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John C. Dinelli
Site Vice President
Waterford 3

10 CFR 21.21

W3F1-2018-0057

September 20, 2018

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

Subject: Part 21 Report of Westinghouse 7300 Circuit Card Increased Failure Rate
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

Dear Sir or Madam:

Pursuant to 10 CFR 21.21(d)(3)(ii), Entergy is providing the Waterford Steam Electric Station, Unit 3 (Waterford 3) required written notification of the identification of a defect associated with Westinghouse 7300 circuit card increased failure rate. This information was initially reported to the NRC with letter W3F1-2018-0040, Interim Report of a Deviation or Failure to Comply, on July 5, 2018 and subsequently to the NRC Operations Center on August 22, 2018.

The attachment to this letter provides the information required by 10 CFR 21.21, including details associated with Westinghouse 7300 circuit card increased failure rate at Waterford 3.

There are no regulatory commitments contained in this correspondence.

Should you have questions regarding this report, please contact John P. Jarrell, Regulatory Assurance Manager, at (504) 739-6685.

Sincerely,


9/20/18 For J. Dinelli
JCD/JPJ/ajh

Attachment: Waterford 3 Part 21 Report of Westinghouse 7300 Circuit Card Increased Failure Rate

cc: Mr. Kriss Kennedy, Regional Administrator
U.S. NRC, Region IV
RidsRgn4MailCenter@nrc.gov

U.S. NRC Project Manager for Waterford 3
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U.S. NRC Senior Resident Inspector for Waterford 3
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Attachment to

W3F1-2018-0057

Waterford 3 Part 21 Report of Westinghouse 7300 Circuit Card Increased Failure Rate

Waterford 3 Part 21 Report of Westinghouse 7300 Circuit Card Increased Failure Rate

This written notification information follows the format of and addresses the considerations contained in 10CFR21.21(d)(4)(i)-(ix).

I. Name and Address

John C. Dinelli
17265 River Road
Killona, LA 70057

II. Facility, Activity or Component

Westinghouse 7300 circuit cards. Based on information to date, increased failure rates of these cards are limited to part numbers:

2838A32G01, Analog Comparator Card (NAC)

2838A30G11 and 2838A30G12, Control Board Card (NCB).

2838A33G01, PROM Logic Card (NPL).

III. Constructor or Supplier

Westinghouse is the supplier of the affected 7300 cards. Westinghouse has been notified of the 10 CFR Part 21 notification and has provided failure analysis documentation to Waterford 3.

IV. Defect and Safety Hazard

The subject circuit boards use a Texas Instruments Part Number SN74LS04N hex inverter chip. The chip failure on cards causes the card output to fail (fail to change state). All failed chips at Waterford Unit 3 (WF3) are from Lot/Date code 45CT3VK or 43A80KM.

A new NAC card was installed in an application which supports the Ultimate Heat Sink (UHS) at WF3. During testing and calibration of the new NAC card, the card was found to be failed (no output). This new card was removed and replaced with an acceptable card. If the new card had remained installed, safety related functions associated with the Essential Chiller supply and return condensing water valves, as well as Auxiliary Component Cooling Water pump start on high temperature would not have occurred. In addition, in the opposite train, the presence of a faulty NAC card could have prevented UHS functions for fan start logic of the Wet Cooling Tower fans, and Auxiliary Component Cooling Water Temperature control valve position.

Both trains of UHS are required to be operable in modes 1-4 per Technical Specification 3.7.3. Based upon the above, the subject NAC Cards could have been installed in both trains, and could have created a substantial safety hazard.

V. Date

On August 14, 2018, Entergy Operations, Inc. (Entergy) completed an evaluation of a deviation at Waterford Steam Electric Station, Unit 3 (Waterford 3) which concluded the condition constitutes a defect pursuant to 10 CFR Part 21. The Waterford 3 Site Vice President was notified of the result of this evaluation on August 21, 2018. NRC Headquarters Operations Center was notified by telephone on August 23, 2018 (Ref. EN#53559).

VI. Location and Number of Defective Components

At Waterford-3, the failed components (5 NAC cards) found with the suspected failed Hex Inverter Chip were returned to the vendor.

A review of stores was completed, and no additional cards in stores were found.

A review of all potentially impacted PAC Cards (NEW cards received from Westinghouse during 2014-2016) was completed, and 13 cards (3 NAC Cards, 2 NCB cards, and 8 NPL cards) were identified that have been installed that may have the suspect HEX Inverter Chip installed.

The search has been limited to 2014 to 2016. In 2014 WF3 began a High Critical PAC card replacement project. In 2015, WF3 noted failures of new NPL cards recently installed as part of this project. The failure analysis conducted indicated that the Hex Inverter Chips as noted above were the cause, and Westinghouse discontinued use of the lot/date codes indicated in this report.

VII. Corrective Action

Westinghouse 7300 Cards (model numbers identified above) received from between 2014 and 2016 were researched to identify the lot/date code of the Hex Inverter Chip. Waterford-3 has identified 13 cards installed in the plant that may contain the suspected chip. The cards must be removed from the system for inspection. Condition Report CR-WF3-2018-1994 contains actions to inspect, and replace if affected, the suspect cards by March 15, 2019.

Supply Chain has added receipt inspection notes that NAC, NCB and NPL cards are inspected during receipt, and any cards containing the suspect Hex Inverter Chip are returned to the Vendor.

VIII. Advice

Waterford has reviewed inventory and card installations of Westinghouse 7300 NAC, NCB and NPL cards received from 2014-2016 for the suspected lot/date codes of the Hex Inverter Chip and will remove or refurbish cards that contain the Hex Inverter Chip.

IX. Early Site Permit

This is not an early site permit concern.