

10 CFR 50.90

August 29, 2018

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

R. E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
NRC Docket No. 50-244

Subject: Response to Request for Additional Information - License Amendment Request: Revision to Technical Specifications to Adopt Technical Specifications Task Force TSTF-547, Revision 1, "Clarification of Rod Position Requirements"

- References:
1. License Amendment Request: Revision to Technical Specifications to Adopt Technical Specifications Task Force TSTF-547, Revision 1, "Clarification of Rod Position Requirements," dated June 25, 2018 (ML18176A327).
 2. E-mail from V. Sreenivas, Ph.D., C.P.M, NRC Licensing Project Manager, to Jessie Hodge, Exelon, "Ginna – TSTF-547 Adoption, Request for Additional Information (RAI), dated August 15, 2018 (ML18228A524).

By letter dated June 25, 2018 (Reference 1), Exelon Generation Company, LLC (EGC) requested a change to the R. E. Ginna (Ginna) Technical Specifications to Adopt Technical Specifications Task Force TSTF-547, Revision 1, "Clarification of Rod Position Requirements.

By e-mail dated August 15, 2018, (Reference 2), NRC issued a Request for Additional Information.

Attachment 1 to this letter contains the NRC's RAI as documented in Reference 2 immediately followed by Exelon's response. As previously discussed with Mr. V. Sreenivas, Exelon requests approval of the proposed amendment by September 30, 2018. This will reduce Station vulnerability to unnecessary plant transients due to required shutdown actions if multiple rod position indications in a group become inoperable. Once approved, the amendment shall be implemented within 120 days.

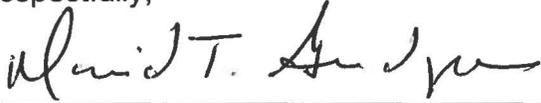
There are no commitments contained in this letter.

Should you have any questions concerning this letter, please contact Enrique Villar at (610) 765-5736.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29th of August 2018.

Respectfully,

A handwritten signature in black ink, appearing to read "David T. Gudger", written over a horizontal line.

David T. Gudger
Manager - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Attachment: 1) Response to Request for Additional Information

cc: Regional Administrator, NRC Region I
NRC Resident Inspector
NRC Project Manager
A. L. Peterson (NYSERDA)

Attachment 1

Response to Request for Additional Information

**License Amendment Request: Revision
to Technical Specifications to Adopt
Technical Specifications Task Force TSTF-547, Revision 1,
"Clarification of Rod Position Requirements"**

REQUEST FOR ADDITIONAL INFORMATION
REQUESTING LICENSE AMENEDMENT REQUEST TO
ADOPT TSTF-547, "CLARIFICATION OF ROD POSITION REQUIREMENTS"
EXELON GENERATION COMPANY, LLC
R. E. GINNA NUCLEAR POWER PLANT
DOCKET NO. 50-244

By application dated June 25, 2018 (Agencywide Documents Access and management System (ADAMS) Accession No. ML18176A327), Exelon Generation Company, LLC (the licensee) submitted a license amendment request (LAR) to revise the R. E. Ginna Nuclear Power Plant (Ginna) Technical Specifications (TSs) by adopting Technical Specifications Task Force (TSTF) change TSTF-547, "Clarification of Rod Position Requirements." The Reactor Systems Branch (SRXB) staff has determined that the following additional information is needed in order to complete its review.

1. Condition A in LCO 3.1.5 and LCO 3.1.6

The proposed TS changes would add a new Condition A to limiting Condition for Operation (LCO) 3.1.5, "Shutdown Bank Insertion Limit", and LCO 3.1.6, "Control Bank Insertion Limits". The proposed Condition A in both LCOs is applicable when one bank is inserted ≤ 8 steps beyond the insertion limit specified in the Core Operating Limits Report. The NRC staff states in its safety evaluation (ADAMS Accession No. ML15328A350) approving TSTF-547 that the bracketed number [16] should be replaced with plant specific minimum number of steps that the rods must be moved to ensure correct performance of Surveillance Requirement (SR) 3.1.4.2.

