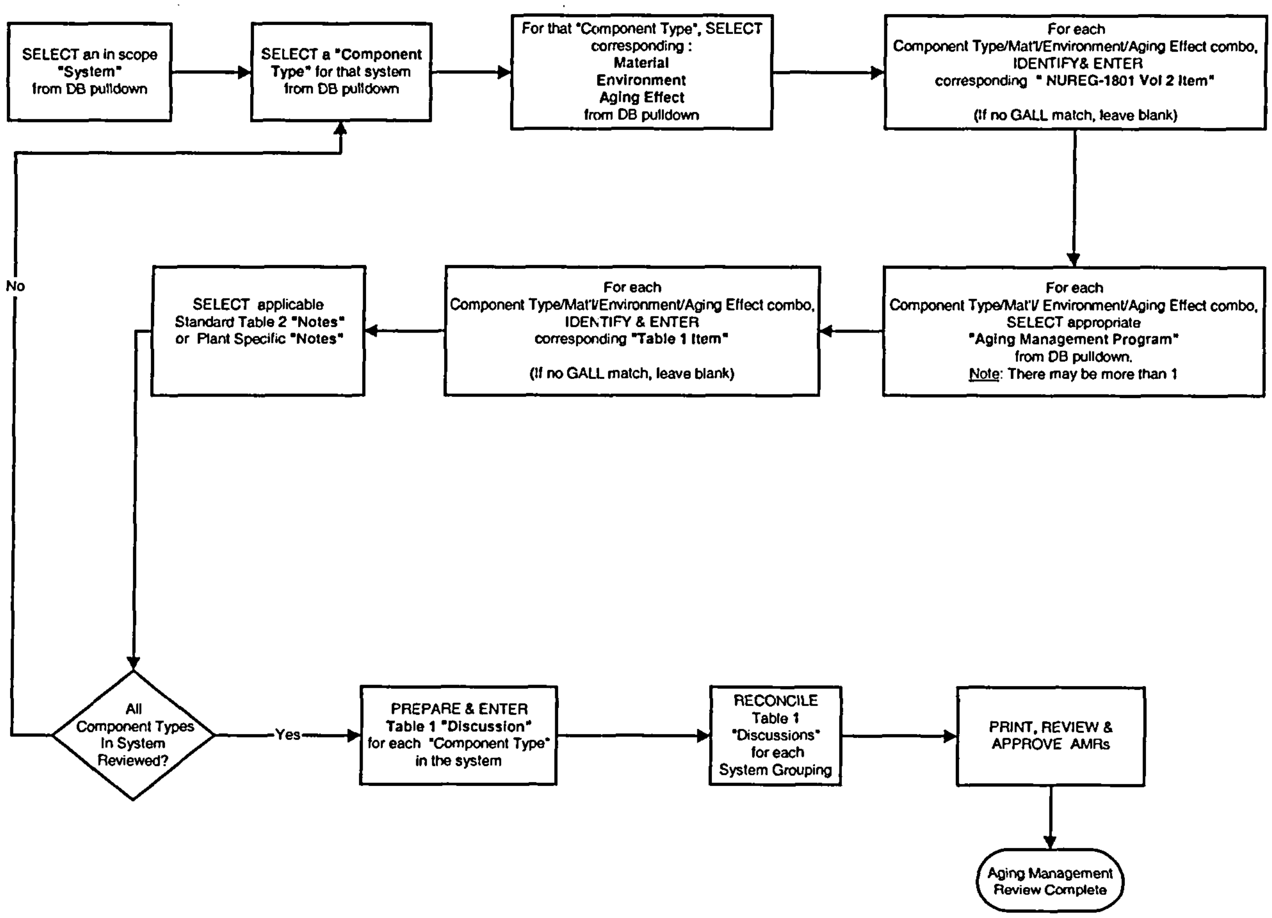


Exhibit 2 – NUREG-1801 Consistency Notes for Aging Management Review Results

Standard Notes

A. Consistent with NUREG-1801 item for component, material, environment and aging effect. AMP is consistent with NUREG-1801 AMP.

B. Consistent with NUREG-1801 item for component, material, environment and aging effect. AMP takes some exceptions to NUREG-1801 AMP.

C. Component is different, but consistent with NUREG-1801 item for material, environment and aging effect. AMP is consistent with NUREG-1801 AMP.

D. Component is different, but consistent with NUREG-1801 item for material, environment and aging effect. AMP takes some exceptions to NUREG-1801 AMP.

E. Consistent with NUREG-1801 item for material, environment and aging effect, but a different aging management program is credited.

F. Material not in NUREG-1801 for this component.

G. Environment not in NUREG-1801 for this component and material.

H. Aging effect not in NUREG-1801 for this component, material, and environment combination.

I. Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.

J. Neither the component nor the material and environment combination are evaluated in NUREG-1801.

Plant-Specific Notes

1. Determined on a plant-specific basis.

Exhibit 3 – Aging Management Review Table Descriptions

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," contains the staff's generic evaluation of existing plant programs. It documents the technical basis for determining where existing programs are adequate without modification, and where existing programs should be augmented for the extended period of operation. The evaluation results documented in the report indicate that many of the existing programs are adequate to manage the aging effects for particular structures or components, within the scope of license renewal, without change. The report also contains recommendations on specific areas for which existing programs should be augmented for license renewal. In order to take full advantage of NUREG-1801, a comparison between the AMR results and the tables of NUREG-1801 has been made. The results of that comparison are provided in the two tables.

Table 1

The purpose of Table 1 is to provide a summary comparison of how the facility aligns with the corresponding tables of NUREG-1801, Volume 1. The table is essentially the same as Tables 1 through 6 provided in NUREG-1801, Volume 1, except that the "Type" column has been replaced by an "Item Number" column and the "Item Number in GALL" column has been replaced by a "Discussion" column.

The "Item Number" column provides the reviewer with a means to cross-reference from Table 2 to Table 1.

The "Discussion" column is used by the applicant to provide clarifying/amplifying information. The following are examples of information that might be contained within this column:

- "Further Evaluation Recommended" information or reference to where that information is located (including a hyperlink if possible)
- The name of a plant specific program being used (and a hyperlink to the program if possible)
- Exceptions to the NUREG-1801 assumptions
- A discussion of how the line is consistent with the corresponding line item in NUREG-1801, Volume 1, when that may not be intuitively obvious
- A discussion of how the item is different than the corresponding line item in NUREG-1801, Volume 1, when it may appear to be consistent (e.g., when there is exception taken to an aging management program that is listed in NUREG-1801, Volume 1)

The format of Table 1 provides the reviewer with a means of aligning a specific Table 1 row with the corresponding NUREG-1801, Volume 1 table row, thereby allowing for the ease of checking consistency.

Table 2

Table 2 provides the detailed results of the aging management reviews for those components identified in LRA Section 2 as being subject to aging management review. There will be a Table 2 for each of the subsystems within a "system" grouping. For example, for a PWR, the Engineered Safety Features System Group contains tables specific to Containment Spray, Containment Isolation, Emergency Core Cooling System, etc.

Table 2 consists of the following nine columns:

- Component Type
- Intended Function
- Material
- Environment
- Aging Effect Requiring Management
- Aging Management Programs
- NUREG-1801 Volume 2 Item
- Table 1 Item
- Notes

Component Type

The first column identifies all of the component types from Section 2 of the LRA that are subject to aging management review. They are listed in alphabetical order.

Intended Function

The second column contains the license renewal intended functions (including abbreviations where applicable) for the listed component types. Definitions and abbreviations of intended functions are contained within the Intended Functions table of LRA Section 2.

Material

The third column lists the particular materials of construction for the component type.

Environment

The fourth column lists the environment to which the component types are exposed. Internal and external service environments are indicated and a list of these environments is provided in the Internal Service Environments and External Service Environments tables of LRA Section 3.

Aging Effect Requiring Management

As part of the aging management review process, the applicant determines any aging effects requiring management for the material and environment combination in order to maintain the intended function of the component type. These aging effects requiring management are listed in column five.

Aging Management Programs

The aging management programs used to manage the aging effects requiring management are listed in column six of Table 2.

NUREG-1801 Vol. 2 Item

Each combination of component type, material, environment, aging effect requiring management, and aging management program that is listed in Table 2, is compared to NUREG-1801, Volume 2 with consideration given to the standard notes, to identify consistencies. When they are identified, they are documented by noting the appropriate NUREG-1801, Volume 2 item number in column seven of Table 2. If there is no corresponding item number in NUREG-1801, Volume 2, this row in column seven is left blank. That way, a reviewer can readily identify where there is correspondence between the plant specific tables and the NUREG-1801, Volume 2 tables.

Table 1 Item

Each combination of component, material, environment, aging effect requiring management, and aging management program that has an identified NUREG-1801 Volume 2 item number must also have a Table 3.x.1 line item reference number. The corresponding line item from Table 1 is listed in column eight of Table 2. If there is no corresponding item in NUREG-1801, Volume 1, this row in column eight is left blank. That way, the information from the two tables can be correlated.

Notes

In order to realize the full benefit of NUREG-1801, each applicant needs to identify how the information in Table 2 aligns with the information in NUREG-1801, Volume 2. This is accomplished through a series of notes. All note references with letters are

standard notes that will be the same from application to application throughout the industry. Any notes the plant requires which are in addition to the standard notes will be identified by a number and deemed plant specific.

Table Numbering scheme:

- **Table 3.x.1** – where '3' indicates LRA Section 3; 'x' indicates the subsection number; and '1' indicates the first table type. For example, in the Reactor Vessel, Internals, and Reactor Coolant System section this table would be numbered 3.1.1 and in the Auxiliary Systems section, this table would be numbered 3.3.1. This table type is referred to as "Table 1."
- **Table 3.x.2.1.y** – where '3' indicates LRA Section 3.0; 'x' indicates the subsection number; '2' indicates the second table type; '1' indicates the summary subsection for materials, environments, aging effects and aging management programs; and 'y' indicates the specific system being addressed. For example, within Section 3.1 for the Reactor Vessel, Internals, and Reactor Coolant System, the table number for the Reactor Internals would be 3.1.2.1.4; and for the Reactor Vessel would be 3.1.2.1.5. Also, within Section 3.2 for Engineered Safety Features, this table would be 3.2.2.1.1, for the Containment Spray System; and the next system, Core Spray, has a table numbered 3.2.2.1.2. This table type is referred to as "Table 2."

Oyster Creek License Renewal Project
Project Level Instruction 6

Evaluation of Time Limited Aging Analyses

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	M. J. May	A. A. Fulvio	D. B. Warfel	1/24/05
1	M. J. May	S. C. Getz	A. A. Fulvio	8/16/05
2	S. Rafferty	J. Hufnagel	D.B. Warfel	9/08/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Updated revision of NEI 95-10 and added NUREG-1800 to references.
2	Updated for formatting reasons.

1.0 Purpose

This instruction provides instruction for identification and disposition of potential time limited aging analyses (TLAAs) in support of the Oyster Creek License Renewal Project.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in preparing Oyster Creek License Renewal Project documents.

3.0 Reference

3.1 10 CFR Part 54 – The License Renewal Rule.

3.2 NEI 95-10, Revision 5 – "Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule".

3.3 PLI-1 "Preparation of Project Level Instructions and Position Papers".

3.4 NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", Revision 1, Draft dated January 2005.

4.0 Definitions

4.1 Current Licensing Basis (CLB) 10 CFR 50.3 defines the CLB as;
"... 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."

4.2 CLB Database - A set of indexed documents in Acrobat PDF format documents that represents the Oyster Creek current licensing basis. These documents can be readily searched for key words and phrases. See Exhibit 2 for a list of documents included in the CLB database.

4.3 Potential TLAA (PTLAA)
A time-dependent analysis, evaluation, calculation, or assumption described, cited, or necessary to support the CLB and whose description in a CLB source document would appear to have the potential to meet all six 10 CFR 54.3(a) criteria for a TLAA. (See TLAA definition below)

4.4 Time-limited aging analysis (TLAA) – A TLAA as defined in 10 CFR 54.3.6, is a calculation, analysis, or evaluation, which meets *all six* of the following criteria:

"*Time-limited aging analyses,* for the purposes of this part [i.e., of 10 CFR 54, the License Renewal Rule], 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.[10 CFR 54.3(a)]

4.5 TLAA Disposition
The license renewal rule provides for TLAAs to be dispositioned in one of three ways:
"

(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.

10 CFR 54.21(c)(1)

4.6 License Exemption Review

The License Renewal rule require License Exemptions to reviewed for TLAAs

" 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."

10 CFR 54.21(c)(2)

5.0 Prerequisites None

6.0 Instructions

The process of identifying and dispositioning TLAAs consists of the following basic steps.

- Identification of Industry Generic TLAA Issues
- Identification of Plant Specific Potential TLAA Issues
- Evaluation of Potential TLAAs to identify TLAA Applicable to Oyster Creek
- Disposition of Each TLAA in Accordance with the License Renewal Rule
- Review of License Exemptions
- Documentation of the Evaluation and Disposition Results in a TLAA Report

6.1 Identification of Industry Generic TLAA Issues

The industry and NRC have developed a set of issues generally common to each plant applying for license renewal. These generic issues are:

Reactor vessel neutron embrittlement
Metal fatigue analysis
Environmental Qualification (EQ) of electrical equipment
Concrete containment tendon pre-stress analyses
Containment fatigue

These TLAA issues are described in industry guidance documents such as NEI 95-10 and in the NRC standard review plan for license renewal NUREG 1800. Additionally they are addressed in Section 4 of every applicant's license renewal application (LRA). These topics form the core list of potential Oyster Creek TLAAs. Each of them applies to Oyster Creek with the exception of containment concrete pre-stress analysis. Each of these generic items contains one or more TLAAs and will be addressed by a specific analysis. They are discussed in Section 4 of the LRA.

Review NUREG 1800 and other Applicants to identify generic TLAAs. Add applicable issues to Exhibit 1 " Oyster Creek Potential TLAAs" under the category of "Generic".

6.2 Identification of Plant Specific Potential TLAA Issues

6.2.1 Review of License Renewal Experience
Each previous license renewal applicant has also identified a number of TLAAs that are specific to that plant. These can be found in the Plant Specific heading of Table 4.1 in the LRA. These issues have the potential to represent a TLAA for Oyster Creek. Therefore, these plant-specific TLAAs are also added to list of OC potential TLAAs (PTLAA) for further evaluation. Some of these plant specific issues clearly do not apply to Oyster Creek, for example those pertaining to jet pumps. Not every plant specific TLAA is expected to apply to Oyster Creek, but the identification of the issue provides a good reference point from which to

search the Oyster Creek licensing basis for TLAAs.

Review the LRA of other BWR applicants (Dresden, Peach Bottom, NMP-1, Browns Ferry and Brunswick) for applicable issues. Add new issues to the Oyster Creek list of potential TLAAs (Exhibit 1) under the category of "Plant Specific".

6.2.2 Expert Review
An important element of this process is the utilization of experienced subject matter experts (SME). There are a number of individuals who have an in-depth knowledge of Oyster Creek issues past and present. The knowledge base of the Exelon subject matter experts for the reactor vessel and reactor vessel internals, EQ, and containment is utilized to develop potential TLAAs.

Interview SMEs to identify potential TLAA issues. Add new issues the list of OC PTLAAs developed in 6.2.1(Exhibit 1) under the category of "SME".

6.2.3 Word Search Process
To provide reasonable assurance the list of Oyster Creek PTLAAs is complete, a word search of the CLB is performed to find any other potential TLAAs not previously identified. An analysis may exist in the CLB that meets the strict definition of a TLAA, but is obscure because it has not been a concern for the plant.

To facilitate the word search process a Oyster Creek CLB database was assembled from the documents listed in Exhibit 2. The majority of this database was developed from the licensing correspondence from approximately 1965 to early 2004. The correspondence and other CLB documents have been scanned and indexed electronically and placed in a Adobe Acrobat database. The database can be searched by key words and phrases.

The list of search words is displayed in Exhibit 3. The list focuses on the time limiting and 40-year plant life of the plant aspects of the TLAA definition (criteria 2 & 3 of 10 CFR 54.3). The list is the same set of words recommended in EPRI TR-105090 Table 4.1-4 with a few minor changes.

6.2.3.1 Review the document containing the word match ('hit') and determine if the hit presents a PTLAA. An issue is considered a PTLAA if meets TLAA criterion 1 (in-scope for license renewal); and if meets either TLAA criterion 2 (considers the effects of aging) or TLAA criterion 3 (involves assumptions containing the life of plant).

6.2.3.2 If the 'hit' represents a new PTLAA add the issue to the "List of Oyster Creek PTLAAs" (Exhibit 1), under the source category of "Word Search".

6.2.3.3 Review licensing correspondence from 2004 to present, following steps 6.2.3.1. and 6.2.3.2.

6.3 Evaluation of Potential TLAAs to Identify TLAA Applicable to Oyster Creek

6.3.1 Review each PTLAA listed on Exhibit 1 against the six TLAA criteria defined in 10CFR 54 to determine if a PTLAA qualifies as a TLAA. Use the CLB Database to find additional information if necessary. Record the evaluation results on Exhibit 1.

6.3.2 Some PTLAAs may require a more detailed evaluation to determine if they qualify as a TLAA. Document these evaluations in the TLAA Report described in Section 6.6.

6.3.3 Add each PTLAA that is determined to be a TLAA to the Oyster Creek TLAA List (Exhibit 4).

6.4 Disposition of Each TLAA in Accordance with the License Renewal Rule

6.4.1 Evaluate each TLAA in Exhibit 4 and determine the appropriate disposition for each TLAA in accordance with10CFR54.21(c) as described in paragraph 4.5 above. TLAA can be demonstrated to acceptable for the period of extended operation in three ways:

- verify the current analysis is valid for the extended period of operation
- extrapolate or re-analyze the results of the current analysis
- provide adequate aging management

6.4.2 Record the results of the disposition on Exhibit 1 and Exhibit 4.

6.4.3 Provide the following information in accordance with NEI 95-10:

- A list of the time-limited aging analyses and exemptions applicable to the plant
- A description of the evaluation performed on each plant-specific TLAA and TLAA-related 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

6.5 Review of License Exemptions

6.5.1 Obtain all license exemption pursuant to 10 CFR 50.12 from Licensing.

6.5.2 Review each exemption to determine if it based on a TLAA (defined in 4.4)

6.5.3 Place the list of exemptions in the TLAA Report.

6.5.4 For each exemption based on a TLAA (if any), provide the basis for continuation of the exemption for the period of extended operation, using the approach provided in paragraph 6.4 above.

6.5.5 Place these justifications (if any) in the TLAA report.

6.6 Documentation of the Evaluation and Disposition Results in a TLAA Report

6.6.1 The disposition of each TLAA shall be documented in a TLAA report.

6.6.2 The TLAA report shall contain the sections specified in Exhibit 6. The report format shall be similar to those in previous LRA's so that the text can be readily used in the development of the TLAA Section (Section 4) of the Oyster Creek LRA.

6.6.3 The report shall be peer reviewed and approved.

7.0 Exhibits

Exhibit 1	List of OC PTLAAs
Exhibit 2	Oyster Creek CLB Database Sources
Exhibit 3	List of Search Words
Exhibit 4	List of OC TLAA
Exhibit 5	TLAA Report Format
Exhibit 6	Flow Chart -Development of Potential TLAA List Evaluation
Exhibit 7	Flow Chart –Evaluation and Disposition TLAA

Exhibit 1

List of Oyster Creek PTLAAs

	Source	Description	TLAA	Disposition	Comments
		Reactor Vessel Neutron Embrittlement			
	Generic	10 CFR 50 Appendix G Reactor Vessel Rapid Failure Propagation and Brittle Fracture Considerations: Charpy Upper-Shelf Energy (USE) Reduction and			
	Generic	Adjusted Reference Temperature Analysis; Operating Pressure-Temperature Limit (P-T Limit) Curves			
	Generic	RPV Circumferential Weld Examination Relief			
	Generic	Reactor Vessel Axial Weld Failure Probability			
		Metal Fatigue			
	Generic	Reactor Vessel Fatigue Analyses			
	Generic	Reactor Vessel Internals Fatigue and Embrittlement			
		Piping and Component Fatigue and Thermal Cycles			
	Generic	Fatigue Analyses of the Isolation Condenser System and Components			
	Generic	Fatigue Analyses of RCPB Piping; and Design Thermal Cycle Assumptions for Other RCPB lines			
	Generic	Assumed Thermal Cycle Count for Allowable Secondary Stress Range Reduction in Piping and Components			
	Generic	Effects of Reactor Coolant Environment on Fatigue Life of Components and Piping (Generic Safety Issue 190)			
	Generic	**Environmental Qualification of Electrical Equipment (EQ)**			
		Loss of Pre-stress in Concrete Containment Tendons (The Oyster Creek containment has no pre-stress tendons.)			

	Source	Description	TLAA	Disposition	Comments
		Containment Fatigue Analyses			
	Generic	Fatigue Analyses of Containment Pressure Boundaries: Analysis of Suppression			
	Generic	Fatigue Analysis of SRV Discharge Lines (Inside the Wetwell) and External Suppression Chamber-Attached Piping, and their Penetrations			
	Generic	Fatigue Analysis of SRV Discharge Lines (Inside the Wetwell) and External Suppression Chamber-Attached Piping, and their Penetrations			
	Generic	Expansion Joint and Bellows Fatigue Analyses: Drywell to Suppression Chamber Vent Bellows			
	Generic	Expansion Joint and Bellows Fatigue Analyses - Containment Process Penetration Bellows			

Exhibit 2
Oyster Creek CLB Database Sources

- Oyster Creek UFSAR
- Oyster Creek FDSAR
- NUREG 0822 (SEP)
- NUREG 1382 (SER for FTOL)
- Tech Specs and Bases
- Fire Hazard Analysis
- Quality Assurance Plan
- COLR
- OCDM
- Licensing Correspondence (1965 to 2004), including:
  - NRC SER's
  - Tech Spec Amendments
  - LERs
  - Responses to Generic Letters, Bulletins
  - NRC Inspections
  - Violation Responses

Exhibit 3
List of Search Words

40 years
Life of the Plant
Plant life
License term
Design life
Lifetime
License period
Component life
Equipment life
License term
EFPY
Effective Full Power Years
Life expectancy
Corrosion allowance
Qualified life
Thermal cycles
Fatigue Usage

Exhibit 4 List of Oyster Creek TLAAs

TLAA Category	Description	Disposition Category	Section
1.	**Neutron Embrittlement of the Reactor Vessel and Internals**		4.2
	Upper-Shelf Energy	§54.21(c)(1)(ii)	4.2.1
	Adjusted Reference Temperature Analysis	§54.21(c)(1)(ii)	4.2.2
	Pressure-Temperature (P-T) Limits	§54.21(c)(1)(ii)	4.2.3
	Elimination of Circumferential Weld Inspection	§54.21(c)(1)(ii)	4.2.4
	Axial Weld Failure Probability	§54.21(c)(1)(ii)	4.2.5
2.	**Metal Fatigue Analysis**		4.3
	Reactor Vessel Fatigue Analyses	§54.21(c)(1)(iii)	4.3.1
	Fatigue Analysis of Reactor Vessel Internals		4.3.2
	Core Shroud and Repair Hardware	§54.21(c)(1)(i)	4.3.2.1
	Reactor Coolant Pressure Boundary Piping and Component Fatigue Analysis		4.3.3
	Reactor Coolant Pressure Boundary Piping and Components Designed to B31.1, ASME Section III Class 2 and 3, or ASME Section VIII Class B and C	§54.21(c)(1)(i)	4.3.3.1
	Fatigue Analysis of the Isolation Condenser	§54.21(c)(1)(i)	4.3.3.2
	Effects of Reactor Coolant Environment on fatigue life of components and piping	§54.21(c)(1)(i) and §54.21(c)(1)(iii)	4.3.4
3.	**Environmental Qualification (EQ)**		
	Electrical Equipment EQ	§54.21(c)(1)(iii)	4.4
4.	**Concrete Containment Tendon Prestress Analysis**		4.5
5.	**Primary Containment, Attached Piping, and Components**		4.6
	Suppression Chamber, Vents, and Downcomers, EMRV Discharge Piping Inside the Suppression Chamber, External Suppression Chamber Attached Piping, Associated Penetrations, and Drywell-to-Suppression Chamber Vent Line Bellows	§54.21(c)(1)(i) and §54.21(c)(1)(iii)	4.6.1
	Containment Process Penetration Bellow Fatigue Analysis	§54.21(c)(1)(i) and §54.21(c)(1)(iii)	4.6.2
6.	**Other Plant-Specific TLAAs**		4.7

Exhibit 5

TLAA Report Format

1. Signature page for preparer and reviewer
2. Table of Contents
3. Introduction and Overview
4. Methodology
5. Disposition of Each TLAA
   5.1 Summary of Issue
   5.2 Current analysis results
   5.3 Disposition Evaluation
6. License Exemptions
   6.1 List of Exemptions
   6.2 Justifications
7. References

Exhibit 6

Development of Potential TLAA (PTLAA) List

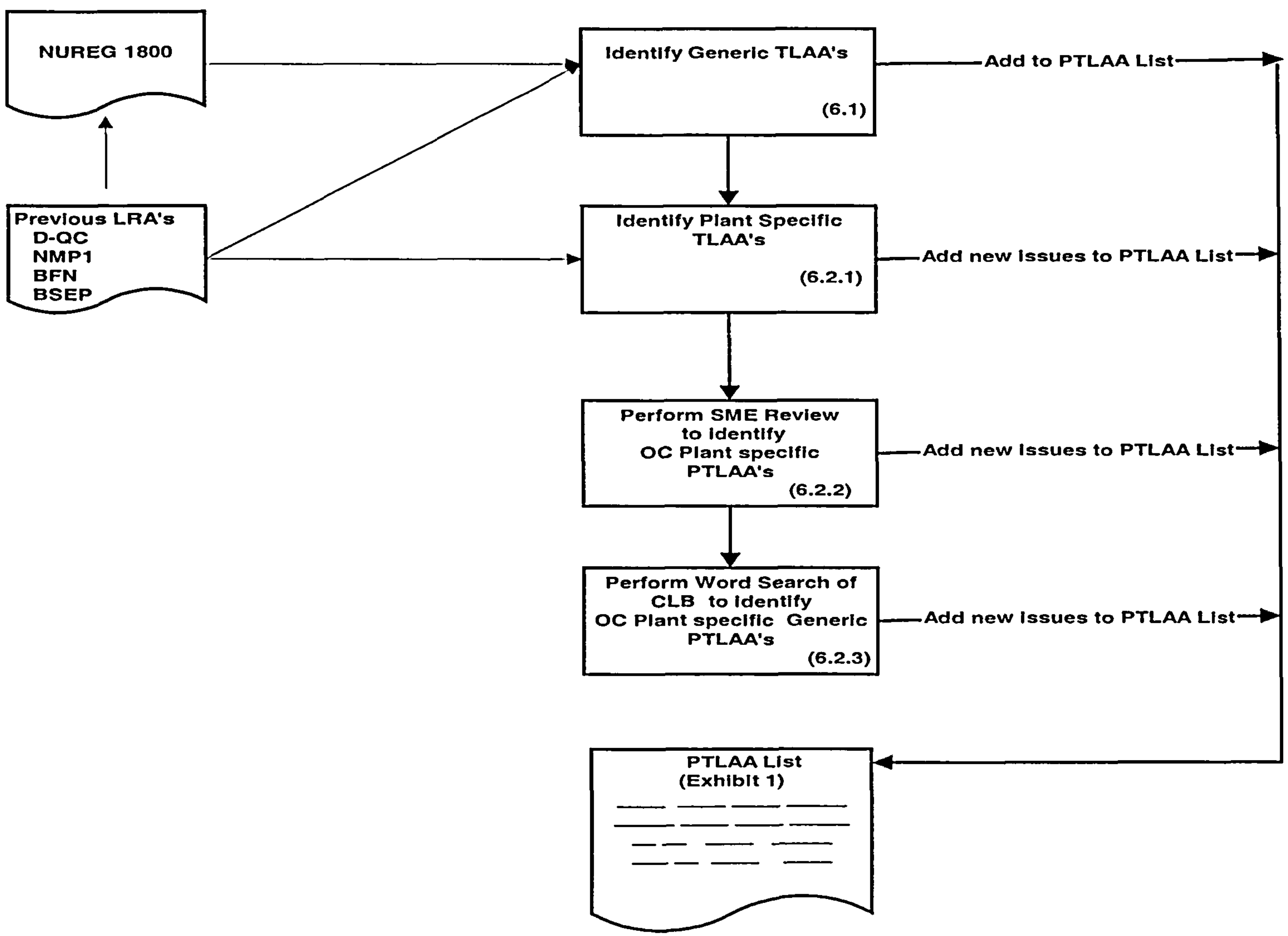
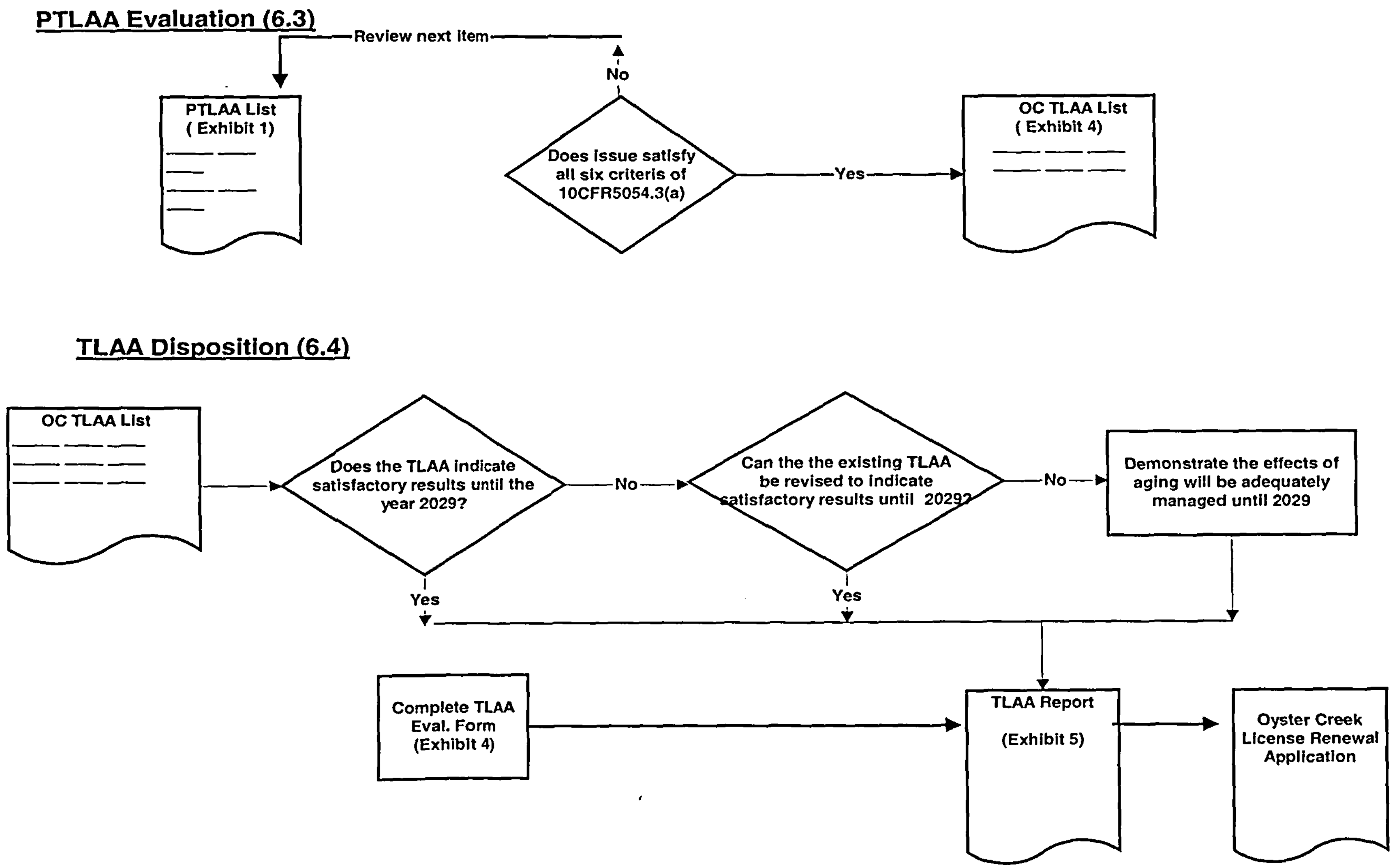


Exhibit 7
Evaluation and Disposition of TLAA's



Oyster Creek License Renewal Project
Project Level Instruction 8

Aging Management Program Reviews

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Mark Miller	Don Warfel	8/19/04
1	Al Fulvio/Lou Corsi	Mark Miller	Don Warfel	4/20/05
2	Lou Corsi	Mark Miller	Don Warfel	6/22/05
3	Shannon Rafferty	John Hufnagel	Don Warfel	9/08/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Added Guidance contained in Exhibits 2 and 3 and approval process prior to Plant Health Committee
2	Added or updated references to NEI and NUREG 1800 and 1801
3	Updated for formatting reasons.

1.0 Purpose

This instruction describes the procedural requirements for Aging Management Program Reviews that are prepared for the Oyster Creek License Renewal Project.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in preparing Oyster Creek License Renewal Aging Management Program Review documents.

3.0 References

3.1 10 CFR Part 54 – The License Renewal Rule
3.2 NEI 95-10 Rev. 5 - Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule
3.3 ER-AA-1100 "Implementing and Managing Engineering Programs"
3.4 ER-AA-2001 "Plant Health Committee"
3.5 PLI-1 "Preparation of Project Level Instructions and Position Papers"
3.6 PLI-5 "Aging Management Reviews"
3.7 PLI-11 "License Renewal Document Control"
3.8 RM-AA-101 "Records Management Program"
3.9 Draft NUREG-1800, January 2005
3.10 Draft NUREG-1801, January 2005

4.0 Definitions

None.

5.0 Prerequisites

None.

6.0 Instructions

6.1. Obtain an electronic copy of the most recent AMP that was done for the Dresden/Quad Cities LR project to use as a starting point for the review for the Oyster Creek LR project.

6.2. Compare the Dresden/Quad Cities NUREG-1801 program description with the actual NUREG to verify that it is exactly the same.

6.3. Identify and obtain Oyster Creek AMP related source documents and implementing procedures. Verify completeness of the list with the site and corporate program owners. Typical documents include:

Corporate procedures, site procedures, FASAs, Program Health Reports, SHIP Reports, System Manager Notebooks, Program Notebooks, Program Plans, Chemistry Notebook, NOS assessments, NRC reports, INPO reports. For operating experience, search CAPs.

6.4. Revise the Program Elements table to provide the Oyster Creek Basis for consistency with the GALL program description.

6.5. During the writing of the OC Basis, interaction with the site program owner will be necessary to obtain all of the information about how the site implements the program elements. Determine if the program is in the process of being revised. If it is undergoing revision, determine the timing of the change in relation to the timing of the LRA submittal. Compare the latest revision with the GALL program description.

6.6. Identify any gaps that may exist between the GALL program description and the current (or planned) implementation of the program at OC. These gaps are called "Exceptions to GALL". Use of the comments field is one way to capture the exceptions.

6.7. Identify options to resolve any "Exceptions to GALL". Draft the LRA Appendix A and Appendix B program description. See Exhibit 3 for format guidance.

6.8. Discuss the "Exceptions to GALL" closure options with the Site Lead License Renewal Engineer.

6.9. Discuss the proposed changes with the site program owner to obtain concurrence on the proposed change.

6.10. Discuss any new programs or program enhancements that are required for aging management with the affected site department management for approval and consideration for review by the Plant Health Committee.

6.11. As Aging Management Reviews (see PLI-5) are completed, incorporate their results into the Program document.

6.12. Finalize the Program document and LRA Appendix B description. This requires completion of the Aging Management Reviews that could possibly impact the Program document. If the results of the Aging Management Reviews change the Program commitments, consider the need for review by the Plant Health Committee.

6.13. Complete the initial approval for the Program document in accordance with PLI-11. This approval is to document completion of steps 6.1 through 6.12.

6.14. As required, obtain approval by the Plant Health Committee for any required program enhancements.

Note: The following steps may be completed after the LRA is submitted.

6.15. Identify all procedures and implementing activities that are required for the Program. Markup the changes required. Populate the procedure tracking list. Procedure revisions can be deferred until after NRC reviews of the LRA.
Refer to Exhibit 2 Aging Management Activity Implementation for guidance.

6.16. Create Commitment Tracking items for each program implementation requirement.

6.17. Complete the Implementing Activities section of the Program document.

6.18. Complete the final approvals for the Program document in accordance with PLI-11.

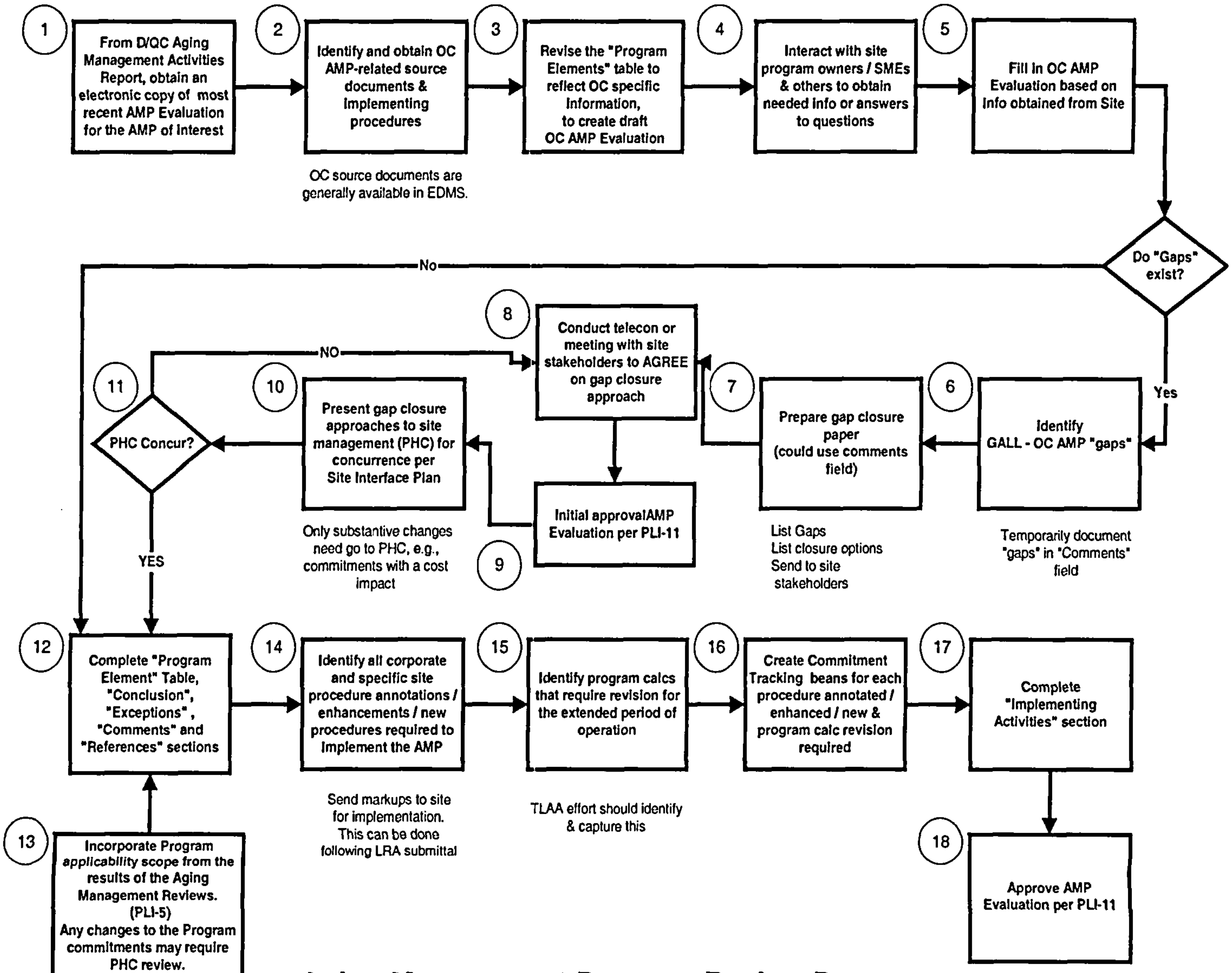
7.0 Exhibits

Exhibit 1 - Aging Management Program Review Process

Exhibit 2 – Aging Management Activity Implementation

Exhibit 3 - Format of LRA Appendix B Program descriptions

Exhibit 1 – Aging Management Program Review Process



Aging Management Program Review Process

Exhibit 2 – Aging Management Activity Implementation

Process:

Identify the aging management activities required for aging management; e.g. visual inspection, NDE examination, chemistry parameter limits, etc.

Find existing procedures, programs, or work orders that implement the activities

Verify that the existing procedures include the required scope, monitor the required parameters, and provide appropriate information about the detection of aging effects and acceptance criteria. Also, ensure that the frequency of the activity will result in adequate aging management

If there are no existing procedures for the required activities, then specify a solution; e.g. new procedure, work order, surveillance test, etc.

If the existing procedures are lacking, then enhance them

If the existing procedures are adequate, then only an annotation is required

Procedure implementation guidelines:

The procedures credited for license renewal need to be administratively controlled

The procedures need to implement the required aging management activities

You are done annotating when you have credited a step that will implement the activity

The annotation of the procedure ensures that it will not be deleted or altered without an evaluation of the commitment requirements

It is preferable to be able to credit corporate procedures and T&RM's for license renewal

Site procedures that implement corporate procedure requirements should be used if the corporate procedure lacks specificity for the required aging management activity

Preventive Maintenance work orders can be credited when no procedure requiring the activity exists or when the existing procedure does not provide for the specific aging management activity

Exhibit 3 – Format of LRA Appendix B Program descriptions

For NUREG-1801 programs, use the following format for LRA Appendix B:

Program Description
NUREG-1801 Consistency
Exceptions to NUREG-1801
Enhancements
Operating Experience
Conclusion

When there are no Exceptions, or Enhancements, include the paragraph heading and say "None".

