DiabloCanyonNPEm Resource

From: Rigel.Davis@aps.com
Sent: Tuesday, July 13, 2010 12:40 PM
To: Pick, Greg
Cc: TLG1@pge.com
Subject: Diablo Canyon LR Procedures (2 of 2)
Attachments: PI-2 AMRs Rev 3 Oct-12-07.pdf; Whitepaper - Process for Review and Approval of LRA.pdf

Hi Greg,

This is the second of two emails transmitting the License Renewal administrative procedures used for the development of the application.

Thank you,
Rye Davis
STARS License Renewal - Diablo Canyon
rigel.davis@aps.com
623-393-5225

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"TLG1@pge.com" <TLG1@pge.com>
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"Pick, Greg" <Greg.Pick@nrc.gov>
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Post Office: VM252.apsc.com

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PAM COB Procedure Cover Sheet

Aging Management Review

PAMCOBP-PI-2 – 10/07 - Rev 3

Prepared by: Eric Bloch

Approved by: Paul F Crawley

Date Approved: October 12, 2007

Project Instruction PI-2

Aging Management Review
for
STARS License Renewal Projects

Revision 3

October 12, 2007

WorleyParsons

Aging Management Review
for
STARS License Renewal Projects

Approval Page

Revision	Prepared by:	Reviewed by:	Approved by:
0	Eric A. Blocher	Gary Warner Tony Grenci Jim Johnson	Eric Blocher
Date	March 31, 2005	April 5, 2005	April 14, 2005
1	Arden Aldridge Al Saunders Philippe Soenen Gary Warner	Gary Warner Tony Grenci Jim Johnson	Eric Blocher
Date	June 15, 2005	June 23, 2005	July 29 , 2005
2	Gary D. Warner	Jim Johnson	Eric Blocher
Date	August 24, 2006	August 25, 2006	September 12, 2006
3	Gary D. Warner	Jim Johnson	Eric Blocher
Date	October 12, 2007	October12, 2007	October 12, 2007

Revision Summary

Revision	Required Changes to Achieve Revision	Date
0	Initial Issue	April 14, 2005
1	Rewrite and Reformat to comply with Lesson Learned suggestion. (Revision bars not used), incorporate NEI 95-10 revision 6.	July 29, 2005
2	Moved attachment E to Topical Report TR-9. Renumbered attachment F, G and H. Added Palo Verde specific operating experience and quality assurance note boxes. Added guidance for revised AMP format and contents of Program Evaluation Report.	Sept. 12, 2006
3	Added Diablo Canyon specific operating experience and quality assurance note boxes. Updated section 2.0 references, revised COB definition, revised USAR definition, added "LRA Appendix A" description guidance, added Checker requirement for OE and deleted reference to PAMCOBG-3 due to its retirement. Revised operating experience reviews to allow review of CAD and/or WO documents.	Oct. 12, 2007

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1.0 SCOPE

This instruction provides detailed guidance for implementation of License Renewal (LR) Aging Management Review (AMR) activities associated with the Integrated Plant Assessment (IPA) required by 10CFR54. This instruction is in support of the License Renewal Applications (LRAs) prepared for the Strategic Teaming and Resource Sharing (STARS) nuclear stations.

The STARS plants are all pressurized water reactors (PWRs). This instruction therefore omits details appropriate only to boiling water reactors (BWRs).

1.1 Purpose

This procedure describes the AMR process used by the LR Staff to perform Aging Evaluations, Aging Management Program Evaluations, and Operating Experience Reviews.

"Aging Evaluations" (AE) is the process used to evaluate components and structures aging effects and 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. Additionally, each combination of component type, material, environment, aging effect requiring management, and aging management program is compared to NUREG-1801 Volume 2 line items for consistency.

"Aging Management Program (AMP) Evaluation" is the process used to identify applicable plant programs and review their ability to manage the aging effects identified during the aging evaluations. To be credited as an AMP, the review must demonstrate that the effects of aging will be adequately managed so that the structure or component intended function(s) will be maintained for the period of extended operation. The AMP process is based on a comprehensive evaluation of the generic 10 program elements in NUREG-1801 Sections X and XI. The AMP is then compared with each of these 10 elements to identify consistencies.

"Operation Experience (OE) Reviews" is the process used to review plant specific and industry wide operating experience data to provide input to the Aging Evaluation and AMP Evaluation. The OE review provides perspective to the consistency of plant specific aging effect with documented industry operating experience and validates the effectiveness of existing programs to manage aging.

1.2 Applicability

This instruction is to be used by STARS Plant Aging Management Center of Business (PAM COB) staff, and plant license renewal project staff for performing, checking, reviewing, or approving AMR scoping and screening work required in support of each STARS plant's LRA.

The STARS LR Project Manager may designate other individuals to perform checking or review. The Plant LR Project Manager may designate other individuals to perform owner acceptance.

2.0 REFERENCES

1. Title 10, United States Code of Federal Regulations, *Energy,* Part 54 (10 CFR 54), *Requirements for Renewal of Operating Licenses for Nuclear Power Plants.*

2. US NRC NUREG-1800. *Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants.* Rev. 1, September 2005.

3. US NRC NUREG-1801. *Generic Aging Lessons Learned (GALL) Report.* Rev. 1 September 2005.

4. Electric Power Research Institute Report EPRI TR-105090. *Guidelines to Implement the License Renewal Technical Requirements of 10CFR54 for Integrated Plant Assessments and Time-Limited Aging Analyses.* Licensed Proprietary Material. MDC-Ogden Environmental and Energy Services, Inc., and Gilbert/Commonwealth, Inc., for EPRI, November, 1995.

5. Nuclear Energy Institute Report NEI 95-10. *Industry Guideline for Implementing the Requirements of 10 CFR Part 54 – the License Renewal Rule.* Revision 6. NEI, January 2005.

6. DG-1, License Renewal Data Management Tool Users Manual

7. TR-9, Plant Systems and Aging Management Programs Topical Report Series (reference plant specific Topical Report)

8. TR-8, Aging Effects Topical Report Series (reference plant specific Topical Report)

9. DG-5, Project Change Tracking for STARS License Renewal Project

3.0 DEFINITIONS

3.1.1 **Aging Effect Requiring Management (AERM)** - Manifested characteristic of a component or structure that occurs with time based on a given material and environment combination and if undetected could result in a loss of component intended function such that the component intended function could not be assured in the period of extended operation.

3.1.2 **Aging Effects Topical Report, TR-8 series** - The Aging Effects Topical Report is used to identify aging effects for a given material-environment combination applicable to STARS facilities and includes primary references to support technical conclusions. The Aging Effects Topical Report is updated as necessary based on the results of the Aging Management Reviews.

3.1.3 **Aging Evaluation** - The process used by the LR Staff to evaluate components and structures aging effects and demonstrate that the effects of aging of will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

3.1.4 **Aging Management Reference (AM Ref)** – The unique identifier used in the LRDMT to identify the aging effect for a component, material and environment combination and the aging management program assigned to manage the aging. The identifier is the NUREG 1801 Item number for NUREG 1801 aging effect, for non-NUREG 1801 aging effect the identifier is NGxxx where xxx is a sequential number.

3.1.5 **Aging Mechanism** - Gradual physical process that produces aging effects.

3.1.6 **Aging Management Program (AMP)** – Various plant activities (engineering, operations, or maintenance) used to assure that the effects of aging will be adequately managed so that the structure or component intended function(s) will be maintained for the period of extended operation.

3.1.7 **Aging Management Program (AMP) Evaluation** – The process used to assess designated plant programs consistence with aging management program recommendations noted in NUREG18-1 Chapters X and XI or generic program elements note in volume 1.

3.1.8 **Aging Management Program Topical Report** – Documents the evaluation of AMPs that are credited in the LRA. The Aging Management Program Topical Report is developed in parallel with the Aging Management Reviews.

3.1.9 **Aging Management Review (AMR)** – An evaluation of aging effects and means of their qualification or management for the period of extended operation, meeting requirements of 10 CFR 54.21(a). The AMR constitutes the Integrated Plant Assessment (IPA) as defined by 10 CFR 54.3(a). The AMR process includes aging evaluations, AMP evaluations and operating experience reviews.

3.1.10 **Center of Business (COB)** - Offices maintained for purposes of managing and performing license renewal activities for STARS nuclear generating plants.

3.1.11 **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.

3.1.12 **Component Group** - A grouping of like structures or components comprised of similar material, exposed to similar environments, and having the same intended function(s) that can be dispositioned with a single aging management review.

3.1.13 **Corrective Action Documents (CADs**) - The documents used by the STARS facility to identify and correct conditions adverse to quality.

3.1.14 **Current Licensing Basis (CLB)** - Documents and commitments on which a plant license is based. See 10 CFR 54.3(a) for a detailed definition.

3.1.15 **Function** - The specific processes, conditions, or actions that a system, structure or component was designed to perform.

3.1.16 **Further Evaluation** - Additional information provided to augment the specified aging management program as recommend by NUREG-1800 and NUREG-1801.

3.1.17 **Integrated Plant Assessment (IPA)** - An assessment of effects of nuclear plant aging in support of a license renewal application. The IPA is defined by 10 CFR 54.3(a). For STARS plants the IPA shall be documented in an Aging Management Review (AMR) and supporting position papers.

3.1.18 **Intended Functions** - Functions that 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 regulated events. Intended functions that are the bases for including systems, structures, and components within the scope of licensee renewal are defined in §54.4(a)(1) through (3). [NEI 95-10, Section 3.2]

3.1.19 **LRID** - A unique identifier assigned to a plant system or group of plant systems. This identifier aligns closely with the plant system identifiers.

3.1.20 **License Renewal Data Management Tool (LRDMT)** - An electronic database used to populate fields of information during the performance, review and approval of scoping/screening and aging management review license renewal activities. This database 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.

3.1.21 **Operation Experience (OE) Reviews -** The process used to review plant specific and industry wide operating experience data to provide input to the Aging Evaluation and AMP Evaluation.

3.1.22 **Plant Aging Management Center of Business (PAM COB)** - See Center of Business (COB), Definition above.

3.1.23 **Plant License Renewal Project Manager (Plant LR Project Manager)** - The project manager assigned by an individual STARS plant organization to manage the license renewal project for that plant.

3.1.24 **Plant License Renewal Discipline Lead Engineer (Plant LR Discipline Lead)** - The engineer or specialists assigned by the Plant License Renewal Project Manger to approve license renewal packages.

3.1.25 **Plant License Renewal Project Staff** - The plant license renewal project manager and subject matter experts (SMEs), and other managers, engineers, data specialists, and support personnel assigned by an individual STARS plant organization to manage and support the license renewal project for that plant.

3.1.26 **Program Evaluation Report (PER)** – Summary report that includes the AMP 10 element evaluation, operating experience summaries, implementing procedures, AMP component applicability list, and LRA Appendix A & B AMP descriptions. NRC review information including Audit Questions/Responses and RAIs/Responses are also included when available.

3.1.27 **Scoping** - The identification of systems, structures, and components that meet the criteria of 10 CFR 54.4(a)(1) through (3).

3.1.28 **Screening** - The process used to determine, for a system or structure within the scope of 10 CFR 54.4(a)(1) through (3), which structures and components require an aging management review.

3.1.29 **STARS** - **S**trategic **T**eaming **A**nd **R**esource **S**haring of nuclear operating plants.

3.1.30 **STARS Aging Management Program (STARS AMP)** - A plant specific AMP (Non NUREG-1801) used to assure that the effects of aging will be adequately managed so that the structure or component intended function(s) will be maintained for the period of extended operation.

3.1.31 **STARS License Renewal Discipline Lead Engineer (STARS LR Discipline Lead Engineer)** - The engineer or specialists assigned by the STARS License Renewal Project Manger as the lead for the Electrical, Mechanical or Structural group.

3.1.32 **STARS License Renewal Project Manager (STARS LR Project Manager)** - The project manager assigned to manage license renewal projects for STARS plants from the PAM COB.

3.1.33 **STARS License Renewal Engineer (STARS LR Engineer)** - The engineer or specialists assigned by the STARS License Renewal Project Manger to PAM COB

3.1.34 **STARS License Renewal Project Staff** - The STARS license renewal project manager, the TLAA lead engineer and any TLAA evaluators, and other engineers and specialists assigned to work on STARS license renewal projects, and STARS plant utility representatives assigned to PAM COB.

3.1.35 **STARS PAM COB Manager** -The manager assigned by the STARS plant organizations to manage PAM COB license renewal business.

3.1.36 **Subject Matter Expert (SME)** - A technical representative responsible for and familiar with a system, structure, component, analysis, program, or other technical issue; and assigned by the individual plant organization to provide support for the plant license renewal project.

3.1.37 **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).

3.1.38 **System** - A group of components united by some interaction or interdependence, performing many duties but functioning as an integrated unit.

3.1.39 **Updated Safety Analysis Report (USAR)** - The most recent safety analysis report (SAR) as required by 10 CFR 50.71. Also known as Updated Final Safety Analysis Report (UFSAR) or Final Safety Analysis Report Updated (FSAR Updated).

4.0 INSTRUCTIONS

4.1 General

The License Renewal Data Management Tool (LRDMT) is used, in association with this instruction, to populate fields of information, produce the License Renewal Aging Evaluation Report (see Attachment A), produce the License Renewal Aging Management Program Evaluation Report (see example in Attachment B) and document Operating Experience Reviews. Control and use of the LRDMT is described in desktop guide DG-1, "License Renewal Data Management Tool Users Manual".

The Aging Effects Topical Report (reference 8) is used, in association with this instruction, to determine plant specific and industry identified aging effects and associated aging mechanisms. Reference 8 should be used as the primary reference when identifying aging effects that are applicable for a given material-environment combination.

A simplified diagram of the license renewal aging management review process is provided in Attachment C.

The following instructions are approximately in order of occurrence, but may be performed in any order that available information and other resources permit.

4.2 Operating Experience Reviews

4.2.1 General

OE reviews provide plant specific and industry wide operating experience perspective to:

- Consistency of plant specific aging effects with documented industry operating experience.
- Demonstrate that the effects of aging are being adequately managed by existing programs.

Industry operating experience reflected in NRC Bulletins, Generic Letters, and Information Notices has been pre-screened for aging effect and aging management program applicability and is included in the operating experience portion of the LRDMT.

NUREG-1801 is based upon industry operating experience prior to its date of issue. For each STARS license renewal project generic communications such as Generic Letters, Bulletins and Information Notices published after the latest

revision of NUREG-1801 should be evaluated to identify possible system/structure aging effects and AMP impacts. Plant specific operating experience such as Corrective Action Documents (CADs) and/or Work Orders (WOs) for each STARS license renewal project will also be evaluated.

Wolf Creek Specific

1. Wolf Creek CADs are referred to as Performance Improvement Requests (PIRs). PIRs generated since 1988 and Work Orders (EMPAC database) generated since 1995 have been identified based on key words associated with aging effects and entered into the LRDMT.
2. For Wolf Creek the LRDMT addresses plant specific operating experience through a cut off date of January 31, 2005. Wolf Creek operating experience after January 31, 2005 should be discussed with the SME and documented as appropriate during the aging management program workshop.

Palo Verde Specific

1. Palo Verde CADs are referred to as Condition Report/Dispostion Request (CRDR). CRDRs generated since 1996 and Work Orders (SWMS database) generated since 1996 have been identified based on key words associated with aging effects and entered into the LRDMT.
2. For Palo Verde the LRDMT addresses plant specific operating experience through a cut off date of May 19, 2006. Palo Verde operating experience after May 19, 2006 should be discussed with the SME and documented as appropriate during the aging management program workshop.

Diablo Canyon Specific

1. Diablo Canyon CADs are referred to as Action Requests (ARs). ARs generated since 1997 have been identified based on key words associated with aging effects and entered into the LRDMT.
2. For Diablo Canyon the LRDMT addresses plant specific operating experience through a cut off date of November 02, 2007. Diablo Canyon operating experience after November 02, 2007 will be reviewed and evaluated prior to a potential NRC submittal.

4.2.2 Responsibilities

STARS LR Engineer

- Perform the OE Reviews for assigned plant systems.
- Notify the Discipline Lead Engineer that OE reviews are ready for checking.
- Receive, compile and reconcile checking comments.

STARS LR Discipline Lead Engineer

- Check OE Reviews.

4.2.3 Operating Experience Reviews

Perform the following using the LRDMT to complete the Operating Experience Reviews.

4.2.3.1 Use the LRDMT OE Review module to select the CAD and/or WO documents for an assigned plant system.

4.2.3.2 Review the problem description and if required the plant document file for the CAD or WO to answer the following questions.

- Does the OE document address an LR AMP?
  - If the OE document explicitly identifies an AMP that can be attributed to managing the aging effect, answer the Aging AMP question with a **Yes**.
  - Select the NUREG-1801 AMP based on the information provided in the CAD or WO.
  - If NUREG-1801 AMP is not readily apparent, select the AMP as a **Plant Specific** and provide a comment in the Comments/Evaluation section.
  - If the OE document does not identify an AMP that can be attributed to managing the aging effect, answer the AMP question with a **No**.