Provide the plant specific justification for use of ≤ 8 steps in Condition A in LCOs 3.1.5 and 3.1.6 in accordance with the NRC staff SE approving TSTF-547.

Exelon Response:

The proposed change to Ginna Station Technical Specifications (TS) Specification Requirement, SR 3.1.4.2 states:

"Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 8 steps in either direction."

The 8 steps is Ginna's specific minimum number of steps that rods must be moved to ensure correct performance of the SR 3.1.4.2. One step is equivalent to 0.625 inches

A value of " ≤ 8 steps" was selected as the number of allowable steps below the insertion limits specified in the proposed Condition A for LCO 3.1.5 and LCO 3.1.6. The selection of " ≤ 8 steps"

for these LCOs is consistent with the statement in the NRC's Safety Evaluation for TSTF-547 that specifies: "*Bracketed number [16] in Condition A should be replaced with plant specific minimum number of steps that the rods must be moved to ensure correct performance of Surveillance Requirement (SR) 3.1.4.2.*"

In evaluating the value of 8 steps, the following factors were considered:

- Design of the Microprocessor Rod Position Indication (MRPI) System
- Impact on the intent of the TS 3.1.5 and TS 3.1.6

Design of the Microprocessor Rod Position Indication (MRPI) System

The MRPI system provides a highly accurate indication of actual control rod position, but at a lower precision than the step counters. The system consists of one detector assembly with 10 coil pairs (coil stack) for each rod. The detectors are constructed with coils of wire spaced on 7.5-inch centers up the drive rod housing, corresponding to 12 steps of control rod movement. As the rod is withdrawn into the drive rod housing, it affects the inductance of the coils, creating a large difference in inductance between consecutive coils. A signal from each pair of detector coils is fed into the signal processing cards. Each signal processor independently monitors all rods and senses a rod bottom for any rod. The true rod position as converted from inductance of the coils is always within ± 8 steps of the indicated position (± 6 steps due to the 12-step interval and ± 2 steps transition uncertainty due to errors arising from linearity, repeatability, long term drift, power source voltage, temperature variations, and coil sensitivity).

Based on this design, each control rod position on the MRPI Cathode Ray Tube (CRT) on the Main Control Board is represented by a bar graph (blue background with yellow fill) and as a control rod is withdrawn, the yellow bar rises against the blue background in 12-step (± 8 steps) increments. To verify rod position, a change of bar graph height must be observed; i.e.: the bank must be inserted a minimum of ≥ 8 steps, as an insertion of less than 8 steps may not result in bar graph height to change. As noted above, the MRPI system is normally accurate to ± 8 steps of rod position.

It is upon this basis and the statement in the NRC's Safety Evaluation for TSTF-547 that specifies: "*Bracketed number [16] in Condition A should be replaced with plant specific minimum number of steps that the rods must be moved to ensure correct performance of Surveillance Requirement (SR) 3.1.4.2.*" that 8 steps in Condition A in LCOs 3.1.5 and 3.1.6 is justified.

Impact on the intent of the TS 3.1.5 and TS 3.1.6

The shutdown bank insertion limits (RILs) in Condition A of LCO 3.1.5 are established to ensure that a sufficient amount of negative reactivity is available to shut down the reactor and maintain the required shutdown margin (SDM). The current cycle RIL for shutdown bank is ≥ 220 steps. As an example, if the shutdown rods are parked at 223 steps, the plant specific procedure directs Operations to move Rods IN from 223 to 212 steps. MRPI transition is normally expected at 217 steps or within the acceptable transition band of 215-219 steps. A review of plant operating experience shows that Ginna station has not been challenged with meeting the acceptable transition band. Therefore, a combination of MRPI design and plant OE provide the basis for the selection of 8 steps as the minimum number of steps that Rods must be moved to ensure correct performance of verification of Rod freedom of movement as well as maintaining the intent of Condition A of LCO 3.1.5 and LCO 3.1.6.

The limits on control banks sequence, overlap, and physical insertion, as defined in the COLR, must be maintained because they serve the function of preserving power distribution, ensuring that the SDM and ejected rod worth are maintained, and ensuring adequate negative reactivity insertion is available on trip. The overlap between control banks provides more uniform rates of reactivity insertion and withdrawal and is imposed to maintain acceptable power peaking during control bank motion.