For plant specific programs, use the following format for LRA Appendix B:

Program Description
Aging Management Program Elements (10 elements)
Enhancements
Conclusion

Oyster Creek License Renewal Project
Project Level Instruction 11

License Renewal Document Control

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Dave Honan	Don Warfel	7/12/04
1	George Beck	Dave Honan	Don Warfel	6/22/05
2	Louis J. Corsi	Stu Getz	Don Warfel	9/1/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Add review and approval requirements for Position Papers and Project Level Instructions; update references
2	Revised para. 6.2.2 and 6.2.4 for clarity

1.0 Purpose

This instruction describes the requirements for approvals and record retention of documents that are prepared for the Oyster Creek License Renewal Project.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in preparing Oyster Creek License Renewal Project documents.

3.0 References

3.1 10 CFR Part 54 – The License Renewal Rule
3.2 NEI 95-10 Rev. 5 - Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule
3.3 PLI-1 "Preparation of Project Level Instructions and Position Papers"
3.3 PLI-15 "License Renewal Document Change Request Process"
3.4 RM-AA-101 "Records Management Program"

4.0 Definitions

Record Copy: The original or copy of an authenticated record or document that is placed on file as the official copy and is turned over to Records Management for retention.

5.0 Prerequisites

None.

6.0 Instructions

6.1 Project Level Instructions contain the guidance for performing the tasks required to develop the License Renewal Application (LRA) and administrative functions. The list of Project Level Instructions which control the associated tasks is in PLI-1 "Preparation of Project Level Instructions and Position Papers".

6.2 The following approvals are required for License Renewal products:

6.2.1 Scoping Package: Preparer, Reviewer, Site Reviewer, LR Technical Lead

6.2.2 Screening Package: Preparer, Reviewer, Site Reviewer, LR Technical Lead
In some cases, the sign-off of the Aging Management Review form was used as concurrence of the Screening package.

6.2.3 Aging Management Reviews: Preparer, Reviewer, Site Reviewer, LR Technical Lead

6.2.4 Aging Management Program Reviews (10 Element): Preparer, Reviewer, Site Reviewer, LR Technical Lead

6.2.5 TLAA Report: Preparer, Reviewer, Site Reviewer, Site Engineering Director (If new commitment activities are identified), LR Technical Lead

6.2.6 Position Papers: Preparer, Reviewer, Site Reviewer (not required for all Position Papers. Site review may be documented in a PIMS evaluation), LR Technical Lead

6.2.7 Project Level Instruction: Preparer, Reviewer, LR Technical Lead

6.3 The initial issue of an approved document is revision 0. Any subsequent revisions are indexed with integers (i.e. 1, 2, etc.). Revisions are performed in accordance with PLI-15 "License Renewal Document Change Request Process".

6.4 The approvals for the Site Engineering Director and the LR Technical Lead may be delegated.

6.5 After initial Site Review approvals, subsequent site approvals are only necessary if the change is significant – i.e. the revision changes the conclusion of whether the system or structure is in scope or changes the commitments for implementing an aging management program.

6.6 The Record Copy of License Renewal documents shall be retained in accordance with RM-AA-101 "Records Management Program".

7.0 Exhibits

None

Oyster Creek License Renewal Project
Project Level Instruction 12

Training of License Renewal Project Team
And Site Personnel

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Tom Quintenz	Don Warfel	
1	George Beck	Dave Honan	Don Warfel	6/22/05
2	John Hufnagel	Dave Honan	Al Fulvio	8/18/05
3	Shannon Rafferty	John Hufnagel	Don Warfel	9/08/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Update references
2	Clarified Applicability Section and Step 6.2
3	Formatting Changes

1.0 Purpose

This instruction provides the guidance and requirements for the training of the License Renewal Project Team and Site personnel.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in preparing Oyster Creek License Renewal Project Documents and to Oyster Creek Site personnel in reviewing project products.

3.0 References

3.1 10 CFR Part 54 – The License Renewal Rule
3.2 NEI 95-10 Rev. 5 - Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule
3.3 PLI-1 "Preparation of Project Level Instructions and Position Papers"
3.4 Draft NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", January 2005
3.5 Draft NUREG-1801, "Generic Aging Lessons Learned (GALL) Report", January 2005

4.0 Definitions

None.

5.0 Prerequisites

None.

6.0 Instructions

6.1 Training for License Renewal Project Team members is accomplished in three formats: classroom instruction, reading packages, and peer instruction.

6.2 Classroom instruction is performed by a subject matter expert. There is a prepared lesson plan (or equivalent) which outlines the objectives and scope of the training session

6.3 Reading packages cover the large reference documents for License Renewal. The reader should become familiar with the general format and content of the documents. The required reading includes:

1. 10CFR54
2. NEI 95-10
3. NRC SRP NUREG 1800
4. GALL NUREG 1801
5. BWROG Training Manual
6. EPRI Tools – Mechanical, Structural, Electrical

6.4 Peer instruction is performed by team members when they have "piloted" a LR process and can share with the team their lessons learned. Also, team members that have performed the activities for previous license renewal projects will mentor the new project team members in the performance of license renewal activities. This type of training is basically ongoing throughout the project and is an integral part of the project.

6.5 A License Renewal Project Team Qualification form (Exhibit 1) shall be completed for each individual on the team. This form shall be signed by either the License Renewal Manager or the Project Team Technical Lead.

6.6 Project team personnel that have participated in previous license renewal projects may be deemed qualified for this project by virtue of that experience. The previous project would have similar training activities. This assessment is performed by the License Renewal Manager and is documented on the License Renewal Project Team Qualification form (Exhibit 1).

6.7 Site personnel training involves a familiarization with the license renewal activity product that they are reviewing. This is performed by the Site License Renewal Lead Engineer prior to the review activity. In addition, more generic license renewal process

training is given to the work groups that are involved in the process for the site. Documentation of site training is the responsibility of the Site License Renewal Lead Engineer.

7.0 Exhibits

Exhibit 1 License Renewal Project Team Qualification

Name:____

Initial Classroom Training Date:______________________

Instructor:__________________

Required Reading completed Date:______________________

Above training is waived because the individual has participated in a previous license renewal project, which had similar training activities:

Previous license renewal project:______________________________________

Qualification certification:

_______________________________________ is qualified to perform activities for the Oyster Creek License Renewal Project

_______________________________________ Date:___________________________

Manager or Technical Lead

Oyster Creek License Renewal Project
Project Level Instruction 15

License Renewal Document Change Request Process

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	H. D. Honan	Al Fulvio	D. B. Warfel	5-28-04
1	L. J. Corsi	Stuart Getz	D. B. Warfel	9-1-05
2	S. B. Rafferty	J. G. Hufnagel	D. B. Warfel	9-8-05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Revised Attachment A to clarify Aging Management Program Review and License Renewal Application.
2	Formatting and Reference Changes.

1.0 Purpose

This instruction describes the process to be used by Exelon to revise previously approved License Renewal documents. This includes, but is not limited to, Scoping, Screening and Aging Management Review packages, Position Papers, Project Level Instructions, and the Aging Management Program Review documents.

2.0 Applicability

This instruction applies to the Oyster Creek License Renewal Project organization personnel engaged in maintaining the accuracy of Oyster Creek License Renewal documents.

3.0 References

3.1 10 CFR Part 54 – The License Renewal Rule
3.2 NEI 95-10 Rev. 54 - Industry Guidance for Implementation of 10 CFR 54 - the License Renewal Rule
3.3 PLI-11 "License Renewal Document Control"
3.4 Draft NUREG-1800, January 2005
3.5 Draft NUREG-1801, January 2005

4.0 Instructions

4.1 If the need for a license renewal document change is identified, then the cognizant License Renewal Engineer shall initiate a License Renewal Change Request (LRCR, Attachment A). Revisions to license renewal documents may be necessary for any of several reasons, e.g.:

- New or revised NRC requirements
- Format, content or process lessons learned on prior work products
- Correction of errors or oversights
- Updating Procedures for commitment annotation
- Self Assessment Results
- Condition Reports
- Plant Modifications

- NRC Request for Additional Information (RAIs) & Exelon responses

- License Renewal Safety Evaluation Report (SER)

4.2 Process the LRCR as follows using Attachment A:

- Enter a description of the proposed change.

- Enter the reason for making the change (change driver) and the reference number of the document driving the change (e.g., CR No.), if applicable.

- Identify all the License Renewal documents that will need to be changed and the nature of the change(s) to each.

- Obtain concurrence from the Technical Lead for the proposed changes.

- Enter the change in the LRCR Log (Attachment B). Take the next sequential number and record that number on the LRCR.

4.3 Implement the proposed change following LRCR approval as follows:

- Make change(s) to the effected document(s) or the LR Database, as described in the approved LRCR.

- Advance the revision number of the effected document(s) to the next numerical revision level.

- Obtain a Peer Review from another License Renewal Engineer. The peer will verify the proposed changes were accurately incorporated, and verify that all impacted documents have been revised appropriately.

- If the change is considered significant, obtain a concurrence review from the cognizant subject matter expert and / or System Manager. Changes which bring a system into the scope of the Rule or change an aging management program (or its implementing procedures) are considered significant. Site Engineering Director signature is required if new commitment activities are identified.

- Update the LR Project commitment tracking mechanism (e.g., CTAI) if necessary.

- Obtain the approval of the Technical Lead on the revised document(s) and on the LRCR.

- Place a copy of the revised document(s) in the appropriate file. Mark the previous revision "Superseded".

Attachment A
License Renewal Change Request

LRCR No. ___________ **Initiated By:** ______________________________

Step	Action	Completed By /Date
1.	**Describe the requested change:**	
2.	**What is the basis for the change (change driver)?:**	
3.	**Describe how this change will effect:**	
3.1	Position Paper(s):	
3.2	Project Level Instruction(s):	
3.3	Scoping Package(s):	
3.4	Screening Package(s):	
3.5	Aging Management Review(s):	
3.6	Aging Management Program Reviews (10 Element Form)	
3.7	License Renewal Database:	
3.8	License Renewal Application Section(s): (including Sections 1 through 4 and Appendix A & B)	
3.9	License Renewal Commitment(s):	
4.	**Obtain Technical Lead concurrence.**	
5.	**Enter the Change into the LRCR Log.**	
6.	**Process the Change:**	
6.1	Make changes to all effected documents or the LR Database.	
6.2	Obtain a Peer Review of changed documents that verifies all impacted	

Attachment A
License Renewal Change Request

LRCR No. __________ **Initiated By:** ______________________________

Step	Action	Completed By /Date
	documents have been revised & commitment changes identified.	
6.3	The change was considered significant (changes the conclusion of the system or structure from in or out of scope of the rule or changes an Aging Management Program) and concurrence review from the site System Manager or SME was obtained. SysMgr/SME: ________________* Date of Concurrence: _______* (Name) *Enter "NA" if the change was not considered significant	
6.4	Identify and update the Commitment Tracking Mechanisms (i.e. Action Tracking, Implementing procedure, Predefine, etc.) as necessary: _________________, _________________, _________________, _________________, _________________, _________________,	
6.5	Print all affected documents for final approval	
6.6	Obtain Technical Lead Approval	
6.7	All completed forms have been filed with the affected document (Scoping, Screening & AMR Packages, etc.).	

Attachment B
License Renewal Change Request Log

LRCR No.	Init'd By	Tech Lead Concur	Change-Affected Documents (Yes/No):								Doc's Rev'd	Peer Review Complt	Change Appvd
			PLIs	PPs	Scoping Pkgs	Screen Pkgs	AMRs	AMPR	LRA	Commit-ments			
0001													
0002													
0003													

Safety Related Systems and Structures

Oyster Creek Nuclear Generating Station

License Renewal

Approval Page

Revision	Prepared by:	Checked by:	Approved by:
00	Louis J. Corsi	Mark Miller	Don Warfel
Date	1/08/04	1/21/2004	1/21/2004
01	Louis J. Corsi	Mark Miller	Don Warfel
Date	4/12/2005	4/22/2005	4/22/2005
02	Louis J. Corsi		
Date	6/21/2005		

Revision Summary

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Revised to agree with Changes to PP-1
2	Revised to make reference to latest NEI and Draft NUREG 1800 & 1801
3	
4	
5	

TABLE OF CONTENTS

1.0 Purpose

The license renewal rule 10 CFR Part 54 requires the licensee to include in the scope of license renewal review, all safety related systems or structures that fall within the scope of 10CFR54.4(a)(1):

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.

This position paper identifies the Oyster Creek Nuclear Generating Station (OCNGS) systems and structures that are included in the scope of license renewal under the above 10CFR54.4(a)(1) safety related scoping criteria. The required systems and structures are identified in Table 1.

Results of this paper (OC safety related systems), along with the output from paper PP-13 (design-basis events), will be used to populate the corresponding license renewal database field. Systems and structures listed will be answered "Yes" to scoping criteria 54.4(a)(1) for Safety Related.

This position paper is for the use of personnel engaged in the preparation, review, or approval of scoping evaluations in support of license renewal activities for Oyster Creek. Rational has been provided within this document for positions, which clarify classifications. This position paper will be used in conjunction with Project Level Instruction PLI-2, "Scoping of Systems and Structures. This paper documents the technical basis for the license renewal scoping conclusions, along with the methodology and CLB source documents used. It identifies which of the "License Renewal Systems & Structures", are required to support 10CFR54.4(a)(1) safety related functions, as described in the CLB.

2.0 Scope

The scope of this document are those systems and structures at OCNGS that are identified as **safety related** and included in the scope of license renewal in accordance with 10CFR54.4(a)(1).

Most components at OCNGS can be associated with a system or structure through design drawings or the Component Record List (Ref. 5). License renewal scoping is performed at the system and structure level. The scope of this review is therefore limited to the identification of systems and structures. The identification of individual components is not within the scope of this position paper.

Requirements for Safety Related

A safety-related system and structure 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:

1. The integrity of the reactor coolant pressure boundary;
2. The capability to shut down the reactor and maintain it in a safe shutdown condition; or
3. The capability to prevent or mitigate the consequences of accidents that could result in potential off-site 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, some systems, structures and components that do not perform any of the requirements of §54.4(a)(1) may have previously been designated as safety related. 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 considered for inclusion into the scope of the Rule using the criteria in §54.4(a)(2) and §54.4(a)(3). System and structure scoping under 10CFR54.4(a)(2) and 10CFR54.4(a)(3) are addressed in position papers PP-3, 4, 5, 6 and 7.

The following table is provided to help reviewers when going through historical documentation. Oyster Creek previously used quality classifications located in station documents which will be treated as equivalent in accordance with the below table:

New QA Class	New QC Code	New Definition	Old Classification	Old QC Code	Old Definition
Q	Q	Safety Related	NSR	1	Nuclear Safety Related
A	A	Augmented Quality	RR	2	Regulatory Required
N	N	Non-Safety Related	Other	3	Other

At OC, the current licensing basis (CLB) definition of safety related (Q) is provided in reference 6 and is as follows:

A structure, system or component shall be classified as Safety Related (Q) if designed to remain functional for all design basis conditions necessary to ensure:

- Integrity of reactor coolant pressure boundary,
- Capability to shutdown reactor and maintain it in a safe (hot) shutdown condition, or
- Capability to prevent or mitigate consequences of accidents which could result in potential off-site exposures comparable to guideline exposures of 10CFR100

This definition is nearly identical to the definition from 10CFR54.4(a)(1), with the following exceptions:

Design Basis Events

The Oyster Creek CLB definition refers to "all design basis conditions" while 10CFR54.4(a)(1) is more specific, referring to design basis events as defined in §50.49(b)(1). For Oyster Creek license renewal, position paper PP-13 will confirm that all applicable events are addressed.

Exposure Limits

The Oyster Creek CLB definition refers to 10CFR100 for accident exposure guidelines. The license renewal rule also references the guidelines in 10CFR50.34(a)(1) and 10CFR50.67(b)(2). The different guidelines appear in three different code sections to address similar accident analyses performed by licensees for different reasons. The guidelines in 10CFR50.34(a)(1) and 10CFR50.67(b)(2) are applicable to facilities seeking a construction permit and to facilities seeking to revise the current accident source term used in their design basis radiological analyses, respectively, and are not applicable to OCNGS.

The Oyster Creek CLB definition of safety related is consistent with the §54.4(a)(1) definition, and applies for purposes of identifying the safety related systems, structures and components that are in the scope of license renewal. This is consistent with NUREG-1800 section 2.1.3.1.1.

Items within the scope of the Quality Assurance Topical Report (QATR) are designated by a quality classification. This classification process produces a Component Record List (CRL), which identifies the permanent plant structures, systems, and components that are within the scope of the QATR and their specific classification. New Items to which the QATR applies shall be added to the Component Record List subsequent to their installation.

3.0 Methodology

The Quality Assurance Topical Report (QATR), as referenced in the OCNGS UFSAR, establishes measures that provide a graded approach to quality at Oyster Creek (Reference 4, Appendix F).

The scope of the QATR includes, but is not limited to, items and activities related to safe nuclear plant operation, protection of personnel, and protection of the public. To ensure consistency in identifying those items and activities within the scope of the QATR, a classification process has been developed and documented.

Items within the scope of the QATR are classified as "Nuclear Safety Related" (NSR) or "Augmented Quality." The classification process results are documented in the Component Record List (reference 5), which identifies the permanent plant structures, systems, and components that are within the scope of the QATR and their specific classification.

This classification of systems, structures and components at Oyster Creek is documented in the "QA Class" data field in the CRL. The "QA Class" data field is a controlled (design quality) field (reference 9). New Items to which the QATR applies are added to the Component Record List (CRL) subsequent to their installation. The classification of structures, systems, and components is subject to independent design review as part of the classification process. Specific guidance used for determining the appropriate QA classification is provided in Section 4.2.3 of reference 6.

The Oyster Creek UFSAR Section 17 references the Quality Assurance Topical Report which indicates that the Component Record List is the source document for identifying the list of safety related systems and structures. The first step to create this list was to download all of the Oyster Creek CRL components into to an Access database. The downloaded list of components was then filtered to identify only the Oyster Creek safety related "Q" components. The filtered list was then used to place a "Y" next to the appropriate ES-017 system name in Table 1.

The systems and structures identified in Table 1 are based on ES-17 system designations. When performing license renewal scoping in accordance with PLI-02 (reference 11), it will be necessary to first refer to PP-1 to determine which ES-17 systems or structures are included in the license renewal system or structure under review. The boundaries of each license renewal system will be determined during the scoping process based on system intended functions and other considerations. If any of the ES-17 systems or structures on Table 1 are included in the license renewal system or structure under review, then the Safety Related scoping question will be answered "Yes."

Position paper PP-13 was developed to cover the second aspect of 10CFR54.4(a)(1) regarding design-bases events (as defined as in 10 CFR 50.49 (b)(1)). The purpose of PP-13 is: (1) To confirm that abnormal operational transients (AOTs) are to be considered when conducting scoping for license renewal; and (2) To identify the OCNGS systems and structures relied on to mitigate the effects of internal and external events including abnormal operational transients, anticipated operational occurrences, and natural phenomena as described in the current licensing basis (CLB).

The conclusion is that Abnormal Operational Transients and other design-basis events as defined in 10 CFR 50.49(b)(1) are specifically required to be considered in conducting scoping for license renewal.

This position paper is considered a "living document" in that the CRL items will change as existing components may be downgraded or upgraded and may impact the system's as identified in this paper.

Conservative CRL Classifications

The conservative methodology used in this position paper results in a few instances where a system is classified as safety related even though the system has no safety related functions in the CLB. This is the result of some existing conservative system and component classifications in the CRL. The results of the review of these instances are documented in this section or in a scoping template for the system. The systems discussed below do not have any intended functions associated with 10CFR54.4(a)(1) license renewal scoping criteria.

<u>Containment Leak Rate Testing System 271</u>

This system designation does not represent an actual installed system at Oyster Creek. There are no CRL components in this system except the F MISC 271 system identifier. This system identifier "component" is conservatively classified as "Q" safety related. There are no safety related functions associated with this system, and so this system is not identified as safety related in Table 1.

<u>Drywell Cooling System 838</u>

The Drywell Cooling System is conservatively classified as safety related in the CRL. The system includes the following CRL items classified as safety related:

E	CBM	RF-1-1	480V MCC BREAKER FOR R.B. RECIRCULATION FAN RF-1-1
E	CBM	RF-1-2	480V MCC BREAKER FOR R.B. RECIRCULATION FAN RF-1-2
E	CBM	RF-1-3	480V MCC BREAKER FOR R.B. RECIRCULATION FAN RF-1-3
E	CBM	RF-1-4	480V MCC BREAKER FOR R.B. RECIRCULATION FAN RF-1-4
E	CBM	RF-1-5	480V MCC BREAKER FOR R.B. RECIRCULATION FAN RF-1-5
F	MISC	838	DRYWELL COOLING SYSTEM

The first five components are safety related circuit breakers located in safety related motor control centers. They are functionally provided to protect and isolate from the safety related power source, and do not provide a safety function related to the Drywell Cooling system. The breaker safety function is to protect the upstream electrical equipment. Electrical breakers are active for license renewal (reference 2, NEI 95-10, Appendix B), and are therefore not subject to aging management review.

The CRL "component" F MISC 838 is a system identifier representing the Drywell Cooling system. This system identifier "component" is conservatively classified as "Q" safety related. The Drywell Cooling system limits normal operating temperature in the

containment and is used to mix, cool and purge the gases in the containment during normal plant operation (reference 3, Section 6.2.1.1.2). There are no safety related functions associated with this system (reference 3, Section 9.4.2.2.2), and so this system is not identified as safety related in Table 1.

Service Air System 851

The UFSAR discusses the service air and instrument air systems as one system called Service and Instrument Air. UFSAR (reference 3) Section 9.3.1.3 indicates that the Service and Instrument Air System is not safety related, except for those portions associated with operation of certain valves (MSIVs, secondary containment isolation and Reactor Building to Torus Vacuum Breakers). The safety related portion of the air piping extends from the actuator of these valves to the associated isolation check valve including the piping to the air accumulator for each valve. These safety related parts of the system are supplied from the dried "control" air portion of the system, not from the Service Air system. On low air pressure, the Service Air system is automatically isolated.

There are no safety related CRL components in the Service Air system, except the F MISC 851 system identifier. This system identifier "component" is conservatively classified as "Q" safety related. The Service Air system is therefore not identified as safety related in Table 1.

The QCL and CRL need to be revisited since it states, "the Service Air System does not perform a safety function. It is being administratively classified NSR because the system includes containment isolation valves V-6S-0133 thru 0138 that isolate and must maintain containment integrity." The CRL currently shows that the valves are Q and have been renumbered to System 241 - Containment Spray System.

4.0 References

1. 10 CFR Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants.
2. Nuclear Energy Institute (NEI), NEI 95-10, Industry Guideline on Implementing the Requirements of 10 CFR Part 54, Revision 5.
3. OCNGS UFSAR, Revision 13, April 2003.
4. NO-AA-10, Quality Assurance Topical Report
5. Oyster Creek Component Record List (CRL)
6. EP-011 Methodology for Assigning and Maintaining the Quality Classification of Components.
7. Oyster Creek Generating Station Procedure ES-012, CRL Component ID, Data Format and Structure.
8. ES-017, Identification of Oyster Creek Plant Systems
9. EP-035, CRL Control
10. PP-13, Abnormal Operational Transients
11. PLI-02, Scoping of Systems and Structures
12. QCL 0-651-0002
13. QCL 0-651-0009
14. GE 237E566, Sheet 1, RPS Elementary Diagram
15. QCL 0-624-0000

16. Draft NUREG 1800, January 2005
17. Draft NUREG 1801, January 2005

5.0 Attachments
Table 1

SYSTEM CODE	SYSTEM NAME	Safety Related
080	SYSTEM FOR ISI AND FAC INSPECTIONS	Y (Note 1)
100	STRUCTURES & CIVIL WORK	
101	EQUIPMENT SUPPORTS	
102	BUILDING FOUNDATIONS	
103	STRUCTURAL STEEL	
104	PIPING AND PIPE SUPPORTS	Y
105	STRUCTURAL WALLS	
106	LADDERS, RAILS, STAIRS, & MISC	
110	SITE PREPARATION	
120	SITE IMPROVEMENTS/FACILITIES	
121	STORM SEWERS AND YARD DRAINAGE	
122	LANDSCAPING	
123	ROADS AND PARKING LOTS	
124	FENCING	
125	RAILROAD	
126	UNDERGROUND	
127	CANALS	
	STRUCTURES	
131	BLDG 1 - TRAINING (FR)	
132	BLDG 2 - TRAINING (FR)	
133	BLDG 3 - STORAGE (FR)	
134	BLDG 4 - STORAGE (FR)	
135	BLDG 5 - GARAGE (FR)	
136	BLDG 6 - WAREHOUSE (FR)	
137	BLDG 7 - WAREHOUSE (FR)	
138	BLDG 8 - TOOL STORAGE (FR)	
139	BLDG 9 - STORAGE (FR)	
140	BLDG 10 - STORAGE (FR)	
141	BLDG 11 - WAREHOUSE (FR)	
142	BLDG 12 - TRAINING (FR)	
143	BLDG 13 - STORAGE (FR)	
144	BLDG 14 - TRAINING (FR)	
145	BLDG 17 - COMBUSTIBLES (FR)	
146	BLDG 18 - CHEM LAB (FR)	
147	BLDG 20-CONCRETE TEST LAB (FR)	
148	BLDG 24 - COMMUNICATIONS (FR)	
151	TURBINE BUILDING	
152	TURBINE GENERATOR PEDESTAL	
153	REACTOR BUILDING	Y
154	OLD RADWASTE BUILDING	
155	NEW RADWASTE BUILDING	

SYSTEM CODE	SYSTEM NAME	Safety Related
156	MAIN OFFICE BUILDING	
157	DIESEL GENERATOR BUILDING	Y
158	HEATING BOILER HOUSES	
159	NEW FUEL STORAGE VAULT	
160	AUXILIARY OFFICE BUILDING	
161	SPENT FUEL STORAGE POOL	Y
162	MAINTENANCE BUILDING	
163	MATERIALS WAREHOUSE	
164	STACK	Y
165	SITE ADMINISTRATION BUILDING	
166	CONSUMABLE MATL/TOOL STRG	
167	PRETREATMENT BUILDING	
168	INTAKE STRUCTURE & CANAL	Y
169	CHLORINATION FACILITY	
170	DILUTION STATION	
171	CONDENSATE TRANSFER BUILDING	
172	EATING AND MEETING BUILDING	
173	CLEAN INSTRUMENT SHOP	
174	BREATHING AIR COMPRESSOR BUILDING	
175	AUGMENTED OFFGAS BUILDING	
176	FIRE PUMP HOUSES (ALL)	
177	SUBSTATION	
178	MAIN GUARD HOUSE	
179	NORTH GUARD HOUSE	
180	DISCHARGE STRUCTURE & CANAL	
181	WASTE STORAGE FACILITY	
182	CONTAMINATED INSTRUMENT SHOP	
183	FISH SAMPLE POOL BUILDING	
184	SITE EMERGENCY BUILDING	
185	NEW SAMPLE PUMP HOUSE	
186	EXPANDED SAFETY SYS FACILITY	
187	DRYWELL AND TORUS	Y
188	MICROWAVE BLDG (FR)	
189	NEW OFFICE BUILDING	
	SPECIAL PURPOSE ROOMS	
191	CONTROL ROOM	Y
192	CABLE SPREADING ROOM	Y
193	NEW CABLE SPRD RM & BRIDGE TNL	Y
194	SWITCHGEAR ROOM (480V)	Y
195	SWITCHGEAR ROOM (4160V)	Y
196	BATTERY ROOM A&B	Y
197	BATTERY ROOM C	Y
	RX PLANT SYSTEMS	

SYSTEM CODE	SYSTEM NAME	Safety Related
	ESF & RX AUXILIARY SYSTEMS	
211	EMERGENCY ISO CONDENSERS	Y
212	CORE SPRAY & AUTO-DEPRESS SYSTEM	Y
213	LIQUID POISON SYSTEM	Y
214	SHUTDOWN COOLING SYSTEM	Y
215	CLEANUP DEMINERALIZER SYSTEM	Y
216	REACTOR HEAD COOLING SYSTEM	Y
	RX COOLANT SYSTEM & COMPONENTS	
221	REACTOR VESSEL	Y
222	REACTOR INTERNALS	Y
223	RECIRCULATION SYSTEM	Y
224	RECIRCULATION PUMPS M/G SETS	
225	CONTROL ROD DRIVE SYSTEM	Y
226	FUEL ELEMENTS/CONTROL BLADES	Y
	RADIOACTIVE WASTE MGMT SYSTEMS	
231	AUGMENTED OFF-GAS SYSTEM	
232	LIQUID RADIOACTIVE WASTE SYS	
233	SOLID RADIOACTIVE WASTE SYS	
234	RADWSTE VOLUME REDUCT/SOLIDIFCAT	
	CONTAINMENT SYSTEMS	
241	CONTAINMENT SPRAY SYSTEM	Y
242	CONTAINMENT INERTING SYSTEM	Y
243	DRYWELL & SUPRESSION SYSTEM	Y
244	CONTAINMENT PENETRATIONS	Y
245	DRYWELL PERSONNEL AIRLOCK	Y
246	PENETRATION PRESSURIZATION SYSTEM	
	FUEL SYSTEMS	
251	SPENT FUEL POOL COOLING SYSTEM	Y
252	REACTOR FUEL HANDLING EQUIPMENT	
253	FUEL RACKS	
254	HIGH DENSITY POISON FUEL RACKS	
255	AUG SPENT FUEL POOL COOLING	Y
257	CASK DROP PROTECTION SYSTEM	
	REACTOR SERVICE SYSTEMS	
261	CRD DRIVE REBUILDING FACILITY	
262	MAINTENANCE & LIFTING EQUIPMENT	
	REACTOR PLANT INSPECTION SYSTEMS	
271	CONTAINMENT LEAK RATE TESTING	Note 2

SYSTEM CODE	SYSTEM NAME	Safety Related
	RADIOLOGICAL FACILITIES	
281	HEALTH PHYSICS & CHANGE FACILITIES	
282	SHIELDING	
283	COUNT ROOM & TLD FACILITIES	
284	RESPIRATOR CLEANING FACILITY	
	TURBINE PLANT SYSTEMS	
301	MAIN TURBINE	
302	MAIN CONDENSER	
303	MOISTURE SEPARATORS	
304	REHEATERS	
	TURBINE AUXILIARY SYSTEMS	
311	TURBINE LUBE OIL/PURIFICATION	
312	TURBINE STEAM SEAL SYSTEM	
313	TURNING GEAR & LIFT PUMP	
314	MHC FRONT STANDARD	
315	MAIN TURB EXHAUST HOOD SPRAY	
	TURBINE GENERATOR SERVICE SYSTEMS	
	CONDENSER AUXILIARY SYSTEMS	
331	STEAM JET AIR EJECTORS/OFF-GAS	
332	MECHANICAL VACUUM SYSTEM	
333	VACUUM PRIMING SYSTEM	
	STEAM & FEEDWATER SYSTEMS	
	STEAM SYSTEMS	
410	STEAM SYSTEMS	
411	MAIN STEAM SYSTEM	Y
412	REHEAT STEAM SYSTEM	
413	EXTRACTION (BLEED) STEAM SYSTEM	
	FEEDWATER & CONDENSATE SYSTEMS	
421	CONDENSATE SYSTEM	
422	FEEDWATER SYSTEM	Y
423	CONDENSATE DEMINERALIZER SYSTEM	
424	CONDENSATE TRANSFER SYSTEM	Y
	FEEDWATER HEATER DRAINS/VENTS	
431	HTR DRAINS, VENT/PRESS RELIEF	
	AUX. BOILERS & AUX. SYSTEMS	
441	AUXILIARY BOILER	
442	MAIN FUEL OIL STORAGE/TRANSFER	

SYSTEM CODE	SYSTEM NAME	Safety Related
443	FUEL OIL METERING/FILL SYSTEM	
444	AUX BOILER STEAM/CONDENSATE	
445	HEATING & PROCESS STEAM SYSTEM	
	WATER/WASTE TREATMENT SYSTEMS	
	WATER TREATMENT & DISTRIBUTION	
521	PRETREATMENT SYSTEM	
522	MAKEUP DEMINERALIZER SYSTEM	
523	DEMINERALIZED WATER TRANSFER	Y (Note 3)
	OPEN CYCLE COOLING WATER SYSTEM	
531	SERVICE WATER SYSTEM	
532	EMERGENCY SERVICE WATER SYSTEM	Y
533	SCREEN WASH SYSTEM	
534	NRW SERVICE WATER SYSTEM	
535	CIRCULATING WATER SYSTEM	
536	DILUTION SYSTEM	
	CLOSED CYCLE COOLING WATER SYSTEM	
541	RX BLDG CLOSED COOLING WATER	Y
542	TURB BLDG CLOSED COOLING WATER	
543	NRW CLOSED COOLING WATER	
544	AUG OFF-GAS CLSD COOLING WATER	
	SAMPLING SYSTEMS	
551	REACTOR SAMPLING SYSTEM	
552	TURBINE SAMPLING SYSTEM	
553	RADWASTE SAMPLING SYSTEM	
554	COMPOSITE SAMPLE SYSTEMS	
555	POST-ACCIDENT SAMPLING SYSTEM	Y
556	H2 DETECTION/SAMPLING SYSTEMS	
557	GAS SAMPLE SYSTEMS	
	CHEM ADD & CHEMISTRY CONTROL	
561	CHLORINATION SYSTEMS	
562	AUX BOILER CHEM ADD SYSTEM	
563	ACID ADDITION SYSTEM	
564	CAUSTIC ADDITION SYSTEM	
565	TBCCW CHEMICAL ADDITION SYSTEM	
566	RBCCW CHEMICAL ADDITION SYSTEM	
567	RX H2 WATER CHEMISTRY	
568	RX WATER ZINC INJECTION	
	SUMPS & WASTE COLLECTION	
571	TURB BLDG FLOOR & EQUIP DRAINS	

SYSTEM CODE	SYSTEM NAME	Safety Related
572	RX BLDG FLOOR & EQUIP DRAINS	
573	DRYWELL FLOOR & EQUIP DRAINS	Y
574	RADWASTE FLOOR & EQUIP DRAINS	
575	LAUNDRY AND LABORATORY DRAINS	
576	ROOF DRAINS/OVERBRD DISCHG SYSTEM	
577	MISCELLANEOUS BUILDINGS SUMPS	
578	CONDENSATE TRANSFER BLDG SUMPS	
579	MISCELLANEOUS OIL DRAINS	
	SEWAGE/INDUST WSTE TREATMENT	
581	SEWAGE LIFT STATION/SYSTEM	
	CHEMICAL CLEANING SYSTEM	
591	CHROMATE REMVL- NOT FUNCTIONAL	
592	DECON FACILITIES-TOOL STATIONS	
593	CHEM CLEANING/DECON FLUID SYSTEM	
	INSTRUMENTATION/CONTROL SYSTEMS	
	INSTRUMENT/CONTROL FACILITIES	
611	MAIN CONTROL ROOM PANELS	Y (Note 5)
612	RADWASTE CONTROL ROOM PANELS	
613	AOG OFF-GAS CONTROL RM PANELS	
614	LOCAL CONTROL/INSTRUMENT RACKS	Y (Note 5)
615	REMOTE SHUTDOWN PANEL	Y
616	PLANT ANNUNCIATOR SYSTEMS	
618	RELAY PANELS AND CABINETS	Y (Note 5)
	POWER CYC CONTROLS/INSTRUMENTS	
621	CORE MONITORING SYSTEM	Y
622	REACTOR PLANT INSTRUMENTATION	Y
623	TRAVELING IN-CORE PROBE SYSTEM	Y
624	TURB GEN CONTROL/MONITORING	Y (Note 6)
625	FEEDWATER CONTROL SYSTEM	Y
626	REMOTE SHUTDOWN CTRL/INSTR	
627	RECIRCULATION SYSTEM FLO CONTROL	
628	REACTOR MANUAL CONTROL SYSTEM	
629	RX OVERFILL PROTECTION (ROPS)	Y
	POWER CYCLE PROTECTION SYSTEMS	
641	REACTOR PROTECTION SYSTEM	Y
642	ENG SAFEGUARDS ACTUATION	Y
643	ALTERNATE ROD INSERTION (ATWS)	
	DATA ACQ/COMPUTER SYSTEM	
651	PLANT COMPUTER SYSTEM	Y (Note 4)

SYSTEM CODE	SYSTEM NAME	Safety Related
652	SEQUENCE OF EVENTS RECORDER	
653	ROD WORTH MINIMIZER	
654	CORE PARAM/FUEL MGMT COMPUTER	
655	SAFETY PARAMETER DISPLAY SYSTEM	
656	ENVIRONMENT TEMP MONITORING	
657	EMERGENCY DIESEL GEN DATA ACQUISITIONS	Y
	PLANT MONITORING SYSTEMS	
660	PLANT MONITORING SYSTEMS	
661	RADIATION MONITORING SYSTEM	Y
662	METEOROLOGICAL MONITORING SYSTEM	
664	POST-ACCIDENT MONITORING SYSTEM	Y
665	FIRE DETECTION SYSTEMS	
666	HYDROGEN & OXYGEN MONITORING	Y
	SECURITY SYSTEMS	
690	SECURITY SYSTEMS	
691	SECURITY COMPUTER SYSTEM	
	ELECTRICAL POWER SYSTEMS	
701	SWITCHYARD FACILITIES	
	PLANT ELECTRICAL GENERATION	
711	MAIN GENERATOR	
712	MAIN GENERATOR EXCITATION	
713	GENERATOR STATOR COOLING	
714	GENERATOR STATOR COOLING SYSTEM	
715	HYDROGEN SEAL OIL SYSTEM	
716	GENERATOR GAS CONTROL SYSTEM	
717	ISOLATED PHASE BUS SYSTEM	
	ELECTRICAL TRANSMISSION	
721	230KV BUS, LINES/ASSOC EQUIP	
722	34.5KV BUS, LINES/ASSOC EQUIP	
723	MAIN & AUXILARY TRANSFORMERS	
724	STARTUP TRANSFORMERS	
	DISTRIBUTION SYSTEMS	
731	4160V AC DISTRIBUTION SYSTEM	Y
732	480V AC DISTRIBUTION SYSTEM	Y
733	120VAC VITAL POWER SYSTEM	Y
734	MISC POWER/LIGHTING PANELS	
735	125V STATION DC SYSTEM	Y
736	24/48V INSTRUMENT POWER DC SYSTEM	Y
737	480/208/120V UTILITY NON-VITAL	

SYSTEM CODE	SYSTEM NAME	Safety Related
	EMERGENCY POWER SYSTEMS	
741	DIESEL GEN/EQUIP(ELECTRICAL)	Y
742	PLNT COMP/TECH SUPP CTR UPS	
743	STATION BLACKOUT & SUPPORT SYSTEMS	
	ELECTRICAL PROTECTIVE SYSTEMS	
751	GROUNDING SYSTEM	
752	LIGHTNING PROTECTION SYSTEM	
753	CATHODIC PROTECTION SYSTEM	
754	ELECTRICAL HEAT TRACE SYSTEMS	
	PLANT LIGHTING SYSTEMS	
761	NORMAL LIGHTING & CONVENIENCE	
762	EMERGENCY LIGHTING SYSTEM	
763	SECURITY LIGHTING	
	ELECTRICAL COMODITIES	
770	CABLE, RACEWAY & CONDUIT	
771	CONDUIT	Y (Note 5)
772	CABLE TRAYS	Y (Note 5)
773	UNDERGROUND DUCT BANKS	
774	PRI CONTAINMENT ELECT PENETR	Y (Note 5)
775	CABLE ROUTING AND TERMINATION (Non System Engineered Item	Y
	PLANT COMMUNICATION SYSTEMS	
781	PLANT TELEPHONE SYSTEMS	
782	PUBLIC ADDRESS/PAGE SYSTEM	
783	SOUND POWERED PHONE SYSTEM	
784	ENS (NRC) & EMERG. TELEPHONE	
785	SURVEILLANCE/INSTRUMENT PHONE	
786	WORK SHIFT ANNUNCIATOR SYSTEM	
787	RADIO COMMUNICATIONS SYSTEM	
788	DRYWELL VIDEO MONITORING	
	MISCELLANIOUS PLANT SYSTEMS	
801	MACHINE SHOP	
	FIRE PROTECTION SYSTEMS	
811	FIRE PROTECTION WATER SYSTEM	
812	FIRE PROTECTION CO2 SYSTEM	
813	FIRE PROTECTION HALON SYSTEM	
814	FIRE BARRIERS/DIKES/PENETRATIONS	
815	FIRE PROTECTION WATER SYSTEMS - FORKED	

SYSTEM CODE	SYSTEM NAME	Safety Related
	RIVER	
816	FIRE PROTECTION HALON SYSTEM-BUILDING 14 SIMULATOR	
817	FR SITE FIRE ALARM DETECT SYSTEM	
818	FR SITE FIRE DAMPER AND PENENTRATIONS	
819	FR SITE MISC FIRE EQUIPMENT	
	HVAC SYSTEMS	
821	TURB BLDG VENTILATION	
822	RX BLDG VENTILATION	Y
823	MAIN OFFICE BUILDING HVAC	Y
824	AUXILIARY OFFICE BUILDING HVAC	
825	MATERIALS WAREHOUSE HVAC	
826	CONTROL ROOM HVAC	Y
827	MAIN GUARD HOUSE HVAC	
828	NORTH GUARD HOUSE HVAC	
829	MAINTENANCE BUILDING HVAC	
830	CLEAN INSTRUMENT SHOP HVAC	
831	COMPUTER ROOM HVAC	
832	EATING & MEETING BUILDING HVAC	
833	MOBILE MAINT FACILITY HVAC	
834	OLD RADWASTE BUILDING HVAC	
835	NEW RADWASTE BUILDING HVAC	
836	HEATING BOILER HOUSE HVAC	
837	AUGMENTED OFF-GAS BLDG HVAC	
838	DRYWELL COOLING SYSTEM	Note 2
839	C BATTERY ROOM HVAC	
840	CHLORINATION BUILDING HVAC	
841	WASTE STORAGE FACILITY HVAC	
842	CONTAMINATED I&C SHOP HVAC	
843	SITE EMERGENCY BUILDING HVAC	
844	MISCELLANEOUS HVAC	
846	OFFICE BLDG CHILLED WATER SYSTEM	
847	MACHINE SHOP & STORAGE BUILDING HVAC	
848	FR SITE BLDG 14 SIMULATOR	
	COMPRESSED AIR & GAS SYSTEMS	
851	SERVICE AIR SYSTEM	Note 2
852	INSTRUMENT (CONTROL) AIR	Y
853	BREATHING AIR SYSTEM	
854	NITROGEN SUPPLY SYSTEM	Y Note 7
855	DOMESTIC WATER COMPRESSED AIR	
856	RADWASTE SERVICE AIR	
857	RADWASTE CONTROL AIR	
858	CHEMICAL LAB AUXILIARY GASES	

SYSTEM CODE	SYSTEM NAME	Safety Related
	DIESEL GENERATOR SYSTEMS	
861	DIESEL GEN/EQUIP (MECHANICAL)	Y
862	DIESEL GEN FUEL OIL STOR/TRANSFER SYSTEM	Y
	PLUMBING SYSTEMS	
871	DOMESTIC WATER SYSTEM	
872	PLUMBING & DRAINAGE SYSTEMS	
873	EYEWASH STATIONS (PORTABLE)	
	CRANES/MATL HANDLING EQUIP	
881	TURBINE BLDG 150/40-TON CRANE	
882	REACTOR BLDG 100/5-TON CRANE	
883	TB ROOF/HEATER BAY CRANE	
884	NRW BUILDING CRANES/HOISTS	
885	MAINTENANCE BUILDING CRANE	
886	WASTE STORAGE FACILITY CRANE	
887	INTAKE STRUCTURE CRANE	
888	MISCELLANEOUS AUXILIARY CRANES	
	ELEVATORS AND MANLIFTS	
891	ELEVATOR, TURBINE BUILDING	
892	ELEVATOR, REACTOR BUILDING	
893	ELEVATOR, OFFICE BUILDING	
894	MANLIFTS	
	SPECIAL-NO COMPONENTS ASSIGNED	
910	PROTECTIVE COATINGS	
911	FIRE HAZARDS ANALYSIS	
912	SIMULATORS	
913	MEASURING AND TEST EQUIPMENT	
915	INDEPENDENT SPENT FUEL STORAGE	
920	DECOMMISSIONING MECHANICAL	
921	DECOM ALT SPENT FUEL POOL CLNG	
922	DECOM AIR COOLED COOLING WATER	
930	DECOMMISSIONING ELECTRICAL	
931	DECOMMISSIONING ELECT 4160V	
932	DECOMMISSIONING ELECT 480V	
933	DECOMMISSIONING ELECT 120V	
999	DUMMY CHARGE NUM JO CLOSING	
NA	Hardened Vent System	
NA	Noble Metals Monitoring System	
NA	Offgas Building Floor and Equipment Drains	
NA	Torus Water Storage and Transfer	
NA	Ultimate Heat Sink	

Table 1 Notes

1. This ES-17 system number represents plant activities and does not include systems, structures or components.

2. See position paper Section 3 (Conservative CRL Classifications) for a detailed discussion of this system.

3. <u>Demineralized Water Transfer System 523</u>

The Demineralized Water Transfer System is conservatively classified as safety related in the CRL. The system includes the following CRL items classified as safety related:

P V V-12-217 DEMINERALIZED WATER DRAIN VALVE @ PENETRATION X-023
P V V-12-60 DEMINERALIZED WTR DRYWELL SUPPLY ISOLATION VALVE

P P 523 DEMINERALIZED WATER TRANSFER SYSTEM-PIPING

F MISC 523 DEMINERALIZED WATER TRANSFER SYSTEM-12,WD

The first two components are manual safety related valves associated with the primary containment penetration X-23. The safety function of these valves is imposed by the primary containment function. These valves do not provide a safety function related to the Demineralized Water Transfer system.

