

SLR Status

Review of Materials Reports

Rich Tilley
EPRI

**NEI LR/SLR Task Force and NRC DLR
Quarterly Meetings**
June 10-11, 2015



Objective

- Identify EPRI documents that potentially require revision or new content to support licensee implementation of an AMP for second license renewal (SLR)

Scope

- Issue Programs – BWRVIP, MRP, SGMP
- List of reports to be evaluated based on www.epri.com database
- Recent and relevant correspondence also evaluated

You Are Here: [Member Center](#) > [Program Cookpits](#) > [P41.01.03](#) > [Research Results](#)

Program 41.01.03: Boiling Water Reactor Vessel and Internals Program-BWRVIP

- [Home](#)
- [Overview](#)
- [Contacts](#)
- [Research Results](#)
- [Research Support](#)
- [In Development](#)

Research Results

Research Results include technical results, software, technical briefs and updates, and peer reviewed literature projects and success stories, go to the Research Support tab.

Filter By:

View Only Supplemental Products

1 - 20 of 310 [Export to: MS Excel](#) 

Approach

- Comprehensive document review of all documents not practical (database too large)
- Two-step evaluation process applied
 - 1) Screening based on document attributes used to exclude majority of documents without the need for review of the document itself
 - 2) Detailed Review of documents not screened out in step 1
- Conservative approach to screening taken to minimize the risk of a document having a significant SLR impact being screened out and not subject to detailed review

Screening Criteria

- Screening elements – documents containing ANY of the following elements were subject to detail review:
 - Document (or prior revision of document) referenced in the GALL Report or has been reviewed and approved by NRC (“-A” reports)
 - Document contains NEI 03-08 mandatory, needed, or good practice elements
 - Document contains relevant keyword hits associated with license renewal or aging effects & degradation mechanisms
 - Expert review of document title, context, status, and use
 - Final review of results by EPRI personnel familiar with the IP being evaluated

Screening - Keyword Review Process

- MRP and BWRVIP document libraries available for keyword search
- Searches performed for both license renewal terms and aging effect / degradation mechanism related terms

Keyword / Key phrase
40 year(s) or 40-year
60 year(s) or 60-year
CFR 54 or CFR54
license renewal
period of extended operation or PEO
time limited or time-limited (TLAA)
54 EFPY (effective full power years)
adjusted reference temperature (ART)
conditional probability of failure (CPoF)
corrosion allowance
cumulative usage factor or CUF
equivalent margin analysis (EMA)
failure probability
fatigue, fatigue usage
high energy line break (HELB)
low temperature overpressure protection (LTOP)
pressurized thermal shock (PTS)
pressure – temperature (P-T) limits
pressure – temperature limits report (PTLR)
probabilistic fracture mechanics (PFM)
reflood thermal shock analysis
upper shelf energy (USE)
fluence
fracture toughness
irradiation-assisted or IASCC
irradiation embrittlement
neutron embrittlement
stress relaxation
thermal aging
thermal embrittlement
void swelling

Screening – Example of Search results

- Results from each search compiled into a single full text searchable PDF.
- Allows for “reverse” search by document number (e.g., a search for “BWRVIP-116” returns all license renewal related keyword hits
- Results provide contextual “snippets” that can be used to infer SLR impact or lack thereof
- Screening included a review of the applicable keyword hits for each document

File : [BWRVIP-116.pdf](#)
Title : BWRVIP-116: BWR Vessel and Internals Project Integrated Surveillance Program (ISP) Implementation for License Renewal
Subject : BWRVIP-116_1007824
Author : EPRI
Keywords :

Document Metadata

 Title: ISP) Implementation for License Renewal

 Found 1 instance(s) in additional metadata

Page: 1

 ISP) Implementation for License Renewal Technical Report N S L I C E E

Page: 2

 ISP) Implementation For License Renewal 1007824 Final Report, July 2003 EPRI Project Manager Robert

Page: 4

 ISP) Implementation for License Renewal, EPRI, Palo Alto, CA: 2003. 1007824.

Page: 6

 testing during the license renewal period are identified, and a testing schedule is proposed.

 ISP into the license renewal period will be of interest to persons responsible for

 ISP into the license renewal period will save the BWR plant the expense of

 BWRs applying for license renewal will be able to cite the ISP as the

Screening – Title Review

- Title and context of a report combined with results of 3 other screening criteria reviewed
- Reviewers highly knowledgeable regarding content and intent of BWRVIP, MRP, and SGMP reports
- Where title “implies” potential for SLR impact, document screened in for detailed review, even if none of the other three screening criteria met
- Review of the draft results will include review by EPRI IP program managers as a further assurance that no significant SLR impact was missed by the screening process

Screening - Disposition Examples

- Documents were screened out (i.e., exempted from detail review) only when all of the criteria were met. Examples of document types that could be readily screened out include:
 - Documents that present the proceedings of industry conferences
 - Documents whose sole objective is to describe testing and associated results
 - Planning documents such as roadmaps and IMTs
 - Documents that have been superseded by a more recent version of the same report (with the caveat that any NRC SEs associated with the superseded document are included in the revision of the report that is evaluated in detail)
 - Historical documents representing early work that has been superseded by more recent / relevant documents
 - Documents that provide recommendations only (not credited as a basis for aging management)

Screening - Results

Issue Program	# Documents Screened	# Documents Screened <u>OUT</u>	# Documents Screened <u>IN</u>
BWRVIP	335	242	93
MRP	592	513	79
SGMP	501	478	23
TOTAL	1,428	1,233	195

