REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
NEDC-34416P, REVISION 0, "ULTRA PLUS CONTROL ROD ASSEMBLY"
GE VERNOVA HITACHI NUCLEAR ENERGY
DOCKET NO. 99900003
ISSUE DATE: 06/11/2026

INTRODUCTION

By letter dated January 26, 2026 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML26026A324 Letter; ML26026A323 Package), GE Vernova Hitachi Nuclear Energy Americas, LLC (GVHA), submitted Topical Report (TR) NEDC-34416P, Revision 0, “Ultra Plus Control Rod Assembly,” for the U.S. Nuclear Regulatory Commission (NRC) staff’s review and approval. On March 10, 2026 (ML26056A048), the NRC staff held a virtual closed post-submittal meeting to discuss with GVHA the NRC completeness/acceptance review results for TR NEDC-34416P, Revision 0, including clarification on the scope of the TR and next steps for the review. By letter dated March 20, 2026 (ML26079A197), GVHA submitted “Scope Update for Ultra Plus Control Rod Assembly Licensing Topical Report.”

The proprietary information in this document is marked with double brackets and bold font.

REGULATORY BASIS

Regulatory guidance for the review of fuel rod cladding materials and fuel system designs and adherence to Title 10 of the *Code of Federal Regulations* Part 50, Appendix A, General Design Criteria (GDC) for Nuclear Power Plants, GDC-10 “Reactor Design,” GDC-27 “Combined Reactivity Control Systems Capability,” and GDC-35 “Emergency Core Cooling” is provided in NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants” (SRP), Section 4.2, “Fuel System Design.” In accordance with SRP, Section 4.2, the objectives of the fuel system safety review are to provide assurance that:

- The fuel system is not damaged as a result of normal operation and anticipated operational occurrences,
- Fuel system damage is never so severe as to prevent control rod insertion when it is required,
- The number of fuel rod failures is not underestimated for postulated accidents, and
- Coolability is always maintained.

NEDC-34416P, Revision 0, TR provides nuclear and mechanical design calculations for the Ultra Plus control blade design. The NRC staff’s review of this TR is to ensure that the Ultra Plus control blade design adequately addresses the regulatory requirements identified in SRP, Section 4.2. The Ultra Plus control blade design has been evaluated to ensure compliance with the same licensing criteria as the original Marathon-Ultra design approved by the NRC in NEDE-33284, Supplement 1P-A, Revision 1, “Licensing Topical Report, Marathon-Ultra Control Rod Assembly.” Therefore, the NRC staff’s review of the Ultra Plus control blade design followed the same logic as was used in the review for Marathon-Ultra TR.

QUESTION 1

Section 3.7, “Handling Loads,” of the TR NEDC-34416P, Revision 0, states that “As analyses show that resulting stresses are linear with respect to input control rod weight, the maximum stress values are scaled using the weight ratio of the Ultra Plus to the Marathon-Ultra control rods. Table 3-13 shows the results of the handle loads analysis, including values from the finite element model performed for Marathon-Ultra control rods and the scaled values for the Ultra Plus control rod.” Please provide justification for this statement, such as data and examples, or calculations for linear relationship relevant to Ultra Plus designs.

QUESTION 2

Section 4.1, “Design Criteria,” of the TR NEDC-34416P, Revision 0, states that a replacement control rod may meet nuclear worth requirements by demonstrating that the initial hot and cold control rod reactivity nodal worths are within ± 5% Δk/k of the original equipment control rod blade design worth. GVHA states that **[[**

]]. There is limited discussion in the TR regarding **[[**

]]. Please provide a discussion and justification of **[[** **]]**.

QUESTION 3

Section 6.5, “Surveillance,” of the TR NEDC-34416P, Revision 0, states that the end-of-life surveillance of the Marathon-Ultra control rod satisfies the end-of-life surveillance of the Ultra Plus control rod, and no additional inspections are required for the Ultra Plus control rod. Based on the NRC staff's discussions with GVHA during the NRC regulatory audit conducted by the NRC staff on May 26-27, 2026, the NRC staff's understanding is that this means that GVHA intends for Ultra Plus to be included in the inspection population along with the Marathon-Ultra control rod, under the requirements described in Section 3.3 of the NRC staff’s SE to NEDE-33284, Supplement 1P-A, Revision 1. Please provide clarification on GVHA's intentions for the current inspection program and how Ultra Plus control rods will be included in the population. Additionally, please provide justification if GVHA intends for surveillance requirements established in Section 3.3 of the NRC staff’s SE to NEDE-33284, Supplement 1P-A, Revision 1, to be relaxed.