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10 CFR 50.59
10 CFR 72.48

GNRO2022-00019

August 23, 2022

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

SUBJECT: 10 CFR 50.59 Evaluations, Commitment Change Evaluations, and 10 CFR 72.48 Evaluations Completed from May 21, 2020 to May 21, 2022

Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Pursuant to 10 CFR 50.59(d)(2), Entergy Operations, Inc. hereby submits a summary of the approved 10 CFR 50.59 Evaluations and the approved Commitment Change Evaluations for the period of May 21, 2020 to May 21, 2022.

In accordance with 10 CFR 72.48(d)(2), Entergy Operations, Inc. hereby submits a summary of 72.48 Evaluations for the period of July 1, 2020 through June 30, 2022. There were no 72.48 Evaluations for the indicated period.

Attachment 1 contains the 10 CFR 50.59 Evaluation Summary Report. Attachment 2 contains the Commitment Change Evaluation Summary Report. There are no commitments contained in this submittal. If you have any questions or need additional information, please contact Jeff Hardy at 802-380-5124.

Sincerely,

Jeffery Hardy
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Attachment: 1) 10 CFR 50.59 Evaluation Summary Report
2) Commitment Change Evaluation Summary Report

cc: NRC Region IV - Regional Administrator
NRC Senior Resident Inspector, Grand Gulf Nuclear Station
NRR Project Manager

Attachment 1
10 CFR 50.59 Evaluation Summary Report

Evaluation Number	Summary	Initiating Document
2020-002-01	**Cycle 23 Reload and Core Operating Limits Report (COLR):** The core reload is a recurring activity for each fuel cycle. At the end of each fuel cycle, depleted fuel assemblies are discharged from the core and replaced by fresh reload assemblies. The remaining bundles resident in the core are shuffled to new locations and fresh fuel is loaded in accordance with the next cycle's core design and reference loading pattern. This evaluation addresses the [Cycle] C23 related reload design changes and the C23 operation of the core. This evaluation will justify the updates to the COLR to reflect the new core operating limits for the Cycle 23 core. The EC85716 evaluation addresses Cycle 23 Reload Licensing Design implementation using Global Nuclear Fuel's (GNF) new GNF3 fuel design for the fresh reload batch. The Cycle 23 core is designed and will be operated in conformance with the cycle-specific analyses, with GESTAR II, its fuel design specific reports, and will be bounded by the results of the Grand Gulf Nuclear Station (GGNS) applicable GNF3 and GNF2 Cycle Independent Analyses in the New Fuel Introduction (NFI) process. The reload design and safety analyses for the Cycle 23 core have been prepared using the approved methods as described in GESTAR II. GESTAR II is the licensing basis for the fuel as described in the UFSAR. GGNS Cycle 23 introduces the GNF3 fuel design as the fresh reload fuel. GNF3 will be loaded with the once and twice burned GNF2 reload fuel. EC85716 documents details of the GNF3 design and its acceptability for GGNS application. The vendor used the NRC approved fuel design methods and documented that the GNF3 fuel design meets all design and licensing criteria in Section 1.1 of GESTAR-II (currently referenced in TS 5.6.5). The GNF3 fuel design, through the approved Amendment 22 process which constitutes the NRC acceptance and approval of the fuel design without specific NRC review, complies with all GESTAR-II design and the reload licensing acceptance criteria. The impact to fuel operating limits and licensing analyses as a result of the application of the GNF3 fuel design is detailed in EC85716. Cycle specific analyses for Cycle 23 were performed in accordance with UFSAR Chapter 15 and the resulting cycle specific limits are documented in the Cycle 23 COLR in accordance with TS 5.6.5. The evaluation of the GNF3 fuel design for GGNS application identified that the changes to the design basis core radionuclide inventory did not result in increases in accident doses listed in the Chapter 15 of the UFSAR. A core radionuclide inventory that bounds the Cycle 23 reload core design with GNF3 was provided by the vendor as part of the NFI analysis. The radionuclide inventory provided was developed using ORIGEN 2 which is approved by the NRC for this application in Regulatory Guide 1.183. The GGNS design basis dose calculations described in UFSAR Chapter 15 were then updated to account for the increase in core inventory consistent with the existing methodology.	EC85716

