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10 CFR 50.90

W3F1-2021-0026

March 19, 2021

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

Subject: Open Item Response - License Amendment Request to Implement a Digital Upgrade to the Core Protection Calculator (CPC) System and Control Element Assembly Calculator (CEAC) System

Waterford Steam Electric Station, Unit 3
NRC Docket No. 50-382
Renewed Facility Operating License No. NPF-38

- References:
- 1) Entergy Operations, Inc. letter to U.S. Nuclear Regulatory Commission (NRC), "License Amendment Request to Implement a Digital Upgrade to the Core Protection Calculator (CPC) system and Control Element Assembly Calculator (CEAC) system," (ADAMS Accession No. ML20205L587), dated July 23, 2020
 - 2) NRC Meeting Summary, "Summary Of September 22, 2020, Category 1 Public Meeting With Entergy Operations, Inc. Regarding License Amendment Request To Install Digital Upgrade In Accordance With Digital Instrumentation And Control Interim Staff Guidance No. 06, Revision 2, 'Licensing Processes' (EPID L-2020-LLA-0164)," (ML20288A742), dated October 22, 2020

In Reference 1, Entergy Operations, Inc. (Entergy) submitted a proposed amendment to Appendix A, "Technical Specifications" (TS) of Renewed Facility Operating License No. NPF-38 for Waterford Steam Electric Station, Unit 3 (Waterford 3). The proposed change would revise the Waterford 3 TS to implement a planned digital instrumentation and control (DI&C) modification at Waterford 3. The DI&C modification will replace the existing digital minicomputers of the Core Protection Calculator (CPC) system and Control Element Assembly Calculator (CEAC) system with a more reliable, digital system based on the Westinghouse Electric Company (Westinghouse) Common Qualified (Common Q) Platform.

On September 22, 2020, the U.S. Nuclear Regulatory Commission (NRC) conducted a virtual Category 1 public meeting with representatives from Entergy and Westinghouse. The purpose of the meeting was to discuss Entergy's license amendment request (LAR) (Reference 1). The results of that meeting are summarized in Reference 2.

During the meeting, as summarized in Reference 2, the NRC discussed a proposed process for dispositioning open items (OIs). The OIs are NRC questions regarding the LAR which the NRC would track and eventually disposition as requests for additional information, requests for confirmation of information, audits, or as needing no additional action. The OI list is an informal tool for increasing the efficiency of the NRC review, as well as promoting communication with Entergy. Enclosure 5 of the Reference 2 meeting summary provided a non-proprietary version of preliminary OIs. The enclosure to this letter provides an additional design document concerning OI No. 35.

The No Significant Hazards Consideration determination provided in the Reference 1 submittal is not altered by the information provided in this letter.

There are no new regulatory commitments included in this letter.

In accordance with 10 CFR 50.91(b)(1), "Notice for public comment; State consultation," a copy of this letter, without the proprietary attachments, is being provided to the designated State Official.

Should you have any questions or require additional information, please contact Paul Wood, Regulatory Assurance Manager, Waterford 3, at (504) 464-3786 or pwood1@entergy.com.

I declare under penalty of perjury, that the foregoing is true and correct. Executed on March 19, 2021.

Respectfully,



Ron Gaston

RWG/jls

Enclosure: Westinghouse Letter LTR-TA-21-17, Revision 2, "Waterford 3 CPCS Safety Function Table - PPS Backup Trips"

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Waterford Steam Electric Station, Unit 3
NRC Project Manager Waterford Steam Electric Station, Unit 3
Louisiana Department of Environmental Quality

Enclosure

W3F1-2021-0026

**Westinghouse Letter LTR-TA-21-17, Revision 2,
"Waterford 3 CPCS Safety Function Table - PPS Backup Trips"**



LTR-TA-21-17, Revision 2

From: Transient Analysis and
Licensing Engineering

Phone: (860) 731-6385

Date: March 23, 2021

Subject: **Waterford 3 CPCS Safety Function Table – PPS Backup Trips**

To: TA (Transient Analysis) File

Introduction

This letter is to provide additional information that was requested from the NRC after reviewing Reference 2. The information herein lists the safety function trips for the Core Protection Calculator System (CPCS) for Waterford Steam Electric Station Unit 3 (Waterford 3) provided in Reference 2 and defines the backup Plant Protection System (PPS) trips for these functions.

The table below contains the following information to provide the response to the NRC.

1. Waterford 3 FSAR Chapter 15 Event
2. Credited Trip/Actuation Signals
3. PPS backup Trip

Table A-1 in Appendix A of this letter provides this information for the Waterford-3 Core Protection Calculator System (CPCS) PPS backup trips.

The information presented in Table A-1 was compiled from reviewing several sources of information. The Waterford-3 Safety Evaluation Report, Reference 4, identified that the NRC staff has taken the operating experience of ANO-2, the previous review and acceptance of the ANO-2 CPCs, and the similarity of the Waterford 3 and ANO-2 CPCs, into account for the acceptance of the Waterford 3 CPCS. As such Reference 5, was reviewed and contained a listing of backup trips that were credited for the ANO-2 CPCS which was considered in the development of Table A-1. Then the Waterford 3 FSAR, Chapter 15, Reference 1, was reviewed to determine the events crediting the CPCS and these events were listed in Column 1 of Table A-1. The CPCS credited functions (e.g. VOPT) were identified in Reference 2 and these were listed in Column 2 of Table A-1. The Waterford 3 FSAR, Chapter 7 – Table 7.2-4, was reviewed to determine the available trip functions in the PPS that could be credited as backup trips to the CPCS. This information along with those backup trips identified in Reference 5 was used to identify PPS trips that could be credited as analog backups to the CPCS. These are listed and identified in Column 3 of Table A-1.