- Provide a comment in the Comments/Evaluation section if no AMP is evident (e.g. corrective maintenance, design evaluation, etc.).

- Does the OE document address an LR Aging Effect?

  - If the OE document explicitly identifies an aging effect that can be attributed to aging, answer the Aging Effect question with a **Yes**.

  - Select the material(s) and environment(s) for the component(s) associated with the aging effect that has been attributed to aging.

  - Based on the material and environment combination and the information from the OE document, select the most applicable aging effect/mechanism from the selections provided.

  - If the OE document provides insufficient information and the answer is indeterminate, answer Aging Effect question with a **Yes,** select the material(s) and environment(s) for the component(s) associated with the aging effect that has been attributed to aging and provide a comment in the Comments/Evaluation section stating the evaluation of the OE is conservative.

  - If the OE document does not explicitly identify an aging effect that can be attributed to aging, answer the Aging Effect question with a **No**.

  - Provide a comment in the Comments/Evaluation section if no aging effect is evident (e.g. design failure, human performance, etc).

4.2.3.3 After all operating experience documents have been evaluated for a system or structure, the individual responsible for performing the operating experience review shall.

- Notify the STARS LR Discipline Lead Engineer or the designated checker assigned by the STARS LR Project Manager that the OE for the system or structure is ready for checking.

4.2.4 Operating Experience Checking

4.2.4.1 The Checker is responsible, as a minimum, to review assigned OE documents for conformance to the following criteria. The Checker's signature confirms reasonable assurance that these criteria are satisfied:

- The checked OE document conforms to the requirements of applicable Instructions and Desktop Guides.
- Appropriate AMPs, material, environments, and aging effects have been assigned.
- The comment/evaluation section is complete for the OE documents that do not address an AMP or aging effect.

4.2.4.2 The Checker upon completion of the checking of the aging evaluation shall:

- Check the "Cked" check box for each OE Document record.

4.2.4.3 If comments are received during the checking, the STARS LR Discipline Lead Engineer is responsible for forwarding the comments to the Preparer of the OE for resolution.

4.3 Aging Evaluation

4.3.1 General

Reference 8 in conjunction with the LRDMT is used to determine aging effects that are likely to occur and that would affect the structure or component such that its intended function(s) may not be maintained consistent with the CLB during the period of extended operation.

The LRDMT is used to create a License Renewal Aging Evaluation Report on a system specific or structure specific basis. The LRDMT assigns a unique number to each License Renewal Aging Evaluation Report using the following format.

<*Plant Id*>-AER-<*LRID*>-Rev N-<Plant System Name>

4.3.2 Responsibilities

STARS LR Engineer

- Perform the AE for assigned LRIDs.
- Prepare the AE Report.
- Notify the Discipline Lead Engineer that the AE Report is ready for checking.
- Receive, compile and reconcile checking comments.

STARS LR Discipline Lead Engineer

- Develop the NUREG-1801 Further Evaluations.
- Check AE Report.
- Notify the Plant LR Discipline Lead Engineer that the AE Report is ready for approval
- Have the approved AE Report (Attachment A) printed in hard copy and filed in the AMR binder by LRID.

Plant LR Discipline Lead Engineer

- Approve the AE Report.

4.3.3 Identification of Aging Effects and Mechanisms

Component aging effects are determined based upon consideration of materials of construction, operating environment(s) and intended function. The LRDMT, using the component screening data, determines the system and structure component, material, environment and intended function combinations (component groups). Potentially applicable aging effects are identified in reference 8. The applicable aging effects have been included in the LRDMT AM Ref pick list.

Perform the following using the LRDMT Aging Evaluation module to document the Aging Evaluation.

4.3.3.1 At the "AEs Tab" select the LRID. This will display a listing of the applicable component groups for the selected LRID.

4.3.3.2 Select a component group to be evaluated.

4.3.3.3 Use reference 8 in conjunction with NUREG-1801 Volume 2, Westinghouse License Renewal Generic Technical Reports, and applicable industry references to identify the aging effects that are likely to occur for the component group.

4.3.3.4 Evaluate the identified aging effects to determine the impact they have on the ability of the component to perform its intended function(s) consistent with the CLB for the extended period of operation.

4.3.3.5 If the identified aging effects impacts the ability of the component to perform its intended function(s), select the aging effect from the LRDMT "AM Ref" pick list and add the AM Reference to the component group.

4.3.3.6 Continue to add AM References until all applicable aging effects have been addressed for the component group.

Note

Based on material and environment combinations, aging effects are identified that potentially affect the structures or components ability to perform their intended function. License renewal requirements are based upon managing the effects of aging on intended functions. Aging mechanisms that produce the aging effect are considered in the context of that requirement.

The LRDMT identifies aging effects and their associated aging mechanisms.

The License Renewal Application will identify aging effects.

4.3.3.7 Review the applicable OE for the component group by clicking on the LRDMT "Op Exp" button.

4.3.3.8 Confirm that aging effects identified in the OE have been assigned to the component group. If an OE aging effect has been identified that is not applicable to the component group, open the OE document perform one of the following.

- Add a comment that states why the OE is not applicable to the specific component, material, and environment group.
- Revise the OE review question "Does the OE address a LR Aging Effect to **"No"** and provide a justification comment.

4.3.3.9 If an aging effect for a specific component, material, and environment group is not addressed in reference 8 or the LRDMT, contact the STARS Discipline Lead Engineer. A documented technical justification (See Attachment F) will need to be prepared to provide a basis for the aging effect evaluation and update of reference 8 and the LRDMT.

4.3.4 NUREG-1801 Aging Effect Exceptions

An aging effect associated with a NUREG-1801 AM reference that is not applicable shall be identified as an exception. Review the exceptions sections of reference 8 for any exception to the NUREG-1801 aging effects and perform the following.

4.3.4.1 Select the identified reference 8 aging effect in the LRDMT. This will cause the AE "Except Flag" check box to be checked.

4.3.4.2 The LRDMT will select Standard Note "I" (Aging effect in NUREG-1801 for this component, material and environment combination is not applicable).

4.3.4.3 Select or enter a plant specific note that explains the reason for the exception. The plant specific note should be a summary of the justification provided in reference 8.

4.3.4.4 If the exception to the NUREG-1801 aging effect is not documented in reference 8 contact the STARS LR Discipline Lead Engineer. A revision to reference 8 is required to justify the aging effects exception (See Attachment F).

4.3.5 Identification of Aging Management Programs

The LRDMT automatically assigns the AMPs based on the guidance provided in NUREG-1801. NUREG-1801 identifies one acceptable way to manage aging. A STARS AMP can be assigned if the STARS AMP is consistent with NUREG-1801 AMP guidance.

If NUREG-1801 indicates that no aging effects require management for the component group the LRDMT will automatically assign "None" for the aging effect and AMP.

Perform the following for each "AM Ref".

4.3.5.1 Review the NUREG-1801 Chapter XI AMP technical basis or plant specific AMP evaluation basis to confirm the following.

- That the scope of the proposed AMP includes the component group of interest. If the component group is not identified contact the STARS LR Engineer responsible for the AMP Evaluation.

- That the proposed AMP identifies the aging effect that requires management.

- If the AMP needs to be changed in some manner, such as to incorporate an additional component group (scope of AMP), or aging effect/mechanism (parameters monitored or inspected), contact the STARS LR Discipline Lead Engineer for concurrence and forward the information to

the STARS License Renewal Engineer responsible for the AMP Evaluation.

4.3.5.2 If a different AMP will be used (Exception to NUREG-1801 AMP) to manage the aging effect of a NURUG-1801 AM reference, obtain the STARS LR Discipline Lead Engineer concurrence to use a different AMP and perform the following

- Select the AMP in the LRDMT. This will cause the AMP "Except Flag" check box to be checked.
- The LRDMT will select Standard Note "E" (Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant specific aging management program.).
- Select or enter a plant specific note that explains the reason for the exception.

4.3.5.3 If the NUREG-1801 aging management reference indicates a "Plant Specific" AMP perform the following

- Select an AMP to manage the aging effect.
- The LRDMT will select Standard Note "E" (Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant specific aging management program.).

4.3.5.4 If a suitable AMP is not available in the LRDMT, use the following process for creation of a STARS AMP.

- Using knowledge of the aging effect to be managed, related NUREG-1801 information, and a general understanding of nuclear plant programs, identify the program activities.
- Write a brief description of the scope of the AMP that identifies the component group(s) and aging effects to be managed.
- Discuss the proposed program and/or aging management activities with the STARS LR Discipline Lead Engineer.

- Obtain concurrence that the proposed program and/or aging management activities will provide adequate management of the aging effect so that the component groups intended function(s) will be maintained during the period of extended operation or define an alternative.

- With STARS LR Discipline Lead Engineer concurrence, initiate an open item action in the Open Item database to create the proposed activity in an existing or new program.

- Forward an email to the LRDMT administrator requesting that the STARS AMP be entered into the LRDMT.

4.3.6 Further Evaluation Review

The STARS LR Discipline Lead Engineer is responsible for the development of the Further Evaluations required by NUREG-1801. The STARS License Renewal Engineer shall perform a review of the Further Evaluation as follows.

4.3.6.1 Review Further Evaluation for AM References that have SRP Subsection listed to verify that the Further Evaluation addresses the component group being evaluated.

4.3.6.2 If the Further Evaluation needs to be revised to include the component group being evaluated, add a comment to the Further Evaluation explaining the required changes.

4.3.6.3 If the Further Evaluation has not been developed contact the STARS LR Discipline Lead Engineer.

4.3.7 NUREG-1801 Consistency Review

Each NUREG-1801 AM reference added to a component group shall be compared to the component group's component type, material, environment, aging effect requiring management and aging management program to identify consistencies.

Attachment D Table 1 provides a summary of standard note consistency considerations.

Non-NUREG-1801 AM References do not require a consistency review, these entries will utilities a separate set of standard notes see 4.3.7.3

Perform the following for each NUREG-1801 AM references.

4.3.7.1 Consistent with NUREG-1801 (Standard Notes A through E)

- Compare the component group's component type, material, and environment to the NUREG-1801 line item's component type, material and environment.

- If the component type, material and environment match use the chart in reference 7 to determine if an AMP exception exists for the listed AMP.

- If an AMP with exception is identified select Standard Note B. If an AMP with exceptions is not identified select Standard Note A.

- If the component material and environment match but the component type is different use the chart in reference 7 to determine if an AMP exception exists for the listed AMP.

- If an AMP with exception is identified use Standard Note D. If an AMP with exceptions is not identified use Standard Note C.

Note

Upon selecting Standard Notes A through D the LRDMT checks the latest data associated with the AMP to determine if an AMP exception exists. If an exception exists the LRDMT will only allow the selection of Standard Notes B or D.

- If the material and environment match but a different AMP was selected (AMP Exception) or NUREG-1801 required a Plant Specific AMP the LRDMT will select Standard Note E. Select or enter a plant specific note that explains the reason for the exception.

4.3.7.2 Aging Effect in NUREG-1801 is not Applicable (Standard Note I)

- If an exception is taken to the Aging Effect the LRDMT will automatically populate the Standard Note as I.

- Use of Standard Note I requires the selection or entry of a Plant Specific Note. Select or enter a plant specific note that explains the reason for the exception. The plant specific note should be a summary of the justification provided in the reference 8.

4.3.7.3 Plant Specific Evaluations (Not Consistent With NUREG-1801 Standard Notes F, G, H, or J)

- If the AM reference is not a NUREG-1801 line item use the following process to select the Standard Note.

- Compare the component type, material, environment, aging effect and AMP to the NUREG-1801 Volume 2 Item line items for the system being evaluated. Select the most applicable standard note from Standard Notes F, G, H or J. See Appendix D for additional guidance relative to Standard Note selection.

- Use of Standard Note H requires the selection or entry of a plant specific note. Plant specific notes shall be added to the LRDMT on an as needed basis.

- The addition of a plant specific note for Standard Note F, G, or J is optional.

4.3.7.4 After all component, material, and environment groups have been evaluated, the individual responsible for preparing the aging evaluation shall:

- Check the “Prep” check box on the LRDMT Approvals Tab.

- Notify the STARS LR Discipline Lead Engineer or the designated checker assigned by the STARS LR Project Manager that the AE Report is ready for checking.

4.3.8 Aging Evaluation Checking and Approval

4.3.8.1 The Checker is responsible, as a minimum, to review assigned AE Reports for conformance to the following criteria. The Checker's signature confirms reasonable assurance that these criteria are satisfied:

- The checked AE Report is in the proper format and conforms to the requirements of applicable Instructions and Desktop Guides.
- The information contained in the AR Report is technically correct, and the basis for aging effects conclusions is adequately referenced and/or justified.
- The AE Report addresses plant specific OE associated with pertinent material and environment combinations.
- NUREG-1801 Volume 2 line items or appropriate non NUREG-1801 aging references have been properly assigned.
- Plant specific evaluations are consistent with reference 8 and assigned AMP.
- Appropriate standard notes and plant specific notes have been assigned.

4.3.8.2 The Checker upon completion of the checking of the aging evaluation shall:

- Check the "Cked" check box on the LRDMT Approvals Tab.
- Notify the Plant LR Discipline Lead Engineer that the AE Report is ready for approval.

4.3.8.3 If comments are received during the approval, the STARS LR Discipline Lead Engineer is responsible for forwarding the comments to the Preparer of the Aging Evaluation for resolution.

4.3.8.4 The approver upon completion of approving the aging evaluation shall.

- Check the "App" check box on the LRDMT Approvals Tab.
- Notify the STARS LR Discipline Lead Engineer that the AE Report has been approval.

4.3.8.5 STARS LR Discipline Lead Engineer shall have the approved AE Report (Attachment A) printed in hard copy and filed in the AMR binder by LRID.

4.4 Aging Management Program Evaluation

4.4.1 General

NUREG-1801 AMP Evaluations are performed using the AMP elements noted in NUREG-1801 Chapter X and XI (see example in Attachment B). STARS (plant specific) AMP Evaluations are performed using the AMP elements of NUREG-1800 Branch Technical Position RLSB-1 (Attachment E).

All plant specific aging management activities credited with managing a certain aging effect for a specific structure or component shall be identified and compared to the related NUREG-1801 AMP. Aging management activities that are associated with a NUREG-1801 AMP shall be documented using the applicable NUREG-1801 AMP Evaluation. Aging management activities that are not associated with a NUREG-1801 AMP shall be documented as a STARS AMP Evaluation.

Contact with plant SMEs may be required to provide an initial understanding of the plant aging management activity and associated activities.

The LRDMT is used to create a License Renewal Aging Management Program Evaluation Report for each AMP. The LRDMT assigns a unique number to each License Renewal Aging Management Program Evaluation Report using the following format.

For NUREG-1801 AMPs:

<Plant Id>-AMP-*<LRA Chapter Designator>*-Rev N -*<AMP Title>*

For STARS AMPs

<Plant Id>-AMP-Rev N -*<AMP Title>*

4.4.2 Responsibilities

<u>STARS LR Engineer</u>

- Perform the AMP Evaluation for assigned AMPs.
- Prepare the AMP Evaluation Report.

- Notify the STARS LR Discipline Lead Engineer that the AMP Evaluation Report is ready for checking.

- Receive, compile and reconcile checking comments.

STARS LR Discipline Lead Engineer

- Check AMP Evaluation Report.

Plant LR Project Manager

- Owner Approve AMP Evaluation Reports which have a revision greater than Rev 0 (after the AMP workshop).

4.4.3 NUREG-1801 Aging Management Program (AMP) Evaluation

The NUREG-1801 AMP Evaluation is a documented assessment of the NUREG-1801 AMP elements to the plant's specific aging management activities. Included as part of the AMP evaluation are summary statements that briefly describe the basis for consistency with each NUREG-1801 AMP element. Each NUREG-1801 AMP element evaluation also includes an evaluation of exceptions, enhancements and a NUREG-1801 consistency conclusion.

Each program element summary statement shall include the reference documents, with associated section(s), used to provide the basis for consistency statement.

Plant specific AMP elements that are not consistent with the corresponding NUREG-1801 Chapter X and XI aging management program elements shall be identified and a Technical Basis shall be entered in the LRDMT to describe and justify the exception. Exceptions described in each NUREG-1801 AMP element evaluation and summarized in the exceptions section of the Program Description section of the LRDMT see 4.4.3.1.

Note:

Exceptions should be limited to the use of different codes or industry guidance documents by STARS or a technically justified alternative that provides an equivalent level of aging management. Specific questions on exceptions should be discussed with the STARS Discipline Lead Engineer.

Enhancements or revisions to STARS aging management activities may be required to make the activities consistent with the NUREG-1801 Chapter X or XI elements.

