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ATTN: Document Control Desk
U.S. 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

SUBJECT: RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI) REGARDING LICENSE AMENDMENT REQUEST PROPOSING TO ADD A QUALIFIED OFFSITE CIRCUIT TO TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES - OPERATING" AND THE USE OF LOAD TAP CHANGERS IN THE AUTOMATIC MODE OF OPERATION ON THE STARTUP TRANSFORMERS

REFERENCES:

1. Duke Energy letter, *License Amendment Request Proposing to Add a Qualified Offsite Circuit to Technical Specification 3.8.1, "AC Sources - Operating" and the Use of Load Tap Changers in the Automatic Mode of Operation on the Startup Transformers*, dated September 27, 2017 (ADAMS Accession No. ML17270A041).

2. Nuclear Regulatory Commission email, *Robinson RAIs – LAR to Revise TS to Add a 2nd Qualified Offsite Power Circuit and Revise UFSAR to Operate LTCs in Automatic Mode*, dated April 18, 2018 (ADAMS Accession No. ML18108A759).

Ladies and Gentlemen:

By letter dated September 27, 2017 (Reference 1), Duke Energy Progress, LLC (Duke Energy) submitted a License Amendment Request (LAR) for H.B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP). The proposed amendment would revise Technical Specifications (TSs) to reflect the addition of a second qualified offsite power circuit. In addition, the proposed amendment would revise the licensing basis to allow for the use of load tap changers (LTCs) in automatic mode on the new 230 kV and replacement 115 kV startup transformers.

By email dated April 18, 2018 (Reference 2), a request for additional information (RAI) was sent to Duke Energy regarding the original application. Duke Energy's response to the RAI is provided in the Enclosure to this letter.

In accordance with 10 CFR 50.91, "Notice for Public Comment; State Consultation," a copy of this application, with attachments, is being provided to the designated South Carolina Official.

If you should have any questions regarding this submittal, please contact Mr. Kevin Ellis, Manager - Regulatory Affairs at 843-951-1329.

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

Executed on 16 MAY 2018.

Sincerely,

Ernest J. Kapopoulos, Jr.
Site Vice President

EJK/jrc

Enclosure: Response to NRC Request for Additional Information

cc (with Enclosure):

C. Haney, NRC Region II – Regional Administrator
J. Rotton, NRC Senior Resident Inspector – RNP
D. Galvin, NRR Project Manager – RNP
S. E. Jenkins, Chief, Bureau of Radiological Health (SC)
A. Wilson, Attorney General (SC)

bcc (with Attachments):

Chris Nolan
Art Zaremba
Jordan Vaughan
John Caves
File: (Corporate)
Electronic Licensing Library (ELL)

Ernie Kapopoulos
Jim Kammer
John Krakuszeski
Chuck Sherman
Kevin Ellis
Ken Ashe
Mark Woodrum
Neil Belanger
Christine Caudell (For RNP Licensing/Nuclear Records Files)

ENCLOSURE

Response to NRC Request for Additional Information

LICENSE AMENDMENT REQUEST REGARDING REVISION TO TECHNICAL SPECIFICATION 3.8.1 AND ADDITION OF A SECOND QUALIFIED OFFSITE CIRCUIT WITH NEW STARTUP TRANSFORMERS AND LOAD TAP CHANGERS IN AUTOMATIC MODE

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

Response to NRC Request for Additional Information

By letter dated September 27, 2017 (ADAMS Accession No. ML17270A041), Duke Energy Progress, LLC (Duke Energy) submitted a License Amendment Request (LAR) for H.B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP). The proposed amendment would revise Technical Specifications (TSs) to reflect the addition of a second qualified offsite power circuit. In addition, the proposed amendment would revise the licensing basis to allow for the use of load tap changers (LTCs) in automatic mode on the new 230 kV and replacement 115 kV startup transformers.

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EEOB RAI-1

Section 3.3 of the LAR summarizes additional information the licensee generated to support the proposed change: (1) Grid Voltage Profile Summary (i.e., Grid Stability Study), (2) Steady State and Transient Load Flow Summaries, and (3) Short Circuit Analysis (i.e., Fault Analysis) Summary.

