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RS-21-087

August 31, 2021

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Additional Information Supporting Request for License Amendment to Revise Degraded Voltage Relay Allowable Values

References:

1. Letter from P. R. Simpson (Exelon Generation Company, LLC) to U.S. NRC, "Request for License Amendment to Revise Degraded Voltage Relay Allowable Values," dated January 20, 2021

2. Email from J. Wiebe (U.S. NRC) to K. M. Nicely (Exelon Generation Company, LLC), "Preliminary Request for Additional Information Regarding Clinton Request to revise Degraded Voltage Instrumentation Setpoints (EPID L-2021-LLA-0005)," dated August 13, 2021

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. Specifically, the proposed change revises the degraded voltage reset and drop-out allowable values that are listed in Technical Specifications (TS) 3.3.8.1, "Loss of Power (LOP) Instrumentation," Table 3.3.8.1-1, "Loss of Power Instrumentation."

The NRC requested additional information that is needed to complete review of the proposed change in Reference 2. In response to this request, EGC is providing the attached information.

EGC has reviewed the information supporting a finding of no significant hazards consideration, and the environmental consideration, that were previously provided to the NRC in Attachment 1 of Reference 1. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the additional information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 31st day of August 2021.

Respectfully,

Patrick R. Simpson
Sr. Manager Licensing

Attachment: Response to Request for Additional Information

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector – Clinton Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT
Response to Request for Additional Information

NRC Request 1

On Page 4 of Attachment 1 of the LAR, the licensee states: "The basis for the dropout Allowable Value lower limit ensures adequate voltage to start plant equipment under non-LOCA [Loss of Coolant Accident] loading conditions."

On Page 16 of Calculation IP-E-0032 (Attachment 4 of LAR), the licensee states: "Per Section 8.1.3 of Reference 6.7.3, the Analytical Limit for the minimum degraded voltage relay Dropout (i.e. trip) voltage is 4035 Volts (V) on the primary bus. All loads connected to Buses 1A1, 1B1 and 1C1 have acceptable voltage under steady state LOCA Loading at 4035 V."

Explain the relationship between the above non-LOCA and LOCA loading statements with respect to the degraded voltage relay dropout voltage.

Response

As described in Technical Specifications (TS) Bases Section 3.3.8.1, during a LOCA, the ECCS and other safety systems will be initiated at the start of the event. This large loading of the safety buses results in a voltage transient of sufficient magnitude to start the degraded voltage timers. If the degraded voltage relays do not reset, which requires the voltage to be restored to a level above the relay reset setpoint, the bus undervoltage time delay relays will trip, resulting in bus transfer to the Diesel Generators (DGs).

Therefore, the dropout lower limit is not selected to ensure adequate voltage to the buses during a LOCA loading scenario.

The wording on page 4 of Attachment 1 of the LAR quoted above refers to ensuring adequate voltage to start plant equipment under non-LOCA loading conditions. These conditions would be considered steady state operation prior to a degraded voltage condition occurring and with no LOCA loading on the buses. Therefore, if during steady state operation the grid voltage begins to degrade, the second level undervoltage trip setpoint is selected to ensure adequate voltage to start plant equipment.

The voltage transient associated with a LOCA block start is sufficient to pull voltage below the dropout setpoint and start the timer. However, voltage must recover above the timer reset voltage to prevent transfer to the DG and allow continued operation of the LOCA loads on the offsite source. The wording on Page 16 of Calculation IP-E-0032 quoted above refers to steady state LOCA loading (i.e., after the LOCA block start voltage transient).

NRC Request 2

The licensee has provided the Analytical Limits (Voltage) for reset and drop out values on Pages 15-16 of Calculation IP-E-0032 [Attach 4 of LAR], which are based on Reference 6.7.3 of the Calculation IP-E-0032 [Reference 6.7.3: Calculation No. 19-AK-13, Revision 4, 4A, 4B and 4C, "Analysis of Load Flow, Short Circuit and Motor Starting using ETAP Power Station."]

Provide information to clarify whether the analytical limits for degraded voltage reset and drop out values are being changed in this LAR based on the latest revision of referenced Calculation

No. 19-AK-13. If yes, please provide supplemental information relating to analytical limits, such as the relevant summary of Calculation No. 19-AK-13, Revision 4, 4A, 4B and 4C, "Analysis of Load Flow, Short Circuit and Motor Starting using ETAP Power Station."

Response

No, the existing Analytical Limits for the degraded voltage relay dropout and reset are not changed. Previously, calculation IP-E-0032 only determined the uncertainty but did not analyze these setpoints. The uncertainty determined in IP-E-0032 was used in setpoint calculation 19-AN-19 to determine the Allowable Values and setpoints, based on the Analytical Limits from calculation 19-AK-13. In this activity, the degraded voltage relay setpoint analysis is moved from 19-AN-19 to IP-E-0032. Calculation IP-E-0032 is now changed to be an uncertainty and setpoint calculation. Using the existing Analytical Limits from 19-AK-13 which were previously utilized in 19-AN-19, the revised IP-E-0032 now determines new Allowable Values and setpoints for the degraded voltage relay dropout and reset.

Other items which are not RAIs:

On Page 51 of 219 of the LAR in Attachment 4, "CALCULATION No. IP-E-0032," (Sheet 29 of 50) the licensee calculated the total negative random errors by equation below:

$$\sigma^- = -\sqrt{RA^2 + (ATE^-)^2 + OPE^2 + SPE^2 + SE^2 + RE^2 + HE^2 + (ATE^-)^2 + REE^2 + ST^2 + CAL^2 + D^2 + \sigma in^2}$$

$$\sigma^- = \sqrt{(-0.0590)^2 + (-0.2273)^2 + 0^2 + 0^2 + 0^2 + 0^2 + 0^2 + (-0.0355)^2 + 0^2 + (-0.0133)^2 + (-0.0097)^2 + (-0.1760)^2 + (-0.0295)^2}\ Vac$$

$$\sigma^- = -0.2975\ Vac \qquad [1\sigma]$$

The following items need clarification:

1. Is the "ATE⁻" (Negative Accuracy Temperature Effect, in highlight text) correct or a typo? The NRC staff verified that "-0.0355" is the value of the "PSE⁻" (Negative Power Supply Effect).

2. Is it missing a minus sign in the highlight spot?

The NRC Staff noted that the result of this equation is correct.

Response

Both of these items are typographical errors that have no impact on the calculation results. The "ATE⁻" term highlighted above should be "PSE⁻" and a leading minus sign is missing at the second highlight above. This issue has been entered into the Corrective Action Program, and the affected calculation has been revised to correct the errors.