The CRL "component" P P 523 is a generic component representing the Demineralized Water Transfer system piping. The Demineralized Water Transfer system pumps, valves and other components are not classified as safety related. With the exception of piping associated with the above containment penetration, the Demineralized Water Transfer system piping does not have any safety related functions and does not need to be classified as safety relayed.

The CRL "component" F MISC 523 is a system identifier representing the Demineralized Water Transfer system. This system identifier "component" is conservatively classified as "Q" safety related. There are no safety related functions associated with this system (reference 3, Section 9.2.3.2.3).

4. <u>Plant Computer System 651</u>

The Plant Computer System is conservatively classified as safety related in the CRL. The system includes the following CRL items classified as safety related:

E MISC PC1 ANALOG ISOLATOR CABINET + 'LAMBDA' POWER SUPPLY
E PNL PC2 DIGITAL ISOLATOR TERMINAL CABINET (IN NCSR)

E MISC PC3 ANALOG ISOLATOR CABINET + 'LAMBDA' POWER SUPPLY
E PNL PC4 DIGITAL ISOLATOR TERMINAL CABINET

E PNL PNL-651-1 ANALOG ISOLATION SUB-SYS SEC 2/3 OF TRW CNTRLS CAB
E PNL PNL-651-2 DIGITAL ISOLATION SUB-SYS SEC 5 OF TRW CNTRLS CAB

F MISC 651 PLANT MONITORING COMPUTER SYSTEM

The first 4 CRL items, panels PC1, 2, 3 and 4, are classified safety related based on the safety function of the isolators inside the cabinets. The isolators are connected to safety related inputs. They serve as isolation devices and prevent failures in the plant computer from degrading the safety function of safety related items. The isolator safety function is to protect the upstream electrical equipment. Electrical isolators are active for license renewal (reference 2, NEI 95-10, Appendix B), and are therefore not subject to aging management review. The host system 651 has no safety function (reference 12).

Similarly, panels PNL-651-1 and PNL-651-2 are conservatively classified safety related. The quality classification report (reference 13) for these panels indicates that the system does not perform a safety function, but interfaces with safety related systems. The system was conservatively classified safety related, based on the safety related isolators in panels PC1, 2, 3 and 4 described above. These isolators are the only safety related components in the system.

The CRL "component" F MISC 651 is a system identifier representing the Plant Computer system. This system identifier "component" is conservatively classified as "Q" safety related. There are no safety related functions associated with this system (reference 12, 13).

5. These items are treated under electrical commodities.

6. System 624 Turbine Gen Control/Monitoring

   The Turbine Gen Control/Monitoring System is conservatively classified as safety related in the CRL. The system includes the following CRL items classified as safety related:

V-58-9	PSL-A ISOLATION VALVE
V-58-14	PSL-D ISOLATION VALVE
V-58-13	PSL-C ISOLATION VALVE
V-58-11	PSL-B ISOLATION VALVE
V-58-10	PSL-A DRAIN VALVE

624 TURBINE GENERATOR CONTROL & E/H CONTROL SYSTEM

The valves are instrument valves associated with turbine hydraulic system low pressure switches that open on low pressure to signal a turbine trip to RPS. Failure of the valve passive pressure boundary would result in the trip so these valves do not have a pressure boundary intended function. Although these valves are conservatively classified Q to allow flow to the RPS instruments, these valves do not have a safety related function and do not need to be included in the scope of license renewal.

The CRL "component" 624 is a system identifier representing the Turbine Gen Control/Monitoring system. This system identifier "component" is conservatively classified as "Q" safety related based on the above valves. There are no other safety related functions associated with this system (reference 14, 15).

7. System 854 Nitrogen Supply System - The Nitrogen Supply System license renewal system functionally includes the TIP indexer nitrogen purge line. This line includes safety related containment isolation valves, which, prior to 1998, were included in PIMS under the non-safety related Nitrogen Supply PIMS system number 854. Although functionally these valves support the Nitrogen Supply System TIP indexer nitrogen purge, they were reassigned in PIMS to the Containment Inerting PIMS system number 242 because this system was classified as safety related. This change was documented in QCL Report No. 0-242-0012. The Nitrogen Supply System functionally supports, and works in conjunction with, the Containment Inerting System.

Criteria for Scoping Systems and Structures Relied Upon to Demonstrate Compliance With 10CFR54.4 (a)(2)

Oyster Creek License Renewal Project

Approvals

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Revision Summary

Rev. No.	Required Changes to Achieve Revision
0	Initial Issue
1	Revised to include 10CFR54.4(a)(2) scoping criteria for OC SSCs
2	Incorporate LRCR #151, add criterion 6 in LRA page 2.1-21
3	Incorporate LRCR #190

TABLE OF CONTENTS

1. Purpose

This position paper provides criteria for identifying Oyster Creek Nuclear Generating Station (OCNGS) systems, structures, and components (SSCs) required to be included in the scope of license renewal to satisfy 10CFR54.4(a)(2) requirements. The paper documents technical basis for license renewal scoping conclusions, along with the methodology and Current Licensing Bases (CLB) documents used to develop the criteria.

The position paper is for use by personnel engaged in the preparation, review, or approval of scoping evaluations in support of OCNGS license renewal activities. This position paper will be used in conjunction with PLI-02, "Scoping of Systems and Structures"

2. Scope

This position paper applies to all non safety-related Systems, Structures, and Components (SSCs) whose failure could prevent satisfactory accomplishment of the applicable functions of the SSCs identified under 10CFR54.4(a)(1).

3. Definitions

Anchor – A seismic anchor or three mutually perpendicular restraints as defined in Specification SP-1302-12-294.

Hazard – Non-safety related SSC whose failure could result in a spatial or structural interaction with safety related active or passive SSC.

Safety Related System – Refer to PP-02, 54.4(a)(1) Safety Related Systems

Spatial interaction – This term refers to the effect(s) of non-safety related system, structure or component (SSC) failure on safety related component, such as Pipe Whip, Jet Impingement, General flooding, Spray, and displacement/Falling

Structural interaction - Occurs in situations where a non-safety related piping system physically connects to a safety related system and the non safety related system is relied upon to provide physical support to the safety related system up to and including an anchor, as defined in the current CLB.

Target – Active and passive components that perform an intended function described in 10CFR54.4 (a)(1).

4. Methodology

4.1 10CFR54.4 (a) Requirements

Section 54.4(a)(2) of License Renewal Rule, requires that all non-safety related systems, structures, and components (SSCs) whose failure could prevent satisfactory accomplishment of the applicable functions of SSCs identified under 10CFR54.4 (a)(1) be included in the scope of license renewal. The Statements of Consideration (SOC) of the Rule provides additional guidance related to this scoping Criterion. Specifically SOC states that " To limit this possibility for the scoping category relating to non safety-related systems, structures, and components... An applicant for license renewal should rely on the plant's Current Licensing Basis (CLB), actual plant-specific experience, industry-wide experience, as appropriate, and existing engineering evaluations to determine those non safety-related systems, structures, and components that are the initial focus of the license renewal review. 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" (Ref. 5.5)

4.2 NRC Staff Position on 10CFR54.4(a)(2) Scoping Criterion

The NRC Staff issued Interim Staff Guidance, ISG-09, to document its position on scoping requirements for 10CFR54.4(a)(2). The guidance requires that a distinction be made, when demonstrating that failures of non safety-related SSCs would not adversely impact on the ability to maintain intended functions, between non safety-related SSCs that are connected to safety-related system and, non safety related SSCs that are not connected to safety-related systems. For a non safety-related SSC that is connected to a safety-related SSC, the non safety-related SSC should be included in within the scope of license renewal up to the first seismic anchor past the safety/non-safety interface.

For non safety-related SSCs which are not connected to safety-related piping or components or are beyond the first seismic anchor past the safety/non-safety interface, but have a spatial relationship such that their failure could adversely impact on the performance of a safety-related SSC's intended function, the applicant has two options when performing its scoping evaluation; a mitigative option or a preventive option. When mitigative features (e.g., pipe whip restraints, jet impingement shields, spray and drip shields, seismic supports, flood barriers) are provided to protect safety-related SSCs from failures of non safety-related SSCs, this demonstration should show that mitigating devices are adequate to protect safety-related SSCs from failures of non safety-related SSCs regardless of failure location (consideration can be give to the likelihood of failure at a particular location based on sound engineering judgment). If this level of protection can be demonstrated, then only the mitigative features need to be included within the scope of the scope of license renewal. However, if an applicant cannot demonstrate that the mitigative features are adequate to protect safety-related SSCs from the consequences of

failures of non safety-related SSCs, then the applicant should utilize the preventive option, which requires that the entire non safety-related SSC be brought into the scope of license renewal.

4.3 Implementation of 10CFR54.4(a)(2) Requirements for OCNGS License Renewal

The identification of SSCs that satisfy 10CFR54.4(a)(2) criterion is based on the review of applicable CLB documents, plant specific and industry operating experience. The preventive option described in ISG-09 is primarily utilized to demonstrate that safety related SSCs are adequately protected from failure of non safety-related SSCs. A limited number of non safety-related mitigative features, such as missile barriers, flood barriers, and spray shields, are credited in the CLB (Ref. 5.1, 5.2), for the protection of safety related SSCs. These mitigative features are also included in the scope of license rule per 10CFR54.4 (a)(2) and evaluated as structural components.

The spaces approach is utilized for scoping of non safety-related SSCs to satisfy 10CFR54.4(a)(2) and ISG-09 criteria. The approach consists of identifying structures that house safety related SSCs based on the CLB safety classification of the structure (e.g. Seismic Class I), by reviewing the CRL component location field, and by reviewing design drawings. As a result the following license renewal structures are identified as containing safety related SSCs.

- Primary Containment
- Reactor Building
- Emergency Diesel Generator Building
- Exhaust Tunnel
- Heating Boiler House (old boiler house)
- Office Building (rooms that house safety related SSCs only)[1]
- Turbine Building

A general walkdown of other plant structures, by experienced design engineering and license renewal personnel, was performed to confirm that only these structures house safety related SSCs.

For each structure listed above, a conservative approach is taken by including the entire structure, structural components, and component supports in the scope of license renewal. Structures and structural components classified safety related in the CLB are included in the scope of 10 CFR 54.4(a)(1), and non-safety related structures, structural components, and component supports are in scope for 10 CFR 54.4(a)(2). Scoping of mitigative features described in NRC Staff ISG-09, non-safety related piping connected to safety related piping, spatial interaction (spray), seismic II/I, and Cranes and hoists housed inside the structures is discussed in detail below.

[1] Battery Room, 480V Switchgear room, and Recirculation MG-Set Room

4.4 Non Safety-Related Mitigative SSCs Identified in The CLB

4.4.1 Missiles Barriers. SSCs that provide missile barrier protection are mostly classified safety related structures in the CLB and are in scope of license renewal per 10CFR54.4(a)(1). However some non safety-related walls of the turbine building are credited for missile protection of the control room, and the 4160 switchgear room (Ref. 5.1, Section 3.5.1.3 and Table 3.5-1) and calculation No. 72-01-01 (Ref. 5.25). These walls are in scope of license renewal per 10CFR54.4 (a)(2).

4.4.2 Flood Barriers. Non safety-related flood protection features, such as walls, dikes, curbs, and seals, are included in the scope of license renewal per 10CFR54.4(a)(2). These features are evaluated as a commodity with structures in which they're located.

CLB References. UFSAR (Ref. 5.1, Section 2.4, 3.4) and NUREG-1382 (Ref. 5.20, Section 3.4) require that safety related SSCs be protected against external design basis flood (probable maximum precipitation). Flood level is established to be elevation 23.5 feet. Internal flooding is discussed throughout the UFSAR (e.g., HELB, actuation of fire protection system, etc.), in NUREG-1382 (Ref. 5.20, Section 3.4), and in Fire Hazard Analysis Report (Ref. 5.2, Appendix A, E.3). Non safety-related design features (walls, slabs, curbs, drains, and seals) are credited for protecting safety-related SSCs from external and internal flooding. The features are included in the scope of 10CFR54.4(a)(2).

4.4.3 Spray Shields. Spray shields are included in the scope of license renewal per 10CFR54.4(a)(2). Spray shields are included as a commodity with structures in which they're located.

CLB References. Spray shields are provided in the CLB (ref. 5.2, Appendix A, E.3) to protect safety-related components from inadvertent operation or failure of fire protection water system.

4.5 Structural Interaction: Non Safety-Related Piping Connected to Safety-Related Piping

The design basis for OCNGS piping systems is based on ANSI B31.1, 1955 Edition, with supplements, addenda and applicable code cases as of 1966. Consistent with this Code requirements, the original design specifications required a dynamic analysis for Class 1 pipe 10 inches IPS and larger, and a static analysis using seismic design coefficients for the smaller pipe. Above ground large pipe systems, within the scope of NRC IE Bulletin 79-14, were evaluated based on ANSI B31.1 1983 Edition through winter 1984 Addenda. Stress analysis was conducted using full three-dimensional models, with modal combinations and directional combination in accordance with Regulatory Guide 1.92. For these systems, pipe stress analysis is based on criteria documented in engineering specifications (Ref. 5.7, 5.22). Specification (Ref. 5.7) requires that mechanical boundaries, as well as, structural

boundaries be established. The mechanical boundaries typically occur at a valve or another mechanical component. The structural boundaries extend beyond the mechanical boundaries to incorporate an anchor or three mutually perpendicular restraints. For other large and small piping systems, there are no specific requirements in the CLB for anchors or three mutually perpendicular restraints.

Therefore scoping methodology for non-safety related piping connected to safety related piping is based on the criteria below. However the application of the criteria is limited because most non-safety related piping systems connected to safety related piping systems are in scope of 10CFR54.4(a)(2) for spatial interaction (e.g. leakage/spray).

4.5.1 If a non-safety related piping system is connected to a safety related piping system, the non-safety related system is conservatively assumed to provide structural support to the safety related system. This applies to water, steam, oil, and air/gas piping systems. Instead of attempting to locate seismic anchors or three mutually perpendicular restraint, the entire non-safety related system is included in the scope of 10CFR54.4(a)(1) or 10CFR54.4(a)(2), or the system boundary is extended to one of the following:

4.5.1.1 Major plant equipment, such as pumps, heat exchangers, or turbines. The equipment is included in scope of 10CFR54.4(a)(2)

4.5.1.2 Anchored to a wall or slab. The wall or slab are included in scope of 10CFR54.4(a)(1) or (a)(2).

4.5.1.3 The non-safety related line exits a structure and then routed underground

4.5.1.4 Up to a flexible hose or flexible joint that is not capable of load transfer.

4.5.1.5 Locate a seismic anchor or a three mutually perpendicular restraint using design drawings or by a walkdown

4.5.1.6 The end of the piping run (e.g., vent and drain lines)

4.6 Spatial Interaction: Non Safety-Related Piping Not Directly Connected to Safety-Related Piping

4.6.1 Systems and Components containing Air/Gas. Air and gas systems (non-liquid) have been determined not to have spatial interactions with safety-related SSCs (Ref. 5.4). Thus the systems (except those portions required for structural support) are not included in the scope license renewal for 10CFR54.4(a)(2). Thus the systems have no leakage boundary function; but have a structural support function. Supports for air and gas systems in areas with the potential for seismic interaction (seismic II/I), are included in the scope of 10CFR54.4(a)(2).

Basis: Operating experience reviews, industry and plant specific, of non-liquid containing systems did not identify failures, which are aged related (Ref. 5.4, Appendix F, Para. 5.2.2.1).

4.6.2 Systems and components containing water, oil, or steam. Non safety-related piping and components, containing water, oil, or steam, which are not connected to safety-related SSCs may have a spatial interaction such that their failure could adversely impact the performance of safety-related SSCs. For high energy lines (HEL), the interaction is a result of pipe whip, jet impingement, spray or leakage, and flooding. For medium/low energy lines (M/LE), the interaction is a result of spray or leakage, and flooding. Pipe whip, jet impingement, spray and leakage are addressed below.

4.6.2.1 High Energy Lines (HEL). All OCNGS high-energy lines inside or outside primary containment are included in the scope of 10CFR54.4(a)(1) or (a)(2), depending on their safety classification. That is, HEL classified safety related are in scope for 10CFR54.4 (a)(1), and non-safety related HEL are in scope for 10CFR54.4 (a)(2). Piping systems, which are considered high energy lines in the UFSAR (Ref. 5.1, Sections 3.6, 3.11) and design calculations (Ref. 5.12, 5.24) are,

- Recirculation piping
- Main steam
- Feedwater
- Isolation Condenser
- Core spray
- Reactor Water Cleanup

CLB Reference: The review of UFSAR (Ref. 5.1, Sections 3.6, 3.8, 3.11), SEP documents (Ref. 5.18, 5.19), NUREG-1382 (Ref. 5.20), calculations (Ref. 5.12, 5.24), and pipe whip study report (Ref. 5.14) concluded that OCNGS original design did not rely solely on mitigative features, such as pipe whip restrains or Jet impingement barriers, to mitigate the effects of high energy line break (HELB). Instead, the primary containment vessel, and safety related SSCs inside or outside primary containment were evaluated for the effects of HELB without pipe whip restraints and jet impingement barriers. The evaluation relied on system separation, redundancy, and preventive measures (Inservice Inspections) to show that systems required for safe shut down will not be affected by HELB. The piping systems were selected for evaluation for the following reasons (ref. 5.14),

- They are subjected to reactor pressure (1050 psia);
- A break could result in blowdown of the entire primary coolant system; and
- They include all of the larger diameter pipes inside the containment and consequently would contain the greatest available energy to penetrate the containment in the event of a pipe rupture.

The 275-psia pressure and the 200°F temperature, typically used for HELB classification are not referenced in OCNGS CLB. However systems that operate at a pressure of 275-psia and 200°F are considered HELB and included in the scope license renewal.

It is conservatively assumed that any mitigative features provided in the CLB are not adequate to protect safety related SSCs from a postulated HELB. Thus, the preventive option is selected to ensure this protection consistent with ISG-09.

4.6.2.2 Moderate/Low Energy (M/LE). Moderate or low energy piping systems are defined as systems not meeting OCNGS HELB criterion. Exelon then elected to conservatively include in the scope of 10CFR54.4(a)(2) all non safety-related M/LE piping systems and components that contain a water, oil, or steam located inside the following license renewal structures.

- Primary Containment
- Reactor Building
- Emergency Diesel Generator Building
- Exhaust Tunnel
- Heating Boiler House (old boiler house)
- Office Building (rooms that house safety related SSCs only)[2]
- Turbine Building

Each structure is discussed below to identify M/LE systems that are excluded from the scope of 10CFR54.4(a)(2) and provide basis for their exclusion. In addition the basis for excluding non safety-related M/LE systems located at the Intake Structure and Canal and in the yard area is discussed below.

4.6.2.2.1 Primary Containment - Non safety-related M/LE systems inside the primary containment are conservatively assumed to have a leakage boundary function and included in scope of 10CFR54.4 (a)(2)

4.6.2.2.2 Reactor building - Non safety-related M/LE systems inside the reactor building are conservatively assumed to have a leakage boundary function and included in the scope of 10CFR54.4(a)(2) excluding the drywell chilled water piping (Drywell Cooling system) and the torus water storage and transfer system. The drywell chilled water piping is only used during refueling outages and the torus water storage and transfer system is used on rare occasions to drain or transfer water from the torus to the torus water storage tank. Both systems are empty during normal plant operation and consequently have no potential long-term spatial interaction due to spray or leakage with safety related SSCs.

4.6.2.2.3 Emergency Diesel generator Building - Non safety-related M/LE systems inside the building are conservatively assumed to have a leakage boundary function and included in scope of 10CFR54.4 (a)(2)

4.6.2.2.4 Exhaust Tunnel - Non safety-related M/LE systems inside the Exhaust Tunnel are conservatively assumed to have a leakage boundary function and included in scope of 10CFR54.4 (a)(2)

[2] Battery Room, 480V Switchgear room, and Recirculation MG-Set Room

4.6.2.2.5 Heating Boiler House (Old boiler house) – Non safety-related M/LE systems inside the old boiler house are conservatively assumed to have a leakage boundary function and included in scope of 10CFR54.4 (a)(2)

4.6.2.2.6 Office Building - Non safety-related M/LE systems inside the battery room, 480V Switchgear room, and recirculation MG-Set room are in scope of 10CFR54.4 (a)(2). Other rooms in the building do not contain safety related components.

4.6.2.2.7 Turbine Building – All non safety-related M/LE systems inside the turbine building are conservatively assumed to have a leakage boundary function and in scope of 10CFR54.4(a)(2).

4.6.2.2.8 Miscellaneous Yard Structure (yard area) – Non safety-related ML/E systems in yard areas are buried underground or have no spatial interaction with safety related SSCs. In addition safety related components in the yard area are designed to operate in a wet environment (rain) and will not be impacted by spray.

4.6.2.2.9 Intake Structure and Canal – Non safety-related ML/E systems located at the intake structure have been determined not to have a leakage boundary function, thus not included in the scope of 10CFR54.4(a)(2). The intake structure is an open structure subject to outside weather conditions. Thus the safety related systems located at the intake structure are designed to operate in a wet environment (rain) and will not be impacted by spray from adjacent non safety-related piping systems.

4.7 Seismic II/I Large and Small Bore Piping. Non safety-related piping systems designed to Seismic Class II requirements could hypothetically fail and fall on or otherwise physically impact safety related SSCs, during a design basis seismic event. However, based on the rationale provided below, the piping is not required to be included in the scope of 10CFR54.4 (a)(2). However its supports need to be intact in order to prevent physical impacts on safety related SSCs during a seismic event and as result must be included within the scope of 10CFR54.4(a)(2) (Ref. 5.4, Appendix F, Para. 5.2.2.3).

Supports for non safety-related SSCs located inside areas that contain safety related SSCs are conservatively included in the scope of license renewal for 10CFR54.4(a)(2).

Basis. Seismic II/I piping is not required to be included in the scope of the Rule based on the following rationale (Ref. 5.4, Appendix F, Para. 5.2.2.3).

- No experience data exists of welded steel pipe segments falling due strong earthquake motion

- Falling of piping segment is extremely rare and only occurs when there is a failure or unzipping of the supports
- These observations hold true for new and aged pipe

Therefore, as long as the supports for piping systems are intact, falling or physical impact of piping sections is not credible.

4.8 Cranes and Hoists. Safety and non safety-related Cranes, monorails, and hoist in scope of NUREG-0612 are in scope of the Rule. Other Non safety-related cranes, monorails, and hoists located in areas containing safety related SSCs are included in the scope of 10CFR54.4(a)(2) if it is determined that their failure could impact an intended function.

Basis. NRC issued NUREG-0612 to provide guidelines for preventing heavy load drops that might affect safety-related equipment or cause fuel damage that would result in significant off site release. Compliance with the NUREG is described in UFSAR Section 9.1.4.2.3. Cranes, monorails, and hoist, which satisfy heavy load requirements of NUREG-0612, are within the scope of license renewal. Other monorails and hoists, located in areas containing safety-related SSCs, but do not meet NUREG-0612 heavy load criteria, are also included in scope of Rule since their failure could adversely impact a safety related intended function.

5.0 References

5.1 Oyster Creek Nuclear Generating Station, Updated Final Analysis Report, Rev. 13

5.2 Oyster Creek Nuclear Generating Station, Fire Hazards Analysis Report, Document No. 990-1746 Revision 12, Appendix A (item E.3)

5.3 10 Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants

5.4 Nuclear Energy Institute (NEI), NEI 95-10, Industry Guidelines on implementing the Requirements of 10CFR Part 54, Revision 5

5.5 NRC Staff Interim Guidance (ISG-09), dated March 15, 2002 "License Renewal Issue: Guidance on the Identification and Treatment of Structures, Systems, and Components which Meet 10CFR54.4(a)(2)", Christopher I. Grimes to Alan Nelson

5.6 Engineering Standard ES-001, Oyster Creek Engineering Classification, Rev. 10

5.7 Specification SP-1302-12-294, Oyster Creek Nuclear Generating Station, Technical Specification for Oyster Creek Generating Station Pipe Stress Analysis, Rev. 1

5.8 Oyster Creek Nuclear Generating Station, Line List Specification, SYS-LL-OC-1

5.9 ASA B31.1, Code for Pressure Piping, 1955 Edition with Supplements, Addenda and Code Cases through September 1966.

5.10 Letter from D.A. Ross (JCP&L) to Boyce H. Grier (U.S NRC), Oyster Creek Nuclear Generation Station Docket No. 50-219, IE Bulletin 79-14 & 79-14, Rev. 1), dated August 31, 1979.

5.11 Letter from Patrick R. Simpson (Exelon) to Document Control Desk (U.S. NRC), Additional Information the Review of the License Renewal Applications for Quad Cities Nuclear Power Station, Units 1 and 2 and Dresden Nuclear Power Station, Units 2 and 3, dated October 3, 2003.

5.12 Calculation No. C-1302-104-E310-077, HELB Location Inside Containment based on NRC Generic Letter 87-11 Criteria.

5.13 MPR Associates Calculation 083-252-2, "Development of Small Bore Piping Deadweight and Seismic Walkdown Screening Criteria", Revision 0.

5.14 MPR Associates Report No. MPR-285, "Oyster Creek Pipe Whip Study", dated May 7, 1971, revised July 28, 1971.

5.15 Technical Data Report, TDR No. 1236, "Oyster Creek Small Bore Piping Inspection Program", Revision 0.

5.16 Technical Data Report, TDR No. 3004, "Oyster Creek Small Bore Piping Inspection Project – Phase Two", Revision 0

5.17 NUREG-0822, "Integrated Plant Safety Assessment Systematic Evaluation Program", Oyster Creek Nuclear Generating Station, Docket No. 50-219, January 1983.

5.18 NUREG-0822 Supplement 1, "Integrated Plant Safety Assessment, Systematic Evaluation Program", Oyster Creek Nuclear Generating Station, Docket No. 50-219. July 1988.

5.19 NUREG-1382, "Safety Evaluation Report Related to the Full Term Operating License for Oyster Creek Nuclear Generating Station", Docket No. 50-219, January 1991.

5.20 5.21 SE No. SE-945100-091, "Engineering Safety/Environmental Determination and 50.59 Review" Rev. 1.

5.21 SP-1302-12-208, Rev. 0, "1985 IE Bulletin 79-02/14 Inspection Program Design Input for Piping Stress Analysis", October 1985.
5.22 Burns & Roe specification No. S-2299-60, "Piping, Reactor Building – Phase I & II – Main Mechanical Equipment Installation and Miscellaneous Equipment", dated 8/66.
5.23 Calculation No. C-1302-822-5450-052, "RB Response to HELB without Blowout Panels", Rev. 2
5.24 PLI-02, "Scoping of System and Structures", Rev. 2
5.25 Oyster Creek Component Record List (CRL)

Systems and Structures

Relied upon to Demonstrate Compliance

With

10 CFR 50.63 – Station Blackout

Oyster Creek Nuclear Generating Station

APPROVAL PAGE

Prepared by: ______________________________ Date: ____________

Checked by: ______________________________ Date: ____________

Approved by: ______________________________ Date: ____________

REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Added Instrument Air bottles for operation of Isolation Condenser makeup valves.
2	Delete non-system ES-17 numbers, add recirculation system for pressure boundary, Remote Shutdown for indication, Radio Communications for plant operators, and 480V Switchgear Room Ventilation, 4160V Switchgear Room Ventilation and Battery & MG Set Room Ventilation systems, incorporated site review comments, other editorial changes.
3	
4	
5	

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1.0 PURPOSE

The License Renewal Rule, 10CFR 54 (Reference 1), requires identification of those systems, structures and components relied on in the safety analysis or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for station blackout (10CFR 50.63) be included in the scope of licensing renewal. This position paper identifies the Oyster Creek Nuclear Generating Station (OCNGS) systems and structures relied on to demonstrate compliance with 10 CFR 50.63.

This position paper is for the use of personnel engaged in the preparation, review, or approval of scoping evaluations in support of license renewal activities for Oyster Creek. This paper documents the technical basis for the license renewal scoping conclusions, along with the methodology and CLB source documents used. It identifies which of the "License Renewal Systems & Structures" identified in PP-01 is required to support 10CFR50.63 Station Blackout functions as described in the CLB. Results will be used to populate the corresponding license renewal database field. Systems and structures listed will answer "Yes" to scoping criteria 54.4(a)(3) for 10CFR50.63. This position paper also provides a source of CLB references that can be reviewed to confirm or establish the license renewal system boundaries associated with this regulated event.

2.0 SCOPE

The Scope of this Position Paper is those systems and structures specifically required for responding to and recovering from a station blackout in accordance with the requirements of 10CFR50.63.

The scope of this review is limited to the identification of systems and structures.
The scoping function is performed at the system and structure level. Identification of individual components is not within the scope of this position paper.

3.0 STATION BLACKOUT REQUIREMENTS

10CFR50, Section 50.63, requires that each light-water-cooled nuclear power plant be able to withstand and recover from a Station Blackout (SBO) of a specified duration. The Regulation identifies factors that must be considered in specifying the station blackout duration. Section 50.63 also requires that, for the station blackout duration the plant must be capable of maintaining core cooling and appropriate containment integrity. Utilities are expected to have the baseline assumptions, analyses and related information used in the coping evaluation available for NRC review.

Section 50.63 requires that each licensee submit the following information:

(i) Proposed station blackout duration, including a justification for the selection based on the redundancy and reliability for the onsite emergency AC power sources, the expected frequency of loss of offsite power, and the probable time needed to restore offsite power;

(ii) A description of the procedures that will be implemented for SBO events for the duration and for recovery there from;

(iii) A list and proposed schedule for any needed modifications to equipment and associated procedures necessary for the specified SBO duration.

NRC Regulatory Guide 1.155, "Station Blackout", describes a means acceptable to the NRC staff for meeting the requirements of 10 CFR 50.63. Regulatory Guide 1.155 states that NUMARC 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors", provides guidance that is in large part identical to the RG 1.155 guidance and is acceptable for meeting 10 CFR 50.63, and notes where the regulatory guide takes precedence.

Oyster Creek was evaluated against the requirements of the SBO Rule using guidance from NUMARC 87-00. NUMARC 87-00 Section 3 was used to determine an SBO coping duration of four hours. The coping duration of four hours is the time to restore offsite power or onsite emergency power.

In order to comply with the SBO Rule, Oyster Creek has added an Alternate AC (AAC) Power Supply System to the existing plant configuration. This AAC power capability will be provided by either one of the two non-class IE combustion turbines that are located at the Forked River site adjacent to the Oyster Creek site. This AAC source supplies power to Oyster Creek via a connection to the non-IE 4160V "1B" switchgear. This AAC power source will be available within one hour of the onset of the SBO and will have sufficient capacity and capability to operate systems required for coping with the SBO for the remaining three hours.

The Oyster Creek Current Licensing Basis (CLB) for a Station Blackout event is documented in the Updated Final Safety Analysis Report (Reference 2), Technical Data Report TDR No. 1099 (Reference 3) and the applicable references to these documents.

The AAC approach uses equipment that is capable of being electrically isolated from offsite and emergency onsite power sources. Coping with the SBO using the AAC approach entails a short period of time without AC power (up to one hour for Oyster Creek), while operators initiate actions to power SBO safe shutdown loads from the AAC source. Once the AAC source is available the plant transitions to the AAC state and provides the ability to maintain safe shutdown until offsite or emergency onsite AC power becomes available.

Compliance with the SBO Rule requires that the plant operators take the actions listed below.

- Response to an SBO Event
- Safe Shutdown of the Plant under SBO Conditions
- Recovery from an SBO event by restoration of offsite power or emergency onsite power

The systems required to respond to, cope with and recover from an SBO event are delineated in Tables I, II, III of this position paper. Table IV lists those structures required for compliance with the SBO Rule.

4.0 METHODOLOGY

The methodology used in identifying those systems and structures required to respond to, cope with, safely shutdown and recover from a station blackout event at Oyster Creek is documented in TDR 1099. The basis for selection of components, SBO equipment determination, a description of the AAC configuration, a list of affected plant procedures and tables of components required to respond to the SBO event are also documented in TDR 1099.

If CLB reference sources in the tables identified components only, the system number was documented by identifying the system to which the component belonged and listing the system in the table with the component.

Those systems, structures and components (SSCs) required to demonstrate compliance with the Commission's regulations for Station Blackout (10CFR 50.63) are located in various systems and structures both in the plant and offsite at the Forked River site. The identification of those systems and structures required to demonstrate compliance with 10CFR 50.63 are categorized as follows:

1. Systems and structures required to respond to and cope with an SBO event. These systems are required for the first hour of the station blackout event.

2. Systems and structures required to bring the plant to a safe shutdown condition and maintain the plant in that condition (long term cooling). For Oyster Creek safe shutdown is defined as hot shutdown conditions (Ref.3).

3. Systems and structures required to recover from an SBO event. These systems are required to restore either offsite power or emergency onsite power for an SBO event.

Station Blackout systems, structures and components are a mix of safety and non-safety related systems, structures and components. Station Blackout systems, structures and components are not required to be safety related to perform the function of mitigating a Station Blackout event.

There has been no attempt to limit or reduce the license renewal boundary of those systems or structures that use only a part of the system (e.g.; components) or portion the structure (e.g.; rooms or areas) to support the SBO function, provide the SBO mitigating function, bring the plant to safe shutdown conditions, or restore offsite or onsite power during an SBO event. The references for the components, partial systems or structures reference(s) used to cope with an SBO event are listed in the Reference column of each Table I through IV.

4.1 SYSTEMS CREDITED FOR RESPONDING TO AN SBO EVENT

Identification of systems and structures credited for response to and coping with an SBO event are obtained from a review of the Current Licensing Bases (CLB) documents that describe the SBO event, and response equipment required to mitigate the event for the coping period. Identification of these systems and structures required to respond to an SBO event were obtained by reviewing the UFSAR, Technical Data Report TDR 1099,

Component Record List, and drawings (flow sheets and electrical diagrams). The results of these document reviews were verified by comparing them with the OCNGS SBO Compliance Package to the NRC (References 5, 6) and the NRC Safety Evaluation Report (Reference 7). The results of the review for SBO response and coping systems is documented in Table I. The specific CLB reference identifying the system as required for SBO is listed in the "Reference" column of Table I. Other information is also listed that gives reference to the system description or function.

4.2 Systems Credited for Safe Shutdown in Response to an SBO Event

Those systems and structures required for safe shutdown of the plant were obtained from a review of the UFSAR, TDR 1099 safe shutdown load Table 5 (equipment required to safely shut the plant down based on SBO conditions) and drawings (flow diagrams and electrical diagrams). The results of these document reviews were verified by comparing them with the OCNGS SBO Compliance Package to the NRC (References 5, 6) and the NRC Safety Evaluation Report (Reference 7). If differences were discovered in the documentation, the OCNGS SBO Compliance Package to the NRC (References 5, 6) and the NRC Safety Evaluation Report (Reference 7) governed. The results of the review for SBO safe shutdown systems are documented in Table II. The specific CLB references identifying the system is listed in the CLB Ref. column of Table II. Other information is also listed that gives reference to the system description or function.

4.3 Systems Credited for Restoration of Offsite or Onsite Power

The Station Blackout event is defined as the loss of offsite and onsite ac electric power to the essential and non-essential switchgear buses in a nuclear power plant. It does not include the loss of ac power fed from inverters by station batteries nor loss of ac power from an SBO defined alternate ac power source. The NRC staff's position specifically stated in Interim Staff Guidance ISG-2 (Ref. 4) is that qualifying the alternate ac power source as a means for recovery from an SBO event is not intended within the context of the SBO rule. Further, ISG-2 states that within the context of the rule, only offsite power and onsite power are credited as a means of recovering from an SBO event; and both must therefore be included within the scope of license renewal.

ISG-2 also states that the use of an offsite system as a means of recovering from an SBO is not construed by the NRC staff to be the only means of recovery from an SBO event. It is not possible to determine prior to an actual SBO event which source of power can be returned first. As a result, 10 CFR 50.63(c)(1)(ii) and its associated guidance in RG 1.155, Section 1.3 and Section 2, requires procedures to recover from an SBO that include restoration of offsite and onsite power.

OCGS has procedures to cope with, withstand and recover from a Station Blackout event. Procedure ABN-37, titled Station Blackout was written and put into place to cope with, withstand and recover from an SBO event. An attachment ABN-37-10 of procedure ABN-37specifies the actions required to restore offsite power to the 4160V buses. Coordination of the switchover from AAC power to offsite or onsite power is also delineated in this

procedure. The restoration of offsite and onsite power and the specific power paths are covered in operating procedures 337 and 338.

Based on the above information, OCNGS meets the requirements of the SBO rule for restoration of offsite and onsite power and will include the NRC staff guidance as specified in ISG-2 for SBO by including the offsite power and onsite power systems into the scope of license renewal for the Oyster Creek Nuclear Generating Station. This Position Paper demonstrates compliance with both the rule and ISG-2 by including the offsite and onsite power systems in Table III of this Position Paper.

Those systems and structures credited for recovering from an SBO event by restoring Offsite or Emergency onsite power (recovery) were obtained from a review of the UFSAR Section 8.2 (Offsite Power Description Section), UFSAR Section 8.3 (Onsite Power Systems), TDR 1099, and electrical diagrams. The results of the review for SBO power restoration systems is documented in Table III. The specific CLB references identifying the system is listed in the "Reference" column of Table III. Other information is also listed that gives reference to the system description or function.

4.4 Structures Credited in Mitigating an SBO Event

Table IV is a list of structures relied upon to demonstrate compliance with 10 CFR 50.63. These structures are considered in the scope of SBO because the structures contain safety related SBO equipment or supporting systems requiring protection from normal or severe weather conditions (e.g.; hurricanes). The source documents used to identify these structures are TDR 1099, UFSAR, Modification Design Descriptions and Engineering Standard ES-17.