- Enhancements may include, verification of inspection values, added steps to procedures to identify specific aging effects, changing the frequency of inspections, added specific mitigation procedures, or changing the record keeping requirements.
- A copy of the applicable pages from the procedure(s) shall be marked-up as a "conceptual draft" to identify recommended enhancements or revisions.
- See section 4.4.3.12 for development of new aging management activities.

Note:

Identify and describe enhancements or revisions of aging management activities as applicable for each AMP element. Enhancements or revisions shall be summarized in the enhancements section of the Program Description. Discuss the enhancement/revisions in the AMP review in the future tense (e.g. **will be**).

Use the LRDMT Aging Management Programs Evaluation module to perform the following.

4.4.3.1 NUREG- 1801 "Program Description"

- Provide a "Program Description" that consists of a minimum of two paragraphs.

  First Paragraph
  The first paragraph shall provide a brief summary of the scope of the AMP, aging effects managed, and reference to the applicable industry guidance documents used by the AMP.

  Second Paragraph
  The second paragraph shall identify the programs, procedures, or activities being credited to be consistent with the AMP.

Third Paragraph (may not be required for all AMPs)
A third paragraph shall identify unique CLB or special considerations associated with the AMP.

- Provide a "LRA Appendix A" description of the AMP that will be used as input to the UFSAR Supplement. The "LRA Appendix A" description should be consistent with the "Program Description" and provide information equivalent to that identified in the applicable 3.X-2 FSAR Supplement table in NUREG-1800.

- Use one of the following consistency conclusion statements

  AMP is Consistent
  The <Insert AMP Name> is an existing program and is consistent with NUREG-1801, Section XI,<Insert section>, <Insert NUREG-1801 Title>. The continued implementation of the <Insert AMP Title> provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

  AMP is Consistent With Enhancements
  The <Insert AMP Name> is an existing program, that following enhancement will be consistent to NUREG-1801, XI.<Insert section>, <Insert NUREG-1801 Title>. The continued implementation of the <Insert AMP Name> will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

  AMP is Consistent With Exceptions
  The <Insert AMP Name> is an existing program, that is consistent, with exception to NUREG-1801, XI.<Insert section>, <Insert NUREG-1801 Title>. The continued implementation of the <Insert AMP Name> will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended

functions consistent with the current licensing basis for the period of extended operation.

AMP is Consistent With Enhancements and Exceptions
The <Insert AMP Name> is an existing program, that following enhancement will be consistent, with exception to NUREG-1801, XI.<Insert section>, <Insert NUREG-1801 Title>. The continued implementation of the <Insert AMP Name> will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

New AMP
The <Insert AMP Name> is a new program, that when implemented, will be consistent with NUREG-1801, Section XI.<Insert section>, <Insert NUREG-1801 Title>. The implementation of the <Insert AMP Name> will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

- Provide a summary of unique exceptions described in each NUREG-1801 AMP element evaluations. Each exception summary shall identify the applicable AMP element using a parenthetical reference at the end of the summary. For example (Element 2 & 5).

- Provide a summary of unique enhancements described in each NUREG-1801 AMP element evaluations. Each enhancement summary shall identify the applicable AMP element using a parenthetical reference at the end of the summary. For example (Element 2 & 5).

4.4.3.2 NUREG-1801 Element 1 “Scope of Program”

- Provide a summary statement that is based on the scope of the component groups that use the AMP to manage the aging effects. Include the reference to the plant implementation procedures with associated section(s).

- Plant implementation procedures are to include or are to be enhanced to include the scope identified by the Aging

Evaluation reviews. Provide a summary of any procedure enhancements or revisions.

- Compare the NUREG-1801 Element 1 "Scope of Program" to the Element 1 Summary Statement and determine if the Element 1 Summary Statement is consistent with Element 1 of the NUREG-1801 Program.
  - If consistent, verify that the question "Is the Program Consistent with Element 1 of NUREG- 1801 Program?" is answered **Yes**.
  - If NOT consistent, answer the question "Is the Program Consistent with Element 1 of NUREG- 1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.3 NUREG-1801 Element 2 "Preventive Actions"

- Provide a summary statement that summarizes the plant's preventive actions and mitigation activities. Include plant implementation procedures with associated section(s).
- Plant implementation procedures are to include or are to be enhanced to include the preventive actions. Provide a summary of any procedure enhancements or revisions.
- Use the following comment for AMPs that do not specify preventive actions.
  - "The <insert name of AMP> does not prevent degradation due to aging effects but provides measures for monitoring to detect the degradation prior to loss of intended function."
- Compare the NUREG-1801 Element 2 "Preventive Actions" to the Element 2 Summary Statement and determine if the Element 2 Summary Statement is consistent with Element 2 of the NUREG-1801 Program.
  - If consistent, verify that the question "Is the Program Consistent with Element 2 of NUREG- 1801 Program?" is answered **Yes**.
  - If NOT consistent, answer the question "Is the Program Consistent with Element 2 of NUREG- 1801

Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.4 NUREG-1801 Element 3 "Parameters Monitored or Inspected"

- Provide a summary statement that summarizes the parameters monitored or inspected that are linked to the degradation of the component group intended function(s). Include plant implementation procedures with associated section(s).

- Plant implementation procedures are to include or are to be enhanced to include the parameters monitored or inspected. Provide a summary of any procedure enhancements or revisions.

- Compare the NUREG-1801 Element 3 "Parameters Monitored or Inspected" to the Element 3 Summary Statement and determine if the Element 3 Summary Statement is consistent with Element 3 of the NUREG-1801 Program.

  - If consistent, verify that the question "Is the Program Consistent with Element 3 of NUREG- 1801 Program?" is answered **Yes**.

  - If NOT consistent, answer the question "Is the Program Consistent with Element 3 of NUREG- 1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.5 NUREG-1801 Element 4 "Detection of Aging Effects"

- Provide a summary statement that summarizes how the aging effects will be detected to ensure that the component group intended function(s) will be adequately maintained for the extended period of operation under all CLB design conditions. Include plant implementation procedures with associated section(s).

- Plant implementation procedures are to include or are to be enhanced to include how the aging effects will be detected. Provide a summary of any procedure enhancements or revisions.

- Compare the NUREG-1801 Element 4 "Detection of Aging Effects" to the Element 4 Summary Statement and determine if the Element 4 Summary Statement is consistent with Element 4 of the NUREG-1801 Program.
  - If consistent, verify that the question "Is the Program Consistent with Element 4 of NUREG- 1801 Program?" is answered **Yes**.
  - If NOT consistent, answer the question "Is the Program Consistent with Element 4 of NUREG- 1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.6 NUREG-1801 Element 5 "Monitoring and Trending"

- Provide a summary statement that describes the monitoring and trending activities. The monitoring and trending activities should provide predictability of the extent of degradation. Include plant implementation procedures with associated section(s).
- Plant implementation procedures are to include or are to be enhanced to include how the monitoring and trending activities. Provide a summary of any procedure enhancements or revisions.
- Compare the NUREG-1801 Element 5 "Monitoring and Trending" to the Element 5 Summary Statement and determine if the Element 5 Summary Statement is consistent with Element 5 of the NUREG-1801 Program.
  - If consistent, verify that the question "Is the Program Consistent with Element 5 of NUREG- 1801 Program?" is answered **Yes**.
  - If NOT consistent, answer the question "Is the Program Consistent with Element 5 of NUREG- 1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.7 NUREG-1801 Element 6 "Acceptance Criteria"

- Provide a summary statement that describes the acceptance criteria of the plant-specific aging management activities. The acceptance criteria should ensure that the component group intended function(s) are

maintained under all CLB design conditions during the period of extended operation. Include plant implementation procedures with associated section(s).

- Plant implementation procedures are to include or are to be enhanced to include acceptance criteria. Provide a summary of any procedure enhancements or revisions.

- Compare the NUREG-1801 Element 6 "Acceptance Criteria" to the Element 6 Summary Statement and determine if the Element 6 Summary Statement is consistent with Element 6 of the NUREG-1801 Program.

  - If consistent, verify that the question "Is the Program Consistent with Element 6 of NUREG- 1801 Program?" is answered **Yes**.

  - If NOT consistent, answer the question "Is the Program Consistent with Element 6 of NUREG- 1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.8 NUREG-1801 Element 7 "Corrective Actions", Element 8 "Confirmation Process" and Element 9 "Administrative Controls" will be generically assessed by the PAM COB staff using Branch Technical Position IQMB-1 "Quality Assurance" that is contained in NUREG-1801.

PAM COB staff will prepare the STARS plant specific Appendix B Quality Assurance (QA) Program evaluation. AMPs shall be reviewed to confirm that the STARS Appendix B QA Program is referenced or incorporated.

- When sections of the aging management activities that implement the Appendix B QA program requirements have been identified insert the following plant specific statement for Elements 7, 8, & 9.

- Include any NUREG-1801 specific requirements.

- Plant implementation procedures are to include or are to be enhanced to include corrective actions, confirmation processes, and administrative controls. Provide a summary of any procedure enhancements or revisions.

- Compare the NUREG-1801 Elements 7, 8, and 9 to the Elements 7, 8, and 9 Summary Statement and determine if the Elements 7, 8, and 9 Summary Statement is consistent with Elements 7, 8, and 9 of the NUREG-1801 Program.
  - If consistent, verify that the question "Is the Program Consistent with Elements 7, 8, and 9 of NUREG-1801 Program?" is answered **Yes**.
  - If NOT consistent, answer the question "Is the Program Consistent with Elements 7, 8, and 9 of NUREG- 1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

Wolf Creek Specific

WCNOC applies its corrective action process to both safety-related and non-safety-related systems, structures, and components. Corrective action process procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10 CFR 50, Appendix B. Conditions adverse to quality (such as failures, malfunctions, deviations, defective material and equipment, and nonconformances) are promptly identified and corrected. In the case of significant conditions adverse to quality, measures are implemented to ensure that the cause is determined and that corrective action is taken to preclude repetition. In addition, the root cause of the significant condition adverse to quality and the corrective actions implemented are documented and reported to appropriate levels of management. The WCNOC corrective action process is consistent with NUREG-1801.

Palo Verde Specific

The PVNGS corrective action process addresses conditions adverse to quality, including failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances, and applies to all PVNGS activities and personnel and to any structure, system, component, process or program that is used in the production of electricity or to ensure the health and safety of personnel and the public. Corrective action process procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10CFR50, Appendix B. Conditions adverse to quality are promptly identified and corrected. Causes of conditions significantly adverse to quality are determined and corrective actions taken to preclude repetition. In addition, the root causes of significant conditions adverse to quality and corrective actions implemented are documented, tracked, and reported to appropriate levels of management. The PVNGS corrective action process is consistent with
NUREG – 1801.

Diablo Canyon Specific

The Diablo Canyon corrective action process is applicable to hardware problems, administrative and organizational issues, human performance issues, or any other activities that have actual or potential problem implications regardless of the quality classification. The corrective action process procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10CFR50, Appendix B, USNRC Regulatory Guide 1.33, Revision 2, 1978 and ANS-3.2/ANSI N18.7-1976. The corrective action process promptly reports, evaluates, resolves, and prevents recurrence of problems, commensurate with the significance of the problem. The Diablo Canyon corrective action process is consistent with NUREG – 1801.

4.4.3.9 NUREG-1801 Element 10 "Operating Experience"

Operating experience is assessed using CAD, Work Order, and/or NRC Generic Communications information currently loaded into the LRDMT.

The operating experience review should confirm that the industry operating experience noted by NUREG-1801 element 10 has been considered as appropriate in the AMP.

- Use the LRDMT "Op Exp" Tab to view the operating experience that has been determined to address the AMP.
- Review operating experience associated with the plant aging management programs. This includes prior revisions to the programs, past corrective actions resulting in program enhancement, recent program inspection reports, and other program documentation.
- Provide a summary statement that summarizes the operating experience which should provide evidence that the intended function(s) are maintained consistent with the CLB during the period of extended operation.
- Compare the NUREG-1801 Element 10 Acceptance Criteria to the Element 10 Summary Statement and determine if the Element 10 Summary Statement is consistent with Element 10 of the NUREG-1801 Program.

- If consistent, verify that the question "Is the Program Consistent with Element 10 of NUREG- 1801 Program?" is answered **Yes**.

- If NOT consistent, answer the question "Is the Program Consistent with Element 10 of NUREG-1801 Program?" **No** and enter a Technical Basis to describe and justify the exception.

4.4.3.10 Reference Documents

- Provide a numbered listing of the references used in the preparation of the aging management evaluation.

4.4.3.11 Comments/Open Issues

- Provide any clarifying comments or include additional information that was used during the AMP evaluation process.

- List any open items.

4.4.3.12 Development of New Aging Management Activities

The development of new STARS aging management activities or One Time Inspections (OTIs) that are required to address management of an aging effect will be prepared as a separate activity.

The new aging management activity or OTI must specify new AMP or OTI requirements consistent with applicable NUREG-1801 AMP 10 elements or further evaluation considerations.

Discussions of the new AMP or OTI review will be in the future tense (e.g. will be).

- Provide a draft of the new aging management activity(ies) or OTI as required supporting the NUREG-1801 AMP 10 elements or further evaluation considerations.

- Summarize in the Procedure Enhancement or Revision Section of the LRDMT the new aging management activity(ies) or OTI.

- Assign numbers to each new activity beginning with the number 1.

4.4.3.13 After each of the 10 elements has been evaluated, the individual responsible for preparing the AMP evaluation shall:

- Check the "Prep" check box on the LRDMT App/Cker Cmts Tab.

- Notify the STARS LR Discipline Lead Engineer or the designated checker assigned by the STARS LR Project Manager that the AMP Evaluation is ready for checking.

4.4.4 STARS (Plant Specific) Aging Management Program (Non NUREG-1801)

A STARS AMP review is required for aging management activities that do not have a comparable AMP identified in NUREG-1801 Chapter X and XI

STARS aging management activities are compared to each of the aging management program elements of NUREG-1800 Branch Technical Position RLSB-1

Enhancements or revisions to plant specific aging management activities may be required.

- List the procedure enhancements or revision.

- Mark-up a copy of the applicable pages from the plant-specific aging management activity(ies) as a conceptual draft.

Note:

Identify and describe enhancements or revisions of aging management activities as applicable for each AMP element. Enhancements or revisions shall be summarized in the enhancements section of the Program Description. Discuss the enhancement/revisions in the AMP review in the future tense (e.g. **will be**).

Use the LRDMT Aging Management Program Evaluation Module to perform the following.

4.4.4.1 Provide a Program Description of the plant-specific aging management activities that makeup the new STARS AMP. The Program Description consists of a minimum of two paragraphs.

First Paragraph
The first paragraph shall provide a brief summary of the scope of the AMP, aging effects managed, and reference to the applicable industry guidance documents used by the AMP.

Second Paragraph
The second paragraph shall identify the programs, procedures, or activities being credited to be consistent with the AMP.

Third Paragraph (may not be required for all AMPs)
A third paragraph shall identify unique CLB or special considerations associated with the AMP.

4.4.4.2 Element 1 "Scope of Program"

- Provide the scope of the new STARS AMP

4.4.4.3 Element 2 "Preventive Actions"

- Describe the activities for prevention or mitigation of aging degradation.
- Use the following comment for AMPs that do not specify preventive actions.
  - "The <insert name of AMP> does not prevent degradation due to aging effects but provides measures for monitoring to detect the degradation prior to loss of intended function."

4.4.4.4 Element 3 "Parameters Monitored or Inspected"

- Identify the parameters to be monitored or inspected.
- Link the monitoring or inspection activities to the degradation of the component groups intended function(s).

- For performance monitoring programs, the parameters monitored or inspected should detect the presence and extent of aging effects.

- For prevention and mitigation programs, the parameters monitored or inspected should be the specific parameters being controlled.

4.4.4.5 Element 4 "Detection of Aging Effects"

- Specific the method(s) used to detect the aging effect(s). The methods should such that the component groups intended function(s) are adequately maintained for the extended period of operation.

4.4.4.6 Element 5 "Monitoring and Trending"

- Describe the monitoring and trending activities used to provide predictability of the extent of aging degradation.

- Describe how the data collected is evaluated. This may include trending.

4.4.4.7 Element 6 "Acceptance Criteria"

- Describe the acceptance criteria of the program and its basis. The description should include a methodology for analyzing the results against applicable acceptance criteria.

4.4.4.8 Element 7 "Corrective Action"

- Describe the actions to be taken when the acceptance criteria is not met.

4.4.4.9 Element 8 "Confirmation Process"

- Describe the confirmation process used to ensure that preventive actions are adequate and appropriate corrective actions are complete and effective.

4.4.4.10 Element 9 "Administrative Controls"

- Describe the administrative controls of the program which should include a formal review and approval process.

4.4.4.11 Element 10 "Operating Experience"

- Review operating experience associated with the plant aging management programs. This includes prior revisions to the programs, past corrective actions resulting in program enhancement, recent program inspection reports, and other program documentation.

