



# Updating License Renewal Guidance Documents

August 3, 2004

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License Renewal and  
Environmental Impacts - B

## Overview


- Background
- Schedule
- Stakeholder involvement
- Examples of new LR documents\*\*
  - \*\*Examples are work in progress and have not received formal approval
- Specific questions and discussion on NEI submittals



## License Renewal Guidance Documents

- NUREG-1800, *Standard Review Plan for License Renewal Applications for Nuclear Power Plants*
- NUREG-1801, *Generic Aging Lessons Learned (GALL) Report*
- RG 1.188, *Standard Format and Content for Applications to Renew Nuclear power Plant Operating Licenses*

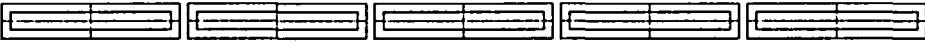
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## Activities since 6/3/04 public meeting

- NEI submittal (5/11/04)
  - Staff complete line by line review of NEI submittal
  - Resolving open items
- Additional NEI submittal (39 items on 7/30/04)
- Staff comment consolidation from NRC staff, contractors and national laboratory

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## Activities since 6/3/04 public meeting

- Development of framework/databases to support project
- Nearing completion of license renewal update section for the license renewal website

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## Tentative Schedule

- September 30, 2004 Preliminary draft update to GALL and SRP-LR (Rev A) scheduled to be posted on Web
- November, 2004 Public meeting on GALL and SRP-LR on Web (Rev A)
- January 30, 2005 Publication of draft update to GALL and SRP-LR (Rev B) with draft reference document that provides justification for changes for public comment

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## Tentative Schedule

- February 1, 2005 to March 30, 2005  
Public Comment Period
- Public Workshop (1 or 2 day workshop  
scheduled late February or early March  
during public comment period)

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## Tentative Schedule

- 6/30/2005 Address public comments  
and prepare final update to GALL and  
SRP-LR (Rev C) with Bases and  
Analysis of Public Comment NUREG
- 9/30/2005 Final Publication of GALL  
and SRP-LR (Rev 1) with Bases and  
Public Comment NUREG

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## Scope for Update in September 2004 (Phase 1)

- The GALL update will involve component consolidations, reformatting, correction of errors, and incorporation of approved staff positions (Precedents, Interim staff guidance)
- Corresponding changes to the SRP-LR will also be developed including update to incorporate new review approach.

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## Phase 2

- Phase 2 involves changes such as development of AMPs, additional approved staff positions, and enhancements
- Phase 2 Comments evaluated for incorporation in January 2005 version
- Significant benefit will be achieved with phase 1, but appropriate consideration will be given to all phase 2 comments

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## Stakeholder Involvement in updating guidance document

- Improvements considered from NEI, NRC staff, Information Systems Laboratories, Inc. (ISL), and Argonne National Laboratory (ANL)
- We welcome any public comments on this update
- September posting on the website is to provide early information to all stakeholders

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## Example: Comment Disposition

ID:	Phase?:	Change Type?:	Structure and/or Components:	Material:	Environment?:	Aging Effect/Mechanism:	ANF?:
GALL04: E-12	P1	1	Piping, piping components, piping elements, and tanks	Stainless Steel	Treated Borewater >140°F	Loss of Material & Cracking/Fitting & crevice corrosion & SCC	XLN2

