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10 CFR 50.90

August 18, 2016
GO2-16-124

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
RESPONSE TO LICENSE AMENDMENT REQUEST - OPPORTUNITY TO SUPPLEMENT

Reference:
1. Letter GO2-16-096 from A. L. Javorik (Energy Northwest) to NRC: "License Amendment Request to Revise Operating License and Technical Specifications for Measurement Uncertainty Recapture (MUR) Power Uprate," dated June 28, 2016 (ADAMS Accession No. ML16183A365)
2. E-mail from NRC to L. L. Williams (Energy Northwest)," Request for conference call, Columbia MUR LAR list of insufficiencies, within 5 working days from today," dated August 2, 2016
3. Letter from NRC to M. E. Reddemann (Energy Northwest), "Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Measurement Uncertainty Recapture Power Uprate Amendment," dated August 8, 2016

Dear Sir or Madam:

By letter dated June 28, 2016 (Reference 1) Energy Northwest submitted a Measurement Uncertainty Recapture license amendment request (LAR) for Columbia Generating Station (Columbia) to revise the operating license and technical specifications to implement an increase in rated thermal power from the current licensed thermal power of 3486 megawatts thermal (MWt) to 3544 MWt.

By e-mail dated August 2, 2016, (Reference 2) Energy Northwest was informed of the current results of the U.S. Nuclear Regulatory Commission (NRC) staff's acceptance review of the LAR and concluded that to make an assessment as to the acceptability of the LAR, more information was needed regarding electrical equipment design. By letter dated August 8, 2016, (Reference 3) the NRC detailed the requested information which was discussed during the phone conversation between the NRC staff and Energy

Northwest on August 5, 2016. Energy Northwest committed to provide the additional information by August 18, 2016. The attachment to this letter provides the requested information.

In accordance with 10 CFR 50.91, a copy of this supplement, with attachments, is being provided to the designated Washington State Official.

The No Significant Hazards Consideration Determination (NSHCD) provided in the original submittal is not altered by this submittal. No new commitments are being made by this letter.

If you should have any questions regarding this submittal, please contact Ms. L. L. Williams, Licensing Supervisor, at 509-377-8148.
I declare under penalty of perjury that the foregoing is true and correct. Executed on the 18th day of August, 2016.

Respectfully,

A. L. Javorik
Vice President, Engineering

Attachments: As stated.

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Sr. Resident Inspector - 988C
CD Sonoda - BPA/1399 (email)
WA Horin - Winston & Strawn (email)
RR Cowley - WDOH (email)
EFSEC @utc.wa.gov (email)

In response to the August 8, 2016 letter, Energy Northwest submits the following responses.

1. Emergency Diesel Generators

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the Columbia Generating Station measurement uncertainty recapture power uprate license amendment request (LAR) dated June 28, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML 16183A365), Section 3.4.5, "Grid Stability Studies," and LAR Enclosure 9,[1] NED0-33853, Revision 0, "Safety Analysis Report for Columbia Generating Station, Thermal Power Optimization," June 2016, Section 6.1, "AC [Alternating Current] Power, and Section 6.1.2, "On-Site Power," and found there is no documentation on emergency diesel generator loading impact due to the power uprate (i.e., the impact of the increased thermal power from 3486 MWt to 3544 MWt on emergency diesel generator loads). Additionally, there is no documentation discussing the LAR's impacts and assessment against battery chargers.

Energy Northwest Response:

Columbia Generating Station's (Columbia's) onsite power system is designed to supply the power requirements of all auxiliary plant loads during normal operation and engineered safety feature (ESF) loads when required to support shutdown and to maintain the unit in a safe condition following a design basis accident.