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2020-002-01	As discussed in EC85716, the changes to the GGNS Cycle 23 core design resulting from the replacements of failed fuel are not adverse and are therefore not addressed by this 10 CFR 50.59 evaluation. However, because the safety analyses were performed as part of the normal BWR reload process, the cycle specific analyses for Cycle 23 require a 50.59 Evaluation per EN-NF-105, 5.4.10, and are therefore addressed in this 10 CFR 50.59 evaluation.	
2020-003-00	**Remove Single Point Vulnerability with Turbine Thrust Wear Bearing:** The turbine trip logic associated with excess thrust bearing wear is designed to operate using a two-out-of-three logic. Due to only the 'C' and 'D' probes available, this condition presents a potential single point vulnerability (SPV) to the turbine trip circuit if one of the two remaining probes should happen to fail. The intent of this temporary modification is to force the Ovation input points related to Proximity Probe 1N30N200A to a GOOD status to provide assurance that failure of either of the remaining instruments will not cause an inadvertent turbine trip. Additionally, the turbine thrust wear bearing detection trip signal point will also force to a GOOD status to eliminate its function in the down-stream logic. Disablement of the turbine trip due to excessive thrust bearing wear is a change with respect to the design function of this trip as described in Section 10.2.2 of the UFSAR. However, the change does not affect the ability of the design to safely shutdown the plant and maintain in a safe condition. The change was evaluated consistent with the requirements of 10 CFR 50.59 and found to be acceptable. Specifically, the evaluation concluded that the change would not result in an increased frequency of previously evaluated accidents, malfunctions, or consequences of these accidents or malfunctions (i.e., radiological consequences). Tripping of the main turbine is an accident evaluated explicitly in Section 15.2.3 of the UFSAR. However, as described in Section 15.2.3.1.1 of the UFSAR, the sequence of events and radiological consequences associated with the main turbine trip evaluated in the UFSAR are independent of the turbine trip initiator.	EC87731
2022-001-00	**Removal of Pump Trips from Fuel Pool Cooling and Clean Up Pumps:** This change will remove three trip functions from the Fuel Pool Cooling and Cleanup System (FPCCU) and Leakage Detection System (LDS) , to trip harden the FPCCU pumps (1G41C001A/B) and ensure cooling is maintained to the spent fuel pool, while retaining the automatic isolation of the non-safety and non-seismic portions of the piping when a leak is detected. Three trip conditions: 1) Pump suction pressure low ≥ 8 inches Hg vacuum 2) LDS Differential Pressure (DP) low flow HI > 141 GPM after 45 seconds 3) LDS Fast Fill/Low Flow Standpipe pump trip to detect leaks in the Filter / Demineralizer	EC91792 EC91793

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2022-001-00	The results of this evaluation determine that the bypass of the three trips for both of the FPCCU pumps are not adverse to the design function of the FPCCU. The two issues that were evaluated in this evaluation are: 1) Elimination of one of the two suction trips results in loss of redundancy for pump suction protection. a) Spurious trip results in loss of a train b) Failure to automatically trip could result in pump damage if they are not manually tripped resulting in loss of a train However, loss of a train does not challenge the single failure criteria established for the FPCCU in UFSAR 9.1.3.3. 2) Fuel Pool Inventory Loss: Makeup water for normal operation could be made unavailable, but emergency water will continue to be available from SSW or the RHR systems.	
2022-002-00	**Enabling Open Phase Detection (OPD) Trips:** An Open Phase Condition (OPC) is a new failure mode of offsite power that was communicated to GGNS in Bulletin 2012-01. EC52500 installed a PCS2000 Open Phase Detection (OPD) system at transformers ST11, ST21 and ESF12. EC90198 will enable the trip functions associated with the Open Phase Detection (OPD) system (installed under EC 52500) to protect Engineered Safety Features (ESF) electrical distribution system by isolating the ESF transformers from degraded offsite power sources. EC90198 proposes to enable the trip features of the OPD system by closing in the test switches, allowing automatic transfer to healthy sources upon an OPD event. Enabling the trip functions will protect ESF equipment from potential overheating due to the imbalanced, open phased, offsite electrical system. The OPD system is designed to detect an open phase on the lines feeding the transformers ESF11, ESF12, and ESF21 and provides alarm and trip signals to isolate the ESF buses from the degraded offsite source. The plant response to postulated accidents is not impacted by the proposed activity. The redundant design in the one out of two taken twice trip logic ensures that the activity does not result in a more than minimal increase in the frequency of occurrence of an accident. The microprocessor relays installed in the OPD system can perform self-diagnostics and identify a relay malfunction which prevents spurious trips. The use of microprocessor relays, system testing and system monitoring along with the redundancy in design ensures that the activity does not result in a more than minimal increase in the likelihood of malfunction and ensures compliance with the method of evaluation.	EC90198