I. Identification	<p>Comment originator: ANL</p> <p>Precedent Source: [NAVSER, Section 3.5.2-1]</p> <p>Specific comment: Table V_JSF-Compliance.doc: GVAJ-1 Add item A1-d for loss of material due to pitting and crevice corrosion in the piping and fittings and miscellaneous elements (including instrument valve assemblies). All else in this item is unchanged from GALL3 item A1-a.</p> <p>Short description of change: Expand the aging effect and mechanism to include loss of material and cracking due to pitting and crevice corrosion and stress corrosion cracking. No other changes are made in NEI rolup line item E-12.</p>																								
II. Evaluation	<p>Type of Change: A</p> <p>Basis for Change (as given by comment originator): Additional aging effect/mechanism. As shown in NAVSER 3.5.2.1, the staff found it acceptable that both loss of material and cracking were conservatively identified as applicable aging effects for those portions of the ESF piping and elements fabricated from SS in sensitized condition and exposed to treated water.</p> <p>Justification for approval: Explicit – [NAVSER, Section 3.5.2-1] "Identifying loss of material and cracking for the material and environment combinations in question are conservative with respect to standard industry practices and are acceptable to the staff."</p>																								
III. Implementation	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Change</th> <th>Type</th> <th>Document</th> <th>Update ID</th> <th>Rev/ID</th> <th>Text</th> </tr> </thead> <tbody> <tr> <td>ESF-1a</td> <td>Insert</td> <td>GALL</td> <td>E-12</td> <td>A1-a</td> <td>Loss of Material &amp; Cracking/Fitting &amp; crevice corrosion &amp; SCC</td> </tr> <tr> <td>ESF-1b</td> <td>Insert</td> <td>GALL</td> <td>E-12</td> <td>A1-c</td> <td>Loss of Material &amp; Cracking/Fitting &amp; crevice corrosion &amp; SCC</td> </tr> <tr> <td>ESF-1c</td> <td>Insert</td> <td>GALL</td> <td>E-12</td> <td>A3-a</td> <td>Loss of Material &amp; Cracking/Fitting &amp; crevice corrosion &amp; SCC</td> </tr> </tbody> </table> <p>Implementation Completion Date: NRC Concurrence Date: 7/08/04</p>	Change	Type	Document	Update ID	Rev/ID	Text	ESF-1a	Insert	GALL	E-12	A1-a	Loss of Material & Cracking/Fitting & crevice corrosion & SCC	ESF-1b	Insert	GALL	E-12	A1-c	Loss of Material & Cracking/Fitting & crevice corrosion & SCC	ESF-1c	Insert	GALL	E-12	A3-a	Loss of Material & Cracking/Fitting & crevice corrosion & SCC
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ESF-1c	Insert	GALL	E-12	A3-a	Loss of Material & Cracking/Fitting & crevice corrosion & SCC																				

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## Example GALL 2005

Containment Spray System (PWR)						
Item	Structure and/or Component	Material	Environment	Aging Effect/ Mechanism	Aging Management Program (AMP)	Further Evaluation
E-12	Piping, piping components, piping elements, and tanks	Stainless steel	Treated borated water > 140°F	Cracking/Stress corrosion cracking	Chapter XI M2, "Water Chemistry," for PWR primary water in EPRI TR-105714	No
E-17	Heat exchanger shell side components	steel	Closed cycle cooling water	Loss of material/ General, pitting and crevice corrosion	Chapter XI M21, "Closed-Cycle Cooling Water System"	No
E-18	Heat exchanger shell side components including tubes	steel	Raw water	Macrofouling and Loss of material/ General, Pitting, crevice, and, microbologically influenced corrosion	Chapter XI M20, "Open-Cycle Cooling Water System"	No
E-19	Heat exchanger shell side components including tubes	Stainless steel	Closed cycle cooling water	And/and/or pitting, and crevice corrosion	Chapter XI M21, "Closed-Cycle Cooling Water System"	No
E-20	Heat exchanger shell side components including tubes	Stainless steel	Raw water	Loss of material and macrofouling/ Pitting, crevice, and microbologically influenced corrosion and biofouling	Chapter XI M20, "Open-Cycle Cooling Water System"	No

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## Example GALL 2005

EP-15	Piping, piping components, and piping elements	Glass	Air - indoor uncontrolled (Est)	None	None
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Note: Scoping/screening and aging management review will continue to apply

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## GALL 2005 (Added Definitions)

- Definitions provided for materials, environments, aging effects, aging mechanisms, and selected components
  - Cross-system analysis of nomenclature to assure consistency throughout GALL 2005
  - Minimization of unnecessary detail and roll-up of similar terms
  - Temperature thresholds for certain aging effects