Structures required to demonstrate compliance with 10CFR 50.63 are listed in Table IV. Those structures identified in Table IV satisfy the following criteria:

1. Structures housing or protecting SBO mitigating systems from severe weather (ie: hurricanes).

2. Structures housing or protecting SBO mitigating systems from normal weather conditions.

4.5 Conservative Results Evaluation

The CLB documents associated with Station Blackout at Oyster Creek include analyses, calculations and various correspondences. In some cases, the analyses include conservative approaches or assumptions that go beyond the requirements of the Station Blackout Rule. For license renewal, only those SSCs that are relied upon to demonstrate compliance with the SBO Rule should be included in scope. The Standard Review Plan for License Renewal (reference 39) states:

"The applicant is required to identify the SSCs whose functions are relied on to demonstrate compliance with the regulations identified in 10 CFR 54.4(a)(3) (that is,

whose functions were credited in the analysis or evaluation). Mere mention of an SSC in the analysis or evaluation does not necessarily constitute support of an intended function as required by the regulation."

Below are systems that are mentioned in the CLB documents for Oyster Creek SBO, but are not required to perform a function necessary to demonstrate compliance with the SBO Rule. These systems are not included in the results tables as systems required for SBO. A discussion and justification is provided for each excluded system.

Containment Spray System 241

The Containment Spray System is included in the Oyster Creek Station Blackout Evaluation TDR-1099 (reference 3) in order to demonstrate the ability to cope with a stuck open EMRV concurrent with the SBO event. This is a conservative evaluation that goes beyond the requirements of the SBO Rule. From reference 40:

"*Station blackout* means the complete loss of alternating current (ac) electric power to the essential and nonessential switchgear buses in a nuclear power plant (i.e., loss of offsite electric power system concurrent with turbine trip and unavailability of the onsite emergency ac power system). Station blackout does not include the loss of available ac power to buses fed by station batteries through inverters or by alternate ac sources as defined in this section, nor does it assume a concurrent single failure or design basis accident."

It is not necessary to assume a stuck open EMRV during the station blackout event. There is no mention of crediting the Containment Spray system in any of the docketed NRC correspondence or the NRC Safety Evaluation Report for Oyster Creek SBO. The Containment Spray System credited to mitigate this combination of events does not need to be included in the scope of license renewal under 10 CRF 54.4(a)(3) scoping criteria for SBO.

Emergency Service Water 532

The Emergency Service Water system is only required to support the Containment Spray system, which is credited only when a stuck open EMRV is assumed concurrent with an SBO event. As discussed above, this assumption is beyond the requirements of the Station Blackout Rule. There is no mention of crediting the Emergency Service Water system in any of the docketed NRC correspondence or the NRC Safety Evaluation Report for Oyster Creek SBO. The Emergency Service Water system does not need to be included in the scope of license renewal under 10 CRF 54.4(a)(3) scoping criteria for SBO.

Condensate System 421

The Condensate System will be available following startup and tie-in of the AAC power source. However, the use of the Condensate System for reactor coolant inventory makeup is not described in the OC submittals (reference 5) and in supplementary submittals (reference 6). The use of the Condensate System for reactor coolant inventory makeup is not described in the NRC SERs (reference 8). The NRC SER clearly states that the use of one control rod drive pump will be sufficient for reactor inventory makeup.

Therefore, the Condensate System does not need to be included in the scope of license renewal under 10 CRF 54.4(a)(3) scoping criteria for SBO.

Feedwater System 422

The Feedwater System will be available following startup and tie-in of the AAC power source. However, the use of the Feedwater System for reactor coolant inventory makeup is not described in the OC submittals (reference 5) and in supplementary submittals (reference 6). The use of the Feedwater System for reactor coolant inventory makeup is not described in the NRC SERs (reference 8). The NRC SER clearly states that the use of one control rod drive pump will be sufficient for reactor inventory makeup. Therefore, the Condensate System does not need to be included in the scope of license renewal under 10 CRF 54.4(a)(3) scoping criteria for SBO.

Non-essential Systems Powered from the AAC

Reference 3 identifies a number of systems that can be powered from the AAC and utilized by plant operators when coping with and recovering from a station blackout. However, the use of these systems is not described in the OC submittals (reference 5) and in supplementary submittals (reference 6). The use of these systems is also not described in the NRC SERs (reference 8). Therefore, these systems that will be powered and available from the AAC do not need to be included in the scope of license renewal under 10 CRF 54.4(a)(3) scoping criteria for SBO:

Reactor Water Cleanup 215 *
Spent Fuel Pool Cooling 251 *
Service Water System 531
Reactor Building Closed Cooling Water System 541
Turbine Building Closed Cooling Water System 542
Security Lighting 763
Reactor Building Ventilation System 822
Old Radwaste Building HVAC 834
Drywell Cooling 838 *
Turbine Building C-Battery Room Ventilation 839
Instrument (Control) Air System 852 (except bottled supply to Isolation Condenser makeup valves V-11-34 and V-11-36)

* TDR 1099 Tbl 4

Microwave Building (Forked River Site) 188

This building contains equipment that provides automatic start of FRCTs one hour after SBO event has begun. However, automatic start is not required for SBO. The FRCTs can be started locally. Arrangements have been made with First Energy to provide manning of the combustion turbines, in the event the microwave building is not available.

5.0 References

1. 10 CFR Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants.
2. Oyster Creek Nuclear Generating Station UFSAR, Rev. 13, April 3, 2003.
3. TDR 1099, Oyster Creek Technical Data Report, Rev. 3, January 1st 1998 titled "Station Blackout Evaluation".
4. ISG-2, Scoping of Equipment Relied on to meet the Requirements of the Station Blackout (SBO) Rule (10CFR Part 50.63) for License Renewal (10CFR50.54(a)(3))
5. GPUN letters dated April 17, 1989 and March 30th 1990, to NRC; Subject: OC Compliance with SBO Rule.
6. GPUN letters dated October 7th 1991, and December 4th, 1991, to NRC and October 22nd 1992; subject: OC Compliance with SBO Rule, Supplementary Information.
7. NRC Regulatory Guide 1.155, "Station Blackout"
8. NRC Safety Evaluation Report Letters, dated August 23rd 1991, February 12th, 1992 and November 23, 1992, subject: NRC SER of OC Compliance with SBO Rule.
9. MDD-OC-743-A, Div I, titled "Division I Modification Design Description for OCNGS-Tie in of Forked River Combustion Turbines For Use As An Alternate AC Source To Mitigate A Station Blackout Event".
10. MDD-OC-743-A, Div II, titled "Division II Modification Design Description for OCNGS-Tie IN of Forked River Combustion Turbines For Use As An Alternate AC Source To Mitigate A Station Blackout Event".
11. SDD OC-700A, Div I System Design Description for OCNGS-Forked River Combustion Turbines For Use As An Alternate AC Source To Mitigate A Station Blackout Event".
12. Controlled Database, (PIMS) Oyster Creek Component Record List (CRL)
13. BR 2003 sht. 1, rev. 83, Condensate/Feed System Flow Diagram
14. BR 2004 sht. 2, rev. 82, Condensate Transfer System Flow Diagram
15. BR 2005 sht. 2, rev. 86, Reactor and Turbine Building Service Water Flow Diagram
16. BR 2005 sht. 4, rev. 73, Emergency Service Water System Flow Diagram
17. BR 2006 sht. 1, rev. 72, Reactor Building Closed Cooling Water Flow Diagram
18. BR 2006 sht. 3, rev. 56, Reactor Building Closed Cooling Water Flow Diagram
19. BR 2006 sht. 4, rev. 63, Turbine Building Closed Cooling Water Flow Diagram
20. BR 2006 sht. 5, rev. 56, Turbine Building Closed Cooling Water Flow Diagram
21. BR 2009 sht. 1, rev. 43, Turbine Building H & V Flow Diagram
22. BR 2010 sht. 3, rev. 23, Office Building HVAC (480V Switchgear Room)
23. BR 2010 sht. 4, rev. 26, Control and Cable Spreading Rooms HVAC Flow Diagram
24. BR 2010 sht. 5, rev. 21, Battery and MG Set Room Ventilation Flow Diagram
25. BR 2011 sht. 1, rev. 40, Drywell Cooling System Flow Diagram
26. BR 2011 sht. 2, rev. 58, Reactor Building Ventilation Flow Diagram
27. BR 2012 sht. 1, rev. 14, Old Radwaste Building H & V Flow Diagram
28. BR 2013 sht. 1, rev. 67, Service Air System Flow Diagram
29. GE148F262, sht. 1 rev. 50, Emergency Condenser Flow Diagram
30. GE148F740 sht. 1, rev. 43, Containment Spray System Flow Diagram
31. GE885D871 sht. 1, rev. 71, Core Spray System Flow Diagram

32. GE112C2650 sht. 15, rev. 14, Main Control Room Panels, Electrical Connection Diagram, Panel 5F/6F
33. GE846D919 sht. 2, rev. 7, Assembly, Panel 5F/6F
34. Engineering Standard ES-17, Identification of Oyster Creek Plant Systems
35. Procedure 2000-OPS-3024.10a, rev. 11 titled Electrical Distribution-4160VAC Diagnostic & Restoration Actions,
36. Procedure ABN-37, rev. 0, titled Station Blackout
37. Procedure 337, rev. 57, titled 4160 Volt Electrical System
38. Procedure 338, rev. 57, titled 480 Volt Electrical System
39. Draft NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, January 2005
40. 10CFR50.2, Definitions
41. Procedure PLI-02, Scoping of Systems and Structures
42. Procedure PP-01, License Renewal Systems and Structures
43. TDR 975, Loss of HVAC during an OCNGS Station Blackout
44. TDR 976, Loss of Spent fuel Pool Cooling during an OCNGS Station Blackout
45. Memo 5350-95-019, OCNGS Station Blackout Ambient Temperature (TDR 1099, Section XI, recommendation 2)
46. TDR 1094, Oyster Creek Station Blackout Loads Control Circuit Analysis

TABLE I - SYSTEMS AND STRUCTURES CREDITED TO COPE WITH AN SBO EVENT

(10 CFR 50.63 Credited Systems – 1st hour)

ES-17 System Number	System Description	System Function	Reference
104	Piping and Pipe Supports (Support System for all SBO fluid systems)	Pressure Boundary for Fluids; Structural Support for Pressure Boundary	UFSAR (Ref. 2), Sections 3.2 thru 3.8; TDR 1099 Table 4 (Ref. 3)
211	Isolation Condenser System and Isolation Condenser Shell Side Water Level Indication LI-IG0007B (Panel 1F/2F)	Decay Heat Removal Provides Isolation Condenser Shell Side Water Level Indication	UFSAR Sections 6.3.1.1 (Ref. 2); TDR 1099 Table 4, Section V; (Ref. 3)
223	Reactor Recirculation System piping	Provides pressure boundary flow path to the Isolation Condenser.	
735	125V Station DC System (B & C Batteries, panels, MCCs & distribution centers)	Powers SBO Response Equipment for the first hour.	UFSAR Section 8.3.1.1, (Ref. 2); TDR 1099 Section IV (Ref. 3).
622	Reactor Plant Instrumentation	Provides Reactor Water Level Indication	TDR 1099 Table 4
626	Remote Shutdown	Reactor Water/Isolation Condenser Level Indication	TDR 1099 (Ref 3)
733	120V AC Vital Power System	Powers critical 120 VAC Instrumentation, controls and Auxiliaries	UFSAR Section 8.3.1.1.4 (Ref. 2); CLR (Ref. 11); TDR 1099 Table 4 & 6
762	Emergency Lighting System	Illuminates SBO Response Equipment	TDR 1099 Table 5 (Ref. 3); TDR 1094, Attachment A (Ref. 4).
787	Radio Communications	Supports communication between operators	QCL 0-787-0000 ABN-37

TABLE II - SYSTEMS CREDITED FOR SAFE SHUTDOWN DURING STATION BLACKOUT

ES-17 System Number	System Description	System Function	Reference
104	Piping and Pipe Supports (Support System for all SBO fluid systems)	Pressure Boundary for Fluids; Structural Support for Pressure Boundary	UFSAR (Ref. 2), Sections 3.2 thru 3.8; TDR 1099 Table 4 (Ref. 3)
211	Isolation Condenser System and Isolation Condenser Shell Side Water Level Indication LI-IG0007A & LI-IG0007B (Panel 1F/2F)	Decay Heat Removal; Provides Isolation Condenser Shell Side Water Level Indication	UFSAR Sections 6.3.1.1 (Ref. 2); TDR 1099 Table 4, Section V; (Ref. 3)
212	Core Spray System & ADS	Isolation Condenser Shell Side Make-up	UFSAR Sections 6.3.1.3 (Ref. 2); TDR 1099 (Ref. 3) Table 4, Section V; Ref. 30
223	Reactor Recirculation System piping	Provides pressure boundary flow path to the Isolation Condenser.	
225	Control Rod Drive System (CRD Pump)	Reactor Makeup	UFSAR Sections 4.6.1.2 & 6.3.1(Ref. 2); TDR 1099 (Ref. 3) Table 4, Section V
424	Condensate Transfer System (CST)	Source of Inventory Make-up for RPV and IC	UFSAR Section 10.4.7 (Ref. 2); Ref. 13 TDR 1099 Table 6 (Ref. 3);
622	Reactor Plant Instrumentation	Monitors Core for adequate cooling,	UFSAR Section 7.6.1.1.1 & 7.6.1.1.2, (Ref. 2); Table 7.5-3 & 7.6-2; TDR 1099 Table 4 (Ref. 3)
626	Remote Shutdown	Reactor Water/Isolation Condenser Level Indication	TDR 1099 (Ref 3)
731	4160 V Distribution System	Restoration of Onsite or Offsite Power, Powers SBO Response Equipment after 1st hour, powered by AAC	UFSAR Section 8.3.1.1.1, & 8.3.11 (Ref. 2); TDR 1099 Table 5 (Ref. 3); TDR 1094, Attachment A (Ref. 4)
732	480 V Distribution System	Restoration of Onsite or Offsite Power, Powers SBO Response Equipment after 1st hour, powered by AAC	UFSAR Section 8.3.1.1.2 & 8.3.1.2, (Ref. 2); TDR 1099 Table 5 (Ref. 3); TDR 1094, Attachment A (Ref. 4).
733	120V AC Vital Power System	Powers critical 120 VAC Instrumentation, controls and Auxiliaries	UFSAR Section 8.3.1.1.4 (Ref. 2); CLR (Ref. 11); TDR 1099 Table 4 & 6

ES-17 System Number	System Description	System Function	Reference
734	120/208V Non-Essential Distribution	Control power for 4160V Ventilation	TDR 1094
735	125V Station DC System (MG Set Battery Charger A & B; C Battery Charger C1/C2)	Powers SBO Response Equipment for the first hour, and provides control power for the coping period duration.	UFSAR Section 8.3.1.1, (Ref. 2); TDR 1099 Section IV (Ref. 3).
743	Station Blackout Combustion Turbines & Supplemental Systems located at Forked River (includes turbine lube oil system, fuel system, DC power system, SBO Transformer)	Powers 4160V bus 1B via Switchgear cubicle 1BO after first hour of SBO event	UFSAR Section 8.3.4 (Ref. 2); TDR 1099 Section IV & IX (Ref. 3);); MDD-OC-743-A Div II (Ref. 8); MDD-OC-743-A Div I (Ref. 7) ; TDR 1094 Attachment A, (Ref. 4).
787	Radio Communications	Supports communication between operators	QCL 0-787-0000 ABN-37
821	4160V Switchgear Room Ventilation	Provides ventilation for equipment cooling	TDR 1099 (Ref 3), TDR 975, Memo 5350-95-019 (Ref 44)
823	480 V Switchgear Room Ventilation	Provides ventilation for equipment cooling	TDR 1099 (Ref 3), TDR 975, Memo 5350-95-019 (Ref 44)
823	Battery and MG Set Room Ventilation	Provides ventilation for equipment cooling	TDR 1099 (Ref 3), TDR 975, Memo 5350-95-019 (Ref 44)
826	Control Room Ventilation	Provides ventilation for cooling equipment	UFSAR Sections 6.4.1 & 9.4.1 (Ref.2); TDR 1099 Table 4 & 6 (Ref. 3)
852	Instrument Air	Provides control air to operate isolation condenser makeup valves V-11-34, V-11-36.	TDR-1099 Table 6 (Ref. 3) BR-2004 sheet 2 (Ref. 14)

TABLE III - SYSTEMS REQUIRED TO RECOVER FROM A STATION BLACKOUT EVENT

ES-17 System Number	Structure Description	System Function	Reference
701	Switchyard Facilities	Restoration of Offsite Power (recovery from an SBO)	References 35, 36, 37
721	230 KV Bus, Lines and Assoc. Equipment, Protective Relays & Controls	Restoration of Offsite Power (recovery from an SBO)	UFSAR Sections 8.1.2, 8.2.1 & 8.2.1.1 (Ref. 2); TDR 1099 Section IV; References 35, 36, 37
722	34.5 KV Bus Lines and Assoc. Equipment, Protective Relays & Controls	Restoration of Offsite Power (recovery) from an SBO	UFSAR Sections 8.1.2, 8.2.1 & 8.2.1.2 (Ref. 2): TDR 1099 Section IV (Ref. 3); References 35, 36, 37
724	Startup Transformers, Protective Relays & Controls	Restoration of Onsite and Offsite Power (recovery from an SBO)	UFSAR Sections 8.1.2, 8.2.1, 8.2.1.1 & 8.3.11 (Ref. 2); TDR 1099 Section IV; References 35, 36, 37
731	4160 V Distribution System	Restoration of Onsite or Offsite Power, Powers SBO Response Equipment after 1st hour, powered by AAC	UFSAR Section 8.3.1.1.1, & 8.3.11 (Ref. 2); TDR 1099 Table 5 (Ref. 3); TDR 1094, Attachment A (Ref. 4); References 35, 36, 37
732	480 V Distribution System	Restoration of Onsite or Offsite Power, Powers SBO Response Equipment after 1st hour, powered by AAC	UFSAR Section 8.3.1.1.2 & 8.3.1.2, (Ref. 2); TDR 1099 Table 5 (Ref. 3); TDR 1094, Attachment A (Ref. 4); References 35, 36, 37
741	Emergency Diesel Generators and Auxiliaries	Restoration of Onsite Power (recovery from an SBO)	UFSAR Section 8.3.2.1 (Ref. 2); TDR 1099 Section IX.2 (Ref. 3); References 35, 36, 37

TABLE IV - STRUCTURES REQUIRED FOR STATION BLACKOUT EVENT

ES-17 System Number	Structure Description	Structure Function	Reference
101	Equipment Supports	Structurally supports equipment within the Scope of 10.CFR 50.63	UFSAR Section 3.8 & 3.9 (Ref. 2)
151	Turbine Building	Protects Safety Related 4160V Switchgear, DC Distribution Center C, Electrical Equipment, Condensate Pumps and Control Room (Mechanical and Electrical Equipment required to mitigate Station Blackout event) from hurricane and tornado events.	UFSAR Section 6.4, 8.3.2 & 2.3.1.2.1(Ref. 2), TDR 1099 Table 6 (Ref 3); TDR 1094 Attachment A (Ref. 4)
153	Reactor Building	Protects Safety Related Core Spray, Containment Spray, CRD Pumps RBCCW pumps and related Electrical Equipment (Mechanical Equipment required to mitigate Station Blackout event) from hurricane and tornado events.	UFSAR Section 6.4. & 8.3 & 2.3.1.2.1 (Ref. 2), TDR 1099 Table 6 (Ref 3); TDR 1094 Attachment A (Ref. 4)
156	Main Office Building	Protects safety related DC Distribution Center B, Battery B and associated chargers (Mechanical and Electrical Equipment required to mitigate an SBO event) from hurricane and tornado events.	UFSAR Sections 6.4, 8.3.2.1 & 2.3.1.2.1; (Ref. 2), TDR 1099 Table 6 (Ref 3); TDR 1094 Attachment A (Ref. 4)
157	Diesel Generator Building	Protects safety related Diesel Generators (equipment that could be used to restore onsite power following an SBO event) from hurricane and tornado events.	UFSAR Sections 3.3, 3.7 & 3.8 (Ref. 2)
171	Condensate Transfer Building	Provides protection for condensate transfer equipment credited for SBO.	
177	Substation	The 34.5kV Oyster Creek substation is the power source for restoration of Onsite & Offsite Power.	UFSAR Section 8.1 & 8.2 (Ref. 2)
773	Underground Duct Banks	Provides protection from the weather, erosion and galvanic corrosion of FRCT Transformer Power Cables,	UFSAR Section 8.3.4 (Ref. 2) MDD-OC-743-A Div II (Ref. 8)

ES-17 System Number	Structure Description	Structure Function	Reference
		Protective Relaying Cables, Control/Instrumentation Cables	
None	Forked River Combustion Turbine Buildings	Provides protection from the weather for personnel, FRCTs and associated equipment.	

Systems and Structures

Relied upon to Demonstrate Compliance

With

10 CFR 50.62 - ATWS

Oyster Creek Nuclear Generating Station

License Renewal

APPROVAL PAGE

Revision	*Prepared by:*	*Checked by:*	*Approved by:*
00	*Kevin Muggleston*	*Mark Miller*	*Don Warfel*
Date	*1/20/04*	*1/20/04*	*1/20/04*
01	*Kevin Muggleston*	*Mark Miller*	*Don Warfel*
Date	*4/26/2005*	*4/26/2005*	*4/26/2005*
02			
Date			

REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	
2	
3	
4	
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1.0 Purpose

License Renewal Rule, 10 CFR Part 54, requires that 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 anticipated transients without scram (10 CFR 50.62, ATWS) be included in the scope of license renewal. (10CFR54.4(a)(3))

This position paper identifies the Oyster Creek Nuclear Generating Station systems and structures relied on to demonstrate compliance with the ATWS rule. The ATWS rule does not require an analysis or demonstration of the ability to cope with an ATWS event, but instead requires the installation of specific systems and equipment to reduce the risk from ATWS. For license renewal, the ATWS scope applies only to these specific systems and their associated supporting or protective structures. The required systems are identified in Attachment 1. The required structures are identified in Attachment 2. This position paper will be used in conjunction with Project Level Instruction PLI-2, "Scoping of Systems and Structures."

This position paper is for the use of personnel engaged in the preparation, review, or approval of scoping evaluations in support of license renewal activities for Oyster Creek. This paper documents the technical basis for the license renewal scoping conclusions, along with the methodology and CLB source documents used. It identifies which of the "License Renewal Systems & Structures" identified in PP-01 is required to demonstrate compliance with 10CFR50.62 ATWS requirements, as described in the CLB. Results will be used to populate the corresponding license renewal database field. Systems and structures listed will answer "Yes" to scoping criteria 54.4(a)(3) for ATWS (reference 11).

2.0 Scope

The scope of this document is considered to be those systems and associated supporting or protective structures that are required for the Oyster Creek Nuclear Generating Station to comply with the requirements of 10 CFR50.62, the ATWS rule.

Components at Oyster Creek Nuclear Generating Station can be associated with a system or structure through design drawings or the Component Record List (Ref. 3). License renewal scoping is performed at the system and structure level. The scope of this review is therefore limited to the identification of systems and structures. The identification of individual components is not within the scope of this position paper.

3.0 Methodology

Regulatory requirements for ATWS are contained in 10CFR50.62. Anticipated Transient Without Scram (ATWS) means an anticipated operational occurrence (as defined in 10CFR50 Appendix A) followed by the failure of the reactor trip portion of the reactor protection system. For boiling water reactors (BWR), the following requirements apply:

1. Each BWR must have an alternate rod injection (ARI) system with redundant scram air header exhaust valves. The ARI system must be independent of the existing reactor trip system.

2. Each BWR must have a standby liquid control system with defined boron injection capabilities. Standby liquid control system automatic initiation is not required for plants issued a construction permit before July 26, 1984, unless already installed.

3. Each BWR must have equipment to trip the recirculation pumps automatically under conditions indicative of an ATWS.

The ATWS rule itself dictates the systems that are required for a boiling water reactor. Oyster Creek compliance with 10CFR50.62, including the required Oyster Creek systems, is described in UFSAR Section 15.8. The CRL (reference 3) contains a controlled data field to identify components credited for ATWS. The ATWS data field is a "Design Quality" field (reference 5), which means the data is controlled and has been verified accurate. Guidance for design control of this data field is provided in reference 8.

Systems and structures in the scope of license renewal under 10 CFR 54.4(a)(3) criteria associated with ATWS are not subject to 10 CFR 54.4(a)(2) system review, for evaluating the failure of non-safety related systems and their impact on satisfying intended functions to meet 10 CFR 54.4(a)(1)(i), (ii), or (iii). The ATWS rule does not require detailed analysis of ATWS event scenarios, but instead prescribes the specific systems that must be installed or upgraded to comply with the regulation. For license renewal, the scope of systems "relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for anticipated transients without scram" are those systems prescribed in the rule.

Attachment 1 is a list of those systems that are credited for mitigation of an ATWS event. The Oyster Creek UFSAR and the Component Record List are the source documents for identifying systems credited for ATWS. The first step to create this list was to download all of the Oyster Creek CRL components from the CRL to an Access database. The downloaded list of components was then filtered to identify only the Oyster Creek ATWS components, based on the controlled "Design Quality" (see reference 5) CRL ATWS data field. The filtered list was then sorted by system to obtain the list of systems identified in Attachment 1. System identification is based on the names and groupings in Engineering Standard ES-17 (reference 4). The Attachment 1 list is consistent with the description of ATWS compliance in the UFSAR Section 15.8. The Attachment 1 systems can be confirmed by review of the identified CLB references.

Technical Data Reports TDR-693 and TDR-793 (references 6 and 7) document technical assessments of the ATWS rule and how it applies and is implemented at Oyster Creek. These documents were reviewed to confirm the list of systems in Attachment 1.

The ATWS Rule was published as 10CFR50.62 in 1984. Prior to publication of the ATWS Rule, General Electric performed an ATWS study for Oyster Creek (reference 13, March 1975). The purpose of this study was to evaluate ATWS consequences at Oyster Creek, to assist the NRC in evaluating whether there is a need for plant changes to resolve the ATWS issue. The study

demonstrated that the postulated ATWS event would not have unacceptable consequences at the Oyster Creek plant if the recirculation pumps are tripped and if the Standby Liquid Control system is manually initiated within 5 minutes. No credit is taken for Alternate Rod Insertion (ARI) initiation in the analysis. This study confirms that the systems required for a BWR under 10CFR50.62 and identified in Attachment 1 are adequate to reduce the risk from an ATWS event.

The structures within the scope of 10CFR50.62 ATWS are identified in Attachment 2. These structures were identified from a review of the systems identified in Attachment 1. Structures that provide physical support or shelter for the systems in Attachment 1 are included in the scope of license renewal and are identified in Attachment 2. These mechanical portions of these systems are known to be located in the Primary Containment or Reactor Building, and the electrical logic and controls are located in the Main Control Room (Turbine Building). A review of the physical location fields in the CRL (an "information only" data field) provided additional assurance that these ATWS system components are located in the identified structures.

The systems identified in Attachment 1 are based on ES-17 system designations. When performing license renewal scoping in accordance with PLI-02 (reference 10), it will be necessary to first refer to PP-1 (reference 11) to determine which ES-17 systems are included in the license renewal system under review. If any of the ES-17 systems on Attachment 1 are included in the license renewal system under review, then the ATWS scoping question will be answered "Yes."

The structures identified in Attachment 2 are based on the structure identification from PP-1.

4.0 References

1. 10 CFR 50.62, "Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants"
2. Oyster Creek Nuclear Generating Station, Updated Final Safety Analysis Report, Revision 13
3. Oyster Creek Component Record List (CRL)
4. Engineering Standard ES-17, Revision 22, Identification of Oyster Creek Plant Systems
5. EP-035, Revision 8, CRL Control
6. TDR 693, Assessment of NRC ATWS Rule
7. TDR 793, Alternate Rod Injection (ARI) Technical Assessment Report for ATWS Rule
8. EP-011, Revision 11, Methodology for Assigning and Maintaining the Quality Classification of Components
9. GE 148F714, Revision 44, Flow Diagram, Reactor Vessel Level/Pressure/Temperature Instruments
10. PLI-02, Scoping of Systems and Structures
11. PP-1, License Renewal Systems and Structures
12. AR A2079502-3, A2079501-4, for update of CRL ATWS field
13. NEDO-20848, Anticipated Transient Without Scram, Study for the Oyster Creek Nuclear Generating Station, March 1975

5.0 Attachments

Attachment 1 - Systems Required for ATWS		
System	ES-17	Reference / Comments
Standby Liquid Control System	213	UFSAR 15.8.2 (Ref. 2), CRL (Ref. 3)
Reactor Plant Instrumentation	622	CRL (Ref. 3)
Alternate Rod Insertion System	643	UFSAR 15.8.1, 3.9.4.4, 7.3.1.1.6 (Ref. 2), CRL (Ref. 3)
Recirculation Pump Trip	642	UFSAR 15.8.3

Attachment 2 - Structures Required for ATWS
Primary Containment
Reactor Building
Turbine Building
Component Supports Commodity Group

Systems and Structures

Relied upon to Demonstrate Compliance

With

10 CFR 50.49 – Environmental Qualification

Oyster Creek Nuclear Generating Station

License Renewal

APPROVAL PAGE

Revision	*Prepared by:*	*Checked by:*	*Approved by:*
00	*Kevin Muggleston*	*Mark Miller*	*Don Warfel*
Date	*1/8/04*	*1/8/04*	*1/13/04*
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02			
Date			

REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Incorporated comments from Oyster Creek EQ SME A. Hertz.
2	
3	
4	
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1.0 Purpose

License Renewal Rule, 10 CFR Part 54, requires that 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 environmental qualification (10CFR50.49 - EQ) be included in the scope of license renewal. (10CFR54.4(a)(3))

This position paper identifies the Oyster Creek Nuclear Generating Station systems and structures relied on to demonstrate compliance with the EQ rule. The required systems are identified in Table 1, and the required structures are identified in Table 2. This position paper will be used in conjunction with Project Level Instruction PLI-2, "Scoping of Systems and Structures." This position paper also documents the Time Limited Aging Analysis (TLAA) approach that will be used to address environmental qualification for license renewal.

This position paper is for the use of personnel engaged in the preparation, review, or approval of scoping evaluations in support of license renewal activities for Oyster Creek. This paper documents the technical basis for the license renewal scoping conclusions, along with the methodology and CLB source documents used. It identifies which of the "License Renewal Systems & Structures" identified in PP-01 are included in the scope of license renewal based on 10CFR50.49 (EQ) compliance as described in the CLB. Results will be used to populate the corresponding license renewal database field. Systems and structures listed will answer "Yes" to scoping criteria 54.4(a)(3) for EQ.

2.0 Scope

The scope of this position paper is those systems at Oyster Creek Nuclear Generating Station that contain electrical equipment subject to the requirements of 10CFR50.49, the EQ rule. Also included in the scope of this position paper are those structures that provide the physical boundaries of the postulated harsh environments and contain environmentally qualified electrical equipment.

Components at Oyster Creek Nuclear Generating Station can be associated with a system or structure through design drawings or the Component Record List (Ref. 3). License renewal scoping is performed at the system and structure level. The scope of this review is therefore limited to the identification of systems and structures. The identification of individual components is not within the scope of this position paper.

3.0 Requirements for Environmental Qualification

Regulatory requirements for environmental qualification are contained in 10CFR50.49. This regulation applies to electric equipment important to safety, the scope of which is defined in the regulation (10CFR50.49(b)(1), (2) and (3)) as follows:

(1) Safety-related electric equipment.

(i) This equipment is that relied upon to remain functional during and following design basis events to ensure

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

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

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

(ii) Design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed to ensure functions (b)(1)(i) (A) through (C) of this section.

(2) Nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions specified in subparagraphs (b)(1) (i) (A) through (C) of paragraph (b)(1) of this section by the safety-related equipment.

(3) Certain post-accident monitoring equipment.

As indicated in 10CFR50.49(c), environmental qualification of electric equipment important to safety located in a mild environment are not included in scope. A mild environment is an environment that would at no time be significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences.

The design basis accident environmental parameters and associated zone boundaries are identified in Oyster Creek Engineering Standard ES-027 (Reference 7).

4.0 Methodology

The Oyster Creek Environmental Qualification (EQ) program includes safety-related electrical equipment, non-safety-related electrical equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions of the safety-related equipment, and certain post-accident monitoring equipment, as defined in 10CFR50.49(b)(1), 10CFR50.49(b)(2), and 10CFR50.49(b)(3) respectively.

The Oyster Creek UFSAR (reference 2) Section 3.11.1.1.1 indicates that the scope of the electrical equipment and components that must be environmentally qualified for use in a harsh environment is identified in the EQ Master List, GPUN document No. 990-1464 (reference 5). This document is a database listing of equipment and components, and includes fields that identify specific equipment information such as manufacturer, plant location and qualification level. The EQ Master List data has been migrated to the Oyster Creek Component Record List (reference 3). The CRL includes an Environmental Qualification data field, and this field is now used to identify the EQ components. The EQ data field is a "Design Quality" field (reference 6), which means the data is

controlled and has been verified accurate. Guidance for design control of this data field is provided in reference 8.

The systems within the scope of 10CFR50.49 environmental qualification requirements are identified in Table 1. The first step to create this system list was to download all of the Oyster Creek CRL components from the CRL to an Access database. The downloaded list of components was then filtered to identify only the Oyster Creek EQ components, based on the controlled "Design Quality" CRL EQ data field described above. The filtered list was then sorted by system to obtain the list of systems identified in Table 1. System identification is based on the names and groupings in Engineering Standard ES-17 (reference 4). As an additional confirmation, the Table 1 list was compared to the EQ Master List (reference 5) to verify that the EQ Master List did not include any systems not identified in the CRL. Individual CLB references for each system in Table 1 is not required, as the entire table is based on the above review of references 3 and 5. Validating the identified EQ systems can be done by verifying that the system is identified as EQ in the Oyster Creek CRL.

The structures within the scope of 10CFR50.49 environmental qualification requirements are identified in Table 2. These structures were identified from a review of Engineering Standard ES-027, (reference 7), and have been validated by review of all EQ component location codes in the CRL. This engineering standard defines the Design Basis Event (DBE) environmental parameters for environmental qualification purposes. Structures that provide the physical boundaries for the postulated harsh environments and contain environmentally qualified electrical equipment are included in the scope of license renewal and are identified in Table 2. Individual CLB references for each structure in Table 2 is not required, as the entire table is based on the above review of reference 7. Validating the identified EQ structure can be done by verifying that the structure provides a harsh environment boundary in reference 7.

As stated above, the purpose of this position paper is to identify the systems and structures that are required to be included in the scope of license renewal under 10CFR54.4(a)(3) for demonstration of compliance with environmental qualification regulations. These systems and structures are identified in Table 1 and Table 2, respectively. The inclusion of a system or structure in Table 1 or Table 2 does not signify that all components or all portions of that system or structure are required to demonstrate compliance with EQ regulations. The appropriate system and structure boundaries for license renewal scope are identified during the scoping process in accordance with PLI-2. The CLB references provided in this position paper will need to be reviewed if it is necessary to determine the specific portions of a system or structure that is in scope for EQ. However, for systems in Table 1 where only a very limited portion of the system is subject to 10CFR50.49 requirements, a comment is included in the Table to clarify the limited scope. Such limited scope comments are not provided if much of the system is likely to be included in the scope of license renewal anyway for other reasons, such as 10CFR54.4(a)(1) or (a)(2). The limited EQ scope described in the comments is based on a review of the scope of components identified as EQ in the CRL for the system.

Systems and structures in the scope of license renewal under the 10CFR54.4(a)(3) criteria associated with environmental qualification are not subject to 10 CFR 54.4(a)(2) support system review, for evaluating the failure of non-safety related support systems and their impact on satisfying intended functions to meet 10 CFR 54.4(a)(1)(i), (ii), or (iii). Non-safety related support systems, if any, would be included in the scope of the Oyster Creek EQ program by regulation under 10CFR50.49(b)(2) EQ scope criteria. The entire scope of systems, structures and

components in the Oyster Creek EQ Program (references 3, 5, and 7) were considered in this position paper.

The systems identified in Table 1 are based on ES-17 system designations. When performing license renewal scoping in accordance with PLI-02 (reference 10), it will be necessary to first refer to PP-1 to determine which ES-17 systems are included in the license renewal system under review. If any of the ES-17 systems on Table 1 are included in the license renewal system under review, then the EQ scoping question will be answered "Yes."

The structures identified in Table 2 are based on the structure identification from PP-1.

4.1 EQ TLAA Approach for License Renewal

For license renewal, the aging effects of the EQ electrical equipment are addressed as a Time Limited Aging Analysis (TLAA) and will be managed during the extended period of operation under 10 CFR 54.21(c)(1)(iii). In some cases, reanalysis of EQ aging evaluations will be performed to extend the qualification life of the electrical equipment.

The reanalysis of an aging evaluation is normally performed to extend the qualification by reducing excess conservatism incorporated in the prior evaluation. Reanalysis of an aging evaluation to extend the qualification of a component is performed on a routine basis pursuant to 10 CFR 50.49(e) as part of the Oyster Creek EQ program. While a component life limiting condition may be due to thermal, radiation, or cyclical aging, the vast majority of component aging limits are based on thermal conditions. Conservatism may exist in aging evaluation parameters, such as the assumed ambient temperature of the component, unrealistically low activation energy, or in the assumed application of a component (de-energized versus energized). The reanalysis of an aging evaluation is documented according to Oyster Creek quality assurance program requirements, which requires the verification of assumptions and conclusions. Important attributes of a reanalysis include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions (if acceptance criteria are not met). These attributes are discussed below.

<u>Analytical Methods</u>

The Oyster Creek EQ program analytical models used in the reanalysis of an aging evaluation are the same as those previously applied during the prior evaluation. The Arrhenius methodology is an acceptable thermal model for performing a thermal aging evaluation. The analytical method used for a radiation aging evaluation is to demonstrate qualification for the total integrated dose (that is, normal radiation dose for the projected installed life plus accident radiation dose). For license renewal, one acceptable method of establishing the 60-year normal radiation dose is to multiply the 40-year normal radiation dose by 1.5 (that is, 60 years/40 years). The result is added to the accident radiation dose to obtain the total integrated dose for the component. For cyclical aging, a similar approach may be used. Other models may be justified on a case-by-case basis.

<u>Data Collection and Reduction Methods</u>

Reducing excess conservatism in the component service conditions (for example, temperature, radiation, cycles) used in the prior aging evaluation is the chief method used for a reanalysis.

Temperature data used in an aging evaluation is to be conservative and based on plant design temperatures or on actual plant temperature data. When used, plant temperature data can be obtained in several ways, including monitors used for technical specification compliance, other installed monitors, measurements made by plant operators during rounds, and temperature sensors on large motors (while the motor is not running). A representative number of temperature measurements are conservatively evaluated to establish the temperature used in an aging evaluation. Plant temperature data may be used in an aging evaluation in different ways, such as (a) directly applying the plant temperature data in the evaluation, or (b) using the plant temperature data to demonstrate conservatism when using plant design temperature for an evaluation. Any changes to material activation energy values as part of a reanalysis are to be justified on a plant-specific basis. Similar methods of reducing excess conservatism in the component service conditions used in prior aging evaluations can be used for radiation and cycling aging.

Underlying Assumptions

The Oyster Creek EQ Program EQ component aging evaluations contain sufficient conservatism to account for most environmental changes occurring due to plant modification and events. When unexpected adverse conditions are identified during operational or maintenance activities that affect the normal operating environment of a qualified component, the affected EQ component is evaluated and appropriate corrective actions are taken, which may include changes to the qualification bases and conclusions.

Acceptance Criteria and Corrective Actions

Under the Oyster Creek EQ Program, the reanalysis of an aging evaluation could extend the qualification of the component. If the qualification cannot be extended by reanalysis, the component is refurbished, replaced, or requalified prior to exceeding the period for which the current qualification remains valid. A reanalysis is to be performed in a timely manner (that is sufficient time is available to refurbish, replace, or requalify the component if the reanalysis is unsuccessful).

5.0 References

1. 10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants"
2. Oyster Creek Nuclear Generating Station, Updated Final Safety Analysis Report, Revision 13
3. Oyster Creek Component Record List (CRL)
4. Engineering Standard ES-17, Revision 22, Identification of Oyster Creek Plant Systems
5. 990-1464, Revision 11, Oyster Creek Electrical Equipment Environmental Qualification Master List
6. EP-035, Revision 8, CRL Control
7. Engineering Standard ES-027, Revision 4, Environmental Parameters – Oyster Creek NGS
8. EP-011, Revision 11, Methodology for Assigning and Maintaining the Quality Classification of Components
9. PP-1, License Renewal Systems and Structures
10. PLI-02, Scoping of Systems and Structures
11. AR A2080015 to remove EQ pull boxes from system 661 and delete EQ from system 641
12. 10CFR54.4 Requirements for Renewal of Operating Licenses for Nuclear Power Plants

Table 1 - Systems Subject to 10CFR50.49 EQ Requirements		
System	**ES-17**	**Comments (Note 1)**
Isolation Condenser	211	
Core Spray System & ADS System	212	
Shutdown Cooling System	214	
Cleanup Demineralizers System	215	
Reactor Head Cooling System	216	
Control Rod Drive System	225	
Containment Spray System	241	
Containment Inerting System	242	Containment isolation valves ~~only~~
Drywell and Suppression System	243	
Main Steam System	411	
Emergency Service Water System	532	
RBCCW System	541	Containment isolation valves and breaker for shutdown cooling outlet valve V-5-106 ~~only~~.
PASS System	555	Containment isolation valve V-40-6 ~~only~~.
Drywell Floor and Equipment Drains	573	Containment isolation valves ~~only~~
Remote Shutdown Panel	615	Panel LSP-1AB2 ~~only~~
Reactor Plant Instrumentation	622	
Engineered Safeguards Actuation System	642	
Post-Accident Monitoring System	664	
Hydrogen and Oxygen Monitoring System	666	
480V System	732	
120V AC Vital Power System	733	
125V Station DC System	735	
Cable, Raceway and Conduit System	770	This is not a system. The CRL contains only electrical commodity items (cables).
Primary Containment Electrical Penetrations	774	This system is included with structures under "Containment Common Components" as documented in position paper PP-1 (Ref 9).
Cable Routing and Terminations	775	This is not a physical plant system and does not include any installed plant components.
Reactor Building Ventilation System	822	
Instrument (Control) Air System	852	

Note 1: See the CRL (reference 3) for complete list of EQ components in the system.
Note 2: The CRL includes EQ circuit breakers in the Recirculation system 223. These breakers are considered to be electrical components of the 480 Volt system 732.

