

**From:** Wiebe, Joel  
**Sent:** Thursday, May 7, 2020 12:43 PM  
**To:** Nicely, Ken M.:(GenCo-Nuc) (ken.nicely@exeloncorp.com)  
**Subject:** Preliminary RAIs for Clinton Load Tap Changer License Amendment Request

Ken,

If you want a clarification call, let me know by May 14, 2020.

Joel

By application dated January 14, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20014E719, Exelon Generation Company, LLC (EGC) (the licensee) requested a license amendment request (LAR) to revise the Clinton Updated Safety Analysis Report (USAR). Specifically, the license amendment request (LAR) would allow EGC to implement the use of an automatic load tap changer (LTC) on the emergency reserve auxiliary transformer (ERAT). The ERAT provides offsite power to Clinton Power Station (CPS), Unit 1.

The NRC staff has identified the need for following additional information to complete the review of LAR:

### **Applicable Regulatory Requirements**

Title 10 of Code of Federal Regulations (CFR) Part 50, Appendix A, "General Design Criteria (GDC) for Nuclear Power Plants," Criterion 17, "Electric power systems," requires, in part, that offsite power be available to the facility to ensure that specified fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

According to the CPS, Updated Safety Analysis Report (USAR), Section 8.2.2.1, offsite alternating current (a-c) power is supplied to the CPS switchyard from the Ameren Illinois grid system and meets the requirements of GDC 17 of Appendix A to 10 CFR 50. To satisfy GDC 17, the voltages provided to safety-related equipment must be adequate (within certain design limits) for satisfactory functioning of equipment.

10 CFR 50.90 requires that whenever a holder of a license wishes to amend the license, including technical specifications in the license, an application for amendment must be filed, fully describing the changes desired.

### **Request for Additional Information (RAI)**

#### **RAI # 1**

On Page 2 of the LAR, Attachment 1, the licensee stated, "the proposed change requests NRC approval to operate the ERAT LTC in the automatic mode (i.e., in lieu of the static VAR compensator (SVC)) to regulate the voltage at the safety-related buses."

***The location/connection of SVC is not shown in any drawings currently available in the USAR, Chapter 8. Provide a copy of Drawing E02-1AP03 referenced in USAR, Chapter 8, or any other drawing which shows location/connection of SVC.***

[Regulatory Basis: Under 10 CFR 50.90, whenever a holder of a license wishes to amend the license, including technical specifications in the license, an application for amendment must be filed, fully describing the changes desired.]

## **RAI # 2**

On Page 6 of the LAR, Attachment 1, the licensee stated that in the automatic mode, the LTC is controlled by a primary VRR [voltage controller] and a backup VBR [voltage controller]. The function of the VRR/VBR is to control the ERAT's secondary voltage by adjusting LTC tap position on the primary winding. The VRR/VBR gets its voltage feedback signal from a potential transformer (PT) on the LTC ERAT secondary winding. The VRR/VBR requires user input setpoints for its voltage control point (i.e., Bandcenter), and tolerance around that voltage control point (i.e., Bandwidth).

***Regarding LTC and VRR/VBR, provide the following information:***

***(a) Provide a frontal diagram of the LTC control panel showing location and name tag of each device.***

***(b) Describe how the VRR Bandcenter and Bandwidth setpoints will be set to provide adequate voltage at the Class 1E 4.16 kV ESF buses (within certain design limits) for satisfactory functioning of ESF equipment.***

[Regulatory Basis: (a) Under 10 CFR 50.90, whenever a holder of a license wishes to amend the license, including technical specifications in the license, an application for amendment must be filed, fully describing the changes desired; (b) GDC 17]

## **RAI # 3**

On Page 7 of the LAR, Attachment 1, the licensee stated that in the event VRR fails, and the voltage rises or falls outside its operating voltage band, the VBR controller will take over automatic operation of the LTC. The VBR also utilizes a redundant relaying scheme to ensure the LTC does not raise or lower the voltage beyond the limits set within the VBR itself. Also, in the LAR, Attachment 1, Page 8, the licensee stated that the VBR will also lower the voltage if the regulated voltage remains above the upper voltage limit past its time delay setpoint.

***Describe how the VBR limits and time delay setpoint will be set to provide adequate voltage at the Class 1E 4.16 kV ESF buses if the VRR lowers the voltage too much and to prevent exceeding the maximum voltage requirements on the Class 1E 4.16 kV ESF buses if the VRR raises the voltage too much.***

[Regulatory Basis: GDC 17]

#### **RAI # 4**

On Page 4 of the LAR, Attachment 1, the licensee stated that an engineering evaluation has been performed to determine the acceptability of using the ERAT LTC in automatic mode without the ERAT SVC.

***Regarding the impact of LTC in automatic mode on safety-related voltages, provide the following information: (a) The minimum steady state voltages calculated at safety-related buses in the scenario "138 kV system voltage at 0.94 pu, ERAT LTC in automatic operation with ERAT SVC out-of-service, and maximum LOOP/LOCA loading condition." (b) The maximum steady state voltages calculated at safety-related buses in the scenario "138 kV system voltage at 1.06 pu, ERAT LTC in automatic operation with ERAT SVC out-of-service, and minimum loading condition."***

[Regulatory Basis: GDC 17]

#### **RAI # 5**

On Page 9 of the LAR, Attachment 1, the licensee stated that the failure probability of the ERAT LTC to spuriously operate or to have a failure of both controllers due to a failure common to both of the controllers was calculated to be 9.77E-07.

***Please provide a summary of the relevant calculation information that determined the failure probability of the ERAT LTC to spuriously operate or to have a failure of both controllers due to a common failure to be 9.77E-07, very low and acceptable.***

[Regulatory Basis: GDC 17]

#### **RAI # 6**

In the LAR, Attachment 2, the licensee provided proposed mark-up of USAR Page 8.3-8. In particular, the markup includes the following bullet: "In the automatic mode, a controller in the ERAT LTC raises or lowers the tap setting in response to grid voltage. A backup controller provides oversight of the primary controller, preventing tap movement above or below prescribed setpoints."

***The staff requests more detail associated with the above description proposed to be provided in the USAR Page 8.3-8. Provide a brief discussion of the primary controller [VRR] and secondary controller [VBR] setpoints. Also, provide a discussion of high and low voltage alarms relating to voltages on safety-related buses, based on which an operator would take actions, whenever the ERAT LTC would be in automatic mode.***

[Regulatory Basis: Under 10 CFR 50.90, whenever a holder of a license wishes to amend the license, including technical specifications in the license, an application for amendment must be filed, fully describing the changes desired.]

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