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## Example GALL Definitions

- Materials --- Steel: Carbon steel, alloy steel, and cast iron (NOT stainless steel) may be considered the same for several aging effects. When other aging effects/mechanisms are addressed, materials are specifically mentioned.
- Environment -- Diesel Exhaust: gases, fluids, particulates present in a diesel engine exhaust.
- Aging Effect -- Macrofouling: fouling that causes plugging as opposed to fouling that causes loss of heat transfer.
- Structures & Components -- Piping, piping components, and piping elements: Examples include piping, fittings, orifices, elements, strainers, pump casing and bowl, valve body, bonnet, nozzles, safe ends, and spray head.

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## Changes to SRP-LR

- SRP-LR changes corresponding to the update in GALL
- Update of review process
- Incorporation of appropriate comments

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## Bases Document

Provides justification for changes to the original GALL Report (July 2001)

- General Chapter describing rollup methodology changes and conversion
- Chapter that provides detailed justification for technical changes and additions

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## Bases Document – Conceptual Outline

### • Section I. Analysis of General Changes in Updated GALL

- Generalized component descriptions
- Consolidated materials types
- Environmental categories & definitions
- Aging effects & aging mechanisms
- Attributable and traceable to GALL 2001

### Section II. Technical Modifications and Additions

- Justification for technical changes and modifications

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## Example Material Conversion

Metal Designation or Definition (as referenced in Material Column of 'OldGALL')	Metal Description	Designation/ Specification Ref.	'OldGALL' Ref, first introduced, questions/comments about original usage	Base Term for Materials Consolidation in 'NewGALL'	Explanation for Usage of Materials Consolidation Term
CF-3M	Cast Austenitic Stainless Steel (CASS), ASTM A743 or A444, Cr-Ni steel	ASM datasheet	IVB4.3	CASS	Cast stainless steels containing ferrite in an austenitic matrix
Inconel 182	Ni-Fe-Cr weld metal (caution- Note that according to ASM, 182 is also nomenclature for Q150cp variant)	ASM datasheet	IVB1.1 - replace the term Inconel wherever it shows up in GALL with Alloy.	Nickel alloys	Nickel alloys are used for a wide variety of applications, the majority of which involve corrosion resistance and/or heat resistance. Nickel and nickel alloys, like the stainless steels, offer a wide range of corrosion resistance. However, nickel can accommodate larger amounts of alloying elements, chiefly chromium, molybdenum, and tungsten, in solid solution than iron. Therefore, nickel-base alloys, in general, can be used in more severe environments than the stainless steels. Nickel-chromium-iron (-molybdenum) alloys are those such as the Alloy 600 and 690
SB-166	Ni-Cr-Fe alloys and Ni-Cr-Co-Mo alloy in form of hot-finished and cold-work rod, bar, and wire.	ASME BPVC Section IIB (p.177-186,'01)	IVA1.4	Nickel alloy	As described for A-182

Particular material retained in GALL 2005 when appropriate

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## Example Bases

Item	Material	Environment	AE	AMP
EP-1	Steel (bolting)	Air - outdoor (Ext)	Loss of material/General pitting, and crevice corrosion	Chapter XI M18, "Bolting Integrity"

**Precedent Basis:** An approved precedent exists for adding this material, environment, aging effect and program combination item to the GALL Report. As shown in VCSNS SER 3.0.3.7.2, the staff has accepted the position that loss of material from general, pitting, and crevice corrosion, exhibited by steel bolting in an outdoor air environment is properly managed by the Bolting Integrity AMP which includes periodic inspection of closure bolting and ensures timely detection of corrosion and/or leakage. This program provides reasonable assurance that the component's intended functions will be maintained within the CLB for the extended period of operation.