Table 2 - Structures Associated with EQ Environment Boundaries
Primary Containment
Reactor Building
Turbine Building
Exhaust Tunnel (known as SGTS Tunnel in reference 7)
Containment Common Components (Primary Containment Electrical Penetrations, see Table 1)
EQ Barriers – 4160 Volt Switchgear Room

Systems and Structures

Relied upon to Demonstrate Compliance

With

10 CFR 50.48 - Fire Protection

Oyster Creek Nuclear Generating Station

License Renewal

APPROVAL PAGE

Revision	*Prepared by:*	*Checked by:*	*Approved by:*
00	*Kevin Muggleston*	*Stu Getz*	*Don Warfel*
Date	*1/13/04*	*1/13/04*	*1/15/04*
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REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Incorporate peer review (C. Pragman, M. Carlson) comments, added fire protection power supply systems.
2	Correct errors in Table 4, add Roof Drains and Overboard Discharge and Chlorination Facility.
3	Credit RPV for FSSD, clarify Reactor Head Vent valve scoping. Open Item 403.
4	
5	

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1.0 Purpose

License Renewal Rule, 10 CFR Part 54, requires that 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) be included in the scope of license renewal. (10CFR54.4(a)(3))

This position paper identifies the Oyster Creek Nuclear Generating Station systems and structures relied on to demonstrate compliance with 10 CFR 50.48 (Fire Protection). The required systems are identified in Table 4 and the required structures are identified in Table 5. This position paper will be used in conjunction with Project Level Instruction PLI-2, "Scoping of Systems and Structures."

This position paper is for the use of personnel engaged in the preparation, review, or approval of scoping evaluations in support of license renewal activities for Oyster Creek. This paper documents the technical basis for the license renewal scoping conclusions, along with the methodology and CLB source documents used. It identifies which of the "License Renewal Systems & Structures" identified in PP-01 is required to support 10CFR50.48 Fire Protection functions as described in the CLB. Results will be used to populate the corresponding license renewal database field. Systems and structures listed will answer "Yes" to scoping criteria 54.4(a)(3) for 10CFR50.48. This position paper also provides a source of CLB references that can be reviewed to confirm or establish the license renewal system boundaries associated with this regulated event.

2.0 Scope

The scope of this document is those systems and structures that are required for the fire protection program to comply with the fire protection requirements of 10 CFR50.48. This includes:

1. Systems and structures required for post-fire safe shutdown.
2. Systems and structures required for fire detection and suppression.
3. Systems and structures required to meet commitments made to Appendix A of Branch Technical Position Auxiliary Power Conversion System Branch BTP APCSB 9.5-1 (Reference 6).

Most components at Oyster Creek Nuclear Generating Station can be associated with a system or structure through design drawings or the Component Record List (Ref. 7). The Component Record List (CRL) is a controlled component database used to identify and track systems, structures and components at Oyster Creek. License renewal scoping is performed at the system and structure level in accordance with project level instruction PLI-2. Therefore, the scope of this review is limited to the identification of systems and structures. The identification of individual components is not within the scope of this position paper. Individual components or pieces of equipment are identified only when an appropriate system correlation does not exist.

3.0 Fire Protection Requirements

10 CFR 50.48 requires each operating nuclear power plant to have a fire protection plan that satisfies the requirements of Criterion 3 of 10 CFR 50 Appendix A.

Criterion 3 -- Fire Protection; "Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room. Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Fire fighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components."

10 CFR 50.48 requires all nuclear power plants licensed to operate prior to January 1, 1979, to comply with Sections III.G, III.J and III.O of Appendix R to 10 CFR 50.

Section III.G requires fire protection features to be provided for those system, structures and components important to safe shutdown. These features must be capable of limiting fire damage so that:

1. One Train of systems necessary to achieve and maintain hot shutdown conditions from either the main control room or the emergency control station(s) is free of fire damage, and

2. Systems necessary to achieve and maintain cold shutdown from either the main control room or the emergency control station(s) can be repaired within 72 hours.

Section III.G also includes requirements for alternative shutdown capability.

Section III.J requires that emergency lighting units with at least 8-hour battery power supply shall be provided in all areas needed for operation of safe shutdown equipment and in access and egress routes thereto.

Section III.L provides the acceptance criteria for III.G.3.

Section III.O establishes requirements for oil collection systems for Reactor Coolant Pumps. This section is not applicable to Oyster Creek because the containment is inert during normal operation.

Except for the requirements of Sections III.G, III.J and III.O, the provisions of 10 CFR 50 Appendix R are not applicable to nuclear power plants licensed to operate prior to January 1, 1979, to the extent that plant fire protection features have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position BTP APCSB 9.5-1 reflected in staff fire protection safety evaluation reports. These "Appendix A" commitments are documented in the Oyster Creek Fire Hazards Analysis Report (Ref. 1), and are part of Oyster Creek's demonstrated compliance with 10 CFR 50.48.

4.0 Methodology

The scope of systems and structures considered necessary to demonstrate compliance with 10 CFR 50.48 can be broken down into the following categories:

1. Systems and structures required for post-fire safe shutdown.
2. Systems and structures required for fire detection and suppression.
3. Systems and structures required to meet commitments made to Appendix A of Branch Technical Position Auxiliary Power Conversion System Branch BTP APCSB 9.5-1

Fire Protection systems are not safety related, and therefore are not subject to 10 CFR 54.4(a)(2) support system review, i.e., for evaluating the failure of non-safety related support systems and their impact on satisfying intended functions to meet 10 CFR 54.4(a)(1)(i), (ii), or (iii). First-level, primary support systems which are necessary for the functioning of equipment credited in the Fire Hazards Analysis Report or Safe Shutdown Analysis to demonstrate compliance with 10 CFR 50.48 (Fire Protection) are included in scope and are identified in the tables. However, second-, third- and fourth-level support systems, back-up systems and systems or structures whose failure could indirectly cause failure of credited equipment are not within the scope of 10 CFR Part 54 unless such lower-level, back-up or indirect support systems or structures are explicitly credited in a CLB document.

The systems and structures required for post-fire safe shutdown are identified from a review of the CLB documents that describe the safe shutdown analysis (see section 4.1 for complete references). The systems and structures required for fire detection and suppression are identified from review of the UFSAR descriptions (including the Fire Hazards Analysis Report), the Component Record List (CRL) and the plant Flow Diagrams. The CRL includes a Fire Protection data field and a Fire Safe Shutdown data field. These data fields are "Design Quality" (reference 33), which means the data is controlled and has been verified accurate. Guidance for design control of these data fields is provided in reference 34. As the final check, the commitments associated with BTP APCSB 9.5-1 were also reviewed to identify any additional fire protection systems and structures not previously identified.

For systems, the results of these three review steps are documented in Tables 1, 2, and 3. The results were documented in separate tables to simplify the review and facilitate future revisions. Table 1 is organized according to FSSD Functions, and so it is possible for the same system to be listed under more than one function. Table 2 identifies the systems required for fire detection and suppression. It is possible for some of the same systems to be listed on both Table 1 and Table 2. It is important to recognize that Table 3 includes ONLY those systems credited in an "Appendix A" commitment and NOT previously identified in Table 1 or Table 2. If any systems or equipment are considered for deletion from Tables 1 or 2 in future revisions to this position paper, the commitments of FHAR Attachment A must also be reviewed. Tables 1, 2, and 3 include a column to identify the appropriate CLB reference(s), additional note references, or any comments. Table 4 is a consolidated list of systems from Tables 1, 2, and 3. Table 4 will be used as the input for completing the system scoping review packages. For structures, the results are provided in Table 5 with the appropriate CLB reference(s) identified.

Not all CLB documents use the exact same terminology for the various plant systems and structures. System identification is based on the names and groupings in Engineering Standard ES-17 (reference 21). Structure identification is based on the names and groupings in Engineering Standard ES-17 (reference 21) or position paper PP-1 (reference 28). Some source documents identify credited components without identifying the associated system. In such cases, the CRL (reference 7) was used as the basis to determine the appropriate system number. The system name was then obtained from ES-17, and the system and components are identified in the table.

Recent NRC guidance, including NUREG-0800 Section 9.5.1 Appendix C (reference 30) and the Proposed Staff Position on the License Renewal Rule as it Relates to the Fire Protection Rule (reference 31), states that the scope of 10 CFR 50.48 goes beyond the protection of safety related equipment, and also includes fire protection systems, structures and components needed to minimize the effects of a fire and to prevent the release of radioactive material to the environment. Fire protection system and structure scoping for Oyster Creek is performed consistent with this guidance, as documented in this position paper.

The systems identified in Table 4 are based on ES-17 system designations. When performing license renewal scoping in accordance with PLI-02 (reference 35), it will be necessary to first refer to PP-1 (reference 28) to determine which ES-17 systems are included in the license renewal system under review. If any of the ES-17 systems on Table 4 are included in the license renewal system under review, then the Fire Protection scoping question will be answered "Yes."

The structures identified in Table 5 are based on the structure identification from ES-17 but also includes additional structural features. Position Paper PP-01 should be used in conjunction with Table 5.

4.1 Systems Credited for Fire Safe Shutdown

Table 1 is a list of those systems that are required for fire safe shutdown (FSSD). The "Specification for Post-Fire Safe Shutdown Program Requirements at Oyster Creek Nuclear Generating Station" (Reference 5) is the source document for identifying systems credited for FSSD. In some cases, the specific systems being credited could not be determined from this specification alone. The INDMS Equipment Report (reference 4) and the Appendix R Safe Shutdown Path drawings (references 8, 9, 10, 11, 12) were used for clarification and additional confirmation of the FSSD systems. Table 1 also includes identification of the specific shutdown functions that each system is credited to perform for FSSD, including support functions. In each case, the CLB reference(s) is identified in the Comments / Reference column.

As an additional confirmation, the CRL was downloaded into an ACCESS database, and then filtered to identify only the FSSD components, based on the controlled FSSD data field. This review did not identify any additional systems required for FSSD.

4.2 Systems Credited for Fire Detection and Suppression

Table 2 is a list of those systems required for fire detection and suppression. The systems in Table 2 are identified from a review of the UFSAR (reference 3), Oyster Creek Fire Protection System Flow Diagrams (references 15 – 20), the Component Record List (CRL) and Engineering Standard ES-17 (reference 21). The CRL includes a field to identify Fire Protection components, and these components were reviewed to confirm the scope of fire protection systems. The appropriate CLB reference is identified in the Comments / Reference column of Table 2.

The fire detection and suppression systems at Oyster Creek are plant-wide systems that protect both in-scope and out of scope plant equipment. Not all portions of these systems are required to demonstrate compliance with 10CFR50.48. Some branches of the fire detection and suppression systems protect plant areas in which a fire would not impact any equipment important to safety, or significantly increase the risk of radioactive releases to the environment. Portions of the fire suppression and detection systems that are not included in the scope of license renewal are identified in the table below.

Excluded Portions of Fire Suppression Systems

Building / Area	Isolation Valve	Suppression System	Associated Hose Stations / Hydrants
Old Warehouse	V-9-34	Sprinkler System #5	#24, 25
New Warehouse	V-9-150	Sprinkler System #8	#56, 57, 58, 59, 60, 61, 62
Old QA Storeroom	V-9-17	Sprinkler System #6	#1, 2
Maintenance Building	V-9-333	Sprinkler System #14	
Site Emergency Building & New Administration Building	V-9-913	Sprinkler System #17A, 17B	#65, 66, 67, 68 and Hydrants #6, 11
Site Emergency Building Halon System	N/A	Halon System	N/A
Low Level Radwaste Storage Facility (LLRW)	V-9-944	Sprinkler System #18, 19	#69, 70, 71, 72, 73, 74, 77, 80, 81, 82, 83

<u>Sprinkler Systems 5, 6, 8, 14, 17A, 17B</u>

These sprinkler systems, downstream of the identified isolation valves, are classified as Not Important to Safety (NITS) on the flow diagram (reference 17) and in TDR-622 (reference 29). The CRL (reference 7) does not identify any safety related components in these areas. The Fire Hazards Analysis (reference 1) does not identify any fire safe shutdown (FSSD) equipment in these areas. A fire in these areas does not significantly increase the risk of radioactive releases to the environment. These identified sprinkler systems in these areas are not included in the scope of license renewal.

Site Emergency Building Halon System

The Site Emergency Building Halon System is classified as Not Important to Safety (NITS) on the flow diagram (reference 20) and in TDR-622 (reference 29). The CRL (reference 7) does not identify any safety related components in this area. The Fire Hazards Analysis (reference 1) does not identify any fire safe shutdown (FSSD) equipment in this area. A fire in this area does not significantly increase the risk of radioactive releases to the environment. This Halon suppression system is not included in the scope of license renewal.

Sprinkler Systems 18, 19 in the LLRW Storage Facility

Fire protection features of the Low Level Radwaste Storage facility (also known as the Waste Storage Facility in ES-17) were determined to be out of scope based on the following analysis in the FHAR (reference 1):

"The building has been analyzed for liquid or airborne radioactive releases to the environment without reliance on active or passive fire protection features. Potential airborne releases were evaluated without reliance on the ventilation systems. Potential contaminated liquids are contained within the building for transport to decontamination processing. Potential release due to a fire was analyzed with no reliance on fire detection or suppression equipment or activities. Inadvertent operation of the sprinkler system was analyzed as a potential liquid release of radioactivity or contamination. In all such cases the radioactive or contamination release was well within the limits of 10 CFR 100. Therefore a fire does not present an unacceptable release to the environment and the active and passive fire protection features of this building are not considered within the scope of BTP APCSB 9.5-1, Appendix A. The active and passive features provided for this building are to protect plant investment, satisfy insurance requirements and comply with building codes only."

The LLRW Storage Facility fire suppression and detection systems are not in the scope of license renewal.

Further reduction of the scope boundaries of fire detection or fire suppression systems, if needed, should be documented on a case-by-case basis in the appropriate system scoping review package.

4.3 Additional Systems Credited in Commitments Made in Response to Appendix A of BTP APSCB 9.5-1

Table 3 is a list of additional systems and equipment that are identified in commitments made in response to BTP APSCB 9.5-1. The Table 3 list was identified by review of the FHAR (reference 1) Attachment A.

The FHAR Attachment A includes discussions covering nearly all aspects of the Oyster Creek Fire Protection Program, including detection, suppression and FSSD systems and equipment. To avoid

significant duplicate effort, Table 3 only includes system or equipment that was not already identified and included on Table 1 or Table 2.

4.4 Structures Relied Upon to Demonstrate Compliance with 10 CFR 50.48

Table 5 is a list of the structures relied upon to demonstrate compliance with 10 CFR 50.48. The source document used to identify structures is the FHAR. Each Fire Area and Fire Zone was reviewed, and the associated structure was included in scope if it included fire barriers credited to prevent the spread of fires between analyzed fire areas or zones. Structures required to support or house Safe Shutdown systems and equipment, as identified in Section 7 of the FHAR, are also included in scope and identified in Table 5. Excluded structures are discussed below.

Table 5 also includes structures that directly support or protect the portions of the fire suppression systems included in the scope of license renewal. With the boundary of the fire suppression systems reduced as described in Section 4.2, the structures included from the FHAR review includes all structures needed to support or protect the in-scope fire suppression components.

Table 5 also lists selected structural component items that were identified during the review. Although these items are not structures, they have been identified here for completeness to assure that they are properly addressed for license renewal.

<u>Excluded Structures</u>

The Old Radwaste Building (Fire Zone OR-FA-19) was excluded from Table 5. The fire hazard analysis (Reference 1, Section 7) states that this area is separated from the reactor building (railroad airlock) by 15 feet, and from other fire areas by open space of at least 50 feet. The Old Radwaste Building does not contain any fire barriers credited in the fire hazards analysis. This building does not contain any safety related or safe shutdown equipment. The structure includes fire detection equipment that alarms locally and in the control room, but does not contain any fire suppression systems within or supported by the structure. The fire detection system will provide early warning of a fire to allow utilization of manual suppression. A fire will be contained within the area and have no effect on safe shutdown.

The New Radwaste Building (Fire Zone NR-FA-20) was excluded from Table 5. The fire hazard analysis (Reference 1, Section 7) states that this area is separated from other fire areas by open space of at least 50 feet. The New Radwaste Building does not contain any fire barriers credited in the fire hazards analysis. This building does not contain any safety related or safe shutdown equipment. The structure includes fire detection equipment that alarms in the control room, but does not contain any fire suppression systems within or supported by the structure. The fire detection system will provide early warning of a fire to allow utilization of manual suppression. A fire will be contained within the area and have no effect on safe shutdown.

The Augmented Off Gas Building (Fire Zone OG-FA-21) was excluded from Table 5. The fire hazard analysis (Reference 1, Section 7) states that this area is separated from other fire areas by at least 50 feet. The Augmented Off Gas Building does not contain any fire barriers credited in the fire hazards analysis. This building does not contain any safety related or safe shutdown equipment. The structure includes fire detection equipment, but does not contain any fire suppression systems within or supported by the structure. The building includes a dry standpipe that can be supplied by a hose connection, and is not normally connected to the fire water system (reference 17). A fire in this area will not affect safe shutdown.

The Low Level Radwaste Storage Facility (Fire Zone LL-FA-29) was excluded from Table 5. The fire hazard analysis (Reference 1, Section 7) states that this area is separated from other fire areas by open spaces of at least 50 feet. The Low Level Radwaste Storage Facility does not contain any fire barriers credited in the fire hazards analysis. This building does not contain any safety related or safe shutdown equipment. As discussed in Section 4.2, the fire suppression and fire detection systems protecting the LLRW Storage Facility are not included in the scope of license renewal.

The Independent Spent Fuel Storage Installation (ISFSI) – Complete Facility (Fire Zone LL-FA-30) was excluded from Table 5. The fire hazard analysis (Reference 1, Section 7) states that this area is separated from other safety related structures by open space of at least 50 feet. The ISFSI does not contain any fire barriers credited in the fire hazards analysis performed under 10CFR50.48. This structure does not contain any safety related or safe shutdown equipment. This structure does not contain any fire suppression or fire detection equipment. This structure contains no flammable or combustible materials. No specific quantification of fire loading is necessary because the facility is in an open area with nothing to contain the heat release in the event of a fire. The design of the facility precludes addition of anything inside the storage module except the shielded canisters.

The following "outdoor" fire zones are identified in Reference 1 Section 7. These fire zones are physically separated from the other plant structures. There are no walls or ceilings that act as fire barriers to other fire zones. Therefore, these fire areas are not structures relied upon to demonstrate compliance with 10 CFR 50.48, and are excluded from Table 5.

Fire Area	Structure
Fire Area LL-FA-32	Low Level Radwaste Storage Facility Yard Area
Fire Area OR-FA-33	Old Radwaste/New Radwaste Yard Area
Fire Area YARD	General Yard Area

5.0 References

1. Oyster Creek Nuclear Generating Station, Fire Hazards Analysis Report, Document No. 990-1746, Revision 12
2. 10 CFR 50.48, "Fire protection"
3. Oyster Creek Nuclear Generating Station, Updated Final Safety Analysis Report, Revision 13
4. INDMS Equipment Report, EL6642002-017-01, Rev. 0
5. SP-1302-06-013, Revision 1, Specification for Post-Fire Safe Shutdown Program Requirements at Oyster Creek Nuclear Generating Station
6. Appendix A to BTP APCSB 9.5 - 1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976," dated August 23, 1976.
7. Oyster Creek Component Record List (CRL)
8. GU 3E-911-41-040, Sheet 1, Rev. 10, Figure A-1, Appendix R Safe Shutdown – Hot Shutdown Paths – Paths 1 & 2
9. GU 3E-911-41-041, Sheet 1, Rev. 6, Figure A-1, Appendix R Safe Shutdown – Hot Shutdown Paths – Paths 3 & 4
10. GU 3E-911-41-042, Sheet 1, Rev. 11, Figure A-2, Appendix R Safe Shutdown – Cold Shutdown Paths – Paths 1 & 2
11. GU 3E-911-41-043, Sheet 1, Rev. 7, Figure A-2, Appendix R Safe Shutdown – Cold Shutdown Paths – Path 3
12. GU 3E-911-41-044, Sheet 1, Rev. 4, Figure A-1, Appendix R Safe Shutdown – Hot Shutdown Paths – Path 5
13. CC-AA-211, Revision 1, Fire Protection Program
14. 2400-APR-3900.01, Revision 11, Appendix R Repair Kit Annual Inspection
15. JC 19479, Sheet 1, Revision 37, Fire Protection Water System Flow Diagram
16. JC 19479, Sheet 2, Revision 36, Fire Protection Water System Flow Diagram
17. JC 19479, Sheet 3, Revision 65, Fire Protection Water System Flow Diagram
18. JC 19479, Sheet 4, Revision 29, Fire Protection Water System Flow Diagram
19. JC 19629, Sheet 1, Revision 8, Fire Protection CO2 Flow Diagram
20. JC 19629, Sheet 2, Revision 8, Fire Protection Halon Flow Diagram
21. Engineering Standard ES-17, Revision 22, Identification of Oyster Creek Plant Systems
22. 101.2, Revision 50, Oyster Creek Site Fire Protection Program
23. 645.6.003, Revision 16, Fire Hose Station, Hose House and Fire Hydrant Inspection
24. 645.6.006, Revision 14, Fire Hose Hydrostatic Testing
25. 645.6.008, Revision 10, Fire Hose Re-Rack and Blockage Inspection
26. 2400-GMM-3681.04, Revision 3, Inspection and Maintenance of Portable Fire Extinguishers
27. NUREG-0800, Rev. 4, October 2003, Section 9.5.1 Fire Protection Program
28. PP-1, License Renewal Systems and Structures
29. TDR-622, Revision 1, ITS/NITS Classification of Fire Suppression Systems and Fire Detection Systems
30. NUREG-0800, Section 9.5.1, Appendix C, Supplemental Fire Protection Review Criteria for License Renewal, Revision 4, October 2003
31. NRC Letter, P.T. Kuo to NEI, dated November 13, 2002, Proposed Staff Guidance on the Scoping of Fire Protection Equipment for License Renewal

32. AR A2018081, Evaluation 45 to update CRL
33. EP-035, Revision 8, CRL Control
34. EP-011, Revision 11, Methodology for Assigning and Maintaining the Quality Classification of Components
35. PLI-02, Scoping of Systems and Structures
36. Procedure 331.1, Revision 15, Control Room and Old Cable Spreading Room Heating, Ventilation and Air Conditioning System
37. 3C-734-11-044, Revision 5, Miscellaneous Power/Lighting Panels Panel Schedule
38. AP PE-521 Sheet 2, Revision 8, Control Module #2, 4160V Switchgear Area
39. AR A2079501, Evaluation 1
40. AR A2079501, Evaluation 7

Table 1 - Systems Credited for FSSD With Associated FSSD Functions

FSSD Function	System	ES-17	Comments / Reference
Reactor Shutdown	Reactor Protection System	641	FSSD Specification (Ref. 5) section 5.2.3.1
	Control Rod Drive System	225	
Pressure Control	EMRVs (including control circuitry)	212	FSSD Specification (Ref. 5) section 5.2.3.2. EMRVs are currently in system 212, Core Spray System and ADS
	Isolation Condenser System	211	FSSD Specification (Ref. 5) section 5.2.3.2
Inventory Control	Control Rod Drive System	225	FSSD Specification (Ref. 5) section 5.2.3.3.1
	Core Spray System	212, 642	FSSD Specification (Ref. 5) section 5.2.3.3.2. Core Spray system is currently system 212, Core Spray System and ADS
	Main Steam System	411	FSSD Specification (Ref. 5) section 5.2.3.3.3 (Note 2)
	Feedwater System (Not required for 10CFR50.48, see Note 1)	422	FSSD Specification (Ref. 5) section 5.2.3.3.3 (Note 1)
	Condensate (Not required for 10CFR50.48, see Note 1)	421	FSSD Specification (Ref. 5) section 5.2.3.3.3 (Note 1)
	Recirculation Pumps and M/G Sets (Not required for 10CFR50.48, see Note 1)	224, 642	FSSD Specification (Ref. 5) section 5.2.3.3.3 (Note 1)
	Cleanup Demineralizer System	215	FSSD Specification (Ref. 5) section 5.2.3.3.3. Called Reactor Water Cleanup System in FSSD Specification (Note 3)
	EMRVs	212	FSSD Specification (Ref. 5) section 5.2.3.3.3. EMRVs are currently in system 212, Core Spray System and ADS
	Reactor Vessel	221 (Note 9)	Head Vent valves - FSSD Specification (Ref. 5) section 5.2.3.3.3
	Isolation Condenser System	211	Tube Vent Valves - FSSD Specification (Ref. 5) section 5.2.3.3.3
	Shutdown Cooling System	214	FSSD Specification (Ref. 5) section 5.2.3.3.3
Decay Heat Removal	Isolation Condenser System	211	FSSD Specification (Ref. 5) section 5.2.3.4.1

Table 1 - Systems Credited for FSSD With Associated FSSD Functions

FSSD Function	System	ES-17	Comments / Reference
	ADS	212, 642	FSSD Specification (Ref. 5) section 5.2.3.4.2. EMRVs, currently in system 212, Core Spray System and ADS
	Shutdown Cooling System	214	FSSD Specification (Ref. 5) section 5.2.3.4.3
	Recirculation System (excludes pumps & MG sets)	223	FSSD Specification (Ref. 5) section 5.2.3.4.3
Process Monitoring	Reactor Plant Instrumentation	622	FSSD Specification (Ref. 5) section 5.2.3.5.1
	Feedwater Control System	625	FSSD Specification (Ref. 5) section 5.2.3.5.1. LI-IA0013 Reactor Wide Range Level, INDMS Equipment Report (Ref. 4)
	Drywell and Suppression System	243	FSSD Specification (Ref. 5) section 5.2.3.5.2 Torus level, INDMS Equipment Report (Ref. 4)
	Torus Temperature Monitoring System	664	FSSD Specification (Ref. 5) section 5.2.3.5.2 Torus Temperature, INDMS Equipment Report (Ref. 4)
	Isolation Condenser System	211	FSSD Specification (Ref. 5) section 5.2.3.5.2. IC Level
	Condensate Transfer System	424	FSSD Specification (Ref. 5) section 5.2.3.5.2. CST Level
Support Systems	Startup Transformers Protective Relays & Controls - Offsite Power	724	FSSD Specification (Ref. 5) section 5.2.3 credits offsite power as a support system. INDMS Equipment Report (Ref. 4)
	Switchyard Facilities	701	34.5 KV Bank 5, 6 Electrical Distribution Line Breakers. INDMS Equipment Report (Ref. 4)
	4160V System	731	FSSD Specification (Ref. 5) section 5.2.3
	Diesel Generators	741	FSSD Specification (Ref. 5) section 5.2.3
	480V System	732	FSSD Specification (Ref. 5) section 5.2.3
	125V Station DC System	735	INDMS Equipment Report (Ref. 4)

Table 1 - Systems Credited for FSSD With Associated FSSD Functions

FSSD Function	System	ES-17	Comments / Reference
	120V AC Vital Power Systems	733	INDMS Equipment Report (Ref. 4)
	Main Office Building HVAC 480V SWGR Room Battery Room	823	Specific HVAC Systems identified From GU 3E-911-41-040 (Ref. 8) and INDMS Equipment Report (Ref. 4)
	Control Room HVAC	826	Specific HVAC Systems identified From GU 3E-911-41-040 (Ref. 8) and INDMS Equipment Report (Ref. 4)
	Containment Spray System	241, 642	FSSD Specification (Ref. 5) section 5.2.3.6.3
	Emergency Service Water System	532	FSSD Specification (Ref. 5) section 5.2.3.6.4
	Reactor Building Closed Cooling Water System	541	FSSD Specification (Ref. 5) section 5.2.3.6.5
	Service Water System	531	FSSD Specification (Ref. 5) section 5.2.3.6.6
	Condensate Transfer System	424	FSSD Specification (Ref. 5) section 5.2.3.6.7
	Instrument Air System	852	BR 2013 sheet 6, INDMS Equipment Report (Ref. 4), FSSD Specification Section 5.2.3.6.7 and 7.2 (Ref. 5) (Note 4)
	Nitrogen Supply System	854	These systems are not required to function during a fire or survive a fire. However, they are credited with establishing the inert drywell environment in which a design basis fire cannot occur. (Ref. 1, Fire Area RB-FA-2)
	Containment Inerting System	242	
	Reactor Building Ventilation System	822	
	Fire Protection Water System	811	FSSD Specification (Ref. 5) section 5.2.3.6.8
	Diesel Generator Systems	861, 741	FSSD Specification (Ref. 5) section 5.2.3.6.9
	Diesel Generator Fuel Oil Storage and Transfer System	862	FSSD Specification (Ref. 5) section 5.2.3.6.9
Alternative Shutdown	Remote Shutdown Panel	615	INDMS Equipment Report (Ref. 4), FSSD Specification Attachment F (Ref. 5)
	Remote Shutdown Control and Instrumentation	626	ES-17 (Ref. 21), CRL (Ref. 7)
	Local Shutdown Panels	615	FSSD Specification Attachment F (Ref. 5)

Table 1 - Systems Credited for FSSD With Associated FSSD Functions

FSSD Function	System	ES-17	Comments / Reference
Emergency Lighting	Emergency Lighting	762	FSSD Specification Section 6.7 (Ref. 5)
	Normal Lighting	761	FSSD Specification Section 6.7 (Ref. 5). Includes AC, Vital AC and DC Lighting discussed in Section 6.7. (Note 5)
High/Low Pressure Interface	Head Vent Valves V-25-21, V-25-22	221 (Note 9)	FSSD Specification Attachment D (Ref. 5) These systems are included in scope for FSSD functions, as identified elsewhere in this table. No additional systems are added due to these High/Low Pressure Interface locations.
	Isolation Condenser Tube Vent Valves V-14-1, V-14-5, V-14-19, V-14-20	211	
	MSIVs	411	
	Main Steam Drain Valves V-1-106, V-1-107, V-1-110, V-1-111	411	
	EMRVs	212	
	Shutdown Cooling Isolation Valves V-17-19, V-17-54	214	
	RWCU Valves V-16-1, V-16-2, V-16-14	215	
	Core Spray Injection Valves V-20-150, V-20-151, V-20-152, V-20-153	212	
Communications	Radio Communications Systems	787	FSSD Specification Section 6.2 (Ref. 5)
	Standby Gas Engine Generator	787	
Repairs	Cable, Connectors, Electrical Tape, Tie Wraps, Splice Kits, tubing, tube fittings, fasteners, hoses, smoke exhauster, flash lights, flexible duct, duct adapter, power cord, level indicators	911	FSSD Specification Section 9 (Ref. 5), Appendix R Repair Kit Annual Inspection (Ref. 14), Procedure 331.1 (Ref. 36) (Note 7)

Table 2 - Systems Credited for Fire Detection and Suppression

System	ES-17	Reference / Comments
Fire Detection Systems	665	UFSAR 9.5.1.2.6
Fire Protection Water System	811	UFSAR 9.5.1.2.3. Includes diesel driven fire pumps, associated diesel fuel oil tank and fuel supply piping, motor driven fire pumps, underground piping, water storage tank, hydrants, interior hose stations and fixed water suppression systems. (Note 8)
Fire Protection CO2 System	812	UFSAR 9.5.1.2.4. Includes Turbine Exciter CO2 and 4160V Switchgear Rooms CO2
Fire Protection Halon System	813	UFSAR 9.5.1.2.4. Includes 480V Switchgear Room Halon, A/B Battery Room and Control Room Panel Halon. The Site Emergency Building Computer Room and Electrical Room Halon systems are not in the scope of license renewal, see Section 4.2.
Portable Foam Equipment	None	UFSAR 9.5.1.2.3
Portable Fire Extinguishers Dry Chemical Carbon Dioxide Pressurized Water	None	UFSAR 9.5.1.2.5 Inspection Procedure 2400-GMM-3681.04 (Note 6)
480/208/120V Utility (JCP&L) Non-Vital Power	737	Provides power to the redundant fire pump.
Miscellaneous Power/Lighting Panels	734	Provides power to 4160V Switchgear vault ventilation controls and fire detection control panels (ref. 37, 38)

Table 3 - Additional Systems Credited in Commitments Made in Response to Appendix A of BTP APSCB 9.5-1		
System	**ES-17**	**Reference / Comments**
Lightning Protection System	752	Item A.4.
Reactor Building Floor and Equipment Drains	572	D.1.I, E.3.a.
Roof Drain and Overboard Discharge System	576	D.1.I, E.3.a.
Turbine Building Floor and Equipment Drains Cable Spreading Room Drain	571	D.1.I, E.3.a.
Portable smoke removal equipment		Item D.4. (Note 7)
Portable ventilation equipment		Item D.4.a. (Note 7)
Main Office Building HVAC Cable Spreading Room HVAC	823	Item D.4.g for smoke removal.
Turbine Building Ventilation System 4160V SWGR Room Ventilation	821	Item D.4.g for smoke removal.
Self Contained Breathing Apparatus (including compressor for providing backup 6-hour supply)		Item D.4.h. (Note 6)
Portable lights (flashlights)		Item D.5.b. (Note 7)
Curbs around stairwells in Reactor Building (southeast corner)		E.3.a – provide protection from water damage

Table 4 - Consolidated Table of Systems Relied Upon to Demonstrate Compliance with 10 CFR 50.48

System Name	ES-17 System Number
Portable Fire Extinguishers (Note 6)	None
Portable Foam Equipment	None
Self Contained Breathing Apparatus (Note 6)	None
Isolation Condenser System	211
Automatic Depressurization System	212
Core Spray System	212
EMRVs (including control circuitry)	212
Shutdown Cooling System	214
Cleanup Demineralizer System (Note 3)	215
Reactor Vessel	221 (Note 9)
Recirculation System	223
Control Rod Drive System	225
Containment Spray System	241
Containment Inerting System	242
Drywell and Suppression System	243
Main Steam System (Note 2)	411
Condensate Transfer System	424
Service Water System	531
Emergency Service Water System	532
Reactor Building Closed Cooling Water System	541
Turbine Building Floor and Equipment Drains	571
Reactor Building Floor and Equipment Drains	572
Roof Drains and Overboard Discharge	576
Remote and Local Shutdown Panels	615
Reactor Plant Instrumentation	622
Feedwater Control System	625
Remote Shutdown Control and Instrumentation	626
Reactor Protection System	641
Engineered Safeguards Actuation System	642
Torus Temperature Monitoring System	664
Fire Detection Systems	665
Switchyard Facilities	701
Startup Transformers Protective Relays & Controls	724
4160V System	731
480V System	732
120V AC Vital Power System	733
Miscellaneous Power/Lighting Panels	734
125V Station DC System	735
480/208/120V Utility (JCP&L) Non-Vital Power	737

Table 4 - Consolidated Table of Systems Relied Upon to Demonstrate Compliance with 10 CFR 50.48

Diesel Generators (Electrical)	741
Lightning Protection System	752
Normal Lighting (Note 5)	761
Emergency Lighting	762
Radio Communications Systems	787
Fire Protection Water System (Note 8)	811
Fire Protection CO2 System	812
Fire Protection Halon System (Note 8)	813
Turbine Building Ventilation System 4160V SWGR Room Ventilation	821
Reactor Building Ventilation System	822
480V Switchgear Room HVAC	823
Battery Room HVAC	823
Cable Spreading Room HVAC	823
Control Room HVAC	826
Instrument Air System (Note 4)	852
Nitrogen Supply System	854
Diesel Generator Systems (Mechanical)	861
Diesel Generator Fuel Oil Storage and Transfer System	862
Portable lights (flashlights) (Note 7)	911
Portable smoke removal equipment (Note 7)	911
Portable ventilation equipment (Note 7)	911
Post FSSD Repair Components (Note 7)	911

Table 5 – Structures Required to Demonstrate Compliance with 10 CFR 50.48

ES-17	STRUCTURE	STRUCTURE FUNCTION	CLB REFERENCE
None	Fire Protection Water Supply Pond	Impoundment for fire protection water supply.	UFSAR (Ref. 3) Section 9.5.1.2.3
None	Hose Houses	Protection for outdoor fire hose stations.	UFSAR (Ref. 3) Section 9.5.1.2.3
None	Fire Protection Shed	Houses Deluge System #10 for Station Blackout Transformer	JC 19479 Sh. 1 (Ref. 15)
None	Curbs around stairwells in Reactor Building (southeast corner)	Provides protection from water damage	FHAR (Ref. 1) Attachment A, Item E.3.a.
None	Fire wrap	Passive fire protection for cables and equipment	
None	Cabinet seals and water shields	Prevent water intrusion from the fire suppression system discharge	FHAR (Ref. 1) Attachment A, Item E.3.a.
None	Structural steel fire resistive covering	Protect structural steel from heat related effects.	
None	SGTS and Ventilation Tunnel	Structure contains FSSD equipment.	FHAR (Ref. 1) Fire Zone SGTS-FZ-31
101	Equipment Supports	Provides support for fire protection equipment.	
104	Piping and Pipe Supports	Provides support for fire protection piping.	
151	Turbine Building	Structure contains fire barriers, fire protection and FSSD equipment.	FHAR (Ref. 1)
153	Reactor Building	Structure contains fire barriers, fire protection and FSSD equipment.	FHAR (Ref. 1)
156	Main Office Building	Structure contains fire barriers, fire protection and FSSD equipment.	FHAR (Ref. 1)
157	Emergency Diesel Generator Building	Structure contains fire barriers, fire protection and FSSD equipment.	FHAR (Ref. 1)
158	Heating Boiler House	Structure contains fire suppression for safety related equipment.	JC 19479 Sh. 3 (Ref. 17), CRL (Ref. 7)
168	Intake Structure and Canal	Structure contains fire barriers, fire protection and FSSD equipment.	FHAR (Ref. 1)
169	Chlorination Facility	Structure contains power supply for Condensate Transfer System pumps.	FSSD Specification (Ref. 5) section 5.2.3.6.7
171	Condensate Transfer Building	Structure contains FSSD equipment.	FHAR (Ref. 1) Fire Area MT-FA-12
176	Fresh Water Pumphouse	Structure houses diesel fire pumps, pond pumps, associated control equipment and intake structure.	UFSAR (Ref. 3) Section 9.5.1.2.3

Table 5 – Structures Required to Demonstrate Compliance with 10 CFR 50.48

ES-17	STRUCTURE	STRUCTURE FUNCTION	CLB REFERENCE
176	Redundant Fire Prot. Pumphouse	Structure houses emergency motor driven electric fire pump and associated control equipment. Called "New Pumphouse" on JC 19479 Sh. 1	UFSAR (Ref. 3) Section 9.5.1.2.3
187	Primary Containment	Structure contains fire barriers and FSSD equipment.	FHAR (Ref. 1)
814	Fire Barriers, Dikes and Penetrations	Dikes are credited to contain flammable fluids. Barriers and penetrations prevent the spread of fire.	FHAR (Ref. 1) Attachment A, Item D.1.g, D.2.d.

Table Notes

1. The FSSD Specification section 5.2.3.3.3 indicates that the Feedwater pumps and Recirculation pumps are required to trip to support safe shutdown of the plant. If the Feedwater pumps cannot be tripped, the Condensate pumps can be tripped. These pumps are not required to perform a safe shutdown function other than to trip. These systems do not have any other safe shutdown function, and so are not considered as systems 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). These systems are not included in Table 4.

2. The only FSSD function of the Main Steam system is to isolate the reactor coolant pressure boundary by closing the main steam isolation valves. Only the reactor coolant pressure boundary piping, isolation valves and associated controls are required to support fire safe shutdown. The Main Steam system downstream of the outboard MSIVs and downstream of the steam drain isolation valves is not required to support fire safe shutdown.

3. The only FSSD function of the Reactor Water Cleanup system is to isolate the reactor coolant pressure boundary by closing the associated containment isolation valves. Only the reactor coolant pressure boundary piping, isolation valves and associated controls are required to support fire safe shutdown. The Reactor Water Cleanup system downstream of the outboard isolation valves is not required to support fire safe shutdown.

4. The Instrument Air system is credited for safe shutdown in two ways. The FSSD Specification section 5.2.3.6.7 indicates that air accumulators are provided to operate valves V-11-34 and V-11-36 to provide makeup to the Isolation Condenser. The accumulators and associated valves and piping are in the instrument air system as shown on drawing BR 3013 sheet 6. The FSSD Specification also credits instrument air in section 7.2. Instrument air is assumed to be available long enough to ensure a one-time closure (< 4 seconds) of the Feedwater regulating valves following reactor trip. These valves are designed "fail-as-is" and do not require air pressure to keep them closed. This is a reasonable assumption based on the fact that since the instrument air system is pressurized prior to the fire (since the plant is in operation), it is reasonable to assume it will remain pressurized for a brief period following the initiation of the fire and reactor trip. Likewise, it is not credible to assume an age related failure will occur during this brief period, and so it is not necessary to include the instrument air system in the scope of license renewal because of this assumption in the safe shutdown analysis. The portion of the

instrument air system associated with the Isolation Condenser makeup valves air accumulators will be included in the scope of license renewal for 10CFR50.48.

5. The portion of the Normal Lighting system in scope is limited to the components and cables described in the FSSD Specification section 6.7.