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2022-002-00	Per Section 4.3 .1 of NEI 96-07 Rev 1, the effect of a proposed activity on the frequency of an accident must be discernible and attributable to the proposed activity to exceed the more than minimal increase standard. These features ensure the modification meets the minimal standard as defined in NEI 96-07.	
2022-003-00	**Cycle 24 Reload / COLR:** The BWR reload process requires that the vendor perform calculations to confirm the new core design meets the licensing acceptance criteria and the 'Analysis of Record' (AOR) continues to bound by the reload core design. Therefore, the core design features requiring the performance of reload transient analysis activity are considered adverse changes that must be evaluated under the 50.59 process. There is no impact on fuel operating limits or licensing analyses because of the application of the GNF2 or GNF3 designs. The GGNS Cycle 24 specific operating limits are addressed as a part of the changes to the Cycle 24 COLR. The GGNS Cycle 24 Reference Loading Pattern (RLP) was developed using approved methods (GESTAR II, currently referenced in TS 5.6.5). An objective of the GGNS Cycle 24 core shuffle was to find & remove a fuel leaker from the GGNS Cycle 23 core. This effort resulted in a change to the GGNS Cycle 24 RLP, called the Updated Loading Pattern (ULP). The ULP design was also developed using approved methods (GESTAR II). When a proposed core loading is not identical to the Reference Loading Pattern (RLP), it is first evaluated per GESTAR Section 3.4.2, "Acceptable Deviation from Reference Core Design". If the core loading conforms to all the requirements of this section, then no further review or analysis is required (Tier 1). If it cannot meet all the restrictions of GESTAR Section 3.4.2, then all the affected licensing parameters must be re-examined to assure there is no adverse impact. The re-examination procedure is described in GESTAR Section 3.4.3, "Re-Examination of Bases" (Tier 2). For the evaluation of the ULP, the requirements of Section 3.4.2 were reviewed per the GESTAR II methodology, and the ULP design was found to remain bound by the original core design with no further analyses required (i.e., Tier 1 screening criteria were met, no further analysis required). An engineering evaluation was performed in EC90704 to document that operation of the GGNS Cycle 24 ULP would continue to meet all applicable core design and licensing criteria. The GGNS Cycle 24 COLR has been prepared and verified to continue to provide adequate protection of core design related safety limits after implementation of the ULP design.	EC90704

Attachment 2
Commitment Change Evaluation Summary Report

Commitment Number	Original Commitment	New Commitment and Justification for Change
36196	GGNS will volumetrically examine 10%, with a maximum of 25, of the socket welds and 10%, with a maximum of 25, of the butt welds within the population of ASME class 1 small bore piping welds. See program description in UFSAR section a.1.34, based on license renewal application appendix a.	GGNS will volumetrically examine 3 percent, with a maximum of 10, of the socket welds and 3 percent, With a maximum of 10, of the butt welds within the population of ASME class 1 small bore piping welds. NUREG-1801, rev. 2, section XL.M.35, one-time inspection of ASME code class 1 small-bore piping, allows the smaller sampling for a plant that "has never experienced a failure in its ASME code class 1 piping (a through-wall crack detected in the subject component by evidence of leakage, or through nondestructive or destructive examination) and has extensive operating history (more than 30 years of operation at time of submitting the application)..." GGNS now has 30 years of operating experience without experiencing a failure.
36194	Enhance the oil analysis program to provide a formalized analysis technique for particulate counting and to include piping and components within the main generator system (N41) with an internal environment of lube oil.	Enhance the oil analysis program to provide a formalized analysis technique for particulate counting. The commitment was made to manage the effects of aging on these non-safety-related components under the oil analysis program because it was thought that the components normally contain oil and that corrosion caused by oil that is not sampled to ensure it does not contain water could result in an adverse impact to safety-related systems or components through spatial interaction due to leakage or spray. However, this was an incorrect, assumption and due to GGNS procedures requiring that any liquid is drained so that only a minimal amount is nominally present and makes an aging management program on the N41 system unnecessary.
36197	UFSAR A.4, item 25: enhance the periodic surveillance and preventive maintenance program to revise program guidance documents as necessary to include all activities as described in LRA section B.1.35. This LRA section included site-specific requirements for coating integrity inspections for license renewal that were made during the NRCs review of the license renewal application. The detailed requirements are included in UFSAR section A.1.35. These requirements were based on a draft version of LR-ISG-2013-01. UFSAR A.4, item 35: the service water integrity program will be enhanced as follows. During the 10-year period prior to the period of extended operation, visual inspections will be performed of coated	License renewal FSAR 50.59 UFSAR A.4, item 25: enhance the periodic surveillance and preventive maintenance program to revise program guidance documents as necessary to include all activities as described in LRA section B.1.35, with the exception of internal coating integrity inspections (see UFSAR section A.1.45, coating integrity program). Implement a coating integrity program consistent with the recommendations of LR-ISG-2013-01 to manage the effects of aging on internal coatings. Section A.1.35, PSPM program: this change removes the coating integrity inspection description in UFSAR section A.1.35. A new UFSAR section A.1.45, coating integrity program, is added instead. Section A.1.45 is consistent with the ISG. UFSAR A.4, item 35: revise service water integrity program documents to include inspections for loss of material due to erosion. This existing