- Discuss the existing programs operating experience. This discussion should provide evidence that supports the conclusion that the aging effects will be managed adequately so that the component groups intended function(s) will be maintained during the period of extended operation.

4.4.4.12 Reference Documents

- Provide a numbered listing of the references used in the preparation of the aging management evaluation.

4.4.4.13 Comments/Open Issues

- Provide any clarifying comments or include additional information that was used during the AMP evaluation process.

- List any open items.

4.4.4.14 After each of the 10 elements has been developed, the individual responsible for preparing the STARS AMP evaluation shall:

- Check the "Prep" check box on the LRDMT App/Cker Cmts Tab.

- Notify the STARS LR Discipline Lead Engineer or the designated checker assigned by the STARS LR Project Manager that the AMP Evaluation is ready for checking.

4.4.5 AMP Checking

4.4.5.1 The Checker is responsible, as a minimum, to review assigned package(s) for conformance to the following criteria. The Checker's signature confirms reasonable assurance that these criteria are satisfied.

- The AMP Evaluation Report is in the proper format and conforms to the requirements of applicable Instructions and Desktop Guides.

- The information contained in the AMP Evaluation is technically correct, and the aging management activity reference for each of the AMP program elements is adequately referenced and/or justified.

- The detailed technical evaluation summarizes the scope of the AMP, industry/regulatory guidance documents used, and plant specific implementing procedures.

- Plant specific implementing procedures enhancements/revisions and/or new plant specific implementing procedures have been identified, described in the future tense, and summarized in the comments section.

- Plant specific implementing procedures mark-ups will be turned over to the Plant LR Discipline Lead Engineer at the SME workshop to track and initiate implementation considerations associated with the marked-up AMP and are not included with the AMP documentation.

- Applicable OE evaluations identified by the LRDMT "Op Exp" Tab have been completed and checked.

- Check the "Cked" check box on the LRDMT App/Cker Cmts Tab.

4.4.5.2 The Checker upon completion of the checking of the aging evaluation shall:

- Notify the STARS LR Engineer the AMP Evaluation has been checked

- Return the plant specific implementing procedures mark-ups to the responsible STARS License Renewal Engineer.

4.4.5.3 If comments are received during the checking of the AMP, the Checker is responsible for forwarding the comments to the Preparer of the AMP Evaluation for resolution.

4.4.5.4 If the AMP is at revision 1 or greater notify the Plant LR Project Manager that the AMP Evaluation is ready for Owner Approval. See section 4.5 (AMP Workshop) for AMP revision 0.

4.4.6 Owner Approval

4.4.6.1 Plant LR Project Manager shall review and Owner Approve AMP Evaluation Report which has a revision greater than Rev 0 (after AMP Workshop).

- Check the "Own App By" check box on the LRDMT App/Cker Cmts Tab.

4.5 AMP Workshops

4.5.1 Workshop Objectives

After completion of the Rev 0 AMP Evaluation an AMP workshop shall be conducted with the SMEs or designee from each STARS participant to discuss the AMP Evaluation (10 element evaluation) and the associated plant specific implementing procedure enhancement mark-ups. The AMP workshop objectives are intended to:

- Present and obtain concurrence from the STARS applicant on the anticipated aging management activities that will be credited in the LRA.
- Confirm the operating experience conclusions, including discussions of prior corrective actions and program enhancements with the STARS applicant.
- Identify implementation considerations of plant specific implementing procedures mark-ups with the STARS applicant.
- Resolve any comments or questions related to the 10 element AMP Evaluation.
- Identify fleet standard AMPs.
- Initiate implementation of plant specific implementing procedures mark-ups by the STARS applicant.

4.5.2 Responsibilities

<u>STARS LR Engineer</u>

- Conduct AMP Workshops.
- Reconcile written comments.

<u>STARS LR Discipline Lead Engineer</u>

- Transmit AMP Evaluation package.

<u>Plant LR Discipline Lead Engineer</u>

- Receive and compile written comments.
- Transmit written comments.

- Initiate procedure enhancement/revision implementation tracking.
- Initiate commitment tracking annotation.

The Plant LR Project Manager or Designee

- Owner Approve the AMP Evaluation Report

4.5.3 Workshop

4.5.3.1 The STARS LR Discipline Lead Engineer shall transmit the AMP Evaluation packages (including plant specific implementing procedures mark-ups) to the following.

- The Plant LR Discipline Lead Engineer.
- The PAM COB utility representatives for the other STARS participants.
- The designated plant SMEs for the STARS applicant.

4.5.3.2 The PAM COB utility representatives will transmit AMP Evaluation packages to the designated SMEs at their STARS facility for review.

4.5.3.3 The Plant LR Discipline Lead Engineer will receive and compile written comments.

- All technical comments should identify a source or reference/basis.
- Non-technical comments should provide clarification or the desired wording.

4.5.3.4 The Plant LR Discipline Lead Engineer will transmit the complied written comments to the following prior to the AMP workshop.

- The STARS LR Engineer
- The PAM COB utility representatives for the other STARS participants.

4.5.3.5 The STARS LR Engineer shall facilitate the AMP workshop by:

- Conducting comment resolution for assigned AMPs.

- Facilitate completion of the workshop objectives see section 4.5.1.

4.5.3.6 The plant SMEs for the STARS applicant that are responsible for credited aging management activities will be required to attend the workshop.

4.5.3.7 The Plant LR Discipline Lead Engineer, plant SME for the STARS applicant, and STARS License Renewal Engineer shall work collaboratively to resolve comments during the workshop.

4.5.3.8 Mark-ups of plant specific implementing procedures will be turned over to the Plant LR Discipline Lead Engineer at the conclusion of the workshop.

4.5.3.9 The Plant LR Discipline Lead Engineer is responsible for commitment tracking and enhancement, revision and annotation of plant specific implementation procedures.

4.5.3.10 The mark-ups of plant specific implementing procedures are not included with the AMP documentation.

4.5.3.11 The STARS License Renewal Engineer is responsible for resolution of comments regarding the AMP Evaluation.

4.5.3.12 The Checker of the AMP Evaluation shall review and check the incorporated comments.

4.5.3.13 The Plant LR Project Manager shall Owner Approve the License Renewal AMP Evaluation by checking the "Own App By" check box on the LRDMT APP/Cker Cmts Tab.

Note:

After approval of revision 0 of the AMP Evaluation package, an AMP workshop is not required for subsequent revisions of the AMP Evaluation package.

4.6 Reporting of Existing Problems Found During the Work

During the Aging Management Review work documentation deficiencies may be found in plant's CLB documents, plant equipment list database or other referenced sources. Examples of current-term deficiencies include:

- An error, either typographical or otherwise, in CLB documentation such as the USAR.
- An incorrect or deficient entry in the plant equipment list.
- A physical plant or equipment defect.

4.6.1 The individual identifying the deficiency is responsible to clearly document the problem(s) and to provide timely notification of the problem(s) to appropriate Plant License Renewal project staff

4.6.2 Upon discovery of an apparent current licensing basis issue, Plant License Renewal project staff shall ensure the issue is entered into the plant's corrective action program.

4.7 Revision to Aging Evaluation or AMP Evaluation Packages

After individual Aging Evaluation or AMP Evaluation packages are approved, it is anticipated that a "clean-up" activity will be performed to ensure consistency of the completed packages and the LRDMT. After the issue of the internal review draft of the License Renewal Application, changes will be tracked using a Project Change Tracking Form (see reference 9).

Revision may also be required based on AMP enhancement implementation at the STARS facility.

4.8 Preparation of Program Evaluation Report

Prior to the issue of the License Renewal Application for NRC Review, a Program Evaluation Report (PER) will be prepared for each AMP. The contents of the PER will be assembled using Attachment G as a guideline. An electronic file and paper copy version of the PER will be prepared.

The content for the Audit Questions & Responses and the RAIs & Responses sections of the PER will be added to the PER after the content is available during the NRC review phase.

Attachment A:
License Renewal Aging Evaluation Report

License Renewal Id No *<LRID System Designator>*

< Name – License Renewal System>

Document No: *<Plant Id>*-AER-*<LRID>*-Rev N-<Plant System Name>

Station and Unit: *<Plant Name>*

Related Plant System(s): *<Plant System Ids>*

Approvals/Revisions:

Rev	Date	Revision	Preparer	Checker	Owner Approval

Sections

1. Introduction
2. Further Evaluations Required By NUREG-1801
3. Results (9 column table and plant specific notes)
4. Aging Evaluation Comments

Attachment A:
License Renewal Aging Evaluation Report

License Renewal Id No *<LRID System Designator>*

< Name – License Renewal System>

1. Introduction

This section provides the summary results of the aging management review for those components identified in <insert system/structure name>, as being subject to aging management review.

Materials

The materials of construction for the <insert system/structure name> components are:

- Provide bulleted list of materials (e.g. carbon steel, stainless steel etc.)

Environment

The <insert system/structure name> components are exposed to the following environments:

- Provide bulleted list of environments (e.g. raw water, air, etc.)

Aging Effects Requiring Management

The following aging effects, associated with the <insert system/structure name> require management:

- Provide bulleted list of aging effects (e.g. loss of material, cracking, etc.)

Aging Management Programs

The following aging management programs manage the aging effects for the <insert system/structure name> components

- Provide bulleted list of aging management programs (e.g. water chemistry control, one-time inspection, etc.)

Attachment A:
License Renewal Aging Evaluation Report

License Renewal Id No *<LRID System Designator>*

< Name – License Renewal System>

2. Further Evaluations Required by NUREG-1801

NUREG-1801 provides the basis for identifying those items that warrant further evaluation by the reviewer in the license renewal application. For the <insert system/structure name> those items are addressed in the following sections. The NUREG-1800 (SRP-LR) title and section number (e.g. 3.2.2.2.2 Loss of Material due to General Corrosion) introduces each further evaluation

3.2.2.2.1 Cumulative Fatigue Damage

Fatigue is a TLAA as defined in 10 CFR 54.3. TLAAs are required to be evaluated in accordance with 10 CFR 54.21(c). The evaluation of this TLAA is addressed separately TLAA disposition activities.

3.2.2.2.3.2 Local Loss of Material due to Pitting and Crevice Corrosion

In general, pitting and crevice corrosion is managed via the Chemistry Control Program, supplemented by a one-time inspection. In certain instances, the Tank Inspection Program also manages these aging mechanisms.

TLAA Further Evaluations are evaluated and reported in a separate report titled "<*Plant Name*> License Renewal Time-Limiting Aging Analysis (TLAA) Report"

Attachment A:
License Renewal Aging Evaluation Report

License Renewal Id No *<LRID System Designator>*

< Name – License Renewal System>

3. Results (9 column table and plant specific notes)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
S&S info	S&S info	S&S info	S&S info	Section 4.3.3	Section 4.3.5	Section 4.3.7	Auto input by LRDMT	Section 4.3.7

Standard Notes:
A. Standard Notes A through J from Table 2 of Attachment D listed here

Plant Specific Notes
1. Listed in number order
2. Etc.

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14
NUREG 1801 Program XI.M30

Attachment B:
License Renewal Program Evaluation Report

Document No	WCGS-AMP-B2.1.14-Rev 2
Document Title	Fuel Oil Chemistry
Revision	2
Station	Wolf Creek Generating Station

DATA SHOWN IS FOR ILLUSTRATION ONLY

Approvals/Revisions

Rev	Date	Revision	Preparer	Checker	Owner Approved
0	12/21/2005	Initial Issue	prsoenen 7/6/2005	angrenci 12/21/2005	liyokum 12/21/2005
1	4/6/2006	Citation Reformating	prsoenen 3/23/2006	angrenci 4/6/2006	rwfoust 4/6/2006
2	5/21/2005	Revised enhancement for diesel fuel oil storage tank 10 year, internal inspection to provide for supplemental ultrasonic thickness measurements.	prsoenen 5/12/2006	angrenci 5/12/2006	liyokum 5/21/2005

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

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Fuel Oil Chemistry - B2.1.14

DATA SHOWN IS FOR ILLUSTRATION ONLY

1.0 PURPOSE AND METHODOLOGY

1.1 Purpose

The purpose of this Program Evaluation Report is to document and evaluate those activities of the Wolf Creek Fuel Oil Chemistry aging management program that are credited for managing aging, as part of Wolf Creek License Renewal to meet the requirements of the License Renewal Rule 10 CFR 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants."

This includes the following:

- The identification of the scope of the program;
- The evaluation of program elements against NUREG-1801;
- The review of Operating Experience to demonstrate program effectiveness;
- The identification of required program enhancements; and
- The identification of Wolf Creek documents required to implement the program

1.2 Methodology

The nuclear power plant License Renewal Rule 10 CFR 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," describes the License Renewal process and provides requirements for the contents of License Renewal Applications. 10 CFR 54.21 (a)(3) states:

"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 Current Licensing Basis (CLB) for the period of extended operation."

The NRC and the industry identified 10 program elements that are useful in describing an aging management program and then demonstrating its effectiveness. These program elements are described in Appendix A.1, Section A.1.2.3 of the Standard Review Plan. NUREG-1801 uses these program elements in Chapter XI to describe acceptable aging management programs.

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Fuel Oil Chemistry - B2.1.14

The purpose of this Program Evaluation Report is to identify and describe the basis for the Fuel Oil Chemistry aging management program and associated activities credited for managing aging. This Program Evaluation Report also provides a comparison of the credited Wolf Creek program with the elements of the corresponding NUREG-1801 Chapter XI program XI.M30, "Fuel Oil Chemistry" aging management program. Project Instruction PI-2 "Aging Management Reviews" prescribes the methodology for evaluating Aging Management Programs. An evaluation of Wolf Creek's aging management program criteria or activities to those of the NUREG-1801 program elements is performed and a conclusion is reached concerning consistency for each individual program element. A demonstration of overall program effectiveness is made after all program elements are evaluated. Required program enhancements are documented. An overall determination is made as to consistency with the program description in NUREG-1801.

2.0 PROGRAM DESCRIPTION

2.1 Program Description

NUREG-1801

The program includes (a) surveillance and maintenance procedures to mitigate corrosion and (b) measures to verify the effectiveness of an aging management program (AMP) and confirm the insignificance of an aging effect. Fuel oil quality is maintained by monitoring and controlling fuel oil contamination in accordance with the plant's technical specifications and the guidelines of the American Society for Testing Materials (ASTM) Standards D 1796, D 2276, D 2709, D6217, and D 4057. Exposure to fuel oil contaminants, such as water and microbiological organisms, is minimized by periodic draining or cleaning of tanks and by verifying the quality of new oil before its introduction into the storage tanks. However, corrosion may occur at locations in which contaminants may accumulate, such as tank bottoms. Accordingly, the effectiveness of the program is verified to ensure that significant degradation is not occurring and the component's intended function will be maintained during the extended period of operation. Thickness measurement of tank bottom surfaces is an acceptable verification program.

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Wolf Creek Generating Station Rev 2

The Fuel Oil Chemistry Program manages aging effects on the internal surface of components in the emergency diesel fuel oil storage and transfer system and fire pump diesel fuel oil system. The program includes: (a) surveillance and monitoring procedures to maintain fuel oil quality and mitigate corrosion (b) periodic draining of water from fuel oil tanks, (c) visual inspection of internal surfaces during periodic draining and cleaning or ultrasonic wall thickness measurements from external surfaces of fuel oil tanks, (d) inspection of new fuel oil before it is introduced into the storage tanks, and (e) one-time inspections of a representative sample of components in systems that contain fuel oil by the One-Time Inspection Program.

Fuel oil quality is maintained by monitoring and controlling fuel oil contaminants in accordance with applicable ASTM Standards. This is accomplished by periodic sampling and chemical analysis of the fuel oil inventory at the plant and sampling, testing, and analysis of new fuel oil prior to delivery at the plant. Initial samples of new fuel oil are visually inspected for entrained foreign material and water as precautions during the delivery process to avoid introducing contaminants. If a sample appears to be unsatisfactory, delivery is discontinued or not allow

All samples are taken in accordance with ASTM D4057 and are shipped to a laboratory approved in accordance with the WCGS QA program for analysis. The Chemistry Surveillance Program, AP 02-002, and Chemistry Specification Manual, AP 02-003, implement the surveillance frequency and chemistry parameters for the Fuel Oil Chemistry Program.

Any accumulated water is removed monthly from the emergency fuel oil storage and emergency fuel oil day tanks, and quarterly from the diesel fire pump fuel storage tank.

Emergency Fuel Oil Storage Tanks:
The internal surfaces of the emergency fuel oil storage tanks are periodically drained, cleaned, and visually inspected to detect potential aging. The tank draining and cleaning procedure, STN MT-002, will be enhanced to provide for supplemental ultrasonic thickness measurements if there are indications of reduced cross sectional thickness found during the visual inspection, which could lead to the loss of the tank's intended function, performed as part of the periodic draining and cleaning of these tanks.

