Southern Nuclear

Delson Erb
Vice President - Farley

Joseph M. Farley Nuclear Plant
7388 North State Hwy 95
Columbia, Alabama 36319
334.661.2100 tel
334.661.2512 fax

derb@southernco.com

Date: March 30, 2023

Docket No.: 50-348 **NL-23-0221**

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

Joseph M. Farley Nuclear Plant - Unit 1
Licensee Event Report 2023-001-00
Automatic Reactor Trip due to DC Ground on Turbine Trip Solenoid

Ladies and Gentlemen:

In accordance with the requirements of 10 CFR 50.73(a)(2)(iv)(A), Southern Nuclear Company is submitting the enclosed Licensee Event Report for Unit 1.

This letter contains no NRC commitments. If you have any questions regarding this submittal, please contact Gene Surber at (334) 661-2265.

Respectfully submitted,

Delson Erb
Vice President – Farley

DE/rgs/cbg

Enclosure: Unit 1 Licensee Event Report 2023-001-00

Cc: Regional Administrator, Region II
NRR Project Manager – Farley Nuclear Plant
Senior Resident Inspector – Farley Nuclear Plant
RTYPE: CFA04.054

Joseph M. Farley Nuclear Plant - Unit 1
Licensee Event Report 2023-001-00
Automatic Reactor Trip due to DC Ground on Turbine Trip Solenoid

Enclosure

Unit 1 Licensee Event Report 2023-001-00

NRC FORM 366 (03-14-2023) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2023

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U. S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by email to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; email: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. Facility Name		2. Docket Number	3. Page
Joseph M. Farley Nuclear Plant, Unit 1	☒ 050 ☐ 052	348	1 OF 2

4. Title

Automatic Reactor Trip due to DC Ground on Turbine Trip Solenoid

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved		
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	☐ 050	Docket Number
02	01	2023	2023	- 001 -	00	03	30	2023	Facility Name	☐ 052	Docket Number

9. Operating Mode	10. Power Level
1	100

11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*

10 CFR Part 20	☐ 20.2203(a)(2)(vi)	**10 CFR Part 50**	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)	☐ 73.1200(a)
☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)	☐ 73.1200(b)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)	☐ 73.1200(c)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.36(c)(2)	☑ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)	☐ 73.1200(d)
☐ 20.2203(a)(2)(i)	**10 CFR Part 21**	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(A)	**10 CFR Part 73**	☐ 73.1200(e)
☐ 20.2203(a)(2)(ii)	☐ 21.2(c)	☐ 50.69(g)	☐ 50.73(a)(2)(v)(B)	☐ 73.77(a)(1)	☐ 73.1200(f)
☐ 20.2203(a)(2)(iii)		☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(2)(i)	☐ 73.1200(g)
☐ 20.2203(a)(2)(iv)		☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(ii)	☐ 73.1200(h)