The reference section of the LAR does not list the actual calculations/analyses supporting this information. For example, calculation(s) that provide the basis for LAR Figure 3 is not identified. The staff requests this information to establish the basis for the summary results presented in the LAR.

Please provide a list of the calculations/analyses supporting the (Grid Stability Study), Steady State and Transient Load Flow Summaries/analysis, and Short Circuit Analysis (i.e., Fault Analysis) in Section 3.3 of the LAR, including document number, title, and revision number, etc.

Duke Energy Response to EEOB RAI-1

Calculation RNP-E-8.066, "RNP-E-8.002 Interim", Revision 0 (draft) supports the proposed modifications and includes the Grid Stability Study, Steady State and Transient Load Flow Summaries/Analysis, and Short Circuit Analysis (i.e., Fault Analysis). It should be noted, RNP-E-8.002, "The AC Auxiliary Electrical Distribution System Voltage/Load Flow/Fault Current Study" is the calculation for the existing plant configuration (UFSAR reference 8.3.1-1). Upon completion of the modifications, the content of RNP-E-8.066 will be incorporated into RNP-E-8.002.

EEOB RAI-2

Robinson was licensed to draft General Design Criteria (GDC) published in the in Federal Register on July 11, 1967, as described in the Robinson UFSAR Section 3.1 (ADAMS Accession No. ML17298A849). Robinson UFSAR Section 3.1.2.39, "Emergency Power," states, in part, that:

> An emergency power source shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning of the engineered safety features and protection systems required to avoid undue risk to the health and safety of the public. This power source shall provide this capacity assuming a failure of a single active components. (GDC 39).

NUREG-0800, the Standard Review Plan (SRP), Section 8.2 (ADAMS Accession No. ML100740246), Subsection III.1.E states in part that the NRC staff should evaluate the capacity and electrical characteristics of the offsite power system to ensure that there is adequate capability to supply the maximum connected load during all plant conditions.

Section 3.3.1 of the LAR states in part that the automatic load tap changing transformers will compensate for the loss of nearby generation sources relied on for voltage support for Robinson. The LAR further states that the transmission system will be managed to ensure adequate Robinson switchyard voltage is maintained in per Figure 3 of the LAR, "Minimum Required Switchyard Voltage Profile Bounding Graph." Thus, with the addition of the load tap changers and changes in local generation sources, it appears that Figure 3 represents part of the design basis of the offsite power system, and thus it or equivalent information should be included in the UFSAR. However, Figure 3 was not included in the proposed UFSAR change sheets.

Please clarify whether information in Figure 3 of the LAR or its equivalent will be included in the UFSAR or explain why such information is not appropriately included in the UFSAR.

Duke Energy Response to EEOB RAI-2

The UFSAR will be updated to include information equivalent to Figure 3 of the LAR. The following will be added to Section 8.2.2:

> A minimum required switchyard voltage profile for the HBRSEP 115kV and 230kV switchyards was developed for the design of the startup transformers. The profile assumed an initial minimum scheduled switchyard voltage. The profile dropped to a minimum switchyard voltage of 0.9305 per unit (based on the nominal voltage of 115 or 230 kV) for the first second following an HBRSEP Unit trip, then ramped linearly to 0.96 per unit voltage over the next 6.5 seconds, reaching a steady state value of 0.96 per unit. Simulations were performed to validate the ability of the transmission system to maintain this voltage profile under a variety of credible contingencies. The 115kV and 230kV switchyard voltage response simulations confirm that the minimum required switchyard voltage profile can be expected to conservatively represent anticipated transmission system performance.

EEOB RAI-3

Robinson UFSAR Section 3.1.2.39, "Emergency Power," states, in part, that:

> An emergency power source shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning of the engineered safety features and protection systems required to avoid undue risk to the health and safety of the public. This power source shall provide this capacity assuming a failure of a single active components. (GDC 39).

