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

Subject: Duke Energy Carolinas, LLC  
McGuire Nuclear Station  
Renewed Facility Operating License Nos. NPF-17  
Docket No. 50-370  
Special Report 370-2023-001

Pursuant to Selected Licensee Commitments (SLC) Manual Section 16.7.1, Required Action A.2, attached is Special Report 370-2023-001 concerning an event where the Unit 2 Anticipated Transients Without Scram (ATWS) and ATWS Mitigation System Actuation Circuitry (AMSAC) System has been nonfunctional for a period greater than 37 days. This event is of no significance with respect to the health and safety of the public.

This document contains no new regulatory commitments. Should you have any questions, please contact Jeff Thomas, McGuire Regulatory Affairs, at 980-875-4499.

Sincerely,

A handwritten signature in black ink, appearing to read 'Brent A. Bare', written in a cursive style.

Brent A. Bare  
Station Plant Manager  
McGuire Nuclear Station

Attachment

U.S. Nuclear Regulatory Commission

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cc (with Attachment):

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## Special Report 370-2023-001

### Requirement

McGuire Nuclear Station Selected Licensee Commitments (SLC) Manual Section 16.2.5 states “Failure to meet a Testing Requirement, whether such failure is experienced during the performance of the Testing Requirement or between performances of the Testing Requirement, shall be failure to meet the Commitment. Additionally, SLC 16.2.6 states “The specified Frequency for each Testing Requirement is met if the Test is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified Frequency is met.

SLC 16.7.1, ATWS/AMSAC, has the following Commitment: The ATWS/AMSAC system shall be FUNCTIONAL in Mode 1 above 40% Reactor Thermal Power (RTP).

If the ATWS/AMSAC system is non-functional in Mode 1 above 40% RTP (Condition A), then Required Action A.1 or Required Action A.2 applies. Required Action A.1 states “Restore the ATWS/AMSAC system to functional status.” The Completion Time (CT) for Required Action A.1 is 7 days. Required Action A.2 states “Prepare and submit a Special Report outlining the cause of the malfunction and plans for restoring the system to functional status.” The CT for Required Action A.2 is 37 days.

There is one Testing Requirement (TR) associated with SLC 16.7.1. TR 16.7.1.1 states “Perform a Channel Operational Test on the ATWS/AMSAC system.” The Frequency for TR 16.7.1.1 is 18 months.

### Background

The AMSAC design is based on conditions that indicate a loss of main feedwater event which, if accompanied by a failure of the reactor trip system (RTS) to scram, leads to overpressurization of the Reactor Coolant System. The Unit 2 system monitors both main feedwater pumps for operating status. It also monitors the position of the main feedwater control valves (2CF32AB, 2CF23AB, 2CF20AB, 2CF17AB), the main feedwater control bypass valves (2CF104AB, 2CF105AB, 2CF106AB, 2CF107AB), and the main feedwater isolation valves (2CF35AB, 2CF30AB, 2CF28AB, 2CF26AB).

AMSAC actuation will occur if (1) both main feedwater pumps trip or (2) the main feedwater flow to the steam generators (3 out of 4 logic) is blocked due to inadvertent valve closure. When an actuation occurs, the AMSAC circuitry will perform the following:

- Trip the main turbine
- Start both motor driven auxiliary feedwater pumps
- Close the steam generator blowdown and sampling valves

The actuation of the AMSAC system on loss of both main feedwater pumps is achieved by three pressure switches which monitor the hydraulic control oil pressure to the stop valves for each turbine. Each of the feedwater pump turbine stop valves closes whenever there is a trip of the feedwater pump turbine. These pressure switches monitor the hydraulic oil pressure holding the stop valves open. Whenever the pressure switches sense a loss of pressure, indicative of a turbine trip, a two out-of-three logic circuit will actuate. If both pumps are tripped, the AMSAC circuitry will actuate.

Main feedwater isolation valve limit switches are set at the full closed valve position since these valves are operated as full open/closed valves only. The control valve signal is interlocked with the bypass valve signal such that the control valve must be less than 25% open and the bypass valve must be less than 100% open. If these two conditions exist for more than 30 seconds, or if the containment isolation valve closes, then a blocked flow path signal is generated. A 3-out-of-4 blocked flow path logic circuit will actuate the AMSAC circuitry.

### **Event Description**

In accordance with SLC 16.2.5, the Unit 2 ATWS/AMSAC system was declared nonfunctional on August 18, 2023, following discovery that a portion of the Channel Operational Test that implements TR 16.7.1.1 was not performed within 1.25 times its specified 18-month Frequency. Specifically, preventative maintenance tasks required by Work Order (WO) 20541778 were not performed on main feedwater isolation valve 2CF35AB during the Unit 2 spring 2023 refueling outage. These preventative maintenance tasks included actuator seal replacement, limit switch setup, and functional tests.

### **Causal Factors**

According to Action Request 02460345, the preventative maintenance tasks required by Work Order (WO) 20541778 were not performed on main feedwater isolation valve 2CF35AB during the Unit 2 spring 2023 refueling outage due to a lack of necessary parts. Action Request 02483599 was generated to document the failure to perform TR 16.7.1.1 within 1.25 times its specified 18-month Frequency, perform an Organizational Programmatic Checklist, and develop actions to resolve the issue. At the time of this Special Report, the Organizational Programmatic Checklist had not been completed. Once completed, the Organizational Programmatic Checklist will be retrievable under Action Request 02483599.

### **Restoration Plans**

TR 16.7.1.1, including limit switch setup of main feedwater isolation valve 2CF35AB, is planned to be performed during the Unit 2 fall 2024 refueling outage. Following satisfactory performance of TR 16.7.1.1 and prior to entering Mode 1 above 40% RTP, the Unit 2 ATWS/AMSAC system will be declared functional.

### **Safety Significance**

The Unit 2 ATWS/AMSAC system was declared nonfunctional because TR 16.7.1.1 was not performed within 1.25 times its specified 18-month Frequency. Consistent with the Technical Specification Bases for SR 3.0.3, the safety significance associated with a delay in completing a required surveillance includes recognition that the most probable result of any particular surveillance being performed is the verification of conformance with the requirements.

Furthermore, the probability of system failure is considered low based on the previous work history and the function these limit switches perform. The limit switches are not cycled often since 2CF35AB is a Containment Isolation Valve. Therefore, wear and drift are not a factor. Also, these limit switches have gold plated contacts which are resistant to oxidation and provide assurance that, if actuated, the circuit will operate as expected.

Based on the probability of failure and consequences, the overall risk to the station is considered low. This event is of no significance with respect to the health and safety of the public.