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36197	internal surfaces of standby service water system components. Subsequent coating inspections will be performed based on inspection results as follows. This commitment includes details for coating inspections based on the draft ISG. The detailed requirements are also in UFSAR section A.1.41.	enhancement in item 35 will be the only enhancement listed. Coating inspection details are deleted. Internal coating inspections for service water components will be conducted under the coating integrity program. Section A.1.41, service water integrity program, will be revised to refer to UFSAR section A.1.45 for internal coating inspections. Section A.1.45, coating integrity program, will be added. This change replaces commitments to perform coating inspections as part of the PSPM and SWI programs with a commitment to implement a coating integrity program consistent with later NRC-issued recommendations.
36177	UFSAR Section A.1.4 and Section A.4, Item 4 license renewal commitments for the Boraflex Monitoring Program. Item 4-1: Enhance the Boraflex Monitoring Program for GGNS to perform periodic surveillances of the Boraflex neutron absorbing material in the spent fuel pool and upper containment pool at least once every 5 years using Boron-10 Areal Density Gage for Evaluating Racks (BADGER) testing. Item 4-2: RACKLIFE analysis will continue to be performed each cycle. This analysis will include a comparison of the RACKLIFE predicted silica to the plant measured silica. This comparison will determine if adjustments to the RACKLIFE loss coefficient are merited. The analysis will include projections to the next planned RACKLIFE analysis date to ensure current Region I storage locations will not need to be reclassified as Region II storage locations in the analysis interval.	UFSAR Section A.1.4 and Section A.4, Item 4 license renewal commitments for the Boraflex Monitoring Program as shown below. Item 4-1: Enhance the Boraflex Monitoring Program for GGNS to perform periodic surveillances of the Boraflex neutron absorbing material in the spent fuel pool at least once every 5 years using Boron-10 Areal Density Gage for Evaluating Racks (BADGER) testing. Item 4-2: RACKLIFE analysis, or an equivalent methodology, will continue to be performed each cycle. This analysis will include a comparison of the RACKLIFE predicted silica to the plant measured silica. This comparison will determine if adjustments to the RACKLIFE loss coefficient are merited. The analysis will include projections to the next planned RACKLIFE analysis date to ensure current Region I storage locations will not need to be reclassified as Region II storage locations in the analysis interval. The upper containment pool is used only for temporary storage during refueling operations, not for long-term storage of spent fuel, the dose received by the Boraflex panels in the upper containment pool (and the resulting boron loss) is many times lower than that of the panels in the spent fuel pool. This change also allows an equivalent methodology to RACKLIFE to be used for analysis.
36202	(Excerpt) ... Enhance the Water Chemistry Control - Closed Treated Water Program to revise the water chemistry procedure for closed treated water systems to align the water chemistry control parameter limits with those of EPRI 1007820.	Enhance the Water Chemistry Control - Closed Treated Water Program to revise the water chemistry procedure for closed treated water systems to align the water chemistry control parameter limits with those of EPRI Closed Cooling Water Chemistry Guidelines. EPRI reports are identified by a title and report number/revision. New revisions of EPRI reports typically change the report number but not the title. The UFSAR should not have a commitment to a specific revision of the guidelines.
36202	Enhance the water chemistry control-closed treated water program to provide testing of the engine jacket water for the engine-driven fire water pump diesels at least annually	Enhance the water chemistry control-closed treated water program to provide replacement of the engine jacket water for the engine-driven fire water pump diesels at least annually.