6. The following statement should be included in Section 2.1 of the License Renewal Application regarding this fire protection equipment:

   Fire extinguishers, self-contained breathing air packs and fire hoses are within the scope of license renewal, but are not subject to aging management because they are replaced on condition. These components are periodically inspected in accordance with National Fire Protection Association (NFPA) standards. These standards require replacement of equipment based on their condition or performance during testing and inspection. These components are not long-lived and are subject to replacement based on NFPA standards, therefore an aging management review is not required.

   This statement was used for Peach Bottom and is also true for Oyster Creek. The applicable Oyster Creek inspection procedure for the extinguishers is 2400-GMM-3681.04. The applicable Oyster Creek inspection procedures for the fire hoses are 645.6.003, 645.6.006, and 645.6.008 (references 23, 24 and 25).

7. The following statement should be included in Section 2.1 of the License Renewal Application regarding this fire protection equipment:

   Equipment that is stored on site for installation or use in response to a design basis event is considered to be within the scope of license renewal. The stored equipment credited for Appendix R repairs are cable, connectors, electrical tape, tie wraps, splice kits, tubing, tube fittings, fasteners, hoses, smoke exhausters, flash lights, flexible ducts, duct adapters, level indicators and power cords. These components are confirmed available and in good operating condition by periodic surveillance inspections. Tools and supplies used to place the stored equipment in service are not in the scope of license renewal.

   A similar statement was used for Peach Bottom and is also true for Oyster Creek. The applicable Oyster Creek inspection procedure for the Appendix R repair equipment is 2400-APR-3900.01.

8. Portions of these systems are not required to demonstrate compliance with 10CFR50.48 and do not need to be included in the scope of license renewal. See Section 4.2 for specific system branches that are not included in scope. Further reduction of the scope boundaries of fire detection or fire suppression systems, if needed, should be documented on a case-by-case basis in the appropriate system scoping review package.

9. The reactor head vent valves are identified as system 221 "Reactor Vessel" in the CRL. For license renewal, the reactor vessel is evaluated without attached piping and valves. The reactor head vent valves are addressed in the Main Steam system. System 221 and Reactor Vessel will remain in this position paper, as it is appropriate and conservative to credit the reactor vessel for FSSD.

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Structures, Components, and Commodity Types with Active, Passive, Short-Lived Determination, and Intended Functions

Oyster Creek Nuclear Generating Station

License Renewal

APPROVAL PAGE

Revision	Prepared by:	Checked by:	Approved by:
00			
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REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	Initial Issue
1	Added new component types and modified component description for NUREG-1801 consistency. Revised intended functions.
2	Incorporate LRCR #6, #41, #68, #89, and #124, LROI #1443.
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1.0 Purpose

The license renewal rule (10 CFR Part 54) Section 54.21(a)(1) requires the integrated plant assessment (IPA) to identify and list those structures and components subject to an aging management review. Section 54.21(a)(3) of the license renewal rule requires that, for each structure and component subject to an aging management review, the integrated plant assessment demonstrates 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.

The purpose of this position paper is to establish a list of standard structures, components, and commodity types potentially applicable to Oyster Creek and to determine if the structure, component, or commodity type is active, passive, or short-lived (Exhibit A). The paper also provides a standard list of intended functions from which the intended functions of passive long-lived structures, components, and commodities will be selected (Exhibit B).

This position paper is for the use of personnel engaged in the preparation, review, or approval of screening evaluations in accordance with Project Level Instruction PLI-3, "Screening of Systems, Structures, and Commodities."

2.0 Scope

The scope of this position paper is to identify standard structures, components, and commodity types applicable or potentially applicable to screening of structures, systems, and commodities at Oyster Creek Nuclear Generating Station (OCNGS), with active, passive, and short-lived determination. Additionally a list of standard intended functions, applicable to passive long-lived structures, components, and commodities, which will be used during the screening and aging management review processes, is identified.

If a structure, component, or commodity type identified during the screening process is not included in Exhibit A, the project Technical Lead shall be notified. Similarly, if an intended function is not included in Exhibit B, but required for a component, structure, or commodity based on its application at OCNGS, the project Technical Lead shall be notified. This position paper will then be revised to include the newly identified structure, component, or commodity type.

3.0 10CFR Part 54 Requirements.

§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 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 is 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.

4.0 Methodology

4.1 Structure, Component, and Commodity Types.

NEI 95-10, reference (2), Appendix B, "Typical Structure, Component, and Commodity Groupings and Active/Passive Determination for the Integrated Plant Assessment," provides industry guidance for screening of structures and components against criterion of 10CFR54.21(a)(1)(i). This guidance is used as a basis for identifying structures, components, and commodity types listed in Exhibit A. Some structures, components, and commodity types are not specifically identified in NEI 95-10 (e.g. reactor vessel internals, containment structure components). These structures, components, and commodities are derived from the UFSAR and previous license renewal applications. Exhibit A list was compared to OCNGS CRL component types to confirm the list envelopes components contained in the CRL.

4.2 Active or passive determination.

Determination of structure, component, and commodity "active" or "passive" is based on the guidance provided in NEI 95-10, Appendix B. Structures, components, and commodities are passive if they perform their intended function without moving parts or a change in configuration or properties. In general structures and commodities are passive, whereas components may be classified as active or passive, depending on how they perform the intended function.

Exhibit A provides a list of components and commodities that are considered passive (P), active (A), or could be either (P/A). Some components designated as "P", such as valves, pumps, and fans, contain subcomponents that are considered active. These subcomponents are not listed in Exhibit A since they are excluded from aging management review and do not require identification in the license renewal application. Consequently the "P" designation is based solely on those parts that perform the passive intended function. That is, the pressure boundary is performed by the valve body, pump or fan casing.

Components designated as "A" perform only an active intended function. Active components are excluded from aging management reviews and do not require identification in the license renewal application.

Components designed as "P/A" may perform a passive or an active intended function depending on component design and its application. For example a pressure sensor is considered passive only if it is a part of the system pressure boundary; otherwise it is considered active. Thus for components designated as "P/A" in Exhibit A, the user must review design documents to establish whether the sensor is passive, "P" or active, "A"

4.3 Short-Lived Determination.

Passive components that are subject to replacement based on a qualified life or specified time period are considered "Short-Lived". NEI 95-10, Appendix B, and previous license renewal applications were used as basis for "Short-Lived" determinations indicated in Exhibit A. The user must confirm that structures, components, and commodity types designated as "Short-Lived" are subject to replacement based on a qualified life or specified time period and document the confirmation basis in accordance with PLI-3.

4.4 Standard Component and Commodity Intended Functions.

Intended functions are those functions that passive structures, components, and commodities are required to perform to ensure success of system and structure level intended functions during the period of extended operation. The list of standard intended functions provided in Exhibit B is generated based on the review of previous license renewal applications and NEI 95-10.

4.5 Consumables

Structures, components, and commodities, which are treated as consumables, need to be identified and considered in the screening and aging management review processes. According to NUREG – 1800 (ref 4), consumables may be divided into the following four categories:

a. Packing, gaskets, component seals, and O-rings
b. Structural Sealants
c. Oil, grease, and component filters
d. System filters, fire extinguishers, fire hoses, and air packs

Consumables included in group (a) are considered subcomponents and are not explicitly called out in Exhibit A. Rather, they are implicitly included at the component level (e.g., if a valve is identified in scope, a seal in the valve would also be in the scope as a subcomponent of the valve). Furthermore, packing, gaskets, component seals, and O-ring are excluded from aging management review, as they are not considered pressure boundaries in ASME III or USAS B31.1 or USAS B31.7.

Consumables included in group (b) are included in Exhibit A as a commodity and evaluated with the structures that contain them.

Consumables included in group (c) are considered short-lived and do not require aging management.

Consumables included in group (d) are typically replaced based on performance or condition monitoring that identifies whether these components are at the end of their qualified lives, and can be excluded from aging management review (AMR) under 10CFR54.21(a)(1)(ii). The user must identify and document, in accordance with PLI-3, the standards (e.g. NFPA, ANSI) and plant specific procedures that are relied upon for replacement of the components. Otherwise, the components should be screened as passive and subject to AMR.

5.0 References

1. 10CFR54.4 Requirements for Renewal of Operating Licenses for Nuclear Power Plants
2. NEI 95-10, "Industry Guideline for Implementing The Requirements of 10 CFR Part 54 – The License Renewal Rule," Revision 5
3. Oyster Creek Component Record List (CRL)
4. NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", Draft Rev. 1, January 2005.
5. PLI-03, "Screening of Systems, Structures, and Commodities"
6. EP-035, Revision 8, CRL Control
7. EP-011, Revision 11, Methodology for Assigning and Maintaining the Quality Classification of Components
8. NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Draft Rev. 1, January 2005.
9. BR 2001 Sheet 1, Revision 20, Mechanical Symbols

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
Reactor Pressure Vessel and Internals	Access hole cover	P	
	Control Rod Blades	S	Document basis for short-lived in accordance with PLI-3
	Control Rod Drive	A	
	Control Rod Drive Assembly (Housing and guide tubes)	P	
	Core Shroud	P	
	Core Spray lines, Thermal sleeves, Spray rings (Sparger), and Spray nozzles	P	
	Core Plate (Lower core grid)	P	
	Core Plate (Lower core grid) wedges	P	
	Core Spray Line Spray Nozzle Elbows	P	
	Core Spray Ring (Sparger) Repair Hardware	P	
	Diffuser	P	(UFSAR Fig 3.9-8)
	Fuel Support Piece	P	
	Incore Neutron Monitor Dry Tubes & Guide Tubes	P	
	Insulation	P	
	Moisture Separator	P	
	Nozzles	P	Nozzles may be listed by name, identified individually, or grouped by type.
	Penetrations	P	Penetrations may be listed by name, identified individually, or grouped by type.
	RPV Support Skirt and attachment welds	P	
	Shroud Support structure	P	
	Shroud Repairs (tie rods and lug/clevis assemblies)	P	
	Vessel Steam Dryer	P	
	Top Head enclosure (head & nozzles)	P	
	Top Head Flange	P	
	Top Head Closure Studs and Nuts	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination

Category	Component Type	A=Active P=Passive S=Short-Lived	Comments
Reactor Pressure Vessel and Internals	Top Head Enclosure Vessel Flange Leak Detection	P	
	Top Guide (Upper core grid)	P	
	Vessel Bottom Head	P	
	Vessel Shell Attachment Welds	P	
	Vessel Shell Flange	P	
	Vessel Shell (upper, upper intermediate, lower intermediate)	P	
Mechanical System Components	Agitator	A	
	Accumulator	P	
	Air Compressor	A	
	Bird Screen	P	
	Closure bolting	P	
	Condensing chamber	P	
	Cooler	P	
	Cranes		
	Rail system (Rail plates, clips)	P	
	Refueling platform	P	
	Hoists (Jib Crane columns, beams, anchorage)	P	
	Hoists (Monorail beams; Lifting Devices, Plates)	P	
	Crane (Bridge; Trolley; girders)	P	
	Cyclone Separator	P	
	Dash pot	P	
	Diffuser	P	
	Demineralizer	P	
	Drain Trap	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
Mechanical Systems Components	Drip leg	P	
	Eductor	P	
	Emergency Diesel Generator	A	
	Engines	A	
	Enclosure boot	P	
	Exhaust Hood	P	
	Exhaust silencer	P	
	Expansion Joint	P	
	Evaporator	P	
	Filter	P/S	See consumables
	Fire Barriers		
	Fire barrier penetration seals	P	
	Fire barrier walls and slabs	P	
	Filter housing	P	
	Fire door	P	
	Fire rated enclosures	P	
	Fire Extinguisher	S	See consumables
	Fire hydrant	P	
	Flame arrestor	P	
	Flexible connection	P	
	Flexible Hose	P	
	Flow element	P	
	Flow glass	P	
	Flow indicator	P	
	Flow meter	P	
	Fuel Storage		
	Cask drop protection cylindrical structure	P	
	Fuel Pool Gates	P	
	Fuel pool liner plate	P	
	Fuel Pool Skimmer Surge tank liner	P	
	Fuel Grapple/Mast	P	
	Fuel Preparation Machine	P	
	New Fuel Storage Racks	P	
	Spent Fuel Storage Racks	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination

Category	Component Type	A=Active P=Passive S=Short-Lived	Comments
Mechanical Systems Components	Fluid Drive – Reservoir	P	
	Gas Bottles	P/S	Short-lived if replaced based on a qualified life or specified time period.
	Gauge Snubber	P	
	Gear Box	P	
	Gland Seal Blower	A	
	Heat Exchanger	P	
	Heater housing	P	
	Hose manifold	P	
	Hose Stations and hose reels	P	
	Instrument tubing and fittings	P	
	Insulation	P	
	Insulation Jacketing	P	
	Level Glass	P	
	Main condenser Shell	P	
	Main condenser Tubes	P	
	Main condenser Tubesheet	P	
	Mixer	A	
	Muffler	P	
	Odorizer	P	
	Oil mist eliminator	P	
	Piping and fittings	P	
	Pressure building coils	P	
	Pressure vessel	P	
	Pump Casing	P	
	Restricting Orifice	P	
	Rotameter	P	
	Rupture Disk	P	
	Sample chamber	P	
	Screen	P	
	Sensor Element	P/A	(P for a pressure boundary, if applicable)
	Sight Glass	P	
	Soot blower	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination

Category	Component Type	A=Active P=Passive S=Short-Lived	Comments
Mechanical Systems Components	Snubber	A	
	Sparger (Y-Quencher)	P	
	Spray Nozzle	P	
	Sprinkler Head	P	
	Steam Trap	P	
	Strainer	P	
	Strainer Body	P	
	Tanks	P	
	Tank heater	P	
	Temperature control manifold	P	
	Thermowell	P	
	Turbine Casing	P	
	Vacuum Breaker	P	
	Vacuum Pump Casing	P	
	Valve Body	P	
	Valve Operator	A	
	Ventilation		
	Damper housing	P	
	Demister	P	
	Ductwork	P	
	Fan Housing	P	
	Filter Housing	P	
	Flexible Connection	P	
	HVAC plenum	P	
	Louver	P	
	Water motor alarm	P	
	Seals & Gaskets	P/S	Short-lived if replaced based on a qualified life or specified time period.
	Access Hatch Covers	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination

Category	Component Type	A=Active P=Passive S=Short-Lived	Comments
Structural Components and Commodities	Class MC Pressure Retaining Bolting	P	
	Downcomers	P	
	Drywell head flange	P	
	Drywell head	P	
	Drywell head gasket	S	
	Drywell Penetration Bellows	P	
	Drywell Penetration sleeves	P	
	Drywell shell	P	
	Drywell support skirt	P	
	Electrical penetrations	P	
	Locks, hinges, and closure mechanisms	P	
	Personnel Airlock/Equipment Hatch	P	
	Penetration closure plate and caps	P	
	Seals, Gaskets, and O-rings	P	See note 1.
	Suppression Chamber Penetrations	P	
	Suppression Chamber ring girders	P	
	Suppression Chamber shell	P	
	Thermowell	P	
	Vent header deflector	P	
	Vent Jet Deflectors	P	
	Vent line bellows	P	
	Vent line, and vent header	P	
	Anchorage	P	
	Concrete Elements		
	Biological shield wall	P	
	Building concrete at locations of expansion and grouted anchors; grouted pads for support base plates	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
Structural Components and Commodities	Curb	P	
	Drywell shield wall	P	
	Equipment and Component Foundations	P	
	Exhaust stack	P	
	Hatch plug	P	
	Masonry block wall	P	
	Reactor pedestal	P	
	Reinforced concrete foundation	P	
	Reinforced concrete Slab	P	
	Reinforced concrete trench	P	
	Reinforced concrete Wall	P	
	Reinforced Concrete Column	P	
	Removable block	P	
	Tank Foundations	P	
	Trench, manhole, ductbank	P	
	Tunnels	P	
	Unreinforced concrete	P	
	Doors		
	Door	P	
	Door gasket	P	
	Steel Elements		
	Access hatch	P	
	Beam Seat	P	
	Biological Shield Wall - Concrete	P	
	Biological shield wall - lateral support	P	
	Biological shield wall structural steel	P	
	Biological Shield wall liner plate	P	
	Bird Screen	P	
	Blowout panel	P	There are no blowout panels at OC. Siding is credited for blowout panel function
	Cable Tray	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
	Concrete embedment	P	
	Conduit	P	
	Curb	P	
	Door	P	
	Emergency Diesel Generator Enclosure	P	
	Hatch cover	P	
	Instrument Rack	P	
	Liner (Sump)	P	
	Lubrite Plate	P	
	Metal Deck	P	
	Metal Siding	P	
	Miscellaneous steel (catwalks, handrails, ladders, manhole cover, platforms, grating, and associated supports)	P	
	Missile Barrier	P	
	Panels and enclosures	P	
	Penetration sleeve, cap plates, capped auxiliary boiler exhaust pipe	P	
	Pipe whip restraints	P	
	Plate	P	
	Refueling bellows	P	
	Removable panel	P	
	Scuppers	P	
	Shielding block and plates	P	
	Spray Shield	P	
	Structural Bolts	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
	Structural steel: Beams, Columns, Girders, Radial beams, posts, bracing, plate, connections, etc..)	P	
	Trash racks	P	
	Tube Tray	P	
	Component Supports		
	Supports for ASME XI Class 1 Piping and Components (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for ASME Class 1 piping and components (constant and variable load spring hangers, guides, stops, sliding surfaces, design clearances)	P	
	Supports for ASME XI Class 2 and 3 Piping and Components (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for ASME Class 2 and 3 Piping and Components (constant and variable load spring hangers, guides, stops, sliding surfaces, design clearances)	P	
	Supports for ASME Class MC Components (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for ASME XI Class MC Components (guides, stops, sliding surfaces, design clearances)	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
Structures and Component Supports	Supports for Cable Trays (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for conduits (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for instrument lines	P	
	Supports for Non-ASME XI Piping and Components (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for HVAC ducts (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for HVAC components and other miscellaneous mechanical equipment	P	
	Supports for HVAC Components (vibration isolation elements)	P	
	Supports for platforms, pipe whip restraints, jet impingement, and spray shields and other miscellaneous structures (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for panels and enclosures, racks (support members, welds, bolted connections, support anchorage to building structure)	P	
	Supports for masonry walls (support members, welds, bolted connections, support anchorage to building structure)	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
	Supports for tube track, and instrument tubing (support members, welds, bolted connections, support anchorage to building structure)	P	
	Penetration Seal	P	
	Sealants		
	Silicone foam	P	
	Caulk	P	
	Seal (Gap)	P	
	Roofing	P	
	Water control		
	Embankment	P	
	Earthen water control structures	P	
	Fire Pond Dam	P	
	Canals	P	
	Transmission towers	P	
	Alarm Unit	A	
	Analyzers	A	
	Annunciator	A	
	Batteries	A	
	Cables	P	
	Cable Connections (metallic parts)	P	
	Chargers	A	
	Circuit Breakers	A	
	Connectors	P	
	Controller Indicator	A	
	Converters	A	
	Electric heaters	P/A	(P for a pressure boundary, if applicable)
	Electrical Bus duct	P	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
Electrical and I&C Components	Electrical Buses	P	
	Electrical penetrations	P	
	Flow elements	P/A	P for a pressure boundary, if applicable
	Fuse	A	
	Fuse Holders	P	
	Generators	A	
	Heat Tracing	A	
	High Voltage Insulators	P	
	Indicators	A	
	Inverters	A	
	Insulated cables and connections	P	
	Insulated cables and connections in instrumentation circuits	P	
	Insulated inaccessible medium-voltage cables	P	
	Isolators	A	
	Lighting	A	
	Load Centers	A	
	Loop Controllers	A	
	Meters	A	
	Motor Control Centers	A	
	Motors	A	
	Power Supplies	A	
	Radiation Monitors	A	
	Recorders	A	
	Regulators (e.g., voltage reg.)	A	
	Relays	A	
Electrical and I&C Components	RTDs	P/A	P for a pressure boundary, if applicable
	Signal Conditioners	A	
	Solenoid Operators	A	
	Solid State Device	A	
	Starters	A	
	Surge Arresters	A	
	Switches	A	
	Switchgear	A	

Exhibit A – Structure, Component or Commodity Type with Active, Passive, Short-Lived Determination			
Category	**Component Type**	**A=Active P=Passive S=Short-Lived**	**Comments**
	Terminal Blocks	P	
	Thermocouples	P/A	P for a pressure boundary, if applicable
	Transducers	P/A	P for a pressure boundary, if applicable
	Transformers	A	
	Transmission conductors and connections	P	
	Transmitters	A	
	Turbine Controls	A	
	Wooden Utility Poles	P	

Notes:

1. Seals and gaskets for primary containment hatches and airlocks are considered part of the primary containment pressure boundary. The components are included in scope of ASME Section XI, Subsection IWE examinations and are not typically replaced based on a qualified life or specified time period.

Exhibit B – Component Intended Functions

Passive Intended Function	Definition
Absorb Neutrons	Provide neutron absorption in spent fuel pool to prevent criticality
Containment, Holdup and Plateout	Provide post accident containment, plateout of iodine and hold-up (for radioactive decay) of iodine and non-condensable gases before release.
Direct Flow	Provide spray shield or curbs for directing flow
Electrical Continuity	Provide electrical connections to specified sections of an electrical circuit to deliver voltage, current, or signals
Enclosure Protection	Provide enclosure, shelter, or protection for in-scope equipment (including shielding)
Filter	Provide filtration
Fire Barrier	Provide rated fire barrier to confine or retard fire from spreading to or from adjacent areas of the plant
Flood Barrier	Provide flood protection barrier (internal and external flood event)
Gaseous Release Path	Provide path for release of filtered and unfiltered gaseous discharge
Heat Transfer	Provide heat transfer
HELB Shielding	Provide HELB shielding
Insulation - Electrical	Insulate and support an electric conductor
Insulation Jacket Integrity	Prevent moisture absorption and provide physical support of thermal insulation
Mechanical Closure	Mechanical closure (e.g., bolting)
Missile Barrier	Provide missile barrier (internal or external missiles)
Leakage Boundary	Non-safety related component that maintains mechanical and structural integrity to prevent spatial interactions that could cause failure of safety related SSCs. This function includes the required structural support when the non-safety related leakage boundary piping is also attached to safety related piping.
Pipe Whip Restraint	Provide pipe whip restraint

Exhibit B – Component Intended Functions

Passive Intended Function	Definition
Pressure Boundary	Provide pressure-retaining boundary so that sufficient flow at adequate pressure is delivered, or provide fission product barrier for containment pressure boundary, or provide containment isolation for fission product retention, or provide the containment, holdup and plateout function (for Main Steam system)
Pressure Relief	Provide a vent path for HELB pressure
Shielding	Provide shielding against radiation
Spray	Convert fluid into spray
Structural Support	Provide structural support for structures and components within the scope for 54.4(a)(1), 54.4(a)(2), or 54.4(a)(3), or provide structural integrity to preclude non-safety related component interactions that could prevent satisfactory accomplishment of a safety related function.
Thermal Insulation	Control of heat loss to preclude overheating of nearby safety related SSCs, 10 CFR 54.4 (a)(2)
Throttle	Provide flow restriction
Vibration Isolation	Provide flexible support for HVAC fan units.
Water retaining boundary	Provide an essentially water leak tight boundary.

Position Paper 13

Abnormal Operational Transients

Oyster Creek Nuclear Generating Station

License Renewal

Approval Page

Prepared by:	S. C. Getz	**Date:**	08/11/2005
Checked by:	M. J. May	**Date:**	08/11/2005
Approved by:	A. A. Fulvio	**Date:**	08/16/2005

REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Added section 4.0.9 Toxic Gas Protection; Toxic Gas Protection for control room HVAC to Table 1 systems 823, 826; combined MHC Front Standard system 314 with Main Turbine and Auxiliary System 301 in Table 2; clarified remarks in Table 1 system 424 and Table 2 system 155; deleted duplicate reference
2	Updated revision dates for NEI 95-10 (to Rev. 5 from Rev. 4) and NUREG – 1800 (Rev. 1 Draft January 2005)
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1.0 Purpose

License Renewal Rule 10 CFR Part 54.4(a)(1) requires that safety-related plant systems, structures, and components relied upon to remain functional during and following design-basis events to ensure 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 which could result in potential offsite exposures comparable to those referred to in § 50.34(a)(1), § 50.67(b)(2), or § 100.11, as applicable, be included in the scope of license renewal. (10CFR54.4(a)(1))

The purpose of this position paper is: (1) To confirm that design basis internal and external events including abnormal operational transients (AOT's), anticipated operational occurrences, and natural phenomena as described in the current licensing basis (CLB) are to be considered when conducting scoping for license renewal; and (2) To identify the Oyster Creek Nuclear Generating Station systems and structures relied upon to remain functional to ensure § 54.4(a)(1) functions during and following such events. Design basis accident events (DBAs) are not included in this review as systems and structures credited with mitigating their effects are considered to be safety related and are already included in license renewal scope. The identified systems and structures are listed in Table 1. Items in Table 1 may be safety-related or nonsafety-related. Table 2 includes nonsafety-related systems and structures that, while not credited with performing a § 54.4(a)(1) function, are credited with operating during and following the event, and is included to provide information for use during system and structure scoping. Systems and structures not credited with mitigating effects of the subject events are not included in these tables. This position paper will be used in conjunction with Project Level Instruction PLI-2, "Scoping of Systems and Structures."

This position paper is for the use of personnel engaged in the preparation, review, or approval of scoping evaluations in support of license renewal activities for Oyster Creek. This paper documents the technical basis for the license renewal scoping conclusions, along with the methodology and CLB source documents used. The resulting Table 1 identifies which of the systems and structures identified in Oyster Creek Engineering Standard ES-017 are credited with ensuring § 54.4(a)(1) functions during design basis events (those that are not considered design basis accidents) as described in the CLB, e.g., abnormal operational transients, anticipated operational occurrences, external events, and natural phenomena. The results will be used to populate the corresponding license renewal database field. Systems and structures listed in Table 1 will result in a "Yes" answer to scoping criteria 54.4(a)(1). Table 2 results will not result in a "Yes" to scoping criteria 54.4(a)(1) but will provide information on system functions, including possible system supporting functions, for use during the scoping process.

2.0 Scope

The scope of this document is those systems and structures that are required for the Oyster Creek Nuclear Generating Station to comply with the requirements of 10 CFR54.4 for non-design basis accident (non-DBA) design basis events, e.g., abnormal operational transients, anticipated operational occurrences, external events, and natural phenomena as described in the CLB.

Components at Oyster Creek Nuclear Generating Station can be associated with a system or structure through design drawings or the Component Record List (Ref. 2). License renewal scoping is performed at the system and structure level. The scope of this review is therefore limited to the

identification of systems and structures. The identification of individual components is not within the scope of this position paper.

3.0 AOT Requirements

Regulatory requirements for inclusion in scope of plant systems, structures, and components for license renewal are stated in 10CFR54.4 as follows:

Part 54 Reference

(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 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).

10 CFR 50.49 (b)(1) defines **design-basis events** (DBEs) in (ii) below:

Part 50 Reference

§50.49 Environmental qualification of electric equipment important to safety for nuclear power plants.

(a) Each holder of or an applicant for a license for a nuclear power plant, other than a nuclear power plant for which the certifications required under §50.82(a)(1) have been submitted, shall establish a program for qualifying the electric equipment defined in paragraph (b) of this section.

(b) Electric equipment important to safety covered by this section is:

(1) Safety-related electric equipment.

(continued)

Part 50 Reference (continued)

> *(i) This equipment is that relied upon to remain functional during and following design basis events to ensure --*
>
> *(A) The integrity of the reactor coolant pressure boundary;*
>
> *(B) The capability to shut down the reactor and maintain it in a safe shutdown condition; or*
>
> *(C) The capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to the guidelines in §50.34(a)(1), §50.67(b)(2), or §100.11 of this chapter, as applicable.*
>
> *(ii)* ***Design basis events are defined as conditions of normal operation, including anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the plant must be designed*** *to ensure functions (b)(1)(i) (A) through (C) of this section.*

The conclusion is that Abnormal Operational Transients and other design-basis events as defined in 10 CFR 50.49(b)(1) are specifically required to be considered in conducting scoping for license renewal.

4.0 Methodology

Systems, structures, and components relied on to mitigate the consequences of design basis accidents are clearly within the scope of license renewal and are addressed by inclusion of safety-related systems, structures, and components per 10 CFR 54.4(a)(1) along with those non safety-related support systems specifically required to demonstrate compliance with the applicable NRC regulation per 10 CFR 54.4(a)(2). However, there exists a wider range of design basis events that are not considered to be design basis accidents – these events are defined in Chapter 15 of the Oyster Creek UFSAR as Abnormal Operational Transients, but also may be found in other sections of the UFSAR as well as other CLB documents.

In regard to identification of these design basis events, Section 2.1.3, "Review Procedures," of NUREG-1800 states:

NUREG 1800 Reference

> *The set of design basis events as defined in the rule is not limited to Chapter 15 (or equivalent) of the UFSAR. Examples of design basis events that may not be described in this chapter include external events, such as floods, storms, earthquakes, tornadoes, or hurricanes, and internal events, such as a high-energy-line break. Information regarding design basis events as defined in 10CFR50.49(b)(1) may be found in any chapter of the facility UFSAR, the Commission's regulations, NRC orders, exemptions, or license conditions within the CLB. These sources should also be reviewed to identify systems, structures, and components that are relied on to remain functional during and following design basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the functions described in 10 CFR 54.4(a)(1).*

To ensure the intent of 10 CFR 54.4(a)(1) was met, a review for systems and structures credited during non-DBA design basis events as described in NUREG-1800 was performed, using CLB documentation sources including the Oyster Creek UFSAR and Facility Description and Safety

Analysis Report (FDSAR), the Oyster Creek IPE Submittal Report in response to Generic Letter 88-20, "Individual Plant Examinations for Severe Accident Vulnerabilities – 10CFR50.54(f)," the Oyster Creek Individual Plant Examination for External Events ("IPEEE" document in response to Generic Letter 88-20 Supplement 4), and Oyster Creek station procedures. Table 1 is a list of those systems and structures that are relied upon to remain functional during and following non-DBA design basis events to ensure a § 54.4(a)(1) function. Table 2 lists nonsafety-related systems and structures that, while not credited with performing a § 54.4(a)(1) function, are credited with operating during and following the event, and are included to provide information for use during system and structure scoping. The systems in Table 2 may provide a supporting function under 10CFR54.4(a)(2). System and structure identification in these tables is based on the names in Oyster Creek Engineering Standard ES-017 (reference 3).

The transients specifically identified in Chapter 15 of the OC UFSAR (Reference 1) were reviewed to identify systems and structures credited for mitigation of the effects of those events. Searches in the UFSAR in entirety and other electronically stored CLB documents were also conducted using the other various internal and external event names, e.g., "flood", "tornado", "missiles", etc. to identify systems and structures whose function is credited for their mitigation. Manual searches of non-electronic documents were also made to identify systems and structures credited with functioning to mitigate effects of design basis events. DBAs were not considered as these events are mitigated by safety related systems (and non-SR support systems) that are already included in license renewal scope. Events described by 10CFR54.4(a)(3) were not considered as these event categories are considered individually for license renewal. Beyond-design basis severe accidents were not considered as these events are not in-scope for license renewal. The systems and structures that were identified to operate to ensure a § 54.4(a)(1) function are recorded in Table 1 with the name of the design basis event for which their function is credited, the document where the reference is located, and their safety classification per PP-02. Nonsafety-related systems and structures that are not credited with performing a § 54.4(a)(1) function, yet are credited with operating during and following the event, are included in Table 2. Systems and structures referenced in the source documents as relied upon to remain functional for a design basis event are included in these tables – during scoping of the individual systems, the evaluator may determine whether the system provides a required function per the license renewal definition. This document (PP-13) may be revised to reflect the results of those scoping determinations.

The categories of non-design basis accident DBEs and the method by which systems and structures credited for their mitigation were identified for inclusion in Table 1 and Table 2 are listed below:

4.0.1 Abnormal Operational Transients

Abnormal operational transients (AOTs) are defined in the OC UFSAR as the result of various system malfunctions or operator errors that can be reasonably expected during plant operations. These defined AOTs are specifically listed in Chapter 15 of the UFSAR, which was reviewed to determine the AOT categories and identify which systems were credited for mitigating the consequences of those transients.

4.0.2 High Winds/Tornado

High wind and tornado conditions including tornado-generated missiles are postulated external events which have been analyzed in various documents. OC procedure ABN-31, "High Winds" (Reference 9) lists systems, including various tanks, which may be used to prepare for mitigating the effects of forecast high wind or tornado events. The IPEEE report (Reference 4) Section 5.1 and OC UFSAR sections 3.3 and 3.8.4 also list systems and structures required for response to high wind or tornado events.

4.0.3 Missiles

Section 3.5 of the OC UFSAR identifies the sources and types of postulated missiles internal and external to the plant, including those internally generated (both inside and outside the drywell), turbine-sourced low- and high-trajectory missiles, and externally generated missiles. Systems and structures reviewed for missile interaction are included in UFSAR Section 3.5 and the IPEEE report (Reference 4) Section 5.1.

4.0.4 Flooding

Flood design considerations including those externally-sourced from intense precipitation, stream and river swelling, hurricanes, storm tides, etc., and internally sourced from piping or tank failure, etc. are discussed in OC UFSAR sections 2.4, 3.8, and 9.3, the IPEEE report (Reference 4) section 5.2, and Technical Data Report (TDR) 779 (Reference 6).

4.0.5 Abnormal Intake Level

Abnormally high or low intake levels and the systems credited for mitigating actions are discussed in Oyster Creek station procedure ABN-32 (Reference 7).

4.0.6 High Energy Line Break (HELB)

The effects of HELBs and those systems relied on to mitigate their effects are discussed in OC UFSAR section 3.6 and in the OC FDSAR (Reference 13) Amendment 75a.

4.0.7 Station Seismic Events

Systems and structures designed to withstand a postulated station seismic event, as well as systems procedurally required for post-seismic function, are listed in OC UFSAR sections 3.2 and 3.7, and Oyster Creek station Procedure ABN-38 (Reference 8).

4.0.8 Reactor Building Crane

In response to NUREG 0612 and NRC Bulletin 96-02, Oyster Creek committed to upgrade the reactor building crane to single-failure proof status. While not specifically a transient, the commitment to upgrade the crane, failure of which could prevent the satisfactory accomplishment of a safety-related function, is considered in the scope of license renewal. Reference NEI 95-10 (Reference 10) Appendix F section 3.2, and OC TDR 3002 (Reference 5).

4.0.9 Toxic Gas Protection

The Control Room HVAC System has been designed to maintain a suitable environment for equipment and personnel during normal and emergency plant conditions. The OC UFSAR section 6.4 describes the control room habitability envelope and performance requirements.

5.0 References

1. Oyster Creek Nuclear Generating Station, Updated Final Safety Analysis Report, Revision 13
2. Oyster Creek Component Record List (CRL)
3. Engineering Standard ES-017, "Identification of Oyster Creek Plant Systems", Revision 22
4. GPU Nuclear Corporation response to Generic Letter 88-20 Supplement 4 "Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities 10 CFR 50.54(f)"
5. Technical Data Report TDR 3002, Single Failure Proof Crane Upgrade
6. Technical Data Report TDR 779, Evaluation of Possible Internal Flooding of OC Nuclear Generating Station Power Plant Bldgs.
7. Oyster Creek Generating Station Procedure ABN-32 Rev. 0, Abnormal Intake Level
8. Oyster Creek Generating Station Procedure ABN-38 Rev. 0, Station Seismic Event
9. Oyster Creek Generating Station Procedure ABN-31 Rev. 0, High Winds
10. Nuclear Energy Institute (NEI), NEI 95-10, Industry Guideline on Implementing the Requirements of 10 CFR Part 54, Revision 5
11. 10 CFR Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants
12. NUREG-1800, Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants, Revision 1 Draft dated January 2005
13. Oyster Creek Facility Description and Safety Analysis Report (FDSAR)

6.0 Attachments

Table 1 -- "Systems and Structures Relied Upon to Function to Ensure Section 54.4(a)(1) Functions During and Following Non-DBA DBEs"

Table 2 – "Systems and Structures Credited with Operating (Not for Performance of Section 54.4(a)(1) Function) During and Following Non-DBA DBEs"

Standard
Materials, Environments, and Aging Effects

Oyster Creek License Renewal Project

APPROVAL PAGE

Revision	Prepared by:	Checked by:	Approved by:
00			
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Date			
01	A. M. Ouaou	K. P. Muggleston	D. B. Warfel
Date			
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Date			
03	A. M. Ouaou	K. P. Muggleston	D. B. Warfel
Date			

REVISION SUMMARY

Rev. No.	Required Changes to Achieve Revision
0	Initial Issue
1	Revised to add ground water, fresh water, and salt water chemistry test results. Added certain environments, and aging effects for NUREG-1801 consistency. Added reference to NEI 95-10 Rev. 5, and NUREG-1801 draft rev. 1 January 2005
2	Incorporate LRCR #7, #41, #68, #89, #116, #136
3	Incorporate LRCR #148, #150, changed LRCR #136 in Rev. 2 to #137

1.0 Purpose

10 CFR 54.21 (a)(3) requires a demonstration that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis throughout the period of extended operation. Aging effects are a function of a material and its normal operating environment. This position paper provides a list of standard materials, environments, and potential aging effects from which Oyster Creek Nuclear Generating Station (OCNGS) plant specific materials, environments, and the applicable aging effect (s) can be selected. The equivalent NUREG-1801 (Ref. 6) materials and environments are listed in the tables to establish a correlation between OCNGS and NUREG-1801 materials and environments.

This position paper is for the use of personnel engaged in systems, structures and commodities screening process defined in PLI-3 (Ref. 1)

2.0 Scope

The scope of this position paper is to identify standard materials, environments, and aging effects applicable or potentially applicable to OCNGS structures, components, and commodities. Environments that have been determined applicable to OCNGS are described in Section 4.2.

This position paper does not describe specific methods or instructions for identifying plant specific materials and aging effects. The user is required to review plant documents to establish material of construction for structures, components, and commodities subject to aging management review. Similarly, the user is required to identify aging effects applicable to OCNGS material-environment combination using previous Exelon aging management reports (Ref. 20), Industry reports (Ref. 13,14), NUREG-1801 (Ref. 6), and plant specific operating experience. For additional details, refer to PLI-3 (Ref. 1)

If a material, environment, or aging effect identified during the screening or aging management review processes is not included in Tables 1-6, the project Technical Lead shall be notified. This position paper will then be revised to include the newly identified material, environment, or aging effect.

3.0 10CFR Part 54 Requirements.

§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 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 b

(ii) oundary, 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 is 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.

4.0 Methodology

4.1 Materials

Standard materials listed in Table-1 were extracted from OCNGS material specifications, Line List Specification (Ref. 9), design and vendor drawings, UFSAR (Ref. 8), and previous license renewal applications (Ref. 21-26). The equivalent NUREG-1801 (Ref. 6) materials are listed in the table to establish a correlation between OCNGS materials used in the application and NUREG-1801 materials.

4.2 Environments

The environments are based on the review of OCNGS UFSAR (Ref. 8), chemistry control procedures (Ref. 17-19), and previous Exelon and other license renewal applications (Ref. 21-26). Grouping of the environments considers proposed industry changes to NUREG-1801 (Ref. 7). Tables 1 and 2 provide a summary of the environments described below and their equivalent NUREG-1801 environment.

4.2.1 Internal Environments

4.2.1.1 Auxiliary Steam

Steam produced in oil fired auxiliary boilers from Boiler Treated Water. Auxiliary steam is used for space heating and for operating a radwaste concentrator for the evaporative processing of liquid radioactive waste (Ref. 8 Section 10.4.8).

4.1.2.2 Boiler Treated Water

Demineralized water subject to chemistry controls specified in the plant Auxiliary Boiler Chemistry procedure.

4.2.1.3 Closed Cooling Water

The chemical makeup of the closed cooling water is maintained in accordance with EPRI TR-107396 "Closed Cooling Water Chemistry Guidelines". Purity and chemical content is maintained by periodic sampling and batch chemical addition in accordance with Exelon procedure (Ref. 19). Reactor Building Closed Cooling Water (RBCCW), Turbine Building Closed Cooling Water (TBCCW), Emergency Diesel Generator (EDGCCW), NRW Closed Cooling Water, and AOG Closed Cooling Water chemistry controls are included in this procedure.

4.2.1.4 Closed Cooling Water < 140°F

Closed Cooling Water at an operating temperature that is below the threshold limit for Stress corrosion Cracking (SCC) in austenitic stainless steel components.

4.2.1.5 Condensation

Air and moisture on internal surfaces of design features, such as drain traps, provided to collect potential moisture in gas or air systems.

4.2.1.6 Containment Atmosphere

The drywell is made inert with nitrogen to render the primary containment atmosphere non-flammable by maintaining the oxygen content below 4% by volume during normal operation. The normal operating temperature within the drywell varies with elevation. Elevations up to elev. 55' are subject an average bulk temperature of 139°F or less. Above this elevation, the temperature varies from 168°F, just above elev. 55', to 256°F above elev. 95'. Humidity within the drywell varies from 20-40% (Ref. 12).

4.2.1.7 Diesel Engine Exhaust

This environment applies to components exposed to hot diesel engine exhaust gases, which contain moisture, particulates, and potentially sulfur residues. The presence of particulates can led to loss of material due to erosion; while sulfur residue in presence of moisture may let to sulfuric acid formation in the exhaust system.

4.2.1.8 Dry Gas

The dry gas environment is industrial gas containing little or no moisture such as nitrogen, carbon dioxide, hydrogen, oxygen, helium, and halon. These gases and dried air are considered inert with respect to corrosion potential because they have no significant moisture content (Ref. 20)

4.1.2.9 Fuel Oil

Fuel oil is used as a fuel in internal combustion diesel engines and auxiliary heating boiler. Fuel oil does not cause or promote aging of the internal and external surfaces of the materials. However, water and other contaminants may become entrained in the fuel oil and cause or promote components aging (Ref. 20).

