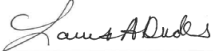




UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

August 9, 2022

MEMORANDUM TO: Cary M. Read, Senior Resident Inspector (V. C. Summer)
Reactor Project Branch 4
Division of Reactor Projects

FROM: Laura A. Dudes  Signed by Dudes, Laura
Regional Administrator on 08/09/22

SUBJECT: SPECIAL INSPECTION CHARTER TO EVALUATE THE LOSS
OF OFFSITE POWER TO THE UNIT 1 4160V "B" TRAIN
EMERGENCY POWER BUS AND FAILURE OF THE TURBINE
DRIVEN AFW PUMP

You have been selected to lead a Special Inspection to assess the circumstances surrounding loss of offsite power to the 4.16-kV "B" train emergency power bus on August 3, 2022 that resulted in a main generator/turbine trip and subsequent automatic reactor shutdown. Additionally, you are to assess the circumstances surrounding the operation and failure of the turbine driven auxiliary feedwater pump (TDAFW). Your onsite inspection should begin on August 10, 2022. Michael Meeks, Senior Operations Engineer and Peter Meier, Senior Resident Inspector Farley will be assisting you in this inspection.

A. Basis

At approximately 12:58 CST PM on August 3, 2022, Farley Unit 1 was in mode 1 at 100% power when the reactor automatically tripped due to a main generator lockout signal and main turbine trip. The event started when an Alabama Power employee inadvertently bumped a relay that caused the opening of the supply breakers for the Unit 1 "B" startup transformer and a loss of offsite power to the "B" train emergency bus. The Unit 1 "B" emergency diesel generator automatically started to restore power to the "B" train emergency bus as expected. Unit 1 operated in natural circulation in Mode 3 after all three reactor coolant pumps (RCP) tripped due to the loss of the A, B and C 4.16-kV busses. During this event, the main condenser was unavailable because there was no power for the Unit 1 circulating water pumps. Operators stabilized the plant with the auxiliary feedwater system (AFW) and the atmospheric relief valves.

Following the reactor trip, all three AFW pumps started automatically as expected. The turbine driven (TD) AFW pump auto started and ran approximately 20 minutes after receiving a station blackout signal from the loss of all three RCPs (i.e., undervoltage condition in two-of-three RCP buses). With two motor driven (MD) AFW pumps running, operators attempted to manually stop the TDAFW, however, the auto-start signal was still present (RCP buses remained de-energized) and the TDAFW pump restarted but immediately tripped on overspeed. Following the overspeed trip the operators secured the steam supply valves to allow the turbine to come to a full stop before attempting to restart it. However, when the valve(s) were re-opened the TDAFW pump tripped again on overspeed. The TDAFW pump was declared inoperable. Following the event, the licensee identified that one of the two steam admission valves for the TDAFW pump was stuck open and appeared to have caused the overspeed condition of the TDAFW pump

On August 4, 2022, the licensee restored offsite power to the “B” emergency bus and the Unit 1 “B” emergency diesel was secured. Operators started the 1B RCP for forced circulation.

This Special Inspection is chartered to identify the circumstances surrounding the oversight and control of the work activities in the switchyard at the time of the event, review the cause of the loss of the Unit 1 “B” startup transformer, review licensed operator response to the transient, including the decision to stop the TDAFW pump, review the technical cause evaluation for the TDAFW overspeed trip, and review the prompt corrective actions associated with operation of the TDAFW pump failure and the work activities in switchyard prior to the event.

B. Scope

The inspection is expected to perform data gathering and fact-finding to address the following:

Work Activities in the High Voltage Switchyard

- Review and evaluate the licensee’s process for control of work in the switchyard. This should include the work control process, management of plant risk, and oversight of switchyard work.
- Verify that the bumped relay caused the breakers in the switchyard to open as they did (verify breaker coordination) prior to the reactor trip.
- Review the work control documents that were being used to perform switchyard maintenance, including release of work and work scope.
- Review the work that was being performed in the switchyard, the location of the work and the equipment in the work area to confirm the work was being performed in accordance with procedures and work instructions.
- Review the licensee’s prompt corrective actions to correct this issue and assess the effectiveness of the actions.
- Review and understand the design of the 'fast' dead-bus transfer of non-safety related 4.16-kV buses “A”, “B” and “C” from the unit auxiliary transformer to the startup transformer and determine (1) if the as-built design/configuration is properly modeled in the online maintenance risk analysis program, (2) if operators have an appropriate understanding of how they function, and (3) determine why the dead bus transfer did not occur.
- Identify any potential generic safety issues and make recommendations for appropriate follow-up action (e.g., Information Notices, Generic Letters, and Bulletins).
- Collect data necessary to support completion of the significance determination process, if applicable.

Operation of the Turbine Driven AFW pump

- Review and assess the plant procedures controlling operation of the TDAFW pump.
- Review and evaluate the operator’s decision to terminate operation of the TDAFW during this event.

- Review and assess the operator training related to the operation of TDAFW pump during a transient.
- Collect data necessary to support completion of the significance determination process, if applicable.

Turbine Auxiliary Feedwater Pump Failure

- Review the licensee's technical cause evaluation and corrective action of the TDAFW pump trip after the automatic restart.
- Review the work package and the work performed to correct the failure mode of the TDAFW pump.
- Determine if there is a design deficiency that would cause the TDAFW pump to trip when stopping with an initiation signal still present.
- Review the maintenance history for components that did not operate as designed.
- Identify any potential generic safety issues and make recommendations for appropriate follow-up action (e.g., Information Notices, Generic Letters, and Bulletins).
- Collect data necessary to support completion of the significance determination process, if applicable.

C. Guidance

Inspection Procedure 93812, "Special Inspection," provides additional guidance to be used during the conduct of the Special Inspection. Your duties will be as described in Inspection Procedure 93812. The inspection should emphasize fact-finding in its review of the circumstances surrounding the event. Safety or security concerns identified that are not directly related to the event should be reported to the Region II office for appropriate action.

You will report to the site, conduct an entrance, and begin inspection no later than August 10, 2022. A daily status briefing of Region II management will be provided beginning the second day on-site at approximately 4:00 p.m., Eastern Daylight Time (EDT). In accordance with IP 93812, you should promptly recommend a change in inspection scope or escalation if information indicates that the assumptions utilized in the MD 8.3 risk analysis were not accurate. A report documenting the results of the inspection should be issued within 45 days of the completion of the inspection. The report should address all applicable areas specified in Section 03.02 of Inspection Procedure 93812. At the completion of the inspection, you should provide recommendations for improving the reactor oversight process baseline inspection procedures and the special inspection process based on any lessons learned.

This charter may be modified should you develop significant new information that warrants review. Should you have any questions concerning this charter, contact Alan Blamey at 404-997-4415.

Docket No. 50-348
License No. NPF-2

CONTACT: Alan Blamey, RII/DRP
404-997-4415

SPECIAL INSPECTION CHARTER TO EVALUATE THE LOSS OF OFFSITE POWER TO THE UNIT 1
 4160V "B" TRAIN EMERGENCY POWER BUS AND FAILURE OF THE TURBINE DRIVEN AFW PUMP
 DATE August 9, 2022

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