DRAFT

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST

HIGH FLUX TRIP FOR 3 RCP OPERATION

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NO'S. 50-269, 50-270, AND 50-287

By letter dated May 19, 2015,[1] as supplemented by letter dated August 20, 2015, [2] Duke Energy Carolinas, Inc., (Duke) requested a license amendment to add a High Flux trip for 3 reactor coolant pump operation to the Technical Specifications (TS) for the Oconee Nuclear Station, Units 1, 2, and 3 (ONS). The request for additional information (RAI) questions listed below are needed to support U.S. Nuclear Regulatory Commission (NRC) staff's continued technical review of the proposed TS change.

RAI- 01

The proposed Nuclear Overpower-High Setpoint Trip function allowable value in TS Table 3.3.1-1 has a trip setpoint valid for four reactor coolant pump (RCP) operation (≤105.5 percent (%) Reactor Thermal Power (RTP)) and a trip setpoint for three RCP operation (≤80.5% RTP). After going to three RCP operation, overpower protection is initially provided by the Nuclear Overpower Flux/Flow/Imbalance trip function until such a time that the 3-RCP allowable value is manually entered as the trip setpoint. In its Technical Evaluation provided in Section 4 of the License Amendment Request (LAR), Duke states, in part, that:

> The existing overpower protection for three RCP operation is the Nuclear Overpower Flux/Flow/Imbalance trip function. However, if [Reactor Coolant System] RCS flow were to increase, as it would for an overcooling event such as a steam line break accident described in UFSAR Chapter 15.17, the flux/flow/imbalance trip setpoint would increase. This increase would result in either a delayed reactor trip or avoidance of a reactor trip altogether.

If the RCS flow situation is such that there could be an "avoidance of a reactor trip altogether," what are the current alternate trip protection functions available?

RAI- 02

In its LAR, Duke proposed Limiting Condition for Operation (LCO) 3.4.4.b, which restricts thermal power to ≤75% when only three RCPs are operating and requires the allowable value of the Nuclear Overpower-High Setpoint Trip function to be reset for three RCPs operating. Duke also proposed a new Condition A to TS 3.4.4 specifies a 10 hour COMPLETION TIME to perform this reset. The 10 hour COMPLETION TIME is consistent with the Davis-Besse Nuclear Power Station Unit 1 TS, which was referenced as a precedent in Duke's LAR.

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML15146A056.
[2] ADAMS Accession Number ML15239B290.

Other than the precedent discussed above, please provide additional specific factors considered in the bases for the selection of this 10 hour COMPLETION TIME.

RAI-03

In its response to Information Request-4, provided by letter dated August 20, 2015, Duke provided an explanation for the proposed TS allowable value setpoint of 80.5% RTP, by stating, in part, that:

> The 5.5% RTP delta is simply added to the maximum power level allowed for three RCP operation, which is 75% RTP. Adding 5.5% RTP to 75% RTP results in the proposed high flux trip setpoint of 80.5% RTP.

Duke also provided the following formula:

$\Phi m \geq \Phi sp$ + trip setpoint uncertainty allowance

Where Φm = flux measured at excore detectors adjusted for transient effects (e.g., downcomer attenuation) and excore detector calibration tolerances,

Φsp = Technical Specification allowable value trip setpoint

Trip setpoint uncertainty = current analysis assumes 1.0% RTP for convenience since that is the old analog RPS trip bistable uncertainty and it bounds the uncertainty on the setpoint in the digital RPS. There is no uncertainty on the trip setpoint in the digital RPS.

Please explain if this means that the actual application of the calibration of the trip setpoint is Φm + 0.01 Φm (at RTP power) = Φsp x A/D conversion factor ≤ 80.5 % RTP following Analog/Digital conversion for RPS digital trip unit for the 3 RCP trip setpoint. Also, please provide further clarification including sample calculations as necessary and explain how the [Φm] and [Φm (at RTP power)] are determined (i.e., how is the analog signal received from the excore neutron flux detectors and/or pre-amps adjusted to account for uncertainties and set to the 100% digital power indication to match the known 100% RTP [MWt heat balance]).

RAI- 04

In Section 2 of the LAR, Duke states, in part, that:

> The three (3) RCP trip will provide protection for power excursion events initiated from three (3) RCP operation, most notably the small steam line break accident.

Please provide a list of accidents discussed in the UFSAR that are initiated from three RCP operation (not including the small steam line break (SSLB) since it's thoroughly discussed in the application). Please also briefly describe the impact on these accidents once the new three RCP Nuclear Overpower-High setpoint trip is implemented.

RAI-05

In its response to NRC Information Request 3, provided by letter dated August 20, 2015, Duke states, in part, that:

The analysis of the three RCP SSLB with the proposed high flux trip setpoint for when three RCPs are operating demonstrates that true core power is significantly reduced before reactor trip occurs.

With the new trip implemented, please estimate the time when the trip is expected to occur and the maximum actual core power for the current limiting case in the UFSAR. Would changing any of the initial conditions cause a significant delay or avoid exceeding the new trip setpoint completely? If so, would any of these cases be the limiting DNB case for 3 RCP operation?