4.1.2.10 Indoor Air

Indoor environment consists of indoor ambient conditions where components are protected from outdoor moisture. Conditions outside the drywell consist of normal room air temperatures ranging from 65°F - 140°F and the relative humidity is 100% maximum. The warmest room outside the drywell is the Trunion room, with an average temperature of 140°F (Ref. 12)

4.1.2.11 Lubricating Oil

Lubricating oil is an organic fluid used to reduce friction between moving parts. This environment is applicable to rotating equipment, such as pumps, compressors, or the diesel engines. Lubricating oil does no cause or promote aging of the internal surfaces of the materials. However, moisture and other contaminants may become entrained in the oil and cause or promote component aging (Ref. 20).

4.1.2.12 Outdoor Air

Outdoor environmental conditions consist of air temperatures typically ranging from 23.7°F - 84°F and an average annual precipitation of approximately 42 inches (Ref. 8, Section 2.3)

4.1.2.13 Raw Water – Raw water consists of fresh water or salt water.

4.1.2.13.1 Fresh Water

Fresh raw water is drawn from either a deep well or from a pond formed by a small dam on the Oyster Creek, known as the Fire Pond Dam.

Water taken from the deep well is processed in the pretreatment facility. After treatment, part of the water goes to the domestic water system and the rest is further treated in the Makeup Demineralized Water System to be used as demineralized water and for makeup to the Condensate Storage and Transfer System. Typical deep well water chemistry parameters identified during original construction, including pH (6.35), Chlorides (19 ppm), sulfates (7.5 ppm), are given in UFSAR (Ref. 8, Table 2.4-3). Recent testing of groundwater taken from 2 wells show a pH range of (5.6 – 6.4), chloride range of (3-138 ppm), and a sulfate range of (7 – 73 ppm).

Fresh water drawn from the Fire Pond Dam is untreated and is used for fire suppression and to the circulating water, service water pumps, and dilution pump oil coolers. Recent chemistry results show that (pH = 4.8, chlorides = 12 ppm, sulfates = 6 ppm).

4.1.2.13.2 Salt water

Raw salt water is drawn from Barnegat Bay, which receives salt water from the Atlantic Ocean and fresh water runoff from streams, which border it on the western shore, including Oyster Creek and Forked River. Salinity of the water varies from 12 parts per thousand (ppt) in the upper reaches to 32 ppt at Barnegat inlet and lower sections of the Bay. Recent tests of salt water at the intake structure showed that (pH = 7.9, Chlorides = 14659, Sulfates = 1419). The average monthly water temperatures range from 37 °F in winter to 80 °F in summer. The salt water is conveyed through the intake canal into the intake structure and subsequently used as a source of water for Service Water System, Emergency Service Water System, and Circulating Water System. Sodium hypochlorite is injected at various points in the systems to eliminate or reduce Biofouling. (Ref. 8, Sections 2.4, 10.4)

4.1.2.14 Refrigerant

Refrigerants constitute a large family of fluorinated hydrocarbon compounds that exhibit similar chemical properties and a wide range of physical characteristics. Their inert character and the range of their vapor pressures, boiling points and other physical properties make them suited for use in refrigeration and air conditioning systems. Fluorocarbons show no appreciable decomposition at temperatures up to 400 °F, and oxidize only with extreme difficulty at very high temperatures. Fluorocarbons are non-corrosive to all common metals except at very high temperatures. Unless the system experiences contamination with moisture and/or sulfur, the conditions necessary for internal corrosion do not exist.

4.1.2.15 Sodium Pentaborate

The sodium pentaborate solution of the Standby Liquid Control (SBLC) system, also known as Liquid Poison system, provides a relatively mild environment (demineralized

water and pH slightly basic). However the solution can potentially induce corrosion if permissible conductivity and pH limits are exceeded. The normal makeup water used for mixing the SBLC borated water solution is demineralized water that is maintained within chemistry guidelines. Borated water chemistry is controlled in accordance with OCNGS Technical Specifications.

4.1.2.16 Steam

Steam produced in the reactor vessel from reactor grade water and has extremely low levels of impurities. The systems that are pertinent to this evaluation are the reactor pressure vessel and internals, isolation condenser, and main steam. The steam exists as a two-phase vapor, ranging from high quality steam in the main steam system to a low quality steam in the Isolation Condenser system. The Isolation Condenser lines normally see little or no steam flow because these systems operate infrequently.

4.1.2.17 Treated Water

Demineralized water consists of pretreated fresh well water that is further purified in a mobile demineralized unit and transferred to the demineralized water storage tank (DWST) where it is stored until it is needed (Ref. 8, Section 9.2.3). The water is not treated with corrosion inhibitors and is not chemically treated to remove oxygen. Demineralized water chemistry is maintained in accordance with Exelon procedures (Ref. 19)

Fuel pool water is demineralized water that is further recirculated through filters, demineralizers, and heat exchangers to achieve desired water quality and clarity. Fuel pool water is in conformance with chemistry parameters specified in EPRI TR-103515 (Ref. 16).
Torus water is demineralized water. Water quality is maintained in accordance with Exelon procedures that include recommendations from EPRI TR-103515 (Ref. 16).

Reactor grade water is water that has been demineralized, contains no added corrosion inhibitors, and low conductivity and impurities. The various reactor grade waters have slightly different chemistry requirements. Reactor grade water is maintained in accordance with more stringent chemistry parameters than other systems since this water is used for reactor coolant. Chemistry activities provide for monitoring and controlling of water chemistry that is based on EPRI TR-103515 (Ref. 16).

Treated water is divided into three categories for the purpose of identifying applicable aging effects, Treated water, Treated water > 482°F, and Treated water < 140°F. Treated Water is used for systems that operate at any temperature and could contain austenitic stainless steel components, but no CASS at temperature >482°F. In this environment, austenitic stainless steel components are conservatively assumed to be subject to SCC in addition to the other applicable aging mechanisms, regardless of actual operating temperature. (For additional details see Ref. 7 & Ref. 13). Treated water > 482°F, and Treated water < 140°F are discussed below.

4.1.2.18 Treated Water < 140°F

Treated water < 140°F environment is used for systems that could contain austenitic stainless steel components. In this environment, thermal aging embrittlement and SCC are not applicable aging mechanisms.

4.1.2.19 Treated Water > 482°F

Treated water > 482°F environment is specified only for cast austenitic stainless steel (CASS) components that normally operate at a temperature greater than 482°F. In this environment, CASS components are susceptible to thermal aging embrittlement, which could lead to loss of fracture toughness aging effect in addition to other applicable aging effects.

4.2.2 External Environments

4.2.2.1 Adverse Localized Environment

Adverse localized environment is an environment that could exist in limited plant areas caused by heat, radiation, moisture, or voltage. This environment is applicable to electrical cables only.

4.2.2.2 Aggressive Environment

Ground water and raw water environments are considered aggressive if pH < 5.5, or chlorides > 500 ppm, or sulfates > 1500 ppm.

4.2.2.3 Boiler Treated Water

Refer to section 4.1.2.2

4.2.2.4 Closed Cooling Water

Refer to section 4.2.1.3

4.2.2.5 Closed Cooling Water < 140°F

Refer to section 4.2.1.4

4.2.2.6 Concrete

Concrete environment refers to components and commodities embedded or encased in concrete. The high alkalinity of concrete (pH >12.5) provides an environment that protects embedded steel from corrosion.

4.2.2.7 Containment Atmosphere

Refer to section 4.2.1.6

4.2.2.8 Dry Gas

Refer to section 4.2.1.8

4.2.2.9 Encased

Applies to components encapsulated in steel, or aluminum. Encased components are inaccessible, and are not exposed to air, water, or other environments.

4.2.2.10 Fuel Oil
Refer to section 4.1.2.9

4.2.2.11 Indoor Air
Refer to section 4.1.2.10

4.2.2.12 Lubricating Oil
Refer to section 4.1.2.11

4.2.2.13 Outdoor Air
Refer to section 4.1.2.12

4.2.2.14 Raw Water – Fresh Water
Refer to 4.1.2.13.1

4.2.2.15 Raw Water – Salt Water
Refer to 4.1.2.13.2

4.2.2.16 Soil
External environment for structures and components that are in contact with soil. Structures and components in contact with soil may be exposed to groundwater if they are located below the local ground water elevation. Site groundwater has been tested and determined non-aggressive to concrete. The soil environment is also used for concrete components that may not be in contact with soil to account for potential cracking due to settlement since OCNGS structures are supported on soil.

4.2.2.17 Steam
Refer to section 4.1.2.16

4.2.2.18 Treated Water
Refer to section 4.1.2.17

4.2.2.19 Treated Water < 140
Refer to section 4.1.2.18

4.2.2.20 Treated Water > 482
Refer to section 4.1.2.19

4.2.2.21 Water – Flowing
Water that is refreshed, thus having a larger impact on leaching of calcium hydroxide from concrete structure

4.2.2.22 Water – Standing
Water that is stagnant and unrefreshed, thus possibly resulting in increased ionic strength of solution up to saturation

4.2.2.23 Adverse Localized Environment

Adverse localized environment is an environment that could exist in limited plant areas caused by heat, radiation, or moisture in the presence of oxygen. This environment is applicable to electrical cables only.

4.3 Aging Effects

The standard aging effects and the corresponding age-related degradation mechanisms listed in Table 4 were extracted from NUREG-1801 (Ref. 6), Industry documents (Ref. 13, 14), and previous license renewal applications (Ref. 21-26). The list should be used when determining aging effects and aging mechanisms applicable to OCNGS structures, components, or commodities as described in PLI-3 (Ref. 1).

5.0 Attachments:

Table 1 – Oyster Creek Materials and Equivalent NUREG-1801 Materials
Table 2 – Oyster Creek Internal Service Environments and Equivalent NUREG-1801 Environments
Table 3 – Oyster Creek External Environments and Equivalent NUREG-1801 Environments.
Table 4 – Standard Mechanical Aging Effects
Table 5 – Standard Structural Aging Effects (Excluding Concrete)
Table 6 – Standard Structural Aging Effects (Concrete)
Table 7 - Electrical Aging Effects and Mechanisms
Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

6.0 References

1. PLI-3, "Screening of Systems, Structures and Commodities"
2. 10CFR54.4 Requirements for Renewal of Operating Licenses for Nuclear Power Plants
3. NEI 95-10, "Industry Guideline for Implementing The Requirements of 10 CFR Part 54 – The License Renewal Rule," Revision 5
4. Oyster Creek Component Record List (CRL)
5. NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", Draft Rev. 1, January 2005.
6. NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Draft Rev. 1, January 2005.
7. NEI Letter to Dr. P.T. Kuo, Proposed method for updating the GALL report, NUREG-1801, dated May 11, 2004.
8. Oyster Creek Nuclear Generating Station Updated Final Safety Analysis Report, Rev. 13
9. SYS-LL-OC-1, "Line List & Specification"
10. BR 2001 Sheet 1, Revision 20, Mechanical Symbols
11. SDBD-OC-243 (MPR), Design Basis Document for Containment System Oyster Creek Nuclear Generating Station
12. ES-027, Environmental Parameters – Oyster Creek NGS, Rev. 4
13. EPRI TR-1003056, "Non-Class 1 Mechanical Implementation Guideline and Mechanical Tools, Revision 3"
14. EPRI TR-1002950, "Structural Tools, Revision 1"
15. EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines"
16. EPRI TR-103515, "BWR Water Chemistry Guidelines"
17. Exelon Procedure CY-AB-120-100, "Reactor Water Chemistry"
18. Exelon Procedure CY-AB-120-320, "Control Rod Drive Water Chemistry"
19. Exelon Procedure CY-AA-120-400, "Closed Cooling Water Chemistry"
20. Aging Effects Topical Report, Dresden Nuclear Power Station Units 2 &3, Quad Cities Nuclear Power Station 1&2.
21. Dresden and Quad Cities License Renewal Application, including RAI 3.0-1
22. Peach Bottom License Renewal Application
23. R.E. Ginna Nuclear Power Plant, Application for Renewed Operating License
24. BFN Units 1, 2, and 3 License Renewal Application
25. Donald C. Cook Nuclear Plant License Renewal Application
26. Joseph M. Farley Nuclear Plant Units 1 and 2, Application for License Renewal
27. EPRI 1003057, "License Renewal Electrical Handbook"

Table 1 – Oyster Creek Materials and Equivalent NUREG-1801 Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Alloy steel	Steel	Alloy steel closure bolting with yield strength < 150 ksi; except for bolting in the Control Rod Drive system where it is considered high-strength (yield > 150 ksi)
Aluminum	Aluminum	
Alumina Silica	Material not in NUREG-1801	Alumina silica consists of high temperature ceramic fibers and inorganic binders. The material is used in fire rated barriers.
Asbestos (Thermal Insulation)	Material not in NUREG-1801	Fibrous material used for thermal insulation of piping and components.
Aluminum bronze	Copper alloy	
Boraflex	Boraflex	
Boral	Boral	
Brass	Copper alloy	
Bronze	Copper alloy	
Calcium Silicate (Thermal Insulation)	Material not in NUREG-1801	Thermal insulation material manufactured from mineral fiber and molded or shaped to easily fit around piping and components.
CASS	Cast austenitic stainless steel (CASS)	
Carbon and low alloy steel	Steel	
Cast Iron	Steel Gray cast iron	For Oyster Creek, cast iron is treated as gray cast iron and subject to loss of material due to selective leaching.

Table 1 – Oyster Creek Materials and Equivalent NUREG-1801 Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Chrome Moly	Steel	Chrome Moly is not specifically identified in NUREG-1801. The material provides high resistance to loss of material due to flow-accelerated corrosion (FAC). However it is conservatively treated as carbon steel.
Concrete	Concrete	
Copper	Copper alloy <15% Zn	
Copper Alloy	Copper alloy > 15% Zn	
Elastomer	Elastomer	Butyl, Rubber, Neoprene, silicones
Epoxy Potting	Material not in NUREG-1801	Epoxy resin material used as a sealant around cables for containment electrical penetrations.
Fiberglass (Thermal Insulation)	Material not in NUREG-1801	Semi-rigid fibrous glass quilted between two layers of scrim and encapsulated in fiberglass cloth jackets, forming a composite blanket; or pre-molded fiberglass modules and panels encased in fiberglass jackets.
Galvanized steel	Galvanized Steel	
Glass	Glass	
Gravel, Sand	Material not in NUREG-1801	Crushed stone and sand used for tank foundations.

Table 1 – Oyster Creek Materials and Equivalent NUREG-1801 Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Grout	Grout	
Gypsum board	Material not in NUREG-1801	Wallboard used in fire barriers.
Insulation material – bakelite, phenolic melamine or ceramic, molded polycarbonate	Insulation materials (e.g. bakelite, phenolic melamine or ceramic, molded polycarbonate)	
High strength alloy steel	Low-alloy steel, yield strength >150 ksi	Closure bolting for the reactor vessel and CRD system.
Lubrite	Lubrite	
Masonry	Concrete block	
Mecatiss	Material Not NUREG-1801	Mecatiss is a trade name for fire barrier material. It consists of layers of mineral wool covered internally and externally by fiberglass cloth, which is saturated with a patented silicon sealer. Each layer of wool and cloth is also coated with patented mastic glue, which forms heat and moisture barriers.
Nickel alloy	Nickel alloys	
NUKON (Thermal Insulation)	Material not in NUREG-1801	NUKON insulation system consists of fiberglass blankets, modules, or panels used for thermal insulation inside the primary containment drywell.

Table 1 – Oyster Creek Materials and Equivalent NUREG-1801 Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Permali	Material Not NUREG-1801	Trade name for a composite material used for shielding purposes in the primary containment biological shield wall penetrations.
Plexiglass	Material Not in NUREG-1801	Plexiglass is clear plastic material (Lucite) used in the Standby Gas Treatment ductwork
Polyethylene	Material Not in NUREG-1801	
Polymers	Polymer (e.g., rubber)	Polymers in the Oyster Creek LRA are plastic materials. Rubbers are addressed as elastomers.
Polypropylene	Material Not in NUREG-1801	Polypropylene is a thermoplastic material with good resistance to strong acids, weak to strong alkalis, and most organic solvents. The material is used for chlorination system piping
Polyvinyl chloride (PVC, CPVC)	Material Not in NUREG-1801	PVC and CPVC piping and fitting and conduits.
Porcelain, malleable iron, aluminum, galvanized steel, cement	Porcelain, malleable iron, aluminum, galvanized steel, cement	Used for High Voltage insulators
Pyrocrete	Material not in NUREG-1801	Used as a Fire Barrier
Roofing Material	Material Not in NUREG-1801	Built-up roofing materials (waterproofing membrane, felt, tar, flashing, etc.) for structures,
Stainless steel	Stainless steel	
Tar	Material Not in NUREG-1801	Bituminous materials used for sealing concrete joints, and intake canal slope protection.
Thermo-Lag	Material not in NUREG-1801	Used as a Fire Barrier
Titanium	Material Not in NUREG-1801	Heat exchanger titanium tubes.

Table 1 – Oyster Creek Materials and Equivalent NUREG-1801 Materials

Oyster Creek Material	Equivalent NUREG-1801 Material	Comments
Treated wood	Material Not in NUREG-1801	Pressure treated utility poles, wood piles and wood sheeting used in water control structures.
Various (Gravel, Tar, Soil, wood, galvanized steel)	Various	Material that make dams, canals, and other earthen water control structures
Various metals used for electrical connections	Various metals used for electrical contacts	
Various organic polymers (e.g. EPR, XLPE, PVC, ETFE)	Various organic polymers (e.g. EPR, SR, EPDM, XLPE)	Polymers used in electrical applications
Zinc	Material not in NUREG-1801	

Delete

Table 2 – Oyster Creek Internal Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Auxiliary Steam[1]	Heating and process steam produced from heating boiler using Boiler Treated Water.	Steam
Boiler Treated Water [1]	Demineralized water subject to chemistry controls specified in the plant Auxiliary Boiler Chemistry procedure.	Treated Water
Closed Cooling Water	Treated water subject to water chemistry controls recommended in EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines." Closed Cooling Water includes Reactor Building Closed Cooling Water (RBCCW), and Turbine Building Closed Cooling Water (TBCCW).	Closed cycle cooling water
Closed Cooling Water < 140°F[2]	Closed cooling water below the temperature threshold for SCC in austenitic stainless steel components.	Closed cycle cooling water
Condensation	Condensation environment applies to internal surfaces of design features, such as drain traps, provided to collect potential moisture in gas or air systems.	Condensation (Internal/External)

[1] This environment is not an exact match of the environment defined in NUREG-1801 because water chemistry is controlled to different guidelines. However for aging management review considerations it is considered equivalent.
[2] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 2 – Oyster Creek Internal Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Containment Atmosphere	This environment is inert with nitrogen to render the atmosphere non-flammable by maintaining the oxygen content below 4% by volume. The average normal temperature inside the drywell is 139°F, with a humidity range of 20-40%. The upper elevations (above elev. 95') of the drywell could be exposed to higher temperatures, up to 256°F.	Air – Indoor Uncontrolled
Diesel Engine Exhaust gases	Gas present in diesel engine exhaust	Diesel Exhaust
Dry Gas	Carbon dioxide, halon, helium, dried air, hydrogen, oxygen, nitrogen	Gas Air, Dry
Fuel Oil	Diesel oil used for the combustion engines and heating boilers.	Fuel Oil
Indoor Air	Air in a sheltered environment, other than containment atmosphere. Air temperature range is 65°F - 140°F and the humidity Is 100% maximum.	Air – Indoor Uncontrolled
Lubricating Oil	Low to medium viscosity hydrocarbons used for lubrication of rotating equipment.	Lubricating Oil
Outdoor Air	Outdoor air environment is subject to local weather conditions. The mean temperature range is 23.7°F -84°F and the average annual precipitation is approximately 42 inches.	Air - Outdoor

Table 2 – Oyster Creek Internal Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Raw Water – Fresh Water	Fresh raw water is drawn from either a deep well or from the Fire Pond Dam. Water taken from the deep wells is processed in the pretreatment facility and used for domestic water or treated further and used as Demineralized water and for make up to the condensate storage and transfer system. Fresh water drawn from the Fire Pond Dam is untreated and is used for fire suppression and to the circulating water and service water pumps seals, and dilution pump oil coolers. Recent chemistry results show that the pH = 4.8, chlorides = 12 ppm, and sulfates = 6 ppm.	Raw Water
Raw Water – Salt Water	Raw salt water is drawn from Barnegat Bay, which receives salt water from the Atlantic Ocean and fresh water runoff from streams, which border it on the western shore, including Oyster Creek and Forked River. Recent tests of water samples taken at the Intake Structure and Canal showed that the pH = 7.9, Chlorides =14659 ppm, and Sulfates 1419 ppm. The average monthly water temperature range is 37°F in the winter and 80°F in summer	
Refrigerant	Inert gases such as Freon commonly used in refrigeration and air conditioning systems.	Gas
Sodium Pentaborate	This environment consists of treated water containing sodium pentaborate solution. The environment is found only in Standby Liquid Control System (Liquid Poison System)	Sodium pentaborate solution
Steam	Steam that is subject to BWR water chemistry controls	Steam

Table 2 – Oyster Creek Internal Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Treated Water	Treated water is demineralized water and is the base water for all clean systems. Depending on the system, this demineralized water may require additional processing. Treated water can be deaerated, include corrosion inhibitors, biocides, or some combination of these treatments. Treated water is subject to BWR water chemistry controls. Treated water includes reactor grade water, spent fuel pool water, torus water, and demineralized water.	Treated water Reactor Coolant
Treated Water < 140°F[1]	Treated Water below the temperature threshold for SCC in austenitic stainless steel components.	Treated water
Treated Water > 482°F	Treated water above thermal embrittlement threshold for CASS components.	Treated water > 482°F

[1] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 3 – Oyster Creek External Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Adverse localized Environment	Environment, which could exist in limited plant areas caused by heat, radiation, or moisture in the presence of oxygen.	Adverse Localized Environment
Aggressive Environment[1]	Ground water and raw water environments are considered aggressive if pH < 5.5, or chlorides > 500 ppm, or sulfates > 1500 ppm.	Aggressive Environment
Boiler Treated Water[2]	Demineralized water subject to chemistry controls specified in the plant Auxiliary Boiler Chemistry procedure	Treated Water
Closed Cooling Water	Treated water subject to water chemistry controls recommended in EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines." Closed Cooling Water includes Reactor Building Closed Cooling Water (RBCCW), and Turbine Building Closed Cooling Water (TBCCW).	Closed cycle cooling water
Closed Cooling Water < 140°F[3]	Closed cooling water below the temperature threshold for SCC in austenitic stainless steel components.	Closed cycle cooling water
Concrete	Embedded or Encased in concrete	Concrete
Containment Atmosphere	This environment is inert with nitrogen to render the atmosphere non-flammable by maintaining the oxygen content below 4% by volume. The average normal temperature inside the drywell is 139°F, with a humidity range of 20-40%. The upper elevations (above elev. 95') of the drywell could be exposed to higher temperatures, up to 256°F. For bolting this environment includes potential leakage of treated water, steam, or raw water	Air – Indoor Uncontrolled Air with Reactor Coolant Leakage Air with Steam or Water Leakage

[1] This environment is not an exact match of aggressive environments defined in NUREG-1801, Table IX.D. However it is an exact match of the aggressive environment used in NUREG-1801 AMR tables, for example line Item III.A3-4 (T-05).

[2] This environment is not an exact match of the environment defined in NUREG-1801 because water chemistry is controlled to different guidelines. However for aging management review considerations it is considered equivalent.

[3] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 3 – Oyster Creek External Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Dry Gas	Nitrogen	Gas Air, Dry
Encased	Applies to components encapsulated in steel, or aluminum. Encased components are inaccessible, and not exposed to air, water, or other environments.	Environment not in NUREG-1801
Fuel Oil	Diesel oil used for the combustion engines and heating boilers.	Fuel Oil
Indoor Air	Air in a sheltered environment, other than containment atmosphere. Air temperature range is 65°F - 140°F and the humidity is 100% maximum. For bolting this environment includes potential leakage of treated water, steam, sodium pentaborate, or raw water	Air – indoor Uncontrolled Air with Reactor Coolant Leakage Air with Steam or Water Leakage
Lubricating Oil	Low to medium viscosity hydrocarbons used for lubrication of rotating equipment.	Lubricating Oil
Outdoor Air	Outdoor air environment is subject to local weather conditions. The mean temperature range is 23.7°F -84°F and the average annual precipitation is approximately 42 inches.	Air - Outdoor
Raw Water – Fresh Water	Fresh water drawn from the Fire Pond Dam is untreated and is used for fire suppression and to the circulating water and service water pumps seals, and dilution pump oil coolers. Recent chemistry results show that the pH = 4.8, chlorides = 12 ppm, and sulfates = 6 ppm.	Raw Water

Table 3 – Oyster Creek External Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Raw Water – Salt Water	Raw salt water is drawn from Barnegat Bay, which receives salt water from the Atlantic Ocean and fresh water runoff from streams, which border it on the western shore, including Oyster Creek and Forked River. Recent tests of water samples taken at the Intake Structure and Canal showed that the pH = 7.9, Chlorides =14659 ppm, and Sulfates 1419 ppm. The average monthly water temperature range is 37°F in the winter and 80°F in summer.	Raw Water
Soil	External environment for structures and components buried in soil. Buried structures and components may be exposed to groundwater if they are located below the local ground water elevation. Site groundwater has been tested and determined non-aggressive to concrete.	Soil
Steam	Steam that is subject to BWR water chemistry controls	Steam
Treated Water	Treated water is demineralized water and is the base water for all clean systems. Depending on the system, this demineralized water may require additional processing. Treated water can be deaerated, include corrosion inhibitors, biocides, or some combination of these treatments. Treated water is subject to BWR water chemistry controls. Treated water includes reactor grade water, spent fuel pool water, torus water, and demineralized water.	Treated water
Treated Water < 140°F[1]	Treated Water below the temperature threshold for SCC in austenitic stainless steel components.	Treated water
Treated Water > 482°F	Treated water above thermal embrittlement threshold for CASS components.	Treated water > 482°F

[1] This environment is not an exact match of environments defined in NUREG-1801; however it is bounded by the listed equivalent NUREG-1801 environment

Table 3 – Oyster Creek External Service Environments and Equivalent NUREG-1801 Environments

Oyster Creek Environment	Description	Equivalent NUREG-1801 Environment
Water – flowing	Water that is refreshed, thus having larger impact on leaching of calcium hydroxide from concrete structures.	Water - flowing
Water - standing	Water that is stagnant and un-refreshed, thus possibly resulting in increased ionic strength of solution up to saturation	Water - standing

Table 4 – Standard Mechanical Aging Effects

Aging Effect	Applicable Aging Mechanism
Buildup of Deposits	Due to: • Biofouling • Fouling
Loss of Material	Due to: • General Corrosion • Crevice Corrosion • Pitting Corrosion • Galvanic Corrosion • Microbiologically Influenced Corrosion (MIC) • Flow Accelerated Corrosion (FAC) • Erosion • Selective Leaching • Wear
Crack Initiation and Growth	Due to: • Hydrogen Damage • Stress Corrosion Cracking (SCC) • Intergranular Stress Corrosion Cracking (IGSCC) • Irradiation Assisted Stress Corrosion Cracking (IASCC) • Cyclic Loading • Fatigue
Loss of Fracture Toughness	Due to: • Neutron Irradiation Embrittlement

Table 4 – Standard Mechanical Aging Effects

Aging Effect	Applicable Aging Mechanism
	• Thermal Aging Embrittlement
Loss of Fracture Toughness (TLAA)	Due to: • Neutron Irradiation Embrittlement • Thermal Aging Embrittlement
Loss of Preload	Due to: • Stress relaxation
Cumulative Fatigue Damage (TLAA)	• Fatigue
Change in Material Properties	Due to: • Irradiation • Thermal Exposure • Ultraviolet Radiation & Ozone
Reduction of Heat Transfer	Due to: • Fouling caused by the buildup (from whatever source) on the heat transfer surface
Reduction of Neutron-Absorbing Capacity	Due to: • Irradiation • Loss of the Boraflex Matrix

Table 5 – Standard Structural Aging Effects (Excluding Concrete)

Aging Effect	Applicable Aging Mechanism
Change in Material Properties	Due to: • Irradiation • Thermal Exposure • Ultraviolet Radiation & Ozone
Crack Initiation and Growth	Due to: • Stress Corrosion Cracking (SCC) • Intergranular Stress Corrosion Cracking (IGSCC) • Cyclic Loading • Fatigue
Cumulative Fatigue Damage	• Fatigue
Cumulative Fatigue Damage (TLAA)	• Fatigue
Fretting or Lockup	Due to: • Mechanical wear
Loss of Preload	Due to: • Stress relaxation
Loss of Material	Due to: • General Corrosion • Crevice Corrosion • Pitting Corrosion • Galvanic Corrosion • Microbiologically Influenced Corrosion (MIC) • Erosion • Selective Leaching • Wear
Loss of Material, Loss of Form (Applies to earthen structures)	Due to: • Erosion • Settlement • Sedimentation • Sink holes
Loss of Mechanical Function	Due to: • Corrosion • Distortion • Dirt • Overload • Fatigue due to vibratory and cyclic thermal loads • Elastomer hardening
Loss of Sealing	Due to: • Deterioration of seals, gaskets, and moisture

Table 5 – Standard Structural Aging Effects (Excluding Concrete)

Aging Effect	Applicable Aging Mechanism
	barriers (caulking, and other sealants)
Reduction or Loss of Isolation Function	Due to: • Radiation hardening • Temperature • Humidity • Sustained vibratory loading
Reduction in Anchor Capacity Due to Local Concrete Degradation	Due to: • Cracking • Loss of material

Table 6 – Standard Structural Aging Effects (Concrete)

Aging Effect	Applicable Aging Mechanism
Loss of Material	Due to: • Freeze – Thaw • Abrasion and Cavitation • Elevated Temperature • Aggressive Chemical Attack • Corrosion of Embedded Steel • Corrosion of Reinforcing Steel
Cracking	Due to: • Freeze-Thaw • Reaction with Aggregates • Shrinkage • Settlement • Elevated Temperature • Irradiation • Fatigue • Restraint (applicable to masonry block walls)
Change in Material Properties	Due to: • Leaching of Calcium Hydroxide • Aggressive Chemical Attack • Elevated Temperature • Irradiation • Irradiation of Reinforcing Steel • Creep • Cathodic Protection Effect on Bond Strength

Table 7 – Electrical Aging Effects and Mechanisms

Aging Effect	Applicable Aging Mechanism
Degradation due to various aging mechanisms (TLAA)	Applies to components subject to 10CFR50.49, Environmental Qualification requirements
Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure caused by thermal/thermoxidative degradation of organics; radiolysis and photolysis (ultraviolet [UV] sensitive materials only) of organics; radiation-induced oxidation; moisture intrusion	
Embrittlement, cracking, melting, discoloration	Due to: • Heat • Ultraviolet
Increased Resistance	Due to: • Ohmic heating • Thermal cycling • Electrical transients
Localized damage and breakdown of insulation leading to electrical failure	Due to: • Moisture intrusion • Water trees
Loss of Material	Due to: • Ant damage • Insect damage • Moisture damage
Change in Material Properties	Due to: • Moisture damage
Various degradations	Due to: • Various mechanisms

Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Change in Material Properties • Concrete	Change in material properties is used to designate loss of bond, increase in porosity and permeability, and loss of strength listed in NUREG-1801. Change in material properties is evidenced in concrete structures and structural members as increased permeability, increased porosity, reduction in pH, reduction in tensile strength, reduction in compressive strength, reduction in modulus of elasticity, and reduction in bond strength.	Loss of Bond/ Corrosion of Rebar Increase in Porosity and Permeability/Aggressive Chemical Attack Increase in Porosity and permeability, Loss of Strength/ Leaching Hydroxide Increase in Porosity, Permeability/ Leaching of Calcium Hydroxide Reduction of Strength and Modulus/ Elevated Temperature (>150° F general; >200° F local)
Change in Material Properties • Elastomer	Change in material properties is used to designate increased hardness, shrinkage and loss of strength due to weathering and hardening and loss of strength due to elastomer degradation.	Increased Hardness, Shrinkage and loss of strength/ Weathering Hardening and Loss of Strength/ Elastomer Degradation
Cracking • Concrete	Cracking in concrete may be due to reaction with aggregate, corrosion of embedded steel, freeze-thaw, aggressive chemical attack, elevated temperature, shrinkage, and settlement. Aging mechanisms are not specifically listed in the AMR tables. However, the applicable mechanisms are addressed as indicated by NUREG-1801 Vol. 2 Item line number.	Expansion and Cracking/ Reaction with Aggregate Loss of Material (Spalling, Scaling) and Cracking/ Freeze-Thaw Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/ Corrosion of embedded Steel Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scalling)/ Aggressive Chemical Attack

Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
		Cracks and distortion due to increased stress levels from settlement
Cracking • Masonry	Cracking of masonry walls is due to restraint against expansion and contraction, shrinkage, and creep. The walls are not exposed to aggressive environment.	Cracking due to Restraint shrinkage, Creep, and Aggressive Environment
Cracking Initiation and Growth	This term is synonymous to the "cracking" standardized expression in NUREG-1801. The Oyster Creek AMR tables present aging at the aging effect level and do not specifically list the associated aging mechanisms. However aging management reviews consider the applicable aging mechanisms and the credited aging management programs are reviewed to ensure that the applicable aging mechanisms are adequately managed.	Cracking/ Cyclic Loading Cracking/ Stress Corrosion Cracking Cracking / Stress Corrosion Cracking and Intergranular Stress Corrosion Cracking Cracking / Stress Corrosion Cracking, Intergranular Stress Corrosion Cracking, and Cyclic Loading Cracking/ Stress Corrosion Cracking, Intergranular Stress Corrosion Cracking, Irradiation-assisted Stress Corrosion Cracking Cracking/ Flow-Induced vibration Cracking/ Thermal and Mechanical Loading
Cumulative Fatigue Damage (TLAA)	Cumulative fatigue damage is due to fatigue as defined by ANSI B31.1, ASME III, and ASME VIII.	Cumulative Fatigue Damage
Embrittlement, Cracking, Melting, Discoloration, Swelling, or Loss of Dielectric Strength	Same as NUREG-1801 Table IX.E	Embrittlement, Cracking, Melting, Discoloration, Swelling, or Loss of Dielectric Strength Leading to Reduced Insulation Resistance

Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Leading to Reduced Insulation Resistance (IR); Electric Failure/ Degradation of Organics (Thermal/Thermoxidative), Radioalysis and Photolysis (UV Sensitive Materials only) of Organics; Radiation-induced Oxidation, and Moisture Intrusion		(IR); Electric Failure/ Degradation of Organics (Thermal/Thermoxidative), Radioalysis and Photolysis (UV Sensitive Materials only) of Organics; Radiation-induced Oxidation, and Moisture Intrusion
Fretting or Lockup	Same as NUREG-1801 Table IX.E	Fretting or Lockup
Localized Damage and Breakdown of Insulation Leading to Electrical Failure/ Moisture Intrusion, Water Trees	Same as NUREG-1801 Table IX.E	Localized Damage and Breakdown of Insulation Leading to Electrical Failure/Moisture Intrusion, Water Trees
Loss of Form	In earthen water-control structures, loss of form can result from erosion, settlement, sedimentation, frost action, waves, currents, surface runoff, and seepage.	Loss of Form
Loss of Fracture Toughness	Same as NUREG-1801 Table IX.E	Loss of Fracture Toughness/ Thermal Aging Embrittlement Loss of Fracture Toughness/ Neutron Irradiation Embrittlement Loss of Fracture Toughness/ Thermal Aging and Neutron Irradiation Embrittlement
Loss of Leak Tightness	The primary containment personnel/equipment airlock can experience loss of leak tightness in closed position resulting from mechanical wear of locks, hinges, and closure mechanisms	Loss of Leak Tightness

Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
Loss of Material • Metallic materials	Loss of material for metallic materials can be the result of one or more aging mechanism including general corrosion, pitting, crevice corrosion, microbiologically influenced corrosion, fouling, flow-accelerated corrosion, galvanic corrosion, selective leaching, and wear. The Oyster Creek AMR tables present aging at the aging effect level and do not specifically list the applicable aging mechanisms. However the Oyster Creek aging management reviews consider the applicable aging mechanisms and the credited aging management programs are reviewed to ensure that the applicable aging mechanisms are adequately managed. For example loss of material due galvanic corrosion is managed by programs that manage loss of material due to general corrosion, such as water chemistry programs and one-time inspection or by periodic inspections. The NRC staff has found that these activities are adequate to manage loss of material due to galvanic corrosion (D/QC SER NUREG-1796, Section 3.3.2.5). Selective leaching and flow-accelerated corrosion mechanisms are also not specifically listed in the Oyster Creek AMR tables. However loss of material due to selective leaching is evaluated as indicated by the use of the Selective Leaching of Materials program. Loss of material or "Wall Thinning" due to flow-accelerated corrosion is evaluated as indicated by identification of the applicable NUREG-1801 Vol. 2 line number and by the use of Flow-Accelerated Corrosion program.	Loss of Material/ General, Pitting, and Crevice Corrosion Loss of Material/ Corrosion Loss of Material/ General Corrosion Loss of Material/ General (Steel Only), Pitting and Crevice Corrosion Loss of Material/ Pitting, Crevice, and Microbiologically influenced Corrosion, and Fouling Loss of Material/ General, Pitting, Crevice, and Microbiologically Influenced Corrosion Loss of Material/ General and Pitting Corrosion Loss of Material/Microbiologically Influenced Corrosion Loss of Material/ Pitting and Crevice Corrosion Loss of Material/ Pitting and Crevice Corrosion, and Fouling Loss of Material/ Pitting, Crevice, and Galvanic Corrosion Loss of Material/ Selective Leaching Loss of Material/ Selective Leaching and General Corrosion Loss of Material/ Wear Wall Thinning/ Flow-Accelerated

Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
		Corrosion
Loss of Material • Concrete	Loss of material in concrete may be due to corrosion of embedded steel, freeze-thaw, aggressive chemical attack, and abrasion or cavitation. Aging mechanisms are not specifically listed in the Oyster Creek AMR tables. However, the applicable mechanisms are addressed as indicated by NUREG-1801 Vol. 2 Item line number.	Cracking, Loss of Bond, and Loss of Material (Spalling, Scaling)/ Corrosion of Embedded Steel Loss of Material (Spalling, Scaling) and Cracking/ Freeze-Thaw Increase in Porosity and Permeability, Cracking, Loss of Material (Spalling, Scalling)/ Aggressive Chemical Attack Loss of Material/ Abrasion; Cavitation Loss of Material/ Corrosion of Embedded Steel
Loss of Material, Loss of Form	Same as NUREG-1801 Table IX.E	Loss of Material, Loss of Form
Loss of Mechanical Function	Same as NUREG-1801 Table IX.E	Loss of Mechanical Function
Loss of Preload	Same as NUREG-1801 Table IX.E	Loss of Preload
Loss of Sealing	Same as NUREG-1801 Table IX.E	Loss of Sealing; Leakage Through Containment
Not Applicable	The aging effect in NUREG-1801 is determined not applicable to Oyster Creek material and environment combination. A basis for this determination is provided in a plant specific note.	

