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10 CFR 50.46

GNRO-2021/00037

November 30, 2021

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

**SUBJECT:** 2021 Annual Report of Changes and Errors to 10 CFR 50.46 Analysis  
Grand Gulf Nuclear Station, Unit 1

NRC Docket No. 50-416  
Renewed Facility Operating License No. NPF-29

**REFERENCE:** 1. Entergy letter to NRC, GNRO-2020/000, "2020 Report of Changes and Errors to 10CFR50.46," dated December 16, 2020 (ADAMS Accession No. ML20351A255).

In accordance with 10 CFR 50.46(a)(3)(ii), Grand Gulf Nuclear Station, Unit 1 (GGNS), is required to report to the Nuclear Regulatory Commission, at least annually, the estimated effect on the limiting Emergency Core Cooling System (ECCS) analysis caused by changes to, or errors discovered in, the accepted ECCS evaluation model.

Since the last 10 CFR 50.46(a)(3)(ii) report, dated December 16, 2020 [Reference 1], through December 1, 2021, there have been two errors identified. The table below summarizes the effects of the two recent notifications 2021-01 and 2021-02 to the GGNS ECCS analysis performed by General Electric-Hitachi Nuclear Energy (GEH) for the current reporting period.

The current Licensing Basis peak clad temperature (PCT) results in a projected current PCT approximately 1715°F. This is below the 2200°F acceptance criterion of 10 CFR 50.46.

Evaluation Model: SAFER/PRIME-LOCA

Notification	Nature of Change or Error to 10 CFR 50.46	Estimated PCT Effect ( $\Delta$ PCT)
2021-01	The fuel pellet to plenum spring conductance is an input to the fuel rod stress and perforation model in ECCS LOCA calculations. The error only affects the temperature and plenum gas pressure calculation in the plenum region, outside of the active fuel region. The error has an insignificant effect on the rod internal pressure calculation because the heat capacity of the spring is much smaller when compared to the fuel stored energy and decay heat. An assessment was performed for a span of representative plants with the SAFER evaluation model. Using the correct input value to SAFER for the fuel pellet to plenum spring conductance parameter, the results confirmed an insignificant PCT impact for affected fuel types.	0°F
2021-02	The inner cladding surface roughness is an input to the gap conductance model. An inconsistency was identified between the roughness value used in fuel performance model PRIME and the input to the SAFER and TRACG calculations. The inner cladding surface roughness affects the pellet-cladding contact heat transfer and therefore, the gap conductance. The input inconsistency is small and should have an insignificant effect on the ECCS LOCA calculations. An assessment was performed for a span of representative plants with the SAFER and TRACG evaluation models. Using consistent values for the inner cladding surface roughness input to SAFER and TRACG, the results confirmed an insignificant PCT impact for affected fuel types.	0°F
Sum of Absolute Magnitude of Error During this Period.		0°F

This letter contains no new Regulatory Commitments. Should you have any questions concerning the content of this letter, please contact Jeff Hardy, Regulatory Assurance Manager at 802-380-5124.

Sincerely,

**Jeff Hardy**  
 Digitally signed by Jeff Hardy  
 Date: 2021.11.30 10:03:55 -06'00'

JAH/fas

Attachments: None.

cc: NRC Senior Resident Inspector  
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