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Emergency Fuel Oil Day Tanks:
The emergency fuel oil day tanks will also be drained, cleaned, and visually inspected at the same time as the emergency fuel oil storage tanks.

Diesel Fire Pump Fuel Tank:
The diesel fire pump fuel tank does not have interior accessibility for cleaning.

Due to the fuel oil day tanks and diesel fire pump fuel tanks periodic sampling and testing for water and sediment, and having no history in the last ten years of having more than trace amounts of water found during sampling, no ultrasonic thickness measurements will be performed on these tanks.

The emergency fuel oil storage tanks and emergency fuel oil day tanks will be drained and inspected before the period of extended operation.

A representative sample of components in systems that contain fuel oil will be inspected for evidence of aging effects via the One-Time Inspection Program and the results documented. These inspections will occur prior to the beginning of the period of extended operation.

Procedure:
STN MT-002
AP 02-002
AP 02-003

2.2 NUREG-1801 Consistency Rev. 1

The Fuel Oil Chemistry Program is an existing program, that following enhancement, will be consistent with NUREG-1801 XI.M30 Fuel Oil Chemistry, but takes exception to Elements 2, 3, and 6. The continued implementation of the Fuel Oil Chemistry program provides reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

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Fuel Oil Chemistry - B2.1.14

2.3 Exception to NUREG-1801 Rev. 1

1. Wolf Creek does not add fuel oil stabilizers, corrosion inhibitors, or biocides. (Element 2)

2. WCGS uses the recommendations and methodology of D 1796 to determine the amount of contamination due to water and sediment in diesel fuel, not D 1796 and D 2709. (Elements 3 and 6)

3. WCGS uses the guidance of D 2276 Method A for determination of particulates, as opposed to the combination of D 2276 and D 6217. (Element 6)

2.4 Enhancements to Plant Program Rev. 1

1. Add TJE02A and TJE02B to the diesel fuel oil storage tank 10 year drain, clean, and internal inspection program. (Elements 2 and 4)

2. Enhance the diesel fuel oil storage tank 10 year drain, clean, and internal inspection procedure to provide for supplemental ultrasonic thickness measurements if there are indications of reduced cross sectional thickness found during the visual inspection. (Element 4)

3. Enhance the Chemistry Surveillance Program and the Chemistry Specification Manual to perform quarterly particulate analysis on the diesel fire pump oil tank at the same time as the quarterly water and sediment sampling. (Elements 2 and 5)

4. Enhance the Fire Pump Diesel Fuel Storage Tank procedure to perform particulate analysis on the diesel fire pump oil tank at the same time as the quarterly water and sediment sampling. (Elements 2 and 5)

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

3.0 EVALUATION AND TECHNICAL BASIS

Note

This section is organized by quoting the relevant NUREG-1801 Chapter XI program element followed by the related Wolf Creek program attributes and a conclusion of the comparison.

Implementing procedure references are included in ( ) for information purposes. This information from the source procedure has been either directly extracted from the procedure or summarized for inclusion into this Program Evaluation Report.

3.1 Scope of Program

NUREG-1801

The program is focused on managing the conditions that cause general, pitting, and microbiologically-influenced corrosion (MIC) of the diesel fuel tank internal surfaces in accordance with the plant's technical specifications (i.e., NUREG-1430, NUREG-1431, NUREG-1432, NUREG-1433) on fuel oil purity and the guidelines of ASTM Standards D1796, D2276, D2709, D6217, and D4057. The program serves to reduce the potential of exposure of the tank internal surface to fuel oil contaminated with water and microbiological organisms.

Wolf Creek Generating Station Rev. 1

The Fuel Oil Chemistry Program manages the conditions that would cause general, pitting, crevice, and microbiological influenced corrosion (MIC) on the internal surfaces of components in the emergency diesel fuel oil storage and transfer system and fire pump diesel fuel oil system (References: STN MT-002, Section 1.1; AP 02-002, Sections 6.4 and 6.40).

Exception to NUREG-1801 Element 1

None

Element 1 Wolf Creek Generating Station Program Enhancements

None.

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Fuel Oil Chemistry - B2.1.14

Element 1 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 1.

3.2 Preventive Actions

NUREG-1801

The quality of fuel oil is maintained by additions of biocides to minimize biological activity, stabilizers to prevent biological breakdown of the diesel fuel, and corrosion inhibitors to mitigate corrosion. Periodic cleaning of a tank allows removal of sediments, and periodic draining of water collected at the bottom of a tank minimizes the amount of water and the length of contact time. Accordingly, these measures are effective in mitigating corrosion inside diesel fuel oil tanks. Coatings, if used, prevent or mitigate corrosion by protecting the internal surfaces of the tank from contact with water and microbiological organisms.

Wolf Creek Generating Station Rev. 1

NUREG-1801 Section XI.M30 states "The quality of fuel oil is maintained by additions of biocides to minimize biological activity, stabilizers to prevent biological breakdown of the diesel fuel, and corrosion inhibitors to mitigate corrosion." The WCGS Fuel Oil Chemistry Program does not routinely add corrosion inhibitors, stabilizers, or biocides, and therefore includes an exception to NUREG-1801 XI.M30 AMP elements. WCGS does not routinely add corrosion inhibitors or stabilizers to the fuel oil because fuel oil storage tank bottoms are periodically sampled and analyzed for corrosion products. The analysis of corrosion products is in accordance with ASTM D1796 (References: AP 02-002, Section 6.40; CHA DF-102, Section 3.1).

WCGS does not routinely add biocides to the fuel oil because, the Chemistry Specification Manual requires a system engineer be contacted for possible corrective actions, including biological testing of fuel, when fuel oil particulate levels equal or exceed 6 mg/L, once the particulate levels are verified by a second particulate level analysis (Reference: AP 02-003, Section 6.43). The Chemistry Specification Manual, the Chemistry Surveillance Program, and the Fire Pump Diesel Fuel Storage Tank procedures will be enhanced to perform quarterly particulate sampling on the diesel fire pump fuel storage tank.

WCGS performs periodic cleanings of its emergency fuel oil storage tanks (Reference: STN MT-002, Section 1.1). The Standby Diesel Fuel

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Oil Storage Tanks Drain and Clean procedure will be enhanced to periodically clean the emergency fuel oil day tanks to allow removal of sediments.

Any accumulated water is removed monthly from the emergency fuel oil storage tanks and emergency fuel oil day tanks and quarterly from the diesel fire pump fuel tank (References: AP 02-002, Section 6.40.2; USAR, Section 9.5.4.2.1).

Tank coatings are not credited for the prevention of any aging effects for license renewal.

Exceptions to NUREG-1801, Element 2

Wolf Creek does not add fuel oil stabilizers, corrosion inhibitors, or biocides, it relies on the periodic sampling and analysis for particulates and corrosion products. Any accumulated water is removed monthly from the emergency fuel oil storage and emergency fuel oil day tanks and quarterly from the diesel fire pump fuel tank.

Element 2 Wolf Creek Generating Station Program Enhancements

1) Add TJE02A and TJE02B to STN MT-002 inspection program.

2) Enhance AP 02-002 and AP 02-003 to perform quarterly particulate analysis on the diesel fire pump oil tank at the same time as the quarterly water and sediment sampling.

3) Enhance STN FP-600 procedure to perform particulate analysis on the diesel fire pump oil tank at the same time as the quarterly water and sediment sampling.

Element 2 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 2 with exceptions.

3.3 Parameters Monitored or Inspected

NUREG-1801

The AMP monitors fuel oil quality and the levels of water and microbiological organisms in the fuel oil, which cause the loss of material of the tank internal surfaces. The ASTM Standard D 4057 is used for guidance on oil sampling. The ASTM Standards D 1796 and D 2709 are used for determination of water and sediment contamination in diesel

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fuel. For determination of particulates, modified ASTM D 2276, Method A, is used. The modification consists of using a filter with a pore size of 3.0 um, instead of 0.8 um. These are the principal parameters relevant to tank structural integrity.

Wolf Creek Generating Station Rev. 1

WCGS uses the recommendations and methodology of D4057-81 for guidance on oil sampling (Reference: AP 02-002, Section 6.4.1).

Emergency Diesel Fuel:

A multilevel sample in addition to a sample collected from the test connection is taken for the emergency diesel fuel storage tank. A sample is taken from each compartment of the diesel fuel truck when it delivers new fuel to the emergency fuel oil storage tanks (Reference: CHS SH-D01, Sections 6.5, 6.6, and 6.7).

Diesel Fire Pump Fuel:

A bottom thief sample is performed on the diesel fire pump fuel tank. The diesel fuel is sampled for viscosity, water, and sediment content before it is added to the diesel-driven fire pump fuel tank (References: CHSF SH-D01-04; STN FP-211, Sections Attachment A, C, and D).

WCGS uses the recommendations and methodology of D1796-83 to determine the amount of contamination due to water and sediment in diesel fuel (Reference: Technical Specification Bases, Section SR 3.8.3.3). The testing conducted using ASTM D1796 gives quantitative results, whereas D2709 testing gives only pass-fail results; therefore, the D1796 method gives more descriptive information about the fuel oil condition than the D2709 method.

WCGS uses the recommendations and methodology of the modified D2276-78 Method A for determination of particulates in diesel fuel (Reference: CHA DF-104, Sections 3.1.3 and 7.1).

Exceptions to NUREG-1801, Element 3

Wolf Creek uses only ASTM Standard D1796-83, not D1796 and D2709. Wolf Creek's Tech Spec is committed to using only D1796-83. The testing conducted using ASTM D1796 gives quantitative results, whereas D2709 testing gives only pass-fail results; therefore, the D1796 method gives more descriptive information about the fuel oil condition than the D2709 method.

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Element 3 Wolf Creek Generating Station Program Enhancements

None.

Element 3 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 3 with exceptions.

3.4 Detection of Aging Effects

NUREG-1801

Degradation of the diesel fuel oil tank cannot occur without exposure of the tank internal surfaces to contaminants in the fuel oil, such as water and microbiological organisms. Compliance with diesel fuel oil standards in item 3, above, and periodic multilevel sampling provide assurance that fuel oil contaminants are below unacceptable levels. Internal surfaces of tanks that are drained for cleaning are visually inspected to detect potential degradation. However, corrosion may occur at locations in which contaminants may accumulate, such as a tank bottom, and an ultrasonic thickness measurement of the tank bottom surface ensures that significant degradation is not occurring.

Wolf Creek Generating Station Rev. 1

WCGS compliance with diesel fuel oil standards and sampling periodicity is discussed in element #3 above.

Emergency Fuel Oil Storage Tanks

The WCGS procedures currently require periodic draining, cleaning, and visual inspection to detect potential aging for the emergency fuel oil storage tanks (Reference: STN MT-002, Section 1.1). The fuel oil tank drain and clean procedure will be enhanced to provide for supplemental ultrasonic thickness measurements if there are indications of reduced cross sectional thickness found during the visual inspection, which could lead to the loss of the tank's intended function, performed as part of the periodic draining and cleaning of these tanks.

Emergency Fuel Oil Day Tanks:

WCGS procedures will be enhanced to include the periodic draining, cleaning, and visual inspection of the emergency fuel oil day tanks.

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Diesel Fire Pump Fuel Tank:

The diesel fire pump fuel tank does not have interior accessibility for cleaning.

Due to the fuel oil day tanks and diesel fire pump fuel tanks periodic sampling and testing for water and sediment, and having no history in the last ten years of having more than trace amounts of water found during sampling, no ultrasonic thickness measurements will be performed on these tanks (References: STN MT-002, Section 1.1; AP 02-002, Sections 6.4 and 6.40). The periodic sampling, cleaning, and visual inspection of the emergency fuel oil day tanks will ensure that significant aging is not occurring. Additionally, the emergency fuel oil tanks inspection results will be of value in assessing the condition of the diesel fire pump fuel oil tanks since these tanks have similar internal conditions.

The effectiveness of the Fuel Oil Chemistry Program will be verified by a onetime inspection of a representative sample of components in systems that contain fuel oil. The one-time inspection will be performed before the period of extended operation.

Exceptions to NUREG-1801, Element 4

None

Element 4 Wolf Creek Generating Station Program Enhancements

1) Enhance STN MT-002 inspection procedure to provide for supplemental ultrasonic thickness measurements if there are indications of reduced cross sectional thickness found during the visual inspection.

2) Enhance STN MT-002 inspection procedure to provide for supplemental ultrasonic thickness measurements if there are indications of reduced cross sectional thickness found during the visual inspection.

Element 4 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 4.

3.5 Monitoring and Trending

NUREG-1801

Water and biological activity or particulate contamination concentrations are monitored and trended in accordance with the plant's technical specifications or at least quarterly. Based on industry operating

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experience, quarterly sampling and analysis of fuel oil provides for timely detection of conditions conducive to corrosion of the internal surface of the diesel fuel oil tank before the potential loss of its intended function.

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Emergency Diesel Fuel:

The monitoring and trending requirements for water, biological activity, and particulate levels controlled by the Fuel Oil Chemistry Program are included in the Technical Specification, the Chemistry Surveillance Program, and the Chemistry Specification Manual. The parameters monitored include water, sediment, particulate, and stability. These parameters are measured and trended, as a minimum, quarterly. The Chemistry Specification Manual requires a system engineer be contacted for possible corrective actions, including biological testing of fuel, when fuel oil particulate levels equal or exceed 6 mg/L (References: Technical Specification, Section 5.5.13; AP 02-002, Sections 6.4 and 6.40; AP 02-003, Section 6.43; STS CH-015, Sections 1.1, 2.0; STN FP-600, Section 6.0).

Diesel Fire Pump Fuel:

The Chemistry Surveillance Program, Chemistry Specification Manual, and Fire Pump Diesel Fuel Storage Tank procedures will be enhanced to perform quarterly particulate sampling for the diesel fire pump fuel tank.

Exceptions to NUREG-1801, Element 5

None.

Element 5 Wolf Creek Generating Station Program Enhancements

1) Enhance AP 02-002 and AP 02-003 to perform quarterly particulate analysis on the diesel fire pump oil tank at the same time as the quarterly water and sediment sampling.

2) Enhance STN FP-600 to perform particulate analysis on the diesel fire pump oil tank at the same time as the quarterly water and sediment sampling.

Element 5 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 5.

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3.6 Acceptance Criteria

NUREG-1801

The ASTM Standard D 4057 is used for guidance on oil sampling. The ASTM Standards D 1796 and D 2709 are used for guidance on the determination of water and sediment contamination in diesel fuel. ASTM D 6217 and Modified D 2276, Method A are used for guidance for determination of particulates. The modification to D 2276 consists of using a filter with a pore size of 3.0 um, instead of 0.8 um.

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WCGS uses ASTM Standard D4057 for guidance on oil sampling (Reference: AP 02-002, Section 6.4.1).

WCGS uses only ASTM Standard D1796 for guidance on the determination of water and sediment contamination in diesel fuel (References: CHA DF-102, Section 3.1; Technical Specification Bases, Section SR 3.8.3.3). The testing conducted using the ASTM D1796 method gives more descriptive information about the fuel oil condition than the D2709 method.

Modified ASTM D2276, Method A, is used for determination of particulates. The modification to D2276 consists of using a filter with a pore size of 3.0 micron instead of 0.8 micron (Reference: CHA DF-104, Sections 3.1.3 and 7.1).

ASTM D6217 states that it is the first ASTM standard test method for assessing the mass quantity of particulates in middle distillate fuels. Test Method D5452 and its predecessor Test Method D2276 were developed for aviation fuels and used 1 gal or 5 L of fuel sample. Using greater than or equal to one gallon of middle distillate fuel often requires significant time to complete the filtration. The D6217 test method uses about a quarter of the volume as the D2276 aviation fuel method. There is no indication that ASTM D6217 is either technically superior to D2276 as far as managing the effects of aging (it merely allows for faster filtration), or that the combination of the two standards adds any value beyond using just D2276 itself. Therefore Wolf Creek's use of D 2276 instead of the combination of D2276 and D6217 is considered an acceptable exception to NUREG-1801.

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Exceptions to NUREG-1801, Element 6

Wolf Creek uses only ASTM Standard D1796-83, not D1796 and D2709. Wolf Creek's Tech Spec is committed to using only D1796-83. The testing conducted using ASTM D1796 gives quantitative results, whereas D2709 testing gives only pass-fail results; therefore, the D1796 method gives more descriptive information about the fuel oil condition than the D2709 method.

ASTM D6217 states that it is the first ASTM standard test method for assessing the mass quantity of particulates in middle distillate fuels. Test Method D5452 and its predecessor Test Method D2276 were developed for aviation fuels and used 1 gal or 5 L of fuel sample. Using greater than or equal to one gallon of middle distillate fuel often requires significant time to complete the filtration. The D6217 test method uses about a quarter of the volume as the D2276 aviation fuel method. There is no indication that ASTM D6217 is either technically superior to D2276 as far as managing the effects of aging (it merely allows for faster filtration), or that the combination of the two standards adds any value beyond using just D2276 itself. Therefore Wolf Creek's use of D 2276 instead of the combination of D2276 and D6217 is considered an acceptable exception to NUREG-1801.