Alternating current (AC) power to the onsite power system is supplied by (i) the main generator through a 25 kV connection to two auxiliary transformers TR-N1 (4.16 kV) and TR-N2 (6.9 kV) during normal plant operation, (ii) from two General Design Criteria (GDC) 17 offsite power circuits from a 230 kV and 115 kV network interconnection at the startup and backup transformers, TR-S and TR-B, respectively, when the main generator is not available to supply station auxiliaries, or (iii) from standby power system emergency diesel generators dedicated to three divisional (1, 2, 3) load group Class-1E 4.16 kV switchgear buses if the offsite power connections are not available to support emergency core cooling system (ECCS)/ESF design functions as described in the Columbia Final Safety Analysis Report (FSAR).

The two redundant ESF electrical load groups (Division 1 and 2) supplying low pressure ECCS and ESF systems are provided with separate onsite standby power sources (emergency diesel generators), electrical buses, branch circuit distribution cables, pump and valve motor loads for low-pressure core spray (LPCS), low-pressure coolant injection (LPCI), standby service water (SW), control rod drive (CRD), and other ESF functions, associated motor controls, protective relays and other support electrical equipment (including battery chargers supporting the Division 1 and 2 Class1E 125 V and 250 V DC stationary batteries). The third electrical load group supplies power required for the high-pressure core spray (HPCS) ECCS. The HPCS power supply consists of the 4.16 kV HPCS switchgear bus, HPCS pump motor and standby diesel generator, and the associated 480 V HPCS auxiliary distribution system supplying

[1] Enclosure 7 is the proprietary version designated as NEDC-33853, Revision 0, "Safety Analysis Report for Columbia Generating Station, Thermal Power Optimization," June 2016

motor-operated valves, and other supporting electrical equipment (including the battery charger supporting the Division 3 Class 1E 125 V DC stationary battery). Note that the Division 3 HPCS dedicated load group 4.16kV switchgear bus does not feature a backup offsite source connection to the 115 kV network.

Each ECCS/ESF (Division 1 and 2) and HPCS (Division 3) load group's capacity to supply connected loads is based upon requirements for normal, transient and accident operating conditions as described in the FSAR.

Emergency operation at the thermal power optimization (TPO) level is achieved by utilizing existing equipment operating at or below equipment nameplate ratings and within the calculated brake-horsepower necessary for the respective ECCS/ESF pump motors and associated valve motors to meet ECCS and ESF performance objectives. Energy Northwest has reviewed the emergency diesel generator loading calculations and results from the TPO uprate review. This review shows that there will be no reactor power dependent increase in pump motor or valve motor flow or pressure requirements that would result in brake-horsepower drive motor increases. Additionally, the analysis of ECCS system performance is bounded by the 102% analysis of the current licensed thermal power which shows the present standby power system (emergency diesel generators) capacity remains adequate.

As a result, with plant operation at the TPO level, the standby power systems (emergency diesel generators) supplying the Division 1, 2 and 3 load groups will continue to have sufficient capacity to support all required loads necessary for safe shutdown, to maintain a shutdown condition, and to support required ECCS/ESF equipment following a design bases accident.

The AC power requirements for the Division 1, 2, and 3 battery chargers were also reviewed against the FSAR requirement to supply connected loads while simultaneously recharging the associated stationary battery. Similar to the onsite AC power systems' larger power apparatus evaluated above, there are no TPO power level related changes to DC loads that would require higher charger capacities. Therefore, the present battery charger capacity remains adequate.

2. AC Power Off-Site and Switchyard Equipment

The NRC staff reviewed LAR Enclosure 9,[1] NED0-33853, Revision 0, Section 6.1, "AC Power," and Section 6.1.1, "Off-Site Power," and found a lack of information regarding the power uprate's impact on electrical equipment ratings in switchyard. Specifically, the LAR does not discuss what switchyard equipment was reviewed for impacts, how an assessment was made against this equipment (by what analyses or standard), nor does the LAR state a cumulative summary of the impact made, if any, of the power uprate against the switchyard and its equipment.

