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ATTN: Document Control Desk
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/RENEWED LICENSE NO. DPR-23

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION RELATED TO THE PRESSURIZED WATER REACTOR INTERNALS PROGRAM PLAN FOR AGING MANAGEMENT OF REACTOR INTERNALS (TAC NO. ME9633)

References:

1. NRC E-Mail, Unit 2 PWR Vessel Internal Program Plan for Aging Management - *Request for Additional Information (RAIs) (TAC No. ME9633)*, dated August 27, 2013, (ADAMS Accession Number ML13240A499)
2. H.B. Robinson Steam Electric Plant, Unit 2, *Response to NRC request for Additional Information Related to the Pressurized Water Reactor Internals Program Plan for Aging Management of Reactor Internals (TAC No. ME9633)*, dated October 01, 2011, (ADAMS Accession Number ML14287A222)

Ladies and Gentlemen:

By e-mail dated August 27, 2013, the NRC requested that Duke Energy Progress, LLC, respond to a request for additional information (RAI) regarding the Aging Management Program for the Reactor Vessel Internals at H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 [Reference 1]. The Duke Energy Progress response to the NRC's request was provided in the letter dated October 1, 2014 [Enclosure 3 to Reference 2]. The vendor provided an affidavit in enclosures 1 and 2 to Reference 2, which requested withholding of the proprietary information contained in Enclosure 3 to Reference 2, from public disclosure, in accordance with paragraph (b)(4) of Section 2.390 of the commission's regulations.

The vendor has removed the proprietary information from Enclosure 3 of the October 1, 2016, submittal and has developed a non-proprietary version. The resulting non-proprietary response is hereby submitted as the enclosure to this letter.

There are no regulatory commitments made in this submittal. If you have any questions regarding this submittal, please contact Mr. Tony Pilo, Manager (Acting) – Nuclear Regulatory Affairs at (843) 857-1409.

I declare under penalty of perjury that the foregoing is true and correct.

Executed On: October 5, 2016

Sincerely,

R. Michael Glover

R. Michael Glover
Site Vice President

RMG/am

Enclosure: H. B. Robinson Unit 2 Summary Report for the Fuel Design / Fuel Management Assessments

cc: NRC Resident Inspector, HBRSEP Unit No. 2
NRC Regional Administrator, NRC, Region II
Dennis Gavin, NRC Project Manager, NRR

United States Nuclear Regulatory Commission
Enclosure to Serial: RNP-RA/16-0081
9 Pages (including cover page)

H. B. Robinson Steam Electric Plant, Unit No. 2

H. B. Robinson Unit 2 Summary Report for the Fuel Design / Fuel Management Assessments

PRESSURIZED WATER REACTOR OWNERS GROUP

PWROG-14018-NP
Revision 0

WESTINGHOUSE NON-PROPRIETARY CLASS 3

H. B. Robinson Unit 2 Summary Report for the Fuel Design / Fuel Management Assessments

Materials Committee

PA-MSC-0983, Revision 1, Task 7

August 5, 2014

PWROG-14018-NP
Revision 0

H. B. Robinson Unit 2 Summary Report for the Fuel Design / Fuel Management Assessments

PA-MSC-0983, Revision 1, Task 7

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Radiation Engineering and Analysis

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This report was developed and funded by the Pressurized Water Reactor Owners Group under the leadership of the participating utility representatives of the Materials Committee.

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1 MRP 2013-025 Guidance Text Demonstrating MRP-227-A Applicability for H. B. Robinson Unit 2 Reactor Internals Aging Management Fuel Design / Fuel Management Assessments

In Request for Additional Information (RAI) 3-1 [1], the U.S. Nuclear Regulatory Commission (NRC) advised Duke Energy Progress that resolution of Applicant/Licensee Action Item (A/LAI) 1 of MRP-227-A would need to be resolved as part of the staff's review of the Aging Management Program for the Reactor Vessel Internals at H. B. Robinson Unit 2, also known as Robinson Nuclear Plant (RNP).