References

1. **NRC Accession Number ML19268A136**, “Waterford Steam Electric Station, Unit 3, Revision 311 to Final Safety Analysis Report, Chapter 15 - Accident Analyses.”
2. **LTR-TA-19-154, Rev. 0**, “Waterford 3 Core Protection Calculator System Safety Function Table,” Westinghouse Electric Company, LLC.
3. **NRC Accession Number ML19268A128**, “Waterford Steam Electric Station, Unit 3, Revision 311 to Final Safety Analysis Report, Chapter 07 – Instrumentation and Controls.”
4. **NRC Accession Number ML20009E071**, “NUREG-0787, July 1981, Safety Evaluation Report related to the operation of Waterford Steam Electric Station, Unit No. 3, dated July 1981.”
5. **NRC Accession Number ML102850080-2**, “NUREG-0308, Safety Evaluation Report for Arkansas Nuclear One Unit 2, Supplement 1 to Appendix D, Core Protection Calculator System.”

Reference titles are provided for reader convenience only. Refer to the archived record in EDMS for the specific document title and approval date.

If you have any questions or concerns, please contact the undersigned.

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Appendix A

Table A-1 - Waterford-3 CPCS PPS Backup Trips

Waterford-3 SAR (Reference 1) Chapter 15 Event / SAR Section #	Credited CPCS Trip Signals	PPS Backup Trip Signals (Waterford-3 SAR Reference 3, Table 7.2-4)
Uncontrolled CEA Bank Withdrawal from a critical condition SAR 15.4.1.3 (at Power)	CPCS VOPT SPVMIN, SPVMAX, or DELSPV, and SUPMAX (rate of power increase for FOLLOW)	High Linear Power
Uncontrolled CEA Bank Withdrawal from HZP SAR 15.4.1.2 (Low Power)	CPCS VOPT SPVMIN or DELSPV, and SUPMAX (rate of power increase for FOLLOW)	High Linear Power High Log Power (Power <10 ⁻⁴ %)
CEA Misoperation – Single Rod Drop / CEA Sub-group Drop SAR 15.4.1.4	None	Not Applicable
Uncontrolled Boron Dilution SAR 15.4.1.5	At HFP and HZP, this event is bounded by the CEA Bank Withdrawals	High Linear Power High Log Power (Power <10 ⁻⁴ %)
Total Loss of Reactor Coolant Forced Flow SAR 15.3.2.1	CPCS RPC Shaft Speed – Low Setpoint	Low RCS Flow
Increased Main Steam Flow SAR 15.1.1.3	Same as Uncontrolled CEA Bank Withdrawal from a Critical Condition	High Linear Power
Single Reactor Coolant Pump Shaft Seizure / Sheared Shaft SAR 15.3.3.1	CPCS RPC Shaft Speed – Low Setpoint	Low RCS Flow
CEA Ejection SAR 15.4.3.2	CPCS VOPT SPVMIN, SPVMAX, or DELSPV, and SUPMAX (rate of power increase for FOLLOW)	High Linear Power High Log Power (Power <10 ⁻⁴ %)

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Table A-1 - Waterford-3 CPCS PPS Backup Trips

Waterford-3 SAR (Reference 1) Chapter 15 Event / SAR Section #	Credited CPCS Trip Signals	PPS Backup Trip Signals (Waterford-3 SAR Reference 3, Table 7.2-4)
Steam Generator Tube Rupture with coincident LOOP SAR 15.6.3.2	CPCS Hot Leg Saturation Temperature (Tsat)	Low Pressurizer Pressure
Letdown Line Break SAR 15.6.3.1	CPCS Tsat CPCS Wide Band Pressure Trip Limits (Low)	Low Pressurizer Pressure
Asymmetric Steam Generator Transient SAR 15.9.1.1	CPCS ΔT_{cold}	Low Steam Generator 1 Pressure Low Steam Generator 2 Pressure Low Steam Generator 1 Level Low Steam Generator 2 Level
Pre-trip MSLB with coincident LOOP SAR 15.1.3.3	Same as Uncontrolled CEA Bank Withdrawal from a Critical Condition	High Linear Power
Increased Main Steam Flow with Loss of Offsite Power SAR 15.1.2.3	CPCS DNBR – Low	High Linear Power
Steam System Piping Failures SAR 15.1.3.1	CPCS RPC Shaft Speed – Low Setpoint CPCS VOPT SPVMIN or DELSPV, and SUPMAX (rate of power increase for FOLLOW)	Low Steam Generator 1 Pressure Low Steam Generator 2 Pressure High Linear Power
Inadvertent Opening of a SG ADV with a concurrent single failure of an active component SAR 15.1.2.4	CPCS Low RPC Shaft Speed – Low Setpoint	Low RCS Flow Low Steam Generator 1 Pressure Low Steam Generator 2 Pressure Low Steam Generator 1 Level Low Steam Generator 2 Level