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## Example Bases (2)

Item	Material	Environment	AE	AMP
EP-5	Steel	Concrete	None	None

**Precedent Basis:** An approved precedent exists for adding this material, environment, aging effect and program combination item to the GALL Report. As shown in VCSNS SER 3.3.2.4.21, the staff has accepted the position that steel in a concrete environment exhibits no aging effect and that the component or structure will therefore remain capable of performing its intended functions consistent with the CLB for the period of extended operation. This conclusion is based on the fact that corrosion of embedded steel is not significant if the attributes of the concrete design are consistent with ACI 318-63, in particular a low water-to-cement ratio, low permeability, and adequate air entrainment as cited in NUREG-1557.

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## Public Comment NUREG

- Document will be developed similar to NUREG-1739, "Analysis of Public Comments on the Improved License Renewal Guidance Documents"
- NRC Staff's analysis of the stakeholders' comments on the license renewal guidance documents during the comment period
  - License renewal public workshop
  - Written comments submitted by NEI
  - Written comments submitted by various stakeholders

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## Example from NUREG 1739

Table C: Disposition of Written Public Comments (continued)

Comment Number	Item Number	Comment/ Proposed Change	Basis for Comment	NRC Disposition
NIRS-4	C.3.13	Additionally, the NRC and industry have provided no "lessons learned" in their GALL approach for assessing demonstrated shortfalls, failures and differing professional opinions in the current process to evaluate aging for the current licensing basis.	These failures and shortfalls can compound to adversely impact the scope and accuracy of generic evaluations within the context of license renewal when overlooked in the evaluation program of the adequacy of generic aging management programs.	The GALL, SRP-LR, and Draft RG have the benefit of the experience of the staff members who are part of the current process in evaluating aging for the current license term and also conducted the review of the initial license renewal applications. Therefore, lessons learned from the current process and from an efficiency and effectiveness standpoint in addressing unique issues related to license renewal from the first reviews have been incorporated into these documents. The GALL, SRP-LR, and Draft RG have been revised to address the issue but not specifically for this comment.

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## License Renewal Guidance Update Website

- Keep all stakeholders informed about schedule and information such as relevant correspondence, meeting notices and summaries, NRC public presentations (coming soon!)

<http://www.nrc.gov/reactors/operating/licensing/renewal/guidance.html>

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## Comments

- Combinations of MEAP where there is no aging management required will still require aging management review
- Even though GALL will be generalized, where appropriate, the license renewal application must provide specific component names
- Recent operating experience (Davis Besse, finding on nickel alloy issue) will change some items in GALL

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## Example of 7/30/04 NEI Submittal

Adobe Reader (07-30-04) NRC New GALL Update Enclosure.pdf

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Additional NEI's

Structure or/and Component	Material	Environment	Ageing Effect/ Mechanism	Ageing Management Program (AMP)	Methods in GALL Chapter
General piping and components	Aluminum	Fuel Oil	Loss of material	AI M20 Fuel Oil Chemistry	VI
General piping and components	Aluminum	Air-Inner Component (IC)	None	None	VI
General piping and components	Aluminum	Rain	None	None	VI, VII
General piping and components	Aluminum	Treatment Water	Loss of material	AI M21 Water Chemistry	V, VI, VII
Heat Exchanger shell	Carbon steel	Lubricating Oil	Loss of Material	Plant Specifics	VI
Heat Exchanger Tubes	Carbon Steel	Air-Outdoor (A/O)	Loss of Material	Plant Specifics	VI
Heat Exchanger Tubes	Carbon Steel	Air-Outdoor (A/O)	Loss of Material	Plant Specifics	VI, VII
General piping and components	Carbon Steel	Cleaner Cycle Cooling Water	Loss of material	AI M21 Cleaner Cycle Cooling Water System	VI
General piping and components	Carbon Steel	Steam	Loss of material	Plant Specifics	VI
General piping and components	Carbon Steel	Lubricating Oil	Loss of Material	Plant Specifics	VI, VII
General piping and components	Gray Cast Iron	Soil	Loss of Material- Surface Leaching	Plant Specifics	VI, VII
General piping and components	Gray Cast Iron	Treatment Water	Loss of Material- Surface Leaching	Plant Specifics	VI, VII

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## Near Term Path forward

- Preliminary draft update to GALL and SRP-LR on September 30
- Proposed public meeting in November