RAI-3-1:

2. *Have RNP ever utilized atypical fuel design or fuel management that could make the assumptions of MRP-227-A regarding core loading/core design non-representative for that plant, including power changes/uprates? If so, describe how the differences were reconciled with the assumptions of MRP-227-A or provide a plant-specific aging management program for affected components as appropriate.*

1.1 H. B. Robinson Unit 2 Evaluation

Westinghouse has evaluated the H. B. Robinson Unit 2 (CPL) reactor internals components with regard to fuel designs and fuel management according to industry guideline MRP 2013-025 [2].

H. B. Robinson Unit 2 has not utilized atypical fuel designs or fuel management that could make the assumptions of MRP-227-A regarding core loading/core design non-representative, including power changes/uprates that have occurred over the operating lifetime of the unit. This conclusion is based on comparisons of the H. B. Robinson Unit 2 core geometry and operating characteristics with the MRP-227-A applicability guidelines for Westinghouse-designed reactors specified in MRP 2013-025 [2].

Specifically, the following comparisons with the MRP-227-A applicability guidelines in MRP 2013-025 [2] were established for the key reactor internals components at H. B. Robinson Unit 2.

1.1.1 Components Located Beyond the Outer Radius of the Reactor Core

Guideline 1 - The reactor has been operated with out-in fuel management for 30 effective full-power years or less and all future operation will use low-leakage fuel management.

Comparison - H. B. Robinson Unit 2 initiated low-leakage fuel management strategy in the ninth fuel cycle following 7.3 effective full-power years (EFPY) of operation and has been implementing low-leakage core designs since that time. There are no current plans to return to out-in fuel management.

Guideline 2 - For operation going forward the average power density of the reactor core (as defined in MRP 2013-025 [2]) shall not exceed 124 W/cm^3.

Comparison - For the last seven operating fuel cycles (Cycles 22 through 28), H. B. Robinson Unit 2 has been operating at a rated power level of 2339 MWt. For the 157 fuel assembly H. B. Robinson Unit 2 core geometry, the 2339 MWt power level corresponds to a core power density of 90.1 W/cm^3. This level of power generation is also representative of anticipated future operation.

Guideline 3 - For operation going forward, the nuclear heat generation rate figure of merit (HGR-FOM) (as defined in MRP 2013-025 [2]) shall not exceed 68 W/cm^3.

Comparison - For the last seven operating fuel cycles at H. B. Robinson Unit 2, the HGR-FOM at key baffle locations has ranged between [ ]^{a,c}. This range of HGR-FOM is representative of anticipated future operation.

1.1.2 Components Located Above the Reactor Core

Guideline 1 - Considering the entire operating lifetime of the reactor, the average power density of the core (as defined in MRP 2013-025 [2]) shall not exceed 124 W/cm^3 for a period of more than two effective full-power years.

Comparison - Over the operating lifetime of the H. B. Robinson Unit 2 reactor, the rated core power level, including power uprates, has varied between 2200 MWt and 2339 MWt. This variation of rated power level corresponds to a power density range of 82.9 W/cm^3 to 90.1 W/cm^3.

Guideline 2 - Considering the entire operating lifetime of the reactor, the distance between the top of the active fuel stack and the bottom of the upper core plate (UCP) shall not be less than 12.2 inches for a period of more than two effective full-power years.

Comparison - For the H. B. Robinson Unit 2 reactor internals and fuel assembly geometry, the nominal distance between the top of the active fuel stack and the bottom of the UCP averaged over the first 28 fuel cycles of operation was [ ]^{a,c}. During that period of time the nominal distance between the UCP and the top of the active fuel was not less than 12.2 inches.

1.1.3 Components Located Below the Reactor Core

Based on the discussion provided in MRP 2013-025 [2], plant-specific applicability of MRP-227-A for components located below the reactor core with no further evaluation required is demonstrated by meeting the MRP-227-A, Section 2.4 criteria. The basic assumptions of MRP-227-A, Section 2.4 are met by H. B. Robinson Unit 2.

2 References

1. U.S. NRC Document, "RE: Robinson, Unit 2 PWR Vessel Internal Program Plan for Aging Management – Revised Requests for Additional Information (RAIs) (TAC No. ME9633)," September 23, 2013. (NRC ADAMS Accession No. ML13266A240)

2. EPRI Letter, MRP 2013-025, "MRP-227-A Applicability Template Guideline," October 14, 2013.