Table 8 – Oyster Creek Aging Effects and Equivalent NUREG-1801 Aging Effects

Oyster Creek Aging Effects	Description or Explanation	Equivalent NUREG-1801 Aging Effects
None	The material in the specified environment does not result in an aging effect requiring management.	None
Reduction in Anchor Capacity Due to Local Concrete Degradation	Same as NUREG-1801 Table IX.E	Reduction in Anchor Capacity Due to Local Concrete Degradation
Reduction of Heat Transfer	Same as NUREG-1801 Table IX.E	Reduction of Heat Transfer
Reduction of Neutron-Absorbing Capacity	Same as NUREG-1801 Table IX.E	Reduction of Neutron-Absorbing Capacity
Reduction or Loss of Isolation Function	Same as NUREG-1801 Table IX.E	Reduction or Loss of Isolation Function
Various degradations / various mechanisms	Same as NUREG-1801	Various degradations / various mechanisms

ATTACHMENT 1 – LR System/Structure Names

LR System Names:

1. "C" Battery Room Heating & Ventilation
2. 120/208 Volt Non-Essential Distribution System
3. 120VAC Vital Power System
4. 125V Station DC System
5. 24/48V Instrument Power DC System
6. 4160V AC System
7. 4160V Switchgear Room Ventilation
8. 480/208/120V Utility (JCP&L) Non-Vital Power
9. 480V AC System
10. 480V Switchgear Room Ventilation
11. Alternate Rod Injection System (ARI)
12. Augmented Off-Gas Closed Cooling Water System
13. Augmented Off-Gas System
14. Automatic Depressurization System
15. Battery and MG Set Room Ventilation
16. Breathing Air System
17. Canal Water Temperature Monitoring System
18. Cathodic Protection System
19. Chemical Laboratory Auxiliary Gases
20. Chlorination System
21. Circulating Water System
22. Condensate System
23. Condensate Transfer System
24. Containment Inerting System
25. Containment Spray System
26. Containment Vacuum Breakers
27. Control Rod Drive System
28. Control Rods
29. Control Room HVAC
30. Core Spray System
31. Cranes and Hoists
32. Dilution System
33. Drywell Cooling System
34. Drywell Floor and Equipment Drains
35. Electrical Commodity Groups
36. Electrical Heat Trace System
37. Elevators and Manlifts
38. Emergency Diesel Generator and Auxiliary System
39. Emergency Service Water System
40. Feedwater System
41. Fire Protection System
42. Fuel Assemblies
43. Fuel Storage and Handling Equipment
44. Grounding and Lightning Protection System

ATTACHMENT 1 – LR System/Structure Names

45. Hardened Vent System
46. Heating & Process Steam System
47. Hydrogen & Oxygen Monitoring System
48. Hydrogen Water Chemistry System
49. Instrument (Control) Air System
50. Intermediate Range Monitoring System
51. Isolation Condenser System
52. Lighting System
53. Local Power Range Monitoring System/Average Power Range Monitoring System
54. Main Condenser
55. Main Condenser Air Extraction System
56. Main Fuel Oil Storage & Transfer System
57. Main Generator and Auxiliary System
58. Main Office Building HVAC
59. Main Steam System
60. Main Turbine and Auxiliary System
61. Meteorological Monitoring System
62. Miscellaneous Floor and Equipment Drain System
63. Miscellaneous HVAC System
64. New Radwaste Closed Cooling Water System
65. New Radwaste Service Water System
66. Nitrogen Supply System
67. Noble Metals Monitoring System
68. Nuclear Boiler Instrumentation
69. Offsite Power System
70. Penetration Pressurization System
71. Plant Annunciator System
72. Plant Communications System
73. Plant Computer System
74. Post-Accident Monitoring System
75. Post-Accident Sampling System
76. Process Sampling System
77. Radiation Monitoring System
78. Radio Communications System
79. Radwaste Area Heating and Ventilation System
80. Radwaste System
81. Reactor Building Closed Cooling Water System
82. Reactor Building Floor and Equipment Drains
83. Reactor Building Ventilation System
84. Reactor Head Cooling System
85. Reactor Internals
86. Reactor Manual Control System
87. Reactor Overfill Protection System (ROPS)
88. Reactor Pressure Vessel
89. Reactor Protection System

ATTACHMENT 1 – LR System/Structure Names

90. Reactor Recirculation System
91. Reactor Water Cleanup System
92. Remote Shutdown System
93. Rod Worth Minimizer
94. Roof Drains and Overboard Discharge
95. Sanitary Waste System
96. Screen Wash System
97. Service Air System
98. Service Water System
99. Shutdown Cooling System
100. Source Range Monitoring System
101. Spent Fuel Pool Cooling System
102. Standby Gas Treatment System (SGTS)
103. Standby Liquid Control System (Liquid Poison System)
104. Station Blackout System
105. Torus Water Storage and Transfer System
106. Traveling In-Core Probe System
107. Turbine Building Closed Cooling Water System
108. Turbine Building Ventilation System
109. Water Treatment & Distr. System

Notes:

1. Review system table to determine makeup of system
2. Numbering does not correspond to license renewal system number

LR Structure Names:

1. Ambulance Building
2. Breathing Air Compressor Building
3. Chlorination Facility
4. Component Supports Commodity Group
5. Condensate Transfer Building
6. Dilution Structure
7. Discharge Structure and Canal
8. Domestic Water Facility
9. Emergency Diesel Generator Building
10. Exhaust Tunnel
11. Fire Pond Dam
12. Fire Pumphouses
13. Fish Sample Pool
14. Heat Exchanger Building
15. Heating Boiler House
16. Independent Spent Fuel Storage Installation
17. Intake Structure and Canal (Ultimate Heat Sink)
18. Low Level Radwaste Facility

ATTACHMENT 1 – LR System/Structure Names

19. Maintenance Buildings
20. Material Storage Buildings
21. Miscellaneous Yard Structures
22. Monitoring and Change Facility
23. New Radwaste Building
24. New Sample Pumphouse
25. Off Gas Building
26. Office Building
27. Old Radwaste Building
28. Other Office Buildings
29. Oyster Creek Substation
30. Pipe Tunnel
31. Piping and Component Insulation Commodity Group
32. Pretreatment Facility
33. Primary Containment
34. RAGEMS Buildings
35. Reactor Building
36. Respirator Facility
37. Security Structures
38. Site Emergency Building
39. Turbine Building
40. Ventilation Stack

Notes:

1. Review structures table to determine makeup of structures
2. Numbering <u>does</u> <u>not</u> correspond to license renewal structure number

Reactor Vessel, Internals, and Reactor Coolant System

1. Control Rods
2. Fuel Assemblies
3. Isolation Condenser System
4. Nuclear Boiler Instrumentation
5. Reactor Head Cooling System
6. Reactor Internals
7. Reactor Pressure Vessel
8. Reactor Recirculation System

Engineered Safety Features

1. Automatic Depressurization System
2. Containment Spray System
3. Core Spray System
4. Standby Gas Treatment System (SGTS)

Auxiliary Systems

1. "C" Battery Room Heating & Ventilation
2. 4160V Switchgear Room Ventilation
3. 480V Switchgear Room Ventilation
4. Augmented Off-Gas Closed Cooling Water System
5. Augmented Off-Gas System
6. Battery and MG Set Room Ventilation
7. Breathing Air System
8. Chemical Laboratory Auxiliary Gases
9. Chlorination System
10. Circulating Water System
11. Containment Inerting System
12. Containment Vacuum Breakers
13. Control Rod Drive System
14. Control Room HVAC
15. Cranes and Hoists
16. Dilution System
17. Drywell Cooling System
18. Drywell Floor and Equipment Drains
19. Elevators & Manlifts
20. Emergency Diesel Generator and Auxiliary System
21. Emergency Service Water System
22. Fire Protection System
23. Fuel Storage and Handling Equipment

24. Hardened Vent System
25. Heating & Process Steam System
26. Hydrogen & Oxygen Monitoring System
27. Hydrogen Water Chemistry System
28. Instrument (Control) Air System
29. Main Fuel Oil Storage & Transfer System
30. Main Office Building HVAC
31. Meteorological Monitoring System
32. Miscellaneous Floor and Equipment Drain System
33. Miscellaneous HVAC System
34. New Radwaste Closed Cooling Water System
35. New Radwaste Service Water System
36. Nitrogen Supply System
37. Noble Metals Monitoring System
38. Penetration Pressurization System
39. Plant Communications System
40. Post-Accident Sampling System
41. Process Sampling System
42. Radiation Monitoring System
43. Radwaste Area Heating and Ventilation System
44. Radwaste System
45. Reactor Building Closed Cooling Water System
46. Reactor Building Floor and Equipment Drains
47. Reactor Building Ventilation System
48. Reactor Water Cleanup System
49. Roof Drains and Overboard Discharge
50. Sanitary Waste System
51. Screen Wash System
52. Service Air System
53. Service Water System
54. Shutdown Cooling System
55. Spent Fuel Pool Cooling System
56. Standby Liquid Control System (Liquid Poison System)
57. Torus Water Storage and Transfer System
58. Traveling In-Core Probe System
59. Turbine Building Closed Cooling Water System
60. Turbine Building Ventilation System
61. Water Treatment & Distr. System

Steam and Power Conversion Systems

1. Condensate System
2. Condensate Transfer System
3. Feedwater System
4. Main Condenser
5. Main Condenser Air Extraction System

6. Main Generator and Auxiliary System
7. Main Steam System
8. Main Turbine and Auxiliary System

Electrical Components

1. 120/208 Volt Non-Essential Distribution System
2. 120VAC Vital Power System
3. 125V Station DC System
4. 24/48V Instrument Power DC System
5. 4160V AC System
6. 480/208/120V Utility (JCP&L) Non-Vital Power
7. 480V AC System
8. Alternate Rod Injection System (ARI)
9. Canal Water Temperature Monitoring System
10. Cathodic Protection System
11. Electrical Commodity Groups
12. Electrical Heat Trace System
13. Grounding and Lightning Protection System
14. Intermediate Range Monitoring System
15. Lighting System
16. Local Power Range Monitoring System/Average Power Range Monitoring System
17. Offsite Power System
18. Plant Annunciator System
19. Plant Computer System
20. Post-Accident Monitoring System
21. Radio Communications System
22. Reactor Manual Control System
23. Reactor Overfill Protection System (ROPS)
24. Reactor Protection System
25. Remote Shutdown System
26. Rod Worth Minimizer
27. Source Range Monitoring System
28. Station Blackout System

Structures and Component Supports

1. Ambulance Building
2. Breathing Air Compressor Building
3. Chlorination Facility
4. Component Supports Commodity Group
5. Condensate Transfer Building
6. Dilution Structure
7. Discharge Structure and Canal
8. Domestic Water Facility

9. Emergency Diesel Generator Building
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15. Heating Boiler House
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17. Intake Structure and Canal (Ultimate Heat Sink)
18. Low Level Radwaste Facility
19. Maintenance Buildings
20. Material Storage Buildings
21. Miscellaneous Yard Structures
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33. Primary Containment
34. RAGEMS Buildings
35. Reactor Building
36. Respirator Facility
37. Security Structures
38. Site Emergency Building
39. Turbine Building
40. Ventilation Stack

License Renewal Systems and Structures

Oyster Creek Generating Station

Prepared by:	Mark A. Miller	**Date:**	
Checked by:	Stu Getz	**Date:**	
Approved by:	Don B. Warfel	**Date:**	

REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	As-built to reflect scoping/screening/AMR completion
2	Revised LR Structures and incorporated administrative changes per OI #'s 1315 and 1440
3	Zinc Injection System was included in the Feedwater System per LRCR's 167 and 170.
4	
5	

TABLE OF CONTENTS

1. Purpose

The license renewal scoping criterion under 10 CFR 54 requires the licensee to identify all systems or structures which fall within the scope of 10CFR54.4(a)(1), 10CFR54.4(a)(2), 10CFR54.4(a)(3).

Procedure ES-017 provides a comprehensive list of Oyster Creek systems and structures. In addition to systems and structures, ES-017 also includes selected components and other special case groupings. This position paper documents a review of the ES-017 list to identify the systems and structures appropriate for license renewal review. The list of systems and structures is verified by review against the Oyster Creek UFSAR. In some cases, system or structure descriptive titles are modified to reflect the UFSAR description terminology. This position paper provides the correlation between the UFSAR and ES-017, and also provides a consolidated list of systems and structures appropriate for license renewal review.

The purpose of this document is to identify a consolidated and verified list of systems and structures subject to 10CFR54.4 review.

2. Scope

This document applies to all systems and structures identified at Oyster Creek Generating Station.

3. Methodology

Engineering Standard ES-017, "Identification of Oyster Creek Plant Systems", has been established as the governing document for the assignment of identification numbers and names to Oyster Creek systems, structures, components, and special items. In some instances, Engineering Standard ES-017 also identifies a hierarchy within a system by identifying its related subsystems. The use of ES-017 for these purposes is invoked in several key Oyster Creek documents and procedures:

- Oyster Creek UFSAR Section 17.2 states that operation and maintenance of the Oyster Creek Generating Station is conducted in accordance with the approved Quality Assurance Plan. Quality Assurance Topical Report (QATR) NO-AA-10, Appendix F, paragraph 2.2.1.1 identifies the PIMS Component Record List (CRL) as the database for the identification of the permanent plant structures, systems, and components within the scope of the QATR. The identification of systems, and their structure, within the CRL has been based on the systems, structures, components, and special items identified in ES-017.
- Oyster Creek maintenance rule basis document TDR 1196, Rev. 01 Section II para. 2.2 identifies Engineering Standard ES-017 as the source document for the system number and name for Oyster Creek systems.

- Oyster Creek Procedure ES-012, "CRL Component ID, Data Format and Structure", Rev. 12 Sections 1.0, 4.9, 5.5 and Exhibit 1 identifies ES-017 as the source document for system identification.
- Oyster Creek Procedure EP-011, "Methodology for Assigning and Maintaining the Quality Classification of Components", Rev. 11 Exhibit 2D identifies ES-017 as the source document for system identification.

Based on this precedence, the initial license renewal systems list was developed from ES-017 systems and groupings. This list was then benchmarked against the DRE/QC and PBAPS license renewal systems lists and further verified against other design basis documents for Oyster Creek (e.g., system DBD's, Maintenance Rule documentation, etc.). These reviews resulted in a validated initial license renewal systems list that could be reviewed against the Oyster Creek UFSAR.

For every system, component, or special item identified, the applicable sections of the Oyster Creek UFSAR were reviewed to determine the relationship between ES-017 and UFSAR descriptions and functions. Where appropriate, ES-017 systems have been combined or segregated to align with UFSAR system descriptions and functions as closely as possible. The UFSAR was also reviewed to identify systems or functions not directly included in the ES-017 listing. UFSAR systems/functions not directly included in ES-017 were either logically grouped within an ES-017 system, or were identified as an individual License Renewal System. (e.g., The attached list of systems does not include a system referred to as primary containment isolation system or secondary containment isolation system. This is because Engineering Standard ES-017 does not include systems by these names. The primary containment and secondary containment isolation functions have been embedded within, and will be scoped with, the systems penetrating these structures.)

Plant structures were identified from the ES-017, UFSAR, plant design drawings, or PIMS. The license renewal name for each structure is based on whether the structure is specifically described in the UFSAR or not. Structures described in the UFSAR are given the UFSAR name as the license renewal name. For structures not described in the UFSAR, the license renewal name is the name used in ES-017 or design drawings. Trailers designated as structures in ES-017 or design drawings are not given a license renewal name. These are considered temporary enclosures and will not be included in the license renewal application.

The 390 ES-017 systems/structures/components/special items have been consolidated down to a total of 149 license renewal system/structure names. Each license renewal system may consist of only one ES-017 systems/structures/components/special item or may consist of multiple logically grouped systems/structures/components or special items. In a few instances, an ES-017 system was separated into multiple systems since the ES-017 system contained several distinctive functional groups that would be better scoped for license renewal individually. An ES-017 system may also be identified as a "non-system" when the system number is used for higher-level system identification, or, when the system number is associated with a special item (such as a process).

The 149 license renewal systems/structures were "binned" by discipline: Structural, Mechanical, and Electrical/I&C. Six (6) categories were then used to further group the license renewal systems and structures. These categories include: Reactor Vessel,

Internals, and Reactor Coolant System; Engineered Safety Features; Auxiliary Systems; Steam and Power Conversion Systems; Electrical Components; and Structures and Component Supports. To aid in the alignment of the Oyster Creek license renewal systems and structures into these categories, the guidance of NUREG-1801 "Generic Aging Lessons Learned (GALL) Report" was utilized.

The resulting list of all Oyster Creek license renewal systems and structures is provided in Attachment 1. Details of the systems review are provided in Attachment 2. Details of the structures review are provided in Attachment 3. Attachment 2 and 3 are to be used to determine system and subsystem groupings during the scoping process. Attachment 4 identifies the license renewal system/structures by category.

4. References

1. 10 CFR Part 54 – Requirements for Renewal of Operating Licenses for Nuclear Power Plants.
2. Nuclear Energy Institute (NEI), NEI 95-10, Industry Guideline on Implementing the Requirements of 10 CFR Part 54, Revision 5.
3. NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," January 2005
4. NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," January 2005
5. TDR-1196, "Oyster Creek Maintenance Rule Technical Basis Document", Revision 1.
6. Engineering Standard ES-017, "Identification of Oyster Creek Plant Systems", Revision 22.
7. Oyster Creek Generating Station Procedure ES-012, "CRL Component ID, Data Format and Structure", Revision 12.
8. Oyster Creek Generating Station Procedure EP-011, "Methodology for Assigning and Maintaining the Quality Classification of Components", Revision 11.
9. Oyster Creek Generating Station UFSAR, Revision 13, April 2003.
10. Oyster Creek PIMS Component Records List (CRL)
11. Exelon Quality Assurance Topical Report NO-AA-10, Revision 72

5. Attachments

1. LR System/Structure Names (4 pgs)
2. LR Name Sort of PP-1 Systems (49 pgs)
3. OC LR Structures (4 pgs)
4. LR Systems/Structures by Category (4 pgs)

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio 5/28/04	Dave Honan	Don Warfel	
1	G. J. Beck	Dave Honan	Don Warfel	6/22/05
2	C.Micklo	Dave Honan	Don Warfel	8/24/05
3	S. B. Rafferty	John Hufnagel JCH	Don Warfel	9/8/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Update references and exhibits
2	Addition of PLI-16
3	Updated for formatting reasons.

Approvals

Rev. No.	*Prepared by:*	*Reviewed by:*	*Approved by:*	*Date*
0	H. D. Honan	K. P. Muggleston	D. B. Warfel	1/16/04
1	K. P. Muggleston	H. D. Honan	D. B. Warfel	1/28/04
2	H. D. Honan	K. P. Muggleston	D. B. Warfel	4/21/05
3	H.D. Honan	J. G. Hufnagel	A.A. Fulvio	8/16/05
4	S. B. Rafferty	J. G. Hufnagel JGH	D. B. Warfel	9/8/05

Approvals

Rev. No.	*Prepared by:*	*Reviewed by:*	*Approved by:*	*Date*
0	K. P. Muggleston	H. D. Honan	D. B. Warfel	6/5/04
1	K. P. Muggleston	C. Micklo	D. B. Warfel	6/17/05
2	S. Rafferty	J. Hufnagel JGH	D. B. Warfel	9/8/05

Revision Log

Rev. No.	Description of the Change(s)
0	Initial issue.
1	Updated to correct references, minor editorial changes.
2	Updated for formatting reasons.

APPROVAL PAGE

Revision	*Prepared by:*	*Checked by:*	*Approved by:*
00	*Kevin Muggleston*	*Al Fulvio*	*Don Warfel*
Date	*1/13/04*	*1/13/04*	*1/13/04*
01	*Kevin Muggleston*	*Stu Getz*	*Al Fulvio*
Date	*8/16/05*	*8/16/2005*	*8/16/05*
02	*Shannon Rafferty*	*John Hufnagel*	9/8/05 *Don Warfel*
Date			

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Mark Miller	Don Warfel	11-16-04
1	Kevin Muggleston	Mark Miller	Al Fulvio	8-17-05
2	Shannon Rafferty	John Hufnagel	Don Warfel	9/8/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Updated references, Database details and Table Description exhibit
2	Updated for formatting reasons.

Approvals

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0	M. J. May	A. A. Fulvio	D. B. Warfel	1/24/05
1	M. J. May	S. C. Getz	A. A. Fulvio	8/16/05
2	S. Rafferty SBR	J. Hufnagel JGH	D.B. Warfel	9/8/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Updated revision of NEI 95-10 and added NUREG-1800 to references.
2	Updated for formatting reasons.

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Mark Miller	Don Warfel	8/19/04
1	Al Fulvio/Lou Corsi	Mark Miller	Don Warfel	4/20/05
2	Lou Corsi	Mark Miller	Don Warfel	6/22/05
3	Shannon Rafferty	John Hufnagel JGH	Don Warfel	9/8/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Added Guidance contained in Exhibits 2 and 3 and approval process prior to Plant Health Committee
2	Added or updated references to NEI and NUREG 1800 and 1801
3	Updated for formatting reasons.

Approvals

Rev. No.	Prepared by:	Reviewed by:	Approved by:	Date
0	Al Fulvio	Dave Honan	Don Warfel	7/12/04
1	George Beck	Dave Honan	Don Warfel	6/22/05
2	Louis J. Corsi	Stu Getz	Don Warfel	9/1/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Add review and approval requirements for Position Papers and Project Level Instructions; update references
2	Revised para. 6.2.2 and 6.2.4 for clarity

Approvals

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0	Al Fulvio	Tom Quintenz	Don Warfel	
1	George Beck	Dave Honan	Don Warfel	6/22/05
2	John Hufnagel	Dave Honan	Al Fulvio	8/18/05
3	Shannon Rafferty	John Hufnagel JJH	Don Warfel	9/13/05

Revision Log

Rev.	Description of the Change
0	Initial Issue
1	Update references
2	Clarified Applicability Section and Step 6.2
3	Formatting Changes

Approvals

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0	H. D. Honan	Al Fulvio	D. B. Warfel	5-28-04
1	L. J. Corsi	Stuart Getz	D. B. Warfel	9-1-05
2	S. B. Rafferty	J. G. Hufnagel	D. B. Warfel	9/8/05

Prepared by:	Mark A. Miller	**Date:**	9/8/05
Checked by:	S.C. Getz Stu Getz	**Date:**	9/8/05
Approved by:	Don B. Warfel	**Date:**	9/8/05

Approval Page

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00	Louis J. Corsi	Mark Miller	Don Warfel
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01	Louis J. Corsi	Mark Miller	Don Warfel
Date	4/12/2005	4/22/2005	4/22/2005
02	Louis J. Corsi		
Date	6/21/2005	6/22/05	6/22/05

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Revision	Prepared by:	Checked by:	Approved by:
00			
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Date			
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Date			
02	A. M. Ouaou	K. P. Muggleston	D. B. Warfel
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Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Service Water System

Part of	Auxiliary Systems	System Grouping

System Functions:

1. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The SWS ensures that the Spent Fuel Pool Cooling and Augmented Spent Fuel Pool Cooling heat exchangers maintain stored fuel within acceptable limits by providing cooling water to the RBCCW System heat exchangers. The SWS contains non-safety related water filled lines throughout the Turbine Building which have spatial interactions (spray or leakage) with safety related SSCs. Reference: UFSAR Section 9.2.1.1 and 9.1.3.1 - 10CFR54.4(a)(2)
2. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The SWS is credited for supporting the Reactor Building Closed Cooling Water (RBCCW) System. References: FSSD Specification SP-1302-06-013 para. 5.2.3.6.6 - 10CFR54.4(a)(3) in the FHA report
3. Maintains the Emergency Service Water (ESW) side of the Containment Spray heat exchangers full to ensure their readiness to perform their emergency function. References: UFSAR Section 9.2.1.1
4. Provide alternate, and/or supplementary seawater cooling to the tube side of the two Turbine Building Closed Cooling Water (TBCCW) heat exchangers. References: UFSAR Section 9.2.1.1
5. Supplies operating pressure for the Chlorination System Circulating 'Water and Service Water eductors. References: Flow Diagram FP SE-5419 sht.. 1
6. Supplies operating pressure for the Turbine Building Closed Cooling Water (TBCCW) heat exchangers water box vacuum priming eductors. References: Flow Diagram BR 2005 sht.. 2

System Intended Functions:

1. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The SWS ensures that the Spent Fuel Pool Cooling and Augmented Spent Fuel Pool Cooling heat exchangers maintain stored fuel within acceptable limits by providing cooling water to the RBCCW System heat exchangers. The SWS contains non-safety related water filled lines throughout the Turbine Building which have spatial interactions (spray or leakage) with safety related SSCs. - 10 CFR 54.4(a)(2)
2. Relied upon 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). The SWS is credited for supporting the Reactor Building Closed Cooling Water (RBCCW) System. - 10 CFR 54.4(a)(3)

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Roof Drains and Overboard Discharge

Part of **Auxiliary Systems** **System Grouping**

System Functions:

1. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The Roof Drains and Overboard Discharge System carries Emergency Service Water from the Containment Spray Heat Exchangers. The Roof Drains and Overboard Discharge System carries Service Water from the Reactor Building Closed Cooling Water Heat Exchangers which are used to cool the Spent Fuel Pool Cooling and Augmented Spent Fuel Pool Cooling Heat Exchangers. The Reactor Building, Turbine Building, and Office Building roof drain systems have potential spatial interaction (leakage/spray) with safety related equipment within these structures. Reference: UFSAR Section 9.3.3.2.9 - 10CFR54.4(a)(2)
2. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The Roof Drains and Overboard Discharge System carries Service Water from the Reactor Building Closed Cooling Water Heat Exchangers which are used to cool the Shutdown Cooling System. The Roof Drains and Overboard Discharge System carries Fire Protection System deluge spray from the Miscellaneous Floor and Equipment Drain System. Reference: FSSD Specification SP-1302-06-013 para. 5.2.3.6.6, FHAR D.1.I and E.3.a, and UFSAR Section 9.3.3.2.9 - 10CFR54.4(a)(3)
3. Receive non-radioactive discharges from building drainage systems and yard drains. Reference: UFSAR Section 9.3.3.2.9 and drawing BR 2192

System Intended Functions:

1. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The Roof Drains and Overboard Discharge System carries Emergency Service Water from the Containment Spray Heat Exchangers. The Roof Drains and Overboard Discharge System carries Service Water from the Reactor Building Closed Cooling Water Heat Exchangers which are used to cool the Spent Fuel Pool Cooling and Augmented Spent Fuel Pool Cooling Heat Exchangers. The Reactor Building, Turbine Building, and Office Building roof drain systems have potential spatial interaction (leakage/spray) with safety related equipment within these structures. - 10 CFR 54.4(a)(2)
2. Relied upon 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). The Roof Drains and Overboard Discharge System carries Service Water from the Reactor Building Closed Cooling Water Heat Exchangers which are used to cool the Shutdown Cooling System. The Roof Drains and Overboard Discharge System carries Fire Protection System deluge spray from the Miscellaneous Floor and Equipment Drain System. - 10 CFR 54.4(a)(3)

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Reactor Building Closed Cooling Water System

Part of	**Auxiliary Systems**	**System Grouping**

System Functions:

1. Provide primary containment boundary. The RBCCW System includes Primary Containment isolation valves that close to prevent the release of radioactive contamination through system lines. References: UFSAR Section 7.3.1.1.1 and Table 6.2-12 - 10CFR54.4(a)(1)
2. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The RBCCW System provides cooling to the Fuel Pool Cooling and Augmented Fuel Pool Cooling Heat Exchangers to ensure that stored fuel is maintained within acceptable temperature limits. The RBCCW System contains non-safety related water filled lines throughout the Primary Containment and the Reactor Building which have spatial interactions (spray or leakage) with safety related SSCs. References: UFSAR Section 9.2.2.2 and 9.1.3.1 - 10CFR54.4(a)(2)
3. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The RBCCW System is credited for supporting the Shutdown Cooling System (SDC). References: FSSD Specification SP-1302-06-013 para. 5.2.3.4.3 and 5.2.3.6.5 - 10CFR54.4(a)(3)
4. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10CFR50.49). The Primary Containment isolation valves within the RBCCW System are Environmentally Qualified. References: UFSAR Section 3.11 - 10CFR54.4(a)(3)
5. Provide inhibited demineralized water to all of the system components at a specified temperature range. References: UFSAR Section 9.2.2.2
6. Act as a buffer between radioactively contaminated systems, which it cools, and the Service Water System, which is the heat sink for the RBCCW System. References: UFSAR Section 9.2.2.2

System Intended Functions:

1. Provide primary containment boundary. The RBCCW System includes Primary Containment isolation valves that close to prevent the release of radioactive contamination through system lines. - 10 CFR 54.4(a)(1)
2. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The RBCCW System provides cooling to the Fuel Pool Cooling and Augmented Fuel Pool Cooling Heat Exchangers to ensure that stored fuel is maintained within acceptable temperature limits. The RBCCW System contains non-safety related water filled lines throughout the Primary Containment and the Reactor Building which have spatial interactions (spray or leakage) with safety related SSCs. - 10 CFR 54.4(a)(2)
3. Relied upon 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). The RBCCW System is credited for supporting the Shutdown Cooling System (SDC). - 10 CFR 54.4(a)(3)
4. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10 CFR 50.49). The Primary Containment isolation valves within the RBCCW System are Environmentally Qualified. - 10 CFR 54.4(a)(3)

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Nitrogen Supply System

Part of	**Auxiliary Systems**	**System Grouping**

System Functions:

1. Provide primary containment boundary. The Nitrogen Supply System includes containment isolation devices that function to prevent the release of radioactive contamination through system lines. References: UFSAR Section 6.2.5 and Table 6.2-12 - 10CFR54.4(a)(1)
2. Control combustible gas mixtures in the primary containment atmosphere. The Nitrogen Supply System supports the Containment Inerting System in accomplishing the function of post LOCA combustible gas control of the primary containment atmosphere. References: UFSAR Sections 1.9.21, 3.1.37, 6.2.5, and NRC SER Related to Combustible Gas Control System dated 11/18/1992 - 10CFR54.4(a)(1)
3. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The Nitrogen Supply System is credited with establishing the inert drywell environment in which a design basis fire cannot occur. The Nitrogen Supply System is not required to function during a fire or survive a fire. The Nitrogen Supply System supports the Containment Inerting System in accomplishing this function. References: FHAR, Document No. 990-1746, Revision 12 - 10CFR54.4(a)(3)
4. Provide nitrogen gas to the feedwater heaters for layup. References: UFSAR 6.2.5, 10.2, and 10.4
5. Provide nitrogen gas to the Traveling In-core Probe (TIP) System for TIP indexing mechanism purge. References: UFSAR 6.2.5 and 7.5
6. Provide nitrogen gas during normal power operation to the drywell nitrogen compressors for pneumatically operated drywell valves. References: UFSAR 6.2.5 and 9.3.1
7. Provide nitrogen gas to the Control Rod Drive System accumulator nitrogen charging system. References: UFSAR 6.2.5 and 4.6
8. Provide nitrogen gas to the Reactor Water Cleanup System recirculating pump surge tank. References: UFSAR 6.2.5 and 5.4.8

System Intended Functions:

1. Provide primary containment boundary. The Nitrogen Supply System includes containment isolation devices that function to prevent the release of radioactive contamination through system lines. - 10 CFR 54.4(a)(1)
2. Control combustible gas mixtures in the primary containment atmosphere. The Nitrogen Supply System supports the Containment Inerting System in accomplishing the function of post LOCA combustible gas control of the primary containment atmosphere. - 10 CFR 54.4(a)(1)
3. Relied upon 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). The Nitrogen Supply System is credited with establishing the inert drywell environment in which a design basis fire cannot occur. The Nitrogen Supply System is not required to function during a fire or survive a fire. The Nitrogen Supply System supports the Containment Inerting System in accomplishing this function. - 10 CFR 54.4(a)(3)

System Functions:

1. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The SWS ensures that the Spent Fuel Pool Cooling and Augmented Spent Fuel Pool Cooling heat exchangers maintain stored fuel within acceptable limits by providing cooling water to the RBCCW System heat exchangers. The SWS contains non-safety related water filled lines throughout the Turbine Building which have spatial interactions (spray or leakage) with safety related SSCs. Reference: UFSAR Section 9.2.1.1 and 9.1.3.1 - 10CFR54.4(a)(2)
2. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The SWS is credited for supporting the Reactor Building Closed Cooling Water (RBCCW) System. References: FSSD Specification SP-1302-06-013 para. 5.2.3.6.6 - 10CFR54.4(a)(3)
3. Maintains the Emergency Service Water (ESW) side of the Containment Spray heat exchangers full to ensure their readiness to perform their emergency function. References: UFSAR Section 9.2.1.1
4. Provide alternate, and/or supplementary seawater cooling to the tube side of the two Turbine Building Closed Cooling Water (TBCCW) heat exchangers. References: UFSAR Section 9.2.1.1
5. Supplies operating pressure for the Chlorination System Circulating `Water and Service Water eductors. References: Flow Diagram FP SE-5419 sht.. 1
6. Supplies operating pressure for the Turbine Building Closed Cooling Water (TBCCW) heat exchangers water box vacuum priming eductors. References: Flow Diagram BR 2005 sht.. 2

System Intended Functions:

1. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. The SWS ensures that the Spent Fuel Pool Cooling and Augmented Spent Fuel Pool Cooling heat exchangers maintain stored fuel within acceptable limits by providing cooling water to the RBCCW System heat exchangers. The SWS contains non-safety related water filled lines throughout the Turbine Building which have spatial interactions (spray or leakage) with safety related SSCs. - 10 CFR 54.4(a)(2)
2. Relied upon 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). The SWS is credited for supporting the Reactor Building Closed Cooling Water (RBCCW) System. - 10 CFR 54.4(a)(3)

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Control Rod Drive System

Part of	Auxiliary Systems	System Grouping

System Functions:

1. Introduce negative reactivity to achieve or maintain subcritical reactor condition 10CFR54.4(a)(1) (UFSAR 4.6.2)
2. Reactor Coolant Pressure Boundary 10CFR54.4(a)(1) (UFSAR 3.1.48)
3. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for Fire Protection (10CFR50.48) 10CFR54.4(a)(3) (UFSAR 3.1.15)
4. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for Environmental Qualification (10CFR50.49) 10CFR54.4(a)(3) (UFSAR 3.11)
5. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for Station Black Out (10CFR50.63) 10CFR54.4(a)(3) (UFSAR 6.3.1 & TDR-1099)
6. Provide cooling water flow to Control Rod Drive Mechanisms (UFSAR 3.9.4.1.2)
7. Provide makeup water to the RPV for other than regulated events (UFSAR 15.2.6)
8. Provide high pressure, low flow water to the Reactor Head Cooling System (UFSAR 5.4.11)
9. Discharge excess flow to the RPV (UFSAR 3.9.4.1.2)
10. Provide high pressure water to the CRDMs for reactivity management (UFSAR 3.9.4.1.2)
11. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. 10CFR54.4(a)(2)

System Intended Functions:

1. Introduce negative reactivity to achieve or maintain subcritical reactor condition. 10 CFR 54.4(a)(1)
2. Provide reactor coolant pressure boundary. 10 CFR 54.4(a)(1)
3. Relied upon 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). 10 CFR 54.4(a)(3)
4. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10 CFR 50.49). 10 CFR 54.4(a)(3)
5. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Station Blackout. (10 CFR 50.63). 10 CFR 54.4(a)(3)
6. Resist non-safety related SSC failure that could prevent satisfactory accomplishment of a safety related function. 10 CFR 54.4(a)(2)

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Containment Inerting System

Part of	Auxiliary Systems	System Grouping

System Functions:

1. Provide Primary Containment Boundary. The CIS includes Primary Containment isolation valves that close to prevent the release of radioactive contamination through system lines. References: UFSAR Section 6.2.5 and Table 6.2-12 - 10CFR54.4(a)(1)
2. Control combustible gas mixtures in the Primary Containment atmosphere. The CIS is used for post accident combustible gas control of the containment atmosphere. References: UFSAR Sections 1.9.21, 3.1.37, and 6.2.5 - 10CFR54.4(a)(1)
3. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The CIS is credited with establishing the inert drywell environment in which a design basis fire cannot occur. The CIS is not required to function during a fire or survive a fire. References: FHAR, Document No. 990-1746, Revision 12 - 10CFR54.4(a)(3)
4. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10CFR50.49). The limit switches associated with the Primary Containment isolation valves within the CIS are Environmentally Qualified. References: UFSAR Section 3.11 - 10CFR54.4(a)(3)

System Intended Functions:

1. Provide primary containment boundary. The CIS includes Primary Containment isolation valves that close to prevent the release of radioactive contamination through system lines. 10 CFR 54.4(a)(1)
2. Control combustible gas mixtures in the primary containment atmosphere. The CIS is used for post accident combustible gas control of the containment atmosphere. 10 CFR 54.4(a)(1)
3. Relied upon 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). The CIS is credited with establishing the inert drywell environment in which a design basis fire cannot occur. The CIS is not required to function during a fire or survive a fire. 10 CFR 54.4(a)(3)
4. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Environmental Qualification (10 CFR 50.49). The limit switches associated with the primary containment isolation valves within the CIS are Environmentally Qualified. 10 CFR 54.4(a)(3)

Oyster Creek Nuclear Generating Station

System and Structure Scoping Form

Nitrogen Supply System

Part of	Auxiliary Systems	System Grouping

System Functions:

1. Provide primary containment boundary. The Nitrogen Supply System includes containment isolation devices that function to prevent the release of radioactive contamination through system lines. References: UFSAR Section 6.2.5 and Table 6.2-12 - 10CFR54.4(a)(1)
2. Control combustible gas mixtures in the primary containment atmosphere. The Nitrogen Supply System supports the Containment Inerting System in accomplishing the function of post LOCA combustible gas control of the primary containment atmosphere. References: UFSAR Sections 1.9.21, 3.1.37, 6.2.5, and NRC SER Related to Combustible Gas Control System dated 11/18/1992 - 10CFR54.4(a)(1)
3. Relied upon in safety analyses or plant evaluations to perform a function that demonstrates compliance with the commission's regulations for Fire Protection (10CFR50.48). The Nitrogen Supply System is credited with establishing the inert drywell environment in which a design basis fire cannot occur. The Nitrogen Supply System is not required to function during a fire or survive a fire. The Nitrogen Supply System supports the Containment Inerting System in accomplishing this function. References: FHAR, Document No. 990-1746, Revision 12 - 10CFR54.4(a)(3)
4. Provide nitrogen gas to the feedwater heaters for layup. References: UFSAR 6.2.5, 10.2, and 10.4
5. Provide nitrogen gas to the Traveling In-core Probe (TIP) System for TIP indexing mechanism purge. References: UFSAR 6.2.5 and 7.5
6. Provide nitrogen gas during normal power operation to the drywell nitrogen compressors for pneumatically operated drywell valves. References: UFSAR 6.2.5 and 9.3.1
7. Provide nitrogen gas to the Control Rod Drive System accumulator nitrogen charging system. References: UFSAR 6.2.5 and 4.6
8. Provide nitrogen gas to the Reactor Water Cleanup System recirculating pump surge tank. References: UFSAR 6.2.5 and 5.4.8

System Intended Functions:

1. Provide primary containment boundary. The Nitrogen Supply System includes containment isolation devices that function to prevent the release of radioactive contamination through system lines. - 10 CFR 54.4(a)(1)
2. Control combustible gas mixtures in the primary containment atmosphere. The Nitrogen Supply System supports the Containment Inerting System in accomplishing the function of post LOCA combustible gas control of the primary containment atmosphere. - 10 CFR 54.4(a)(1)
3. Relied upon 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). The Nitrogen Supply System is credited with establishing the inert drywell environment in which a design basis fire cannot occur. The Nitrogen Supply System is not required to function during a fire or survive a fire. The Nitrogen Supply System supports the Containment Inerting System in accomplishing this function. - 10 CFR 54.4(a)(3)

Plant Structure Name	System Number	CRL Class	UFSAR Section	UFSAR Name	UFSAR Seismic Class	License Renewal Structure Name
Drywell and Torus	187	Q	6.2, 1.2.2.2, Table 3.2-1,3.1.12	Containment Structure Also Drywell, Vents, Torus and Penetrations	Class I	**Primary Containment**
Containment penetrations	244	Q			Class I	
Mechanical		Q				
Electrical	774	Q				
Drywell Personnel Airlock	245	Q				
Structural Steel	103					
Reactor Pedestal						
Biological Shield Wall						
Reactor Building	153	Q	1.2.2.2, 3.8.4.1, Table 3.2-1, 3.1.12	Reactor Building	Class I	**Reactor Building**
Spent Fuel Storage Pool	161	Q				
New Fuel Storage Vault	159					
Structural Steel	103					
Structural Walls	105					
Ladders, handrail, etc..	106					
Control Rod Drive Rebuilding Facility	261					
Emergency Diesel Generator Building	157	Q	1.2.2.2, 3.8.4	Emergency Generator Building	Class I	**Emergency Diesel Generator Building**
Turbine Building	151		1.2.2.2,3.8.4	Turbine Building	Class II	**Turbine Building**
Turbine Generator Pedestal	152					
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New Cable Spreading Rm & Bridge Encl	193	Q				
Switchgear Room 4160V	195	Q				
Battery Room C	197	Q				
Clean Instrument Shop	173					

Contaminated Instrument Shop	182					
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Chlorination Facility						**Chlorination Facility**
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Conduits and Supports	771	Q				
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Tube Track & Supports						
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Redundant Fire Prot. Pump house						
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Battery Room A&B	196	Q				
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Boiler House						
Heating Boiler House						
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Level D Storage Area						
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Transmission Towers						
H2 Bottle Racks						
Tank Foundations						
Torus Tank						
Fire Water Storage Tank						
Condensate Storage Tank						
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Turbine Building Dirty Oil Tank						

Underground	126					
Duct Banks	773					
Manholes						
Trailers						
Toilet						
Instrumentation & Calibration Trailers						
Pretreatment/Demin. Trailers						
Package Treatment Plant						
Outage Command Center						
Drywell support Center						
Respirator Facility	284					**Respirator Facility**
Ambulance Building						**Ambulance Building**
Monitoring and Change Facility						**Monitoring and Change Facility**
RAGEMS Building				RAGEMS Building	Class II	**RAGEMS Buildings**
Heat Exchanger Building				Heat Exchanger Buildin	Class II	**Heat Exchanger Building**
Pretreatment Building	167		3.8.4	Pretreatment Building	Class II	**Pretreatment Facility**
Exhaust Tunnel				Ventilation Tunnel	Class II	**Exhaust Tunnel**
Pipe Tunnel				Pipe Tunnel	Class II	**Pipe Tunnel**
Breathing Air Compressor Bldg	174					**Breathing Air Compressor Building**
Independent Spent Fuel Storage Installation	915	A				**Independent Spent Fuel Storage Installation**
Main Control Panels	611	Q				
Relay Panels & Cabinets	618	Q				
Local Control/Instrument Rack	614	Q				
Remote shutdown and local shutdown panels	615	Q				
Radwaste Control Room Panels	612					
AOG Off-Gas Control Room Panels	613					
Protective Coating	910	A				
Fire barriers, Dikes, and Penetrations	814	A				

Building Foundation	102					
Structural Steel	103					
Structural walls	105					
Ladders, Handrails, stairs, & Miscellaneous	106					
Forked River Structures						**N/A**
Various	131-148, 188					
Microwave Building	159					
Combustion Turbine Building						
Insulation						**Piping and Component Insulation Com**
Domestic Water Facility						**Domestic Water Facility**

GALL Group	Comments
IIB.1	
IIB.4	
IIIA.2	
IIIA.3	
IIIA.3	

IIIA.3	
N/A	
N/A	
IIIA.9	
III A.3	
IIIA.6	
N/A	
III.B	
N/A	
IIIA.6	
III.A3	

III.A3	
III.A3	
N/A	
III.A3	Contains SR MCC 1A24 and 1B24
N/A	
N/A	
N/A	Machine Shop
N/A	

N/A	
N/A	
N/A	
N/A	
N/A	
N/A	Low Level Radwaste Facility
N/A	Does not exist
N/A	

N/A	
N/A	
N/A	
N/A	
III A3	
N/A	
N/A	
N/A	
	Structure and anchorage onlly
	Structure and anchorage onlly
	Structure and anchorage onlly
	Structure and anchorage onlly
	Not a system
VII.G	

	Included with buildings
	Included with buildings or commodies
	Included with buildings
	Included with buildings
	The structures are outside the protected area
	and are not considered plant structures
nodity Group	