

MRP Materials Reliability Program _____ MRP 2017-009
(via email)

DATE: March 15, 2017

TO: MRP Integration Committee Members

FROM: David Czufin, TVA, PMMP Chairman
Brian Burgos, EPRI, MRP Program Manager

SUBJECT: Transmittal of NEI-03-08 “Needed” Interim Guidance Regarding Baffle Former Bolt Inspections for PWR Plants as Defined in Westinghouse NSAL 16-01 Rev.1

The purpose of this letter is to inform members of the MRP Integration Committee (IC) that the Pressurized Water Reactor Materials Management Program (PMMP) Executive Committee has endorsed implementation of Interim Guidance regarding baffle former bolt (BFB) inspections for Westinghouse Electric Company designed PWR plants. The guidance herein was developed by the joint EPRI/PWR Owners Group Baffle-Former Bolt Focus Group (BFB FG), and is intended as a supplemental guidance to clarify the intended links between inspection requirements, reinspection requirements and acceptance criteria methodologies and to impose limits on reinspection intervals to account for recent operating experience and major design differences between the plants. It is a requirement of MRP-227-A/Rev. 1 Section 7.5 to disposition relevant conditions detected during the required examinations via the utility corrective action program (CAP). This includes disposition of any baffle-former bolt degradation; therefore, any relevant conditions require a plant-specific evaluation. The extent of the evaluation is assumed to be commensurate with the extent of degradation discovered. There is an extensive amount of BFB research, operating experience reports, generic studies, and potentially plant-specific analyses that are available to assist utilities in the disposition of inspection findings; however, it is understood that this volume of distributed information impedes the efficient use by utility program owners. The new interim guidance in item B below has been vetted through the OEM and industry subject matter experts (SMEs) as conservative limits for reinspection intervals when examination results are atypical or of concern. **This guidance is NOT intended to modify the WCAP-17096-NP-A acceptance criteria, nor the expansion criteria associated with MRP-227 Section 5. These criteria may be adjusted in the future via other guidance.**

Westinghouse NSAL-16-1 Rev.1 identifies that plants may be at risk for BFB failures over the remaining life of the PWR plant (up to 60 calendar years and beyond). All of the PWR plants (both domestic and international plants) that have found degradation of BFBs are less than 45 calendar years of age. Therefore, additional interim guidance to supplement MRP-227-A/Rev.1 and WCAP-17096-NP Revision 2 for Westinghouse-designed plants is considered reasonable and appropriate.

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Westinghouse NSAL-16-1 Rev.1 categorizes plants using a tiered approach to reflect the relative risk of BFB failures. Using this approach, NSAL-16-1 Rev.1 identifies that plants operating in an upflow configuration have a lower relative risk of the cascading of BFB failures experienced by the Tier 1 downflow plants and of BFB failures in general over the remaining life as compared to plants operating in a downflow configuration due to bolt stress differences. This relative susceptibility was considered in the guidance provided herein.

Additionally, some latitude for PWR plants regarding planning for and implementation of BFB replacements as a method to improve and enhance the baffle-former assembly structure as preventative maintenance and an asset management tool is considered reasonable. As part of NEI-03-08 industry initiatives, the industry group (EPRI/PWR Owners Group) will continue to provide comprehensive evaluations of relevant PWR plant conditions using as generic methods as possible in the future (including potential repair and replacement options).

In the first refueling outage after March 1, 2018, domestic US utility plants are to implement the following interim guidance as ‘Needed’ actions per NEI-03-08 protocol.

The existing MRP-227-A/Rev.1 Table 4-3 entry for “Examination Method/Frequency” of Baffle-Former-Bolts is modified as follows:

Current Requirement:

Baseline volumetric (UT) examination between 25 and 35 EFPY, with subsequent examination on a ten-year interval.

Modified Requirement:

A. Baseline volumetric (UT) examination shall be performed as follows:

- 1. NSAL-16-1 Rev.1 Tier 1 plants: per NSAL-16-1 Rev.1 and MRP-2016-021**
- 2. NSAL-16-1 Rev.1 Tier 2 plants: no later than 30 EFPY**
- 3. Remaining plants: no later than 35 EFPY*

**-initial baseline UT exams performed prior to 1/1/2018 are acceptable*

B. Subsequent volumetric (UT) examinations shall be performed on an interval established by plant-specific evaluation per MRP-227 Needed Requirement 7.5 as documented and dispositioned in the owner’s plant corrective action. A reduced reinspection interval has been determined to be an appropriate response to atypical or aggressive BFB degradation and shall satisfy the following criteria:

WEC Plant Design Type	%UT Indications and Visually Failed BFBs	UT Re-Exam Period
<i>Down-Flow WEC Plants</i>	<i><3% indications with no clustering^(a)</i>	<i>not to exceed 10-years</i>
<i>Down-Flow WEC Plants</i>	<i>≥3% indications or clustering^(a)</i>	<i>not to exceed 6-years^(b)</i>
<i>Up-Flow WEC Plants</i>	<i><5% indications with no clustering^(a)</i>	<i>not to exceed 10-years</i>
<i>Up-Flow WEC Plants</i>	<i>≥5% indications or clustering^(a)</i>	<i>not to exceed 6-years^(b)</i>
<p><i>Note: (a) Clustering defined per NSAL-16-1 Rev.1: three or more adjacent defective BFBs or more than 40% defective BFBs on the same baffle plate. Untestable bolts should be reviewed on a plant-specific basis consistent with WCAP-17096-NP-A for determination if these should be considered when evaluating clustering.</i></p> <p><i>(b) A longer reinspection interval, not to exceed 10-years, may be justified by plant-specific evaluation based on plant-specific exam findings. This evaluation may include additional justification from plant modifications and/or improvements (for example: replacements of BFBs, conversion to up-flow, replacement of lower internals, etc.).</i></p>		

C. As an alternative to performing UT inspections, a plant may perform proactive bolt replacements as preventative maintenance justified by plant-specific evaluation using established methodologies (for example, WCAP-15029-P-A or equivalent). The plant-specific evaluation shall also establish and justify the UT re-examination period resulting from the bolt replacements performed.

NOTE: The MRP-227 Section 7.5, NEI 03-08 Needed requirement is unchanged with this interim guidance:

Examination results that do not meet the examination acceptance criteria defined in Section 5 of MRP-227 shall be recorded and entered in the owner's plant corrective action program and dispositioned. Engineering evaluations used to disposition an examination result that does not meet the examination acceptance criteria in Section 5, shall be conducted in accordance with NRC approved evaluation methods (i.e., ASME Code Section XI, WCAP-17096-NP or equivalent method).

This guidance is supplemental to interim guidance previously promulgated by EPRI letter MRP-2016-021, dated 7/25/2016. However, this guidance supersedes MRP-2016-033, dated 9/29/2016 in its entirety. Please contact Maurice Dingler-Wolf Creek (madingl@wcnoc.com) or Tim Wells-Southern (tgwells@southernco.com) from the BFB Focus Group with questions related to this interim guidance.

Sincerely,



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