Element 6 Wolf Creek Generating Station Program Enhancements

None.

Element 6 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 6 with exceptions.

3.7 Corrective Actions

NUREG-1801

Specific corrective actions are implemented in accordance with the plant quality assurance (QA) program. For example, corrective actions are taken to prevent recurrence when the specified limits for fuel oil standards are exceeded or when water is drained during periodic surveillance. Also, when the presence of biological activity is confirmed, a biocide is added to fuel oil. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions.

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

Wolf Creek Generating Station Rev.1

Chemistry Specification Manual specifies the requirements for corrective actions when the fuel oil parameters are out of specification (Reference: AP 02-003, Section 6.4). If a supervisory limit is exceeded the appropriate supervisor will be notified for potential corrective action and in the case of a chemistry specification being exceeded immediate corrective actions will be taken.

Wolf Creek Generating Station QA procedures, review and approval processes and administrative controls are implemented in accordance with the requirements of 10CFR50, Appendix B, which are acceptable in addressing the Fuel Oil Chemistry Program (References: USAR, Sections 17.2.15 and 17.2.16; AP 28A-001; AP 28-007; AP 28-011; AP 22C-002).

Exceptions to NUREG-1801, Element 7

None

Element 7 Wolf Creek Generating Station Program Enhancements

None.

Element 7 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 7.

3.8 Confirmation Process

NUREG-1801

Site QA procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the confirmation process and administrative controls.

Wolf Creek Generating Station Rev. 1

Wolf Creek Generating Station QA procedures, review and approval processes and administrative controls are implemented in accordance with the requirements of 10CFR50, Appendix B, which are acceptable in addressing the Fuel Oil Chemistry Program (References: USAR, Sections 17.2.15 and 17.2.16; AP 28A-001; AP 28-007; AP 28-011; AP 22C-002).

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

Exceptions to NUREG-1801, Element 8

None

Element 8 Wolf Creek Generating Station Program Enhancements

None.

Element 8 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 8.

3.9 Administrative Controls

NUREG-1801

See Item 8

Wolf Creek Generating Station Rev. 0

See item 8

Exceptions to NUREG-1801, Element 9

None.

Element 9 Wolf Creek Generating Station Program Enhancements

None.

Element 9 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 9.

3.10 Operating Experience

NUREG-1801

The operating experience at some plants has included identification of water in the fuel, particulate contamination, and biological fouling. However, no instances of fuel oil system component failures attributed to contamination have been identified.

Wolf Creek Generating Station Rev. 1

A search of plant-specific operating experience indicates that both emergency fuel oil storage tanks have experienced high particulate counts. Also during this search it was noticed that after the high particulate, near 6 mg/L, in September and October 2000, the trend dropped off, remaining well below 4 mg/L for 12 months. The fuel oil

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

tanks are checked regularly for the presence of water and sediment and the emergency fuel oil storage tanks are regularly checked for particulates; any instances are corrected in a timely manner. Neither the fuel oil day tanks nor the diesel fire pump fuel tanks have any history, within the last ten years, of water and sediment levels exceeding the normal chemistry level of 0.05%. The internals of the emergency fuel oil storage tanks were visually inspected in 2002. During this inspection the results revealed that the interior coating of one of the emergency fuel oil storage tanks was deteriorated and some rust had developed in the interior walls of the tank. An engineering evaluation determined that the failure of the interior coating should not result in degradation or failure of the diesel system to perform its intended functions. It was also determined that the rust identified during this inspection was an acceptable condition because it is not at a stage that could result in the component failures to perform its intended function and any degraded conditions in future inspections will be documented in a non-conformance work order. Upon the discovery of the condition of the emergency fuel oil storage tank interior coating a biocide was added to that tank and all of the diesel fuel in the emergency fuel oil storage tanks was subsequently replaced with new fuel. Since the discovery of the condition of the emergency fuel oil storage tank interior coating, one of the emergency fuel oil day tanks has been visually inspected, and no coating degradation was found. The other fuel oil day tank is scheduled to be visually inspected by the end of 2006 (Ref.: CCP 10153; PIR 2003-0177; WO 02-235284-021).

There have been no identified instances of component failure due to loss of material resulting from fuel oil contamination and there has been no need to take corrective actions for the fuel oil program due to fuel oil chemistry being out of specification. As additional operating experience is obtained, lessons learned may be used to adjust this program.

This element is consistent with the corresponding NUREG-1801 aging management program element.

Exceptions to NUREG-1801, Element 10

None

Element 10 Evaluation Conclusion

This element is consistent with NUREG-1801 Element 10.

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

4.0 References Rev. 1

4.1. CCP 10153
4.2. AP 02-002, "Chemistry Surveillance Program", Rev. 23
4.3. AP 02-003, "Chemistry Specification Manual", Rev. 27
4.4. CHS SH-D01, "Sampling Diesel Fuel", Rev. 6
4.5. CHA DF-102, "Determination of Water and Sediment in Oil (Centrifuge Method)",Rev. 4
4.6. CHA DF-104, "Diesel Fuel Particulate Analysis", Rev. 6
4.7. STS CH-015, "Emergency Diesel New Fuel", Rev. 21
4.8. STN MT-002, "Standby Diesel Fuel Oil Storage Tanks Drain and Clean", Rev. 3
4.9. STN FP-600, "Fire Pump Diesel Fuel Storage Tank", Rev. 8
4.10. USAR, Rev. 18
4.11. AP 28A-001, "Performance Improvement Request", Rev. 25
4.12. AP 28-007, "Control of Nonconformances", Rev. 3
4.13. AP 28-011, "Resolving Deficiencies Impacting SSCs", Rev. 1
4.14. AP 22C-002, "Work Controls", Rev. 12
4.15. PIR 2003-0177
4.16. STN FP-211, "Diesel Fire Pump 1FP01PB Monthly Operation and Fuel Level Check", Rev. 11
4.17. WO 02-235284-021
4.18. Technical Specification, Amendment No. 162
4.19. Technical Specification Bases, Rev. 24
4.20. CHSF SH-DO1-04, "Sampling of the Fire Pump Diesel Storage Tank", Rev. 0

5.0 COMMENTS/OPEN ITEMS Rev. 1

5.1 Comments/Additional Information

5.1.1 ASTM D2709 is recommended to D1796 in detecting those fuel degradation products that are soluble in the toluene used in the D1796 procedure. Sediment from tank degradation would be iron oxide, which is not soluble in toluene.

5.1.2 Wolf Creek uses No. 2 diesel fuel for the fuel oil systems.

License Renewal Program Evaluation Report
Fuel Oil Chemistry - B2.1.14

5.1.3 The parameters for fuel oil particulates is a supervisory limit of to not exceed 6 mg/L and chemistry spec. limit of less then 10 mg/L

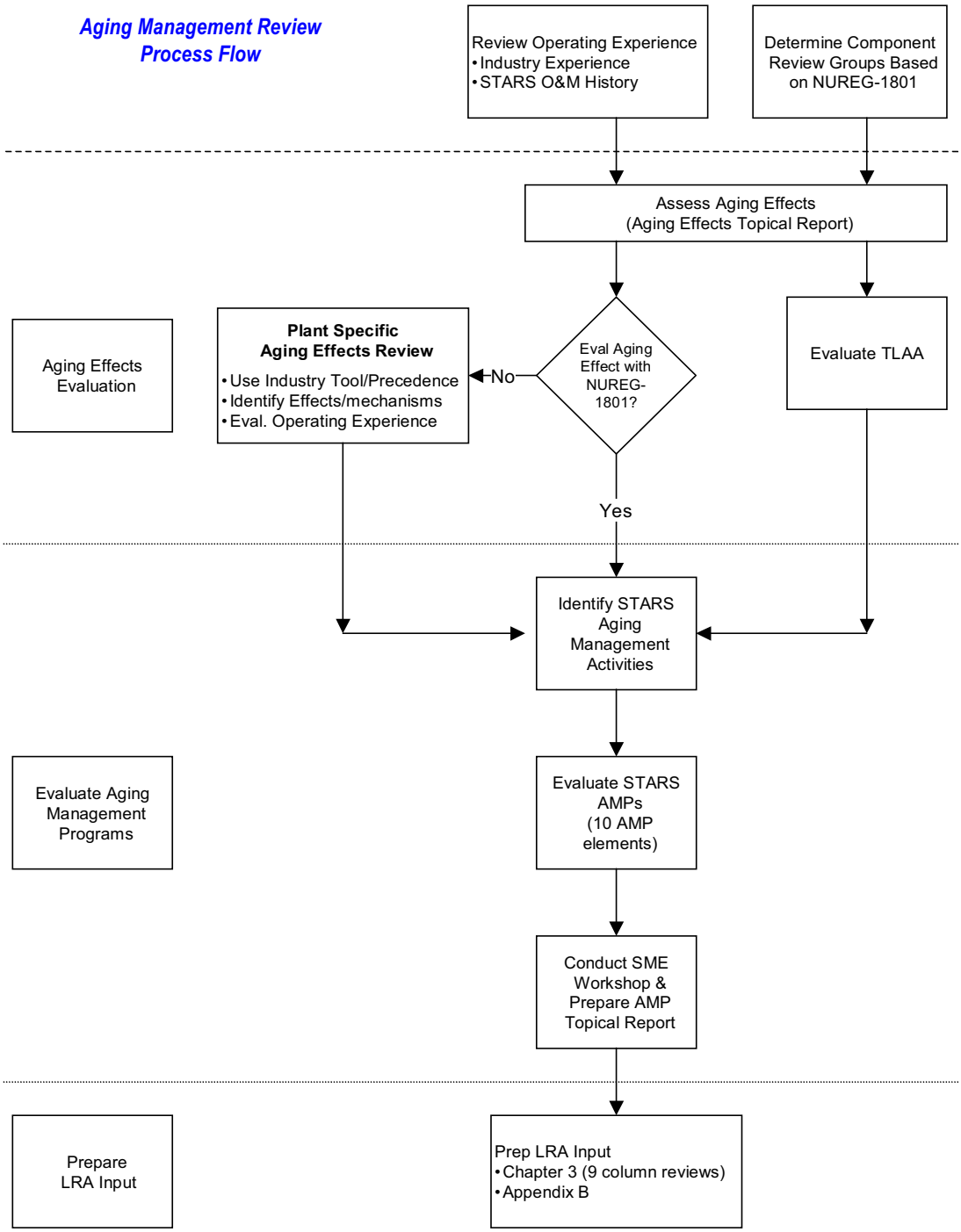
5.1.4 The parameter for fuel oil viscosity is equal to or between 1.9 and 4.1 cSt @ 40 deg. C

5.1.5 The parameter for fuel oil water and sediment limit is less than or equal to 0.05%

5.2 Open Items

None

Attachment C:
Aging Management Review Process Flow



Attachment D:
Application of LRA Standard Notes

Table 1 summarizes the NUREG-1801 consistency considerations for LRA standard notes.

Table 2 lists the standard notes, accompanied by an expanded interpretation of the note's meaning and application.

Table 1 – Summary of Standard Note Consistency Considerations

Std Note	Component Type	Material	Environment	AERM	AMP	Link to NUREG 1801 V2?
A	Match	Match	Match	Match	Consistent	Yes
B	Match	Match	Match	Match	Consistent w/Exception	Yes
C	Different	Match	Match	Match	Consistent	Yes
D	Different	Match	Match	Match	Consistent w/Exception	Yes
E	Either	Match	Match	Match	Different or Plant Specific	Yes
F	Either	No Match	--	--	--	No
G	Either	Match	No Match	--	--	No
H	Either	Match	Match	No Match	--	No
I	Either	Match	Match	Exception	--	Yes
J	Either	No Match for Combination		--	--	No

Items with component type matches - may select any note except C, D, or J.

Items without component types matches - must be selected from yellow list, or note E.

Note E can be used with or without a component type match.

Table 2 – Expanded Discussion of Standard Notes

Note	Standard Note Wording in LRA	Expanded Discussion of Standard Note
A	Consistent with NUREG 1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG 1801 AMP.	Application of this standard note indicates that all aspects of the line item are consistent with the referenced NUREG-1810 volume 2 line item. All individual AMPs referenced in the NUREG-1801 volume 2 line item must be determined by the AMP preparer to be consistent with the 10 element program evaluation and technical basis in NUREG-1801 Chapter X and XI. Check the AMP exceptions chart in reference 7 to identify if an exception is anticipated to NUREG-1801 AMP program elements. Link to a NUREG-1801 volume 2 item when using this note. Component Type – Match Material – Match Environment – Match (bounding) Aging Effect – Match Program - Consistent
B	Consistent with NUREG 1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG 1801 AMP.	Application of this standard note indicates that all aspects of the line item are consistent with the reference NUREG-1801 item except for the AMP column. One or more of the individual AMPs referenced in the NUREG-1801 volume 2 line item must be determined by the AMP preparer to be consistent with exceptions to the 10 element program evaluation and technical basis in NUREG-1801 Chapter X and XI. Check the AMP exceptions chart in reference 7 to identify if an exception is anticipated to NUREG-1801 AMP program elements. Link to a NUREG-1801 volume 2 item when using this note. Component Type – Match Material – Match Environment – Match (bounding) Aging Effect – Match Program – Consistent w/Exceptions
C	Component is different, but consistent with NUREG 1801 item for material, environment, and aging effect. AMP is consistent with NUREG 1801 AMP.	Application of this note indicates that only that the component (component type) is not listed in NUREG-1801 volume 2. All other criteria to conclude applicability of standard note A were present. Link to a NUREG-1801 volume 2 item when using this note. Component Type – Substitution Material – Match Environment – Match (bounding) Aging Effect – Match Program - Consistent

Table 2 – Expanded Discussion of Standard Notes

Note	Standard Note Wording in LRA	Expanded Discussion of Standard Note
D	Component is different, but consistent with NUREG 1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG 1801 AMP.	Application of this note indicates that only that the component (component type) is not listed in NUREG-1801 volume 2. All other criteria to conclude applicability of note B were present. Link to a NUREG-1801 volume 2 item when using this note. Component Type – Substitution Material – Match Environment – Match (bounding) Aging Effect – Match Program – Consistent w/Exceptions
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited or NUREG-1801 identifies a plant-specific aging management program.	This standard note does not address component type. As such, the note may be applied whether the component type is specifically consistent with NUREG-1801 or not. A plant specific note is required to provide a brief justification for the selection of the alternate AMP. If the component type is not consistent with GALL, the plant specific note should also address the difference. If NUREG-1801 identifies a plant-specific aging management program, a plant specific note is not required. Link to a NUREG-1801 volume 2 item when using this note. Component Type – Match or Substitution Material – Match Environment – Match (bounding) Aging Effect – Match Program - Different or Plant Specific
F	Material not in NUREG 1801 for this component.	Indicate this standard note only if this material is not identified anywhere in the NUREG-1801 Volume 2 system tables for the same component type. Search NUREG-1801 Volume 2 tables only for the applicable system. Do **NOT** link to any NUREG-1801 Volume 2 item when this note is utilized. Component Type – Match or Substitution Material –**No Match** Environment – N/A Aging Effect – N/A Program – N/A

Table 2 – Expanded Discussion of Standard Notes

Note	Standard Note Wording in LRA	Expanded Discussion of Standard Note
G	Environment not in NUREG 1801 for this component and material.	Indicate this standard note only if this environment is not identified anywhere in the NUREG-1801 Volume 2 system tables for the same component type and material. Search NUREG-1801 Volume 2 tables only for the applicable system. Do **NOT** link to any NUREG-1801 Volume 2 item when this note is utilized. Component Type – Match or Substitution Material – Match Environment – **No Match** Aging Effect – N/A Program – N/A
H	Aging effect not in NUREG 1801 for this component, material, and environment combination.	Indicate only if the aging effect is not identified anywhere in the NUREG-1801 volume 2 system tables for the same component type, material, and environment combination. Search NUREG-1801 volume 2 items only for the applicable system. A plant specific note is required when using this standard note. Component Type – Match or Substitution Material – Match Environment – Match (bounding) Aging Effect – **No Match (Not in GALL)** Program – N/A
I	Aging effect in NUREG 1801 for this component, material, and environment combination is not applicable.	Indicate only if this aging effect is different than the aging effect identified in the NUREG-1801 volume 2 system tables for the same component type, material, and environment combination. Search NUREG-1801 volume 2 items only for the applicable system. A plant specific note is required when using this standard note. Link to a NUREG-1801 volume 2 item when using this note. Component Type – Match or Substitution Material – Match Environment – Match (bounding) Aging Effect – **No Match** Program – N/A

Table 2 – Expanded Discussion of Standard Notes

Note	Standard Note Wording in LRA	Expanded Discussion of Standard Note
J	Neither the component, nor the material and environment combination is evaluated in NUREG 1801.	This note is to be used when the component, material and/or environment match is not identified anywhere in the NUREG-1801 volume 2 system tables. Do **NOT** link to any NUREG-1801 Volume 2 item when this note is utilized. Component Type – Match or Substitution Material / Environment – **No Match** Aging Effect – N/A Program – N/A

Attachment E:
STARS AMP Program Elements

License Renewal Aging Management Program Evaluation Report
<AMP Name>

Document No	<Plant Identifier>-AMP-<LRA Section>-<Rev #>
Document Title	<AMP Name>
Revision	<Revision #>
Station and Unit	***<Plant Name>***

Approvals/Revisions:

Rev	Date	Revision	Preparer	Checker	Owner Approval
0		Initial Issue			

License Renewal Aging Management Program Evaluation Report
<AMP Name>

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1.0 PURPOSE AND METHODOLOGY

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2.4 Enhancements to Plant Program

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3.5 Monitoring and Trending

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3.7 Corrective Actions

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3.9 Administrative Controls

3.10 Operating Experience

4.0 REFERENCES

5.0 COMMENTS/OPEN ITEMS

Element 1 - Scope of Program Rev N

Scope of the program/activity should include the specific structures and components subject to an AMR for license renewal.