Energy Northwest Response:

The off-site power analysis included a comparison of the off-site power system components before and after a 1.66 percent MWt power uprate to determine if sufficient

design margin exists to perform its functions at the uprated conditions. The analysis was performed by establishing which of the off-site power system's design parameters change as a result of the uprated conditions and then evaluating those changes relative to the off-site power system's existing capacity. The evaluation considered the existing generator running MW from November 2012 to March 2015. The average summer generator output was determined to be 1158 MWe and the average winter generator output was 1172 MWe. The generator typically operates at approximately 1172 MWe. Assuming a 1.66% increase in generator output, the generator would provide approximately 1192 MWe which is below the generator rating shown in Table 6.1 of Enclosure 7 of Reference 1; therefore, the generator capacity is sufficient for the uprated conditions.

The generator and switchyard transformer ratings were previously provided in Enclosure 7 of Reference 1. The existing plant equipment has been sized to permit nameplate full power operation of the main generator within its capability curve when connected to the Federal Columbia River Transmission System (FCRTS) under normal and abnormal operating conditions.

Operation of Columbia at the TPO level will not require modifications to the generator, bus duct, main transformer, transmission line, or Ashe 500 kV bus power circuit breaker capacity. No changes to associated high voltage structures are required under normal operation or abnormal faulted equipment conditions (as from short circuits). There are no modifications required to the offsite power equipment supporting station service along the qualified GDC-17 circuit paths. There are no TPO level power changes to ECCS and ESF equipment capacity and any incremental increase in brake-horsepower requirements for thermal power related to the condensate system equipment in the turbine generator thermal cycle for power generation remain within the rating of the normal auxiliary and startup transformer, the associated 4.16 kV and 6.9 kV bus duct, the 230 kV transmission line and 230 kV PCB at the Ashe 230 kV bus to support the offsite power connection to TR-S for initial shutdown following a turbine generator trip.

Therefore, the offsite circuit path from the main generator output along the 25 kV iso-phase bus duct through the main transformer bank to the 500 kV Ashe bus power circuit breakers (PCBs), including the 500 kV line and associated 500 kV hard bus connections to Columbia's main step up transformers in the transformer yard will continue to support operation at the nameplate output capacity of the unit.

3. DC Power

The NRC staff reviewed LAR Enclosure 9,[1], NED0-33853, Revision 0, Section 6.2, "DC [Direct Current] Power," and found a lack of information regarding the power uprate's impact on Class 1 E 125 Volt DC electrical loading. The LAR does not also state if a review of the leading edge flow meter's electrical distribution loading was complete and did not provide a summary of those results.

Energy Northwest Response:

The direct current (DC) loading requirements documented in the FSAR and station load calculations were reviewed, and no reactor power-dependent loads were identified. The Class 1E 125 V and 250 V DC power distribution system provides control and motive power for various systems and components (DC valves, protection circuits, instrumentation and controls, etc.)

Typically, these loads are used as inputs for the computation of capacity for distribution equipment, voltage drop for operation of connected equipment, and short circuit current values for selection of protection devices and specification of equipment with adequate withstand ratings. Operation at the TPO level does not increase any load capacity, available short circuit capacity (affecting selection of protective devices) or revise control circuit burden or operating logic (affecting equipment selection or affecting control or periodic testing of connected loads).

There are no changes to the DC system load, voltage drop or short circuit current values required to operate at the TPO level. The plant's DC equipment and the design basis analysis of the DC power systems, including the Class 1E 125 V DC and 250 V DC systems, remain adequate and unaffected by this change.

The Leading Edge Flow Meter (LEFM) modification was installed in refueling outage R22 (2015). The LEFM electronics required additional 120 V AC power. The modification was completed in accordance with the station's design modification and work control procedures which require updating associated calculations and drawings that included in a revision to the low voltage loading calculation and the associated AC distribution calculations. All changes to supporting calculations for the LEFM modification were evaluated and found to be within the applicable acceptance criteria.

References

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