Detailed Review

- Document keyword hits, scope, objective, results and conclusions sections reviewed
- Additional sections reviewed in detail as necessary to reach a conclusion
- Document keyword hits, scope, objective, results and conclusions sections reviewed
- Additional sections reviewed in detail as necessary to reach a conclusion
- Documents dispositioned based on issue program (IP) impact and SLR elements:
- Impact classified as no change required (NCR), no change required but clarification would benefit (NCR*) or some change required:
 - NCR: No change required AND no optional revisions
 - NCR*: No change required, BUT optionally document could be revised to provide clarification
 - Change required: Revisions to address SLR appear to be needed:
 - Some are simple that can be managed within existing IP plans/budgets with minor adjustments
 - A few may require technical work and involve more substantial effort and resources

IP Impact Summary

Issue Program	# Documents Reviewed	NCR	NCR*	Change Needed	TBD
BWRVIP	93	47	25	20	1
MRP	79	46	13	16	4
SGMP	23	21	1	1	0
TOTAL	195	114	39	37	5

Detailed Review Results - Observations

- No new / unanticipated issues identified
- Relatively few documents require revision for SLR. A number of cases identified where clarifications would be helpful to users
- Existing technical guidance is adequate to enter into the 60 year window of operation
- Most significant BWRVIP issue identified is 80-year ISP
 - Driven by RPV material surveillance limitations
 - Most internal I&E guidelines already include periodic examination requirements not tied to plant life
- Most significant MRP issue identified is updating MRP-227 to address 60-80 year operations

Status

- Materials programs are reviewing the screening results
- Materials programs will verify the results and defined needs or provide revisions based on technical reviews.
 - Will rely on utility personnel familiar with license renewal
 - Will involve technical resources that know and / or involved in development of technical bases
 - Review likely to have some impact on screening categorization
- Materials programs will develop plans and prioritization of updates
- Materials programs to share work scope and prioritization with utility leadership
- NRC will be updated by LTO program end of 2015



Together...Shaping the Future of Electricity

Industry Guideline Documents

- NEI 14-13, “Use of Industry Operating Experience for Age-Related Degradation and Aging Management Programs”
 - Industry approach for collecting and sharing OE for passive long-lived components – based on plant CAP
 - Finalizing minor wording improvements and plan to issue to industry June 2015
 - Working with INPO to revise INPO 12-009, “INPO Consolidated Event System (ICES) Reporting Requirements and Standards”
 - INPO targeting revision release by end of 2015 - will include other updates
 - Implement for plants in Period of Extended Operation (PEO) in conjunction with changes to INPO 12-009
 - Additional ICES reports generated as a result of this guideline expected to be 5 – 10/yr across the fleet

Industry Guideline Documents, cont.

- NEI 14-12, “Aging Management Program Effectiveness”
 - Released to industry on Feb 2015
 - Standardized approach for self-assessment of Aging Management Programs
 - Helps ensure ongoing program effectiveness
 - Documentation of assessments for future NRC inspections and SLR preparation
 - Minimal additional impact on plant activities (may improve efficiency of AMP assessments)
 - Document provided to NRC March 2015

LICENSE RENEWAL/SECOND LICENSE RENEWAL TASK FORCE

ACTION ITEMS MATRIX

Item	Status	Responsible Individual	Projected Completion Date
1. NRC and NEI are to continue their discussion on the industry's two guideline documents on operating experience and AMP effectiveness self-assessment.	NEI 14-12 was issued to the industry, NEI 14-13 Rev. 1 to be issued in June, 2015.	Gary Peters	December, 2015 (due to INPO issuing INPO 12-009)
2. NRC to provide schedule updates to GALL-SLR and SRP-SLR.	Meeting has been scheduled to discuss SLR-GALL with NRC.	Jason Remer	June 18, 2015
3. NEI and EPRI will work with the NRC on a case-by-case basis to review requests for EPRI documents to be made available to support the SLR expert panels.	Closed activity, process in place to address. Selected EPRI reports are publicly available for download from the EPRI.COM website. EPRI can and does currently supply proprietary EPRI reports to NRC for review under an affidavit process that excludes public posting. Case-by-case review will be required to identify effort for public sharing of selected information in EPRI proprietary reports. EPRI reports are also publicly available for purchase under a license agreement.	R. Tilley, EPRI	Closed
4. NRC and NEI will consider having a separate meeting on the draft Selective Leaching AMP after the NEI Mechanical Working Group Review releases the document to the NRC.	Action closed. No meeting required.	Jason Remer	Closed

<p>5. We understood that EPRI was going to review their topical reports (including their MRP and VIP) reports and let us know which ones need to be updated to go to 80.</p>	<p>On-going activity. EPRI Technical Programs are developing plans and schedules for updates. Update to DLR will be provided by December 31, 2015.</p>	<p>R. Tilley, EPRI</p>	<p>December 31, 2015</p>
<p>6. GALL and SRP tables: a) Do they need a column for GALL 1 ID numbers? b) Do they need a designation for new line items or will a blank (or the word "new" or revised) in the GALL 2 ID column work?</p>	<p>Meeting has been scheduled to discuss SLR-GALL with NRC.</p>	<p>Jason Remer</p>	<p>June 18, 2015</p>
<p>7. NRC to have future public meeting on GALL-SLR civil/structural AMPs.</p>	<p>Action closed. Meeting took place on April 8, 2015.</p>	<p>Jason Remer</p>	<p>Closed.</p>
<p>8. Plan and schedule additional electrical working group meeting on GALL report.</p>	<p>Recommendation made to NRC staff during the June 1st bi-weekly call. Date TBD.</p>	<p>Jason Remer/Jerud Hanson</p>	<p>September, 2015</p>
<p>9. Develop ACRS presentations in support of November 17, 2015 meeting.</p>	<p>Work in progress involving DOE, EPRI and NEI.</p>	<p>Jason Remer/Jerud Hanson</p>	<p>November 17, 2015</p>