Element 2 - Preventive Actions Rev N

Preventive actions should mitigate or prevent aging degradation.

Element 3 - Parameters Monitored or Inspected Rev N

Parameters monitored or inspected should be linked to the degradation of the particular structure or component intended function(s).

Element 4 - Detection of aging effects Rev N

Detection of aging effects should occur before there is a loss of structure or component intended function(s). This includes aspects such as method or technique (i.e. visual, volumetric, surface inspection), frequency, sample size, data collection and timing of new/one-time inspections to ensure timely detection of aging effects.

Element 5 - Monitoring and trending Rev N

Monitoring and trending should provide predictability of the extent of degradation and provide timely corrective or mitigating actions.

Element 6 - Acceptance Criteria Rev N

Acceptance criteria, against which the need for corrective action will be evaluated, should ensure that the structure or component intended function(s) are maintained under all current licensing basis design conditions during the period of extended operation.

Element 7 - Corrective Actions Rev N

Corrective actions, including root cause determination and prevention recurrence, should be timely.

Element 8 - Confirmation Process Rev N

Confirmation processes should ensure that preventive actions are adequate and that appropriate corrective actions have been completed and are effective.

Element 9 - Administrative Controls Rev N

Administrative controls should provide a formal review and approval process.

Element 10 - Operating Experience Rev N

Operating experience of the aging management activity, including past corrective actions resulting in program enhancements or additional programs or activities, should provide objective evidence to ensure that the effects of aging will be adequately managed so that the intended functions of the structure or component will be maintained during the period of extended operation.

Comments/Open Issues Rev N

1. Clarifying Comments or Additional Information

2. Open Items

References Rev N

Provide a number list of the references and implementing procedures.

Attachment F:

Aging Reference Request Form (Typical)

Change Request No.:	Enter the next sequential number from the TR-8 Change Log	
LRID:	Enter the LRID	
Component Type:	Enter the component type	
Material:	Enter the material	
Environment:	Enter the environment	
Aging Effect/Mech.:	Enter the aging effect/mechanisms	
AMP:	Enter the aging management program	
Reason for Request:	State a reason for the request	
Submitted By:		**Date:**
Reviewed By:		**Date:**
Disposition:	☐ **Approved**	☐ **Rejected**
Comments:		
☐ **Added to TR-8**	**By:**	**Date:**
☐ **Added to LRDMT**	**By:**	**Date:**

Attachment G:

Contents of Program Evaluation Report

Section	Contents
Cover Page	Identify AMP and revision number
1. AMP 10 Element Evaluation	AMP 10 Element Evaluation from LRDMT
2. Operating Experience	Operating Experience (OE) List
	Industry OE Summaries from LRDMT (NRC Communications)
	Plant Specific OE Summaries from LRDMT (PIRs & Work Orders)
	Plant Specific OE (Inspections/Other)
3. Implementing Procedures	Implementing Procedures List (Identify procedures credited in the program element summary statement of the AMP 10 element evaluation.)
	Credited procedures including mark-ups & drafts
4. AMP Applicability	AMP Applicability List from LRDMT
5. LRA Appendix A	LRA Appendix A
6. LRA Appendix B	LRA Appendix B
7. Audit Questions & Responses	Audit Questions & Responses
8. RAIs & Responses	RAIs & Responses

WHITE PAPER

DCPP PROCESS FOR REVIEW AND APPROVAL OF LICENSE RENEWAL APPLICATION DOCUMENTS

05/13/2009

PREPARED BY Roger D. Johnson DATE 5/13/09

MANAGER APPROVAL [signature] DATE 5/13/09

DCPP WHITE PAPER
PROCESS FOR REVIEW AND APPROVAL OF LRA DOCUMENTS

1.0 INTRODUCTION

This White Paper describes the process used by DCPP to review and approve License Renewal Application (LRA) documents to ensure they are consistent with the current licensing basis (CLB) and are accurate and complete in accordance with 10 CFR 54.13. This process includes:

1. Preparation of LRA documents and incorporation of review comments by the STARS Center of Business (COB), except for the Environmental Report (ER), which is prepared and revised by PG&E.

2. Review of individual sections of LRA documents by PG&E technical personnel, License Renewal Feasibility Study (LRFS) management, and selected third parties.

3. Review of the consolidated LRA draft by Project Engineers, Independent Technical Reviewers, PG&E Legal, Engineering and Project Managers, Industry Peers, the Plant Staff Review Committee (PSRC), and the Nuclear Safety Oversight Committee (NSOC).**[Validate]**

In addition to using various DCPP documents to verify accuracy of the LRA information, reviewers use the GALL Report (NUREG-1801, Rev. 1), the Standard Review Plan (NUREG-1800, Rev. 1), and applicable requests for additional information (RAIs) together with associated SERs received by other LR applicants to verify completeness of the LRA documents.

Flow Chart 1 shows the review process for the Scoping, Screening, and Aging Management Review (AMR) Reports for systems, structures, and components (SSCs) from initial preparation through readiness for submittal to the NRC. Similarly, Flow Charts 2 through 4 show the review process for the Aging Management Programs (AMPs), Time Limited Aging Analyses (TLAAs), and Environmental Report, respectively.

2.0 STARS COB – PREPARATION AND REVIEW ACTIVITIES (SCOPING, SCREENING, AND AMRs, AMPs, TLAAs)

The STARS COB, with WorleyParsons and PG&E support, prepares and checks the initial drafts of the Scoping, Screening, and AMR, AMP, and TLAA documents in accordance with STARS COB Project Instructions PI-1, PI-2, and PI-3, respectively. As shown in Flow Charts 1, 2, and 3, the STARS COB resolves and incorporates comments into the LRA documents at specified times throughout the entire review process. All LRA documents, review

comments, and resolutions are documented and maintained in accordance with XI1.ID1 in an auditable and retrievable condition.

3.0 PG&E – REVIEW ACTIVITIES (SCOPING, SCREENING, AND AMRs, AMPs, TLAAs)

PG&E LRFS engineers and management coordinate internal reviews of Scoping, Screening, and AMR, AMP, and TLAA documents in accordance with LFRS Work Guideline 1, "Integrated Plant Assessment," as shown in Flow Charts 1, 2, and 3. The AMPs and TLAAs that are reviewed in accordance with Flow Charts 2 and 3 are shown in Tables 1 and 2. All of the individual LRA documents are reviewed in accordance with the "Record of Review Checklist" contained in Attachment 8.1 of DCPP Procedure XI1.ID1. The checklist reviewers include the Subject Matter Expert (SME), Independent Technical Reviewer (ITR), Lead Manager, Cross-Discipline Reviewers, and Legal Reviewers. It is during these internal reviews that the individual bases document reports are validated and verified by the LRFS project. The individual AMPs and TLAA sections are also subjected to a focused peer review and PSRC Sub-Committee review before they are rolled up into draft LRA chapters. If the reviewer comments are of an editorial or clarification nature, re-review by the SME and ITR is not required. Only substantive changes require re-review by the SME and ITR.

After resolution and incorporation of comments into the individual LRA documents by the COB, the individual documents are combined into LRA chapters, which are further reviewed as shown in the flow charts. The entire LRA will undergo an integration review by the LRFS project staff, industry peers, ITR, and PSRC Sub-Committee. Finally, after all comments are resolved and incorporated, the LRA is presented to the full PSRC for approval. Once PSRC comments are resolved and incorporated, a summary of the LRA is presented to NSOC for information, following which Rev. 0 of the LRA is considered ready to submit to the NRC. **[Validate]**

4.0 PG&E – PREPARATION AND REVIEW ACTIVITIES (ENVIRONMENTAL REPORT)

PG&E prepares the initial drafts of the Environmental Report (ER) and coordinates reviews in accordance with LRFS Work Guideline 2, "Environmental Report," as shown in Flow Chart 4. All of the individual ER documents are reviewed in accordance with the "Record of Review Checklist" contained in Attachment 8.1 of XI1.ID1. The checklist reviewers include the SME, ITR, Legal, Project Manager, Project Engineer, and Industry Peers. If the collective reviewer comments are of an editorial or clarification nature, re-review by the SME and ITR is not required. Only substantive changes require re-review by the SME and ITR. Management phase reviews are performed once earlier comments have been resolved and incorporated and, at a

minimum, include Legal and the PSRC Sub-Committee. Once all individual sections have been reviewed by management and assembled as a complete ER, an integration review is performed. Reviewers will include, as a minimum, Legal, PSRC Sub-Committee, and Industry Peers.

After all comments are resolved and incorporated, the ER is presented to the full PSRC for approval. Once PSRC comments are resolved and incorporated, a summary of the ER is presented to NSOC for information, following which Rev. 0 of the ER is considered ready to submit to the NRC. **[Validate]**

All review comments and resolutions are documented and included in Project records.

5.0 EXAMPLE – REVIEW RECORD

Table 3 shows an example of the review and approval record for TLAAs. Similar review records are prepared and maintained for the Scoping, Screening, AMR, AMP, and ER documents.

TABLE 1
AGING MANAGEMENT PROGRAMS (AMPs)

XI.M1	ASME Section XI ISI Subsections IWB, IWC, and IWD
XI.M2	Water Chemistry
XI.M3	Reactor Head Closure Studs
XI.M10	Boric Acid Corrosion
XI.M11A	Nickel Alloy Penetration Nozzles Welded to the Upper RV Closure Heads
XI.M12	Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)
XI.M17	Flow-Accelerated Corrosion
XI.M18	Bolting Integrity
XI.M19	Steam Generator Tube Integrity
XI.M20	Open-Cycle Cooling Water System
XI.M21	Closed-Cycle Cooling Water System
XI.M23	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems
XI.M26	Fire Protection
XI.M27	Fire Water System
XI.M30	Fuel Oil Chemistry
XI.M31	Reactor Vessel Surveillance
XI.M32	One-Time Inspection
XI.M33	Selective Leaching of Materials
XI.M34	Buried Piping and Tanks Inspection
XI.M35	One-Time Inspection of ASME Code Class 1 Small-Bore Piping
XI.M36	External Surfaces Monitoring Program
XI.M37	Flux Thimble Tube Inspection
XI.M38	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components
XI.M39	Lubricating Oil Analysis
XI.E1	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
XI.E2	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits
XI.E3	Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
XI.E4	Metal Enclosed Bus
XI.E5	Fuse Holders
XI.E6	Electrical Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
XI.S1	ASME Section XI, Subsection IWE
XI.S2	ASME Section XI, Subsection IWL
XI.S3	ASME Section XI, Subsection IWF
XI.S4	10 CFR 50, Appendix J

XI.S5	Masonry Wall Program
XI.S6	Structures Monitoring Program
XI.S7	RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants
X.M1	Metal Fatigue of Reactor Coolant Pressure Boundary
X.E1	Environmental Qualification (EQ) of Electrical Components
-	Nickel Alloy Aging Management Program

TABLE 2
TIME LIMITED AGING ANALYSES (TLAAs)
(From "License Renewal Application – Initial Draft")

4.2	Reactor Vessel Neutron Embrittlement Analysis
4.3	Metal Fatigue Analysis
4.4	Environmental Qualification of Electric Equipment
4.6	Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis
4.7.1	Crane Load Cycle Limits
4.7.2	Absence of TLAAs for Fatigue Crack Growth, Fracture Mechanics Stability, or Corrosion Analyses Supporting Repair of Alloy 600 Materials
4.7.3	Absence of a TLAA for Reactor Vessel Underclad Cracking Analyses
4.7.4	Absence of a TLAA for a Reactor Coolant Pump Flywheel Fatigue Crack Growth Analysis
4.7.5	Inservice Flaw Growth Analyses that Demonstrates Structural Stability for 40 Years
4.8	TLAAs Supporting 10 CFR 50.12 Exemptions

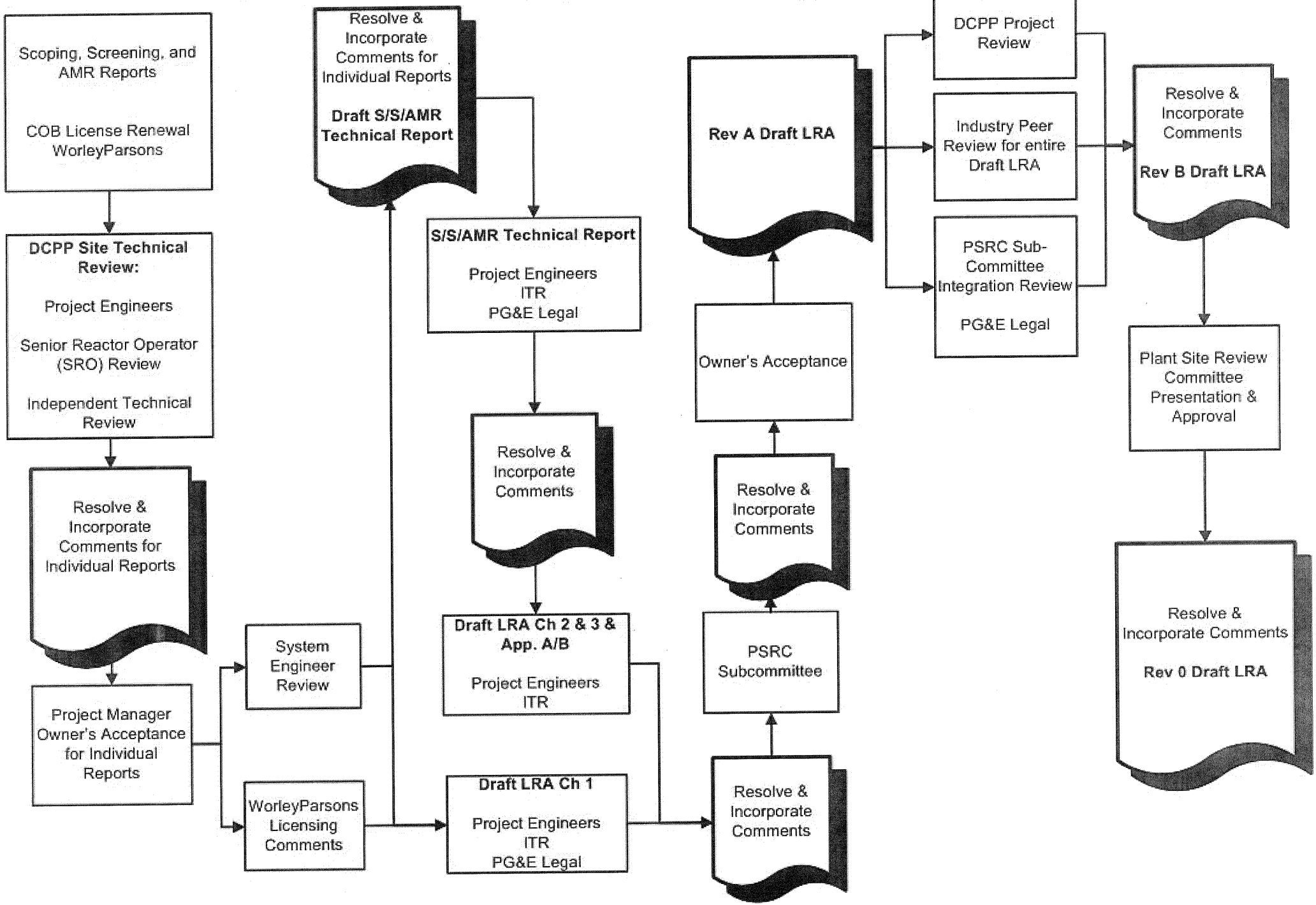
LRFS Review and Approval Record for TLAA