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		This coolant replacement activity performed in lieu of coolant testing is adequate to ensure that the intended function of these components is maintained. The commitment is therefore changed to credit the annual engine jacket water (coolant) replacement in place of testing.
36180	Enhance the Compressed Air Monitoring Program for GGNS to apply a consideration of the guidance of ASME OM-S/G-1998, Part 17; American National Standards Institute (ANSI)/ISA-S7.0.01-1996; EPRI NP-7079; and EPRI TR-108147 to the limits specified for air system contaminants. Enhance the Compressed Air Monitoring Program to include periodic and opportunistic inspections of accessible internal surfaces of piping, compressors, dryers, aftercoolers, and filters and to apply consideration of the guidance of ASME OM-S/G-1998, Part 17 for inspection frequency and inspection methods of these components in the following compressed air systems„: 1) ADS, 2) Division 1, 2, & 3 DG Starting Air, 3) Instrument Air	The Compressed Air Monitoring Program will be enhanced as follows. • Apply a consideration of the guidance of ASME OM-S/G-1998, Part 17; American National Standards Institute (ANSI)/ISA-S7.0.01-1996; EPRI NP-7079; and EPRI TR-108147 to the limits specified for air system contaminants. • Revise Compressed Air Monitoring Program procedures to include opportunistic visual inspections of components downstream of system air dryers. Inspections consist of visual examination of accessible component internal surfaces. A review of ASME OM-S/G-1998 Part 17 found that it does not include a requirement for periodic inspection. The absence of periodic compressed air component inspections will not diminish the ability of compressed air systems to perform their intended function since periodic testing for moisture and opportunistic inspections will ensure that loss of material is not occurring. In support of this conclusion, the latest NRC guidance for license renewal, the XI.M24 Compressed Air Monitoring program description in NUREG-2191 does not specify periodic inspections but does include opportunistic inspections.
36178	Implement the Buried Piping and Tanks Inspection Program for GGNS as described in LRA Section B.1.5 Soil testing will be performed at two locations near the SS condensate storage system piping that is subject to aging management review. Measure parameters will include soil resistivity, bacteria, pH, moisture, chlorides, and redox potential. If the soil is determined to be corrosive, then the number of inspections will be increased from one to two prior to and during the period of extended operation.	Implement the Buried Piping and Tanks Inspection Program for GGNS to be consistent with the program as described in LR-ISG-2015-01. Soil testing will be performed at two locations near the SS condensate storage system piping that is subject to aging management review. Measure parameters will include soil resistivity, bacteria, pH, moisture, chlorides, and redox potential. If the soil is determined to be corrosive, then the number of inspections will be increased from one to two prior to and during the period of extended operation. These changes were made by the NRC staff based on industry OE gained during the implementation of the Buried Piping Initiative described in NEI 09-14 as well as license renewal buried piping inspections and the review of additional industry standards related to buried piping.
36167	Site severe accident management guidelines (SAMG) will be updated to future revisions of the boiling water reactor owner's group generic severe accident technical guidelines, and the SAMGs will be integrated with other emergency response guideline sets and symptom-	Site severe accident management guidelines (SAMG), which includes the emergency procedures and the severe accident procedures at GGNS, will be updated to future revisions of the boiling water reactor owner's group generic severe accident technical guidelines, and the SAMGs will be integrated with other emergency response guideline sets and symptom-

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36167	based emergency operating procedures, and validated, using the guidance in NEI 14-01, emergency response procedures and guidelines for beyond design basis events and severe accidents.	based emergency operating procedures, and validated, using the guidance in NEI 14-01, emergency response procedures and guidelines for beyond design basis events and severe accidents, excluding BWROG SAMG revision 4 which will be incorporated into the sites SAMG by July 31, 2022. Delaying GGNS implementation of SAMG revision 4 will not significantly increase the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident, or involve a significant reduction in a margin of safety as this guidance is for beyond design basis events, and GGNS has already implemented BWROG SAMG revision 3, which gives adequate guidance for beyond design basis events. This extension is necessary to ensure that GGNS operators are adequately trained on SAMG revision 4.