REQUESTS FOR ADDITIONAL INFORMATION FOR ELECTRIC POWER RESEARCH INSTITUTE REPORT NO. BWRVIP-139-A, APPENDIX B

RAI No. BWRVIP-139-Appendix B-1

Background: Section B.1 of Appendix B to Boiling Water Reactor (BWR) Vessel Internals Project (BWRVIP)-139 provides the following information marked as trade secrets (i.e., proprietary information):

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Issue: The staff notes that the designated proprietary information does not meet the criteria in 10 CFR 2.390(b)(4) because it is already available in public sources or of a type that is not customarily withheld from the public.

Request: Provide the basis for identifying the italicized information in the quoted paragraph in the "Issue" section of this Request for Additional Information (RAI) as a "Trade Secret" and justify why this meets the five criteria for proprietary withholding in paragraph §(b)(3) of 10 CFR 2.390.

RAI No. BWRVIP-139-Appendix B-2

Background: The background section in RAI BWRVIP-139-DLR-1 is applicable to this RAI.

Section B.3.(a) of Appendix B to BWRVIP-139 provides the following information marked as trade secrets (i.e., proprietary information):

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Issue: The staff notes that the designated proprietary information does not meet the criteria in 10 CFR 2.390(b)(4) because it is already available in public sources or of a type that is not customarily withheld from the public.

Request: Provide the basis for identifying the italicized information in the quoted paragraph in the "Issue" section of this RAI as a "Trade Secret" and justify why this meets the five criteria for proprietary withholding in paragraph §(b)(3) of 10 CFR 2.390.

RAI No. BWRVIP-139-Appendix B-3

Background: The summary of the regulatory requirements in the background section of RAI BWRVIP-139-DLR-1 are applicable to this RAI.

Section B.3.(b) of Appendix B to BWRVIP-139 provides the following information marked as confidential or privileged commercial information (i.e., proprietary information):

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Issue: The staff notes that the designated proprietary information does not meet the criteria in 10 CFR 2.390(b)(4) because it is already available in public sources or of a type that is not customarily withheld from the public.

Request: Provide the basis for identifying the italicized information in the quoted paragraph in the "Issue" section of this RAI as a "Trade Secret" and justify why this meets the five criteria for proprietary withholding in paragraph §(b)(3) of 10 CFR 2.390.

RAI No. BWRVIP-139-Appendix B-4

Background: Appendix B of the BWRVIP-139 report includes Section B.2, "Steam Dryer Components Subject to Aging Management Review." In this section of the appendix, the EPRI BWRVIP makes the following non-proprietary statement with respect to meeting Section §54.21(a)(1) of the license renewal Rule:

> §54.21(a)(1) of the license renewal rule provides the requirements for identifying components that are subject to aging management review. The steam dryer license renewal evaluation boundary includes those steam dryer components that are required to accomplish the intended function described above in Section B.1 (i.e., to maintain structural integrity). The approach used in BWRVIP-139-A does not rely on evaluation to exclude any steam dryer sub-component from aging management review. FMEA, finite element structural analyses, and operating experience are used as inputs to guide development of an integrated inspection program that manages aging of the entire steam dryer.

Issue: The regulation in 10 CFR 54.21(a)(1) requires a license renewal applicant to perform a plant-specific integrated plant assessment (IPA) of those structures and components (SCs) that have been scoped in for license renewal in accordance with 10 CFR 54.4 and to identify all SCs that would need to be screened in for an Aging Management Review (AMR). The regulation in 10 CFR 54.21(a)(1) identifies that the SCs subject to an AMR are those SCs that have been scoped in for license renewal in accordance with 10 CFR 54.4 and that: (a) do not involve moving parts or changes in configuration, and (b) are not subject to replacement based on a qualified life or specified time period.[1] It was not evident whether the EPRI BWRVIP is making a determination that all steam dryer components would need to be within the scope of an AMR or whether only those steam dryer components that are defined as "passive, long-lived" components for the LRA will need to be within the scope of an AMR.

Request: Clarify whether the quoted paragraph above is intended to mean that all BWR steam dryer components are within the scope of an AMR, or whether only those specific steam dryer components that are defined as being "passive, long lived" need to be within the scope of an AMR.

[1] Collectively referred to as "passive, long-lived" SCs.

RAI No. BWRVIP-139-Appendix B-5

Background: Section B.3 of Appendix B to BWRVIP-139 provides the following information marked as trade secrets (i.e., proprietary information):

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In its proprietary statement, the EPRI BWRVIP establishes that *[*

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The U.S. Nuclear Regulatory Commission (NRC) staff recommended Aging Management Program (AMP) for managing aging in BWR vessel internal components is given in Section XI.M9, "BWR Vessel Internals," of NUREG-1801, Revision 2, "Generic Aging Lessons Learned" (GALL) Report. The scope of AMP XI.M9 includes implementation of TR BWRVIP-139-A for BWR steam dryer assemblies and their subcomponents.