TABLE 3

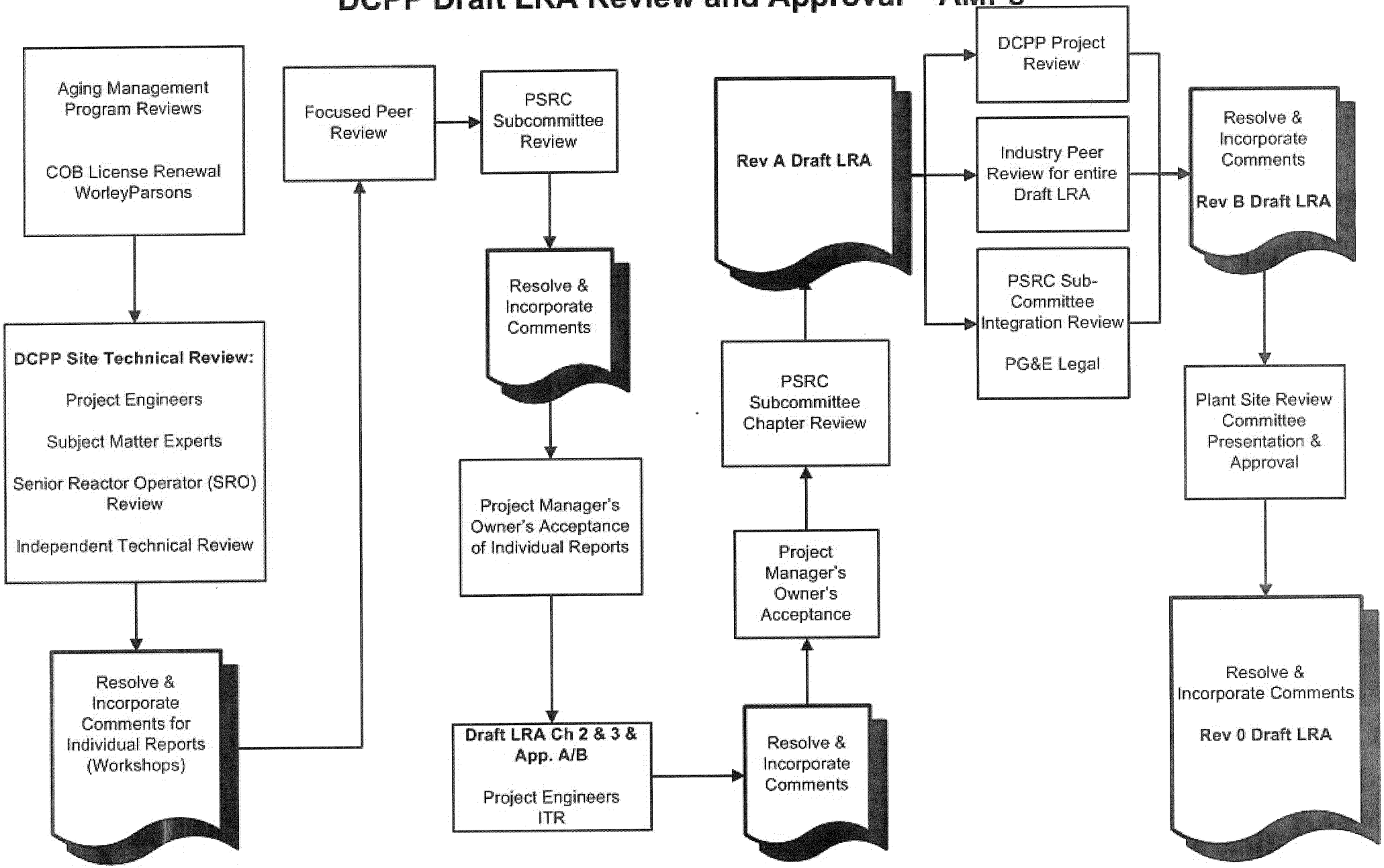
TLAAs	Current Rev	Review per XI1.ID1 Checklist: Lead Tech/SME	Lead Mgt	ITR	CDRs	Law	LRFS	Comments/Status	App. A Draft Complete	App. B Draft Complete	Owners Accepted	PSRC Sub-Committee Review	PSRC Sub-Committee Resolved	Document Ready for LRA	Comments/ Status/Details
Chapter 1 TLAA	B	1/7/2009 A	A			1/16/2009 A	B		N/A	N/A					
Chapter 4	D	C	C	C	A	A	3/2/2009 D	Rev A to Rev B is editorial change. Rev C to Rev D is editorial change. 3/24/09	N/A	N/A					
Chapter 5	B	10/9/2008 A	10/9/2008 A	10/9/2008 A	10/9/2008 A		B	Rev A to B is editorial change. 3/24/09	N/A	N/A					
Chapter 6	D	10/9/2008 A	10/9/2008 A	11/18/2008 C	10/9/2008 A	10/9/2008 A	B	Rev A to B is editorial change. No record of Review checklist for Rev C. Rev D will be review at owner acceptance phase. 3/24/09	N/A	N/A					
Section 7.1 Cranes	?	11/12/2008 B	B	8/22/2008 B	B	12/2/2008 B	C	Rev B to C is editorial change. There is a 02.27.09 folder with crane review comments form in it. Is this file part of Rev C? 3/24/09	N/A	N/A					
Section 7.2 Alloy 600	B	11/30/2008 A		11/9/2008 A		11/20/2008 A	12/2/2008 A	Rev B record of review checklist not found. 3/24/09	N/A	N/A					
Section 7.3 RV Underclad Cracking	E	12/2/2008 C	12/3/2008 C	11/12/2008 C		11/25/2008 C	12/3/2008 E	Rev D to Rev E is editiorial change. Finding on Rev E is editiorial. 3/24/09	N/A	N/A					
Section 7.4 RCP Flywheels	D	10/27/2008 C	C	8/21/2008 C		9/12/2008 C	11/6/2008 D	Record of review checklist for RCP Flywheels 20080821 not found. Rev C to Rev D is editiorial change. 3/25/09	N/A	N/A					
Section 7.5 Inservice Flaw Growth	C	10/27/2008 B	11/6/2008 B	10/28/2009 B		10/16/2008 B	C	Rev B to Rev C is editiorial change. 3/25/09	N/A	N/A					
Chapter 8	D	9/22/2008 C	D	8/22/2009 C		9/12/2009 C	D	Rev C to D is editorial change. 5/25/09	N/A	N/A					
Section 9.01 Pro forma	B		11/20/2008 A	11/20/2008 A		11/20/2008 A	3/3/2009 B	Rev A to B is editorial change. 5/25/09	N/A	N/A					
Section 9.02 Valves	B	A	2/4/2009 A	11/10/2008 A		A	3/3/2009 B	Rev A to B is editorial change. 5/25/09	N/A	N/A					
Section 9.03 ASME Class 2 and 3	C	12/21/2008 B	12/17/2008 B	11/10/2008 B		B	12/17/2008 C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.04 Metal Corrosion	C	11/5/2008 B	1/12/2009 B	11/12/2008 B		B	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.05 RPV BA Leakage	C	12/2/2008 B	A	10/28/2008 A			C	Rev B to C is editorial change. Rev C folder should be renamed to 12.17.08 5/25/09	N/A	N/A					
Section 9.06 CRDM Life Testing	B	11/20/2008 B	A	A		B	B	Rev A to B is editorial change. Law comments not found. 5/25/09	N/A	N/A					
Section 9.07 Thimble Tubes	C	8/21/2008 B		9/4/2008 B		9/12/2008 B	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.08 No Break Zones	C	B	A	A		A	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.09 RI ISI	B	12/2/2008 B	B	11/10/2008 B		B	B	The title of Record of review checklist located in Rev B 08.27.08 folder does not indicate RI-ISI 20080827. 5/25/09	N/A	N/A					
Section 9.10 Large Pipe Hangers	B	11/17/2008 A	A	10/27/2008 A		A	B	Rev A to B is editorial change. 5/25/09	N/A	N/A					
Section 9.11 Bellows, Exp Joints	B	11/12/2008 A	A	10/27/2008 A			B	Rev A to B is editorial change. 5/25/09	N/A	N/A					
Section 9.12 SG Tubes Corrosions	C	B	B	9/4/2008 B		9/12/2008 B	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.13 Missile Ejections	C	11/25/2008 B	B	11/10/2008 B		B	C	Rev B to C is SME comments related change. 5/25/09	N/A	N/A					
Section 9.14 FAC	C	10/23/2008 B	B	9/4/2008 B		9/12/2008 B	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.15 Boraflex	C	8/29/2008 B	B	8/29/2008 B		9/12/2008 B	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					
Section 9.16 Settlement	C	9/2/2008 B	B	8/26/2008 B		B	C	Rev B to C is editorial change. Need Rev C folder created. 5/25/09	N/A	N/A					
Section 9.17 Tritium Concentration	B	A	A	10/27/2008 A		A	B	Rev A to B has no changes (updated copy only). 5/25/09	N/A	N/A					
Section 9.17 Liners	C	B	B	9/5/2008 B		B	C	Rev B to C is editorial change. 5/25/09	N/A	N/A					

Flow Chart 1

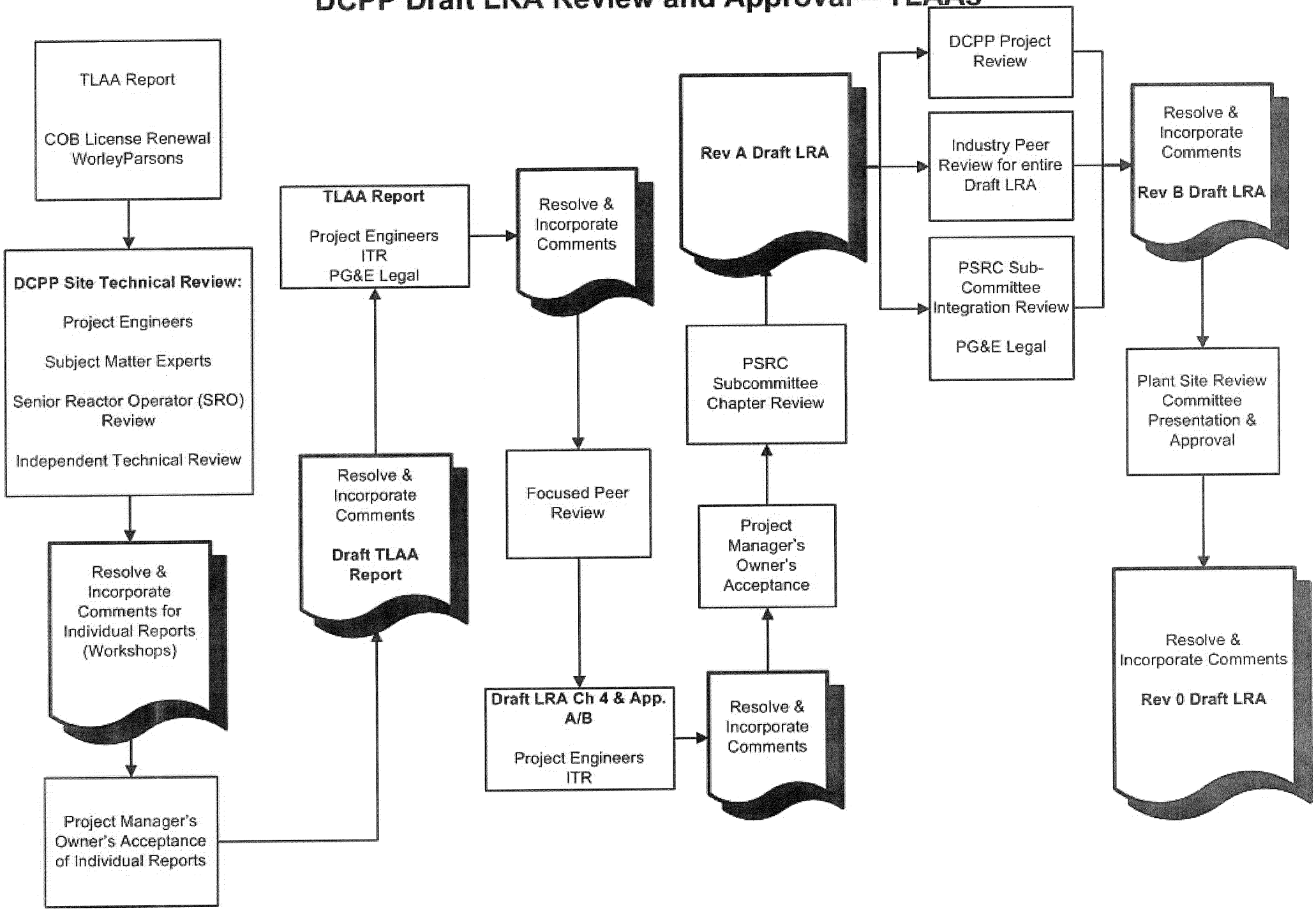
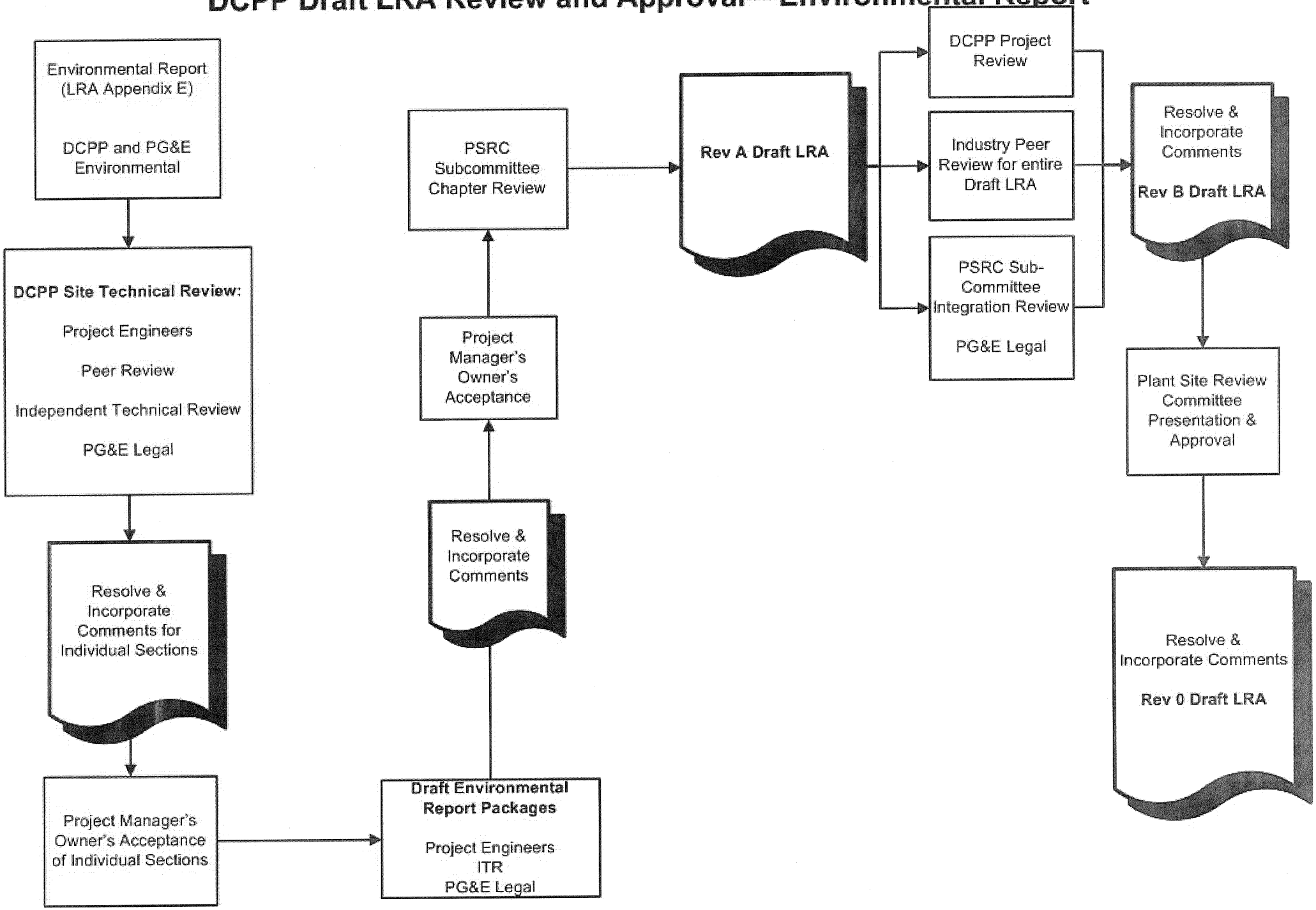
DCPP Draft LRA Review and Approval – Scoping, Screening, AMR Reports



Flow Chart 2
DCPP Draft LRA Review and Approval – AMPs



Flow Chart 3
DCPP Draft LRA Review and Approval – TLAAs



Flow Chart 4
DCPP Draft LRA Review and Approval – Environmental Report