The proposed change to SR 3.1.4.2 ensures verification of freedom of the shutdown and control rods to move below the LCO limits. The minimum of 8 steps ensure satisfactory completion of SR 3.1.4.2 while the rods are monitored and controlled during power operation to ensure that safety analyses assumptions for SDM, ejected rod worth, and power distribution power peaking are preserved.

2. SR 3.1.4.2

The proposed Ginna SR 3.1.4.2 requires movement of control and shutdown rods a minimum of 8 steps in either direction. The value of 8 steps required for the minimum rod movement is different from the value of 10 steps in the corresponding SR 3.1.4.2 of TSTF-547. Section 2.2 of the LAR dated June 25, 2018 indicated that difference in the values of the minimum required rod movement is due to the differences between Digital Rod Position Indication (DRPI) and Microprocessor Rod Position Indication (MRPI) used in Ginna.

Discuss the determination of the value of 8 steps used in Ginna SR 3.1.4.2 based on Ginna's MRPI, and address acceptability of the use of 8 steps as the minimum rod movement in Ginna SR 3.1.4.

Exelon Response:

The value of 8 steps used in the Ginna's SR 3.1.4.2 is the minimum number of steps required to see a rod position transition on MRPI, hence successful completion of Surveillance requirement (SR) 3.1.4.2.

The true rod position on MRPI is always within ± 8 steps of the indicated position (± 6 steps due to the 12-step interval and ± 2 steps transition uncertainty due to errors arising from linearity, repeatability, long term drift, power source voltage, temperature variations, and coil sensitivity). Using the current cycle RIL for shutdown bank (≥ 220 steps) as an example, if the shutdown rods are parked at 223 steps, the plant specific procedure directs Operations to move Rods IN from 223 to 212 steps. MRPI transition is normally expected at 217 steps or within the acceptable transition band of 215-219 steps. Once the MRPI transition is obtained, the bank is moved OUT to its pre-test position. A review of plant operating experience shows that Ginna station has not been challenged with meeting the acceptable transition band. Therefore, a combination of MRPI design and plant OE provide the basis for the selection of 8 steps as the minimum number of steps that Rods must be moved to ensure correct performance of verification of Rod freedom of movement.

3. SR 3.1.4.2 and Condition A in LCOs 3.15 and 3.1.6

TSTF-547 uses the different values of 10 steps and [16 steps, a plant specific value] for the required rod movement in SR 3.1.4.2, and Condition A of LCOs 3.15 and 3.1.6, respectively, while Ginna uses the same value of 8 steps for both SR 3.1.4.2 and Condition A in LCOs 3.1.5 and 3.1.6.

Justify the use of the same value of 8 steps in the corresponding Ginna SR and Condition A compared to the different values for SR 3.1.4.2 and Condition A of LCOs 3.1.5 and 3.1.6 respectively approved in the NRC staff SE for TSTF-547.

Exelon Response:

The proposed change to SR 3.1.4.2 states:

"Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core ≥ 8 steps in either direction."

Specifically, the proposed change to Condition A of LCOs 3.15 and 3.1.6 respectively states:

"Shutdown bank inserted ≤ 8 steps beyond the insertion limit specified in the COLR."

"Control bank A, B, or C inserted ≤ 8 steps beyond the insertion, sequence, or overlap limits specified in the COLR."

The selection for the same value of 8 steps for SR 3.1.4.2 and Condition A of LCOs 3.15 and 3.1.6 is consistent with the statement in the NRC's Safety Evaluation for TSTF-547 that specifies: *"Bracketed number [16] in Condition A should be replaced with plant specific*

minimum number of steps that the rods must be moved to ensure correct performance of Surveillance Requirement (SR) 3.1.4.2.” As discussed in responses for question 1 and 2, a minimum of 8 steps has been evaluated based on the design of MRPI and successful completion of SR 3.4.1.2 while the rods are monitored and controlled during power operation to ensure that safety analyses assumptions for SDM, ejected rod worth, and power distribution power peaking are preserved.