Issue: The BWRVIP-139-A report *[*

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Based on operating experience reflecting licensee actions to address steam dryer wear, the methodology in BWRVIP-139, Appendix B, should be amended to identify loss of material due to wear (or similar mechanical mechanisms such as fretting) as an additional applicable aging effect/mechanism that may occur in BWR steam dryer assemblies and their subcomponents during the period of extended operation. Also, specific "detection of aging effect," "monitoring and trending," "acceptance criteria," and "corrective action" program element recommendations should be established in BWRVIP-139, Appendix B, methodology to manage this aging effect/mechanism combination.

Request: In light of the applicable operating experience with steam dryer wear at the *[* *]* provide your basis why the EPRI BWRVIP has not identified loss of material due to wear as an applicable aging effect requiring management for BWR steam dryer assemblies and their subcomponents. In addition, provide your basis (i.e., justify) why the BWRVIP has not credited either *[*

] would be entered into a BWR applicants corrective action program and assessed for its impact on both the safety related components at the plants and the applicant's bases (i.e., program element criteria) for implementing the BWRVIP-139-A guidelines under the scope of the licensee's BWR Vessel Internals program.

RAI No. BWRVIP-139-Appendix B-6

Background: NRC AMP XI.M9, "BWR Vessel Internals," in the GALL Report (current version is Revision 2), provides an acceptable AMP that may be used to manage those aging effects that may occur in reactor vessel internal (RVI) components in BWR designs. This includes those aging effects that may occur in the steam dryer assemblies and their subcomponents. Currently, GALL AMP XI.M9, invokes the current methodology in Technical Report No. BWRVIP-139-A as the basis for managing aging that may occur in a BWR steam dryer assembly and its subcomponents.

Issue: The methodology in BWRVIP139-A will be implemented within the scope of either a GALL-based or plant-specific AMP for an applicant's BWR RVI components. However, the methodology in BWRVIP-139 Appendix B does not provide any criteria on how the methodology in BWRVIP-139-A report will be factored into the scope of the AMP that will be used to manage aging in BWR RVI components. The methodology in BWRVIP, Appendix B, also does not establish how the methodology in BWRVIP-139-A will be applied to the steam dryer assemblies and their components as part of the procedural controls for implementing the applicable AMP.

Request: Provide the basis why the BWRVIP-139, Appendix B report methodology does not contain any applicable guidelines regarding the relationship between the AMP that will be applied to an applicant's BWR RVI components and the methodology in BWRVIP-139-A that will be applied to the BWR steam dryer components. Specifically, provide the basis why the methodology in BWRVIP-139, Appendix B, does not establish that: (a) the methodology in BWRVIP-139-A will need to be incorporated into the scope of the plant-specific or GALL-based AMP that will be applied to an applicant's BWR RVI components, and (b) the methodology in BWRVIP-139-A will be applied to the steam dryer assemblies and their components as part of the procedural controls for implementing the applicable AMP during a proposed period of extended operation (including proposed subsequent license renewal periods).

RAI No. BWRVIP-139-Appendix B-7

Background: Some of the BWR plants that have received renewed operating licenses are either currently operating at NRC-approved 20% extended power uprate (EPU) conditions or have requested approval of 20% EPUs and are awaiting the NRC staff decision on the requested power uprate amendments.

Issue: The BWRVIP-139-A report *[*

]. Recent plant experience indicates that cracking may develop very rapidly in existing dryers and replacement steam dryers during operations at full-EPU or partial-EPU power levels (Refer to events summarized in NRC Information [IN] Notice 2013-10, "Programs for Monitoring Boiling-Water Reactor Steam Dryer Integrity," dated June 14, 2013 [ML13003A049]).

Request: Given the information in IN No. 2013-10, provide the basis why the previous visual inspection methods and frequencies in BWRVIP-139-A for detecting and managing cracking are adequate to managing fatigue and intergranular stress-corrosion cracking (IGSCC) induced cracking in BWR steam dryer components during a proposed period of extended operation, both at partial-EPU and full-EPU operating conditions.

RAI No. BWRVIP-139-Appendix B-8

Background: For some BWR plants that have been approved for operation at 20% EPU conditions, the owners (licensees) of the facilities have replaced or are planning to replace their existing General Electric Company-designed steam dryers with steam dryers that were designed by the Westinghouse Electric Company (i.e., Westinghouse Nordic steam dryers that use hexagonal or orthogonal design symmetries).

Issue: The scope of the previous inspection and evaluation methodology in BWRVIP-139-A does not include evaluations of cracking and loss of material due to wear in Westinghouse-design steam dryer components. In addition, the use of Westinghouse-design steam dryers has only been implemented recently in this country. Therefore, the U.S. BWR industry has yet to report any domestic operating experience with respect to crack-induced or wear-induced failures of Westinghouse steam dryer designs in the USA, especially under full-EPU or partial-EPU operating conditions.

Request: Clarify whether the scope of the inspection and flaw evaluations (I&FE) methods in BWRVIP-139-A can be extended to the management of fatigue and IGSCC induced cracking and loss of material due to wear or fretting in Westinghouse-designed steam dryer assembly components during a proposed period of extended operation. If so, justify why the scope of I&FE methodology in BWRVIP-139-A can be extended to aging management of Westinghouse-designed steam dryer assemblies and components without requiring a modification or amendment of the I&FE methodology in BWRVIP-139-A.