Section 8.2 Subsection III.1.E of the SRP states in part that the NRC staff should evaluate the preferred power source for each path ensure that there is adequate capability to supply the maximum connected load during all plant conditions. The design should also be examined to ensure that during transfer from one power source to another the design limits of equipment are not exceeded.

In Section 3.3.2.4 of the LAR, the licensee states, "In the normal or shutdown bus alignments and when EDG A or EDG B are running in parallel with an offsite power source for surveillance testing, the momentary short circuit ratings of E1/E2 switchgear, respectively, are exceeded. HBRSEP will implement changes to procedures prior to implementation of the transmission upgrade modifications in order to limit loads on the applicable emergency bus. Limiting loads on the applicable bus will bring the fault current within the duty cycle." The LAR did not discuss how the EDG test loading requirement in Robinson TS Surveillance Requirement 3.8.1.8 with power factor ≤ 0.9 will be met with the proposed limiting of loads on the applicable emergency buses E1/E2.

Please provide a discussion on how EDG test loading requirements will be met when loads are limited and EDGs are running in parallel with an offsite power source.

Duke Energy Response to EEOB RAI-3

Although NOTE 2 of TS Surveillance Requirement (SR) 3.8.1.8 discusses the capability to perform this test while synchronized with offsite power, HBRSEP currently satisfies SR 3.8.1.8 by operating each Emergency Diesel Generator (EDG) in turn on an isolated bus and not in parallel with any other power source. This test approach is not changing. Restrictions to the operation of loads on the emergency busses to limit available fault current to within the duty cycle of the E1/E2 switchgear applies only to operations when the EDGs are in parallel with an offsite power source. This emergency bus loading restriction does not impact the performance of SR 3.8.1.8.

EEOB RAI-4

In Section 3.3.3.7 of the LAR, the conclusion section for the Transient Load Flows Summary, the licensee states, "In bus alignments N2, N3, N5, and N6, the voltage excursions fell below the maximum DGVR pick-up voltage of 433 V. As such, it would be necessary to disable DGVR relay during RCP start as required in the existing plant configuration."

However, bus alignment "N6" is not previously discussed in Section 3.3.3 of the LAR. For example bus alignment N6 is missing in the description of bus alignments in LAR Section 3.3.3 and from the discussion of bus transients – pump starts in Section 3.3.3.2 of the LAR. Therefore, the NRC staff is unable to review the licensee's conclusion regarding bus alignment N6 in Section 3.3.3.7 of the LAR.

Please provide a discussion of bus alignment N6 sufficient to support the conclusion in LAR Section 3.3.3.7, including a description of the bus alignment N6 and applicable transients.

Duke Energy Response to EEOB RAI-4

Inclusion of the N6 alignment in the conclusion section 3.3.3.7 was in error. This alignment represented operation of the unit at 100% power with both the Unit Auxiliary Transformer and the 230kV Startup Transformer both out of service. This distribution system alignment resulted in exceeding equipment ratings during fault conditions and HBRSEP eliminated this as a possible alignment.

The verbiage of section 3.3.3.7 is hereby revised as indicated below:

LAR, section 3.3.3.7, second paragraph:

> However, in bus alignments N2, N3, N5 and N6, the voltage excursions do fall below the maximum DGVR pickup voltage of 433V. Therefore, while operating in these bus alignments, it is necessary to disable the DGVR relay during a RCP start as already required in the existing plant configuration.

Revised:

> However, in bus alignments N2, N3, and N5, the voltage excursions do fall below the maximum DGVR pickup voltage of 433V. Therefore, while operating in these bus alignments, it is necessary to disable the DGVR relay during a RCP start as already required in the existing plant configuration.

LAR, section 3.3.3.7, fourth paragraph:

> In bus alignments N5 and N6, while starting a RCP with the LTC in automatic position, results in bus overvoltage conditions due to the LTC overshooting the setpoint. In these bus alignments, the LTC will be placed in the manual position during a RCP start.

Revised:

> In bus alignment N5, starting a RCP with the LTC in automatic position results in a bus overvoltage condition due to the LTC overshooting the setpoint. In bus alignment N5, the LTC will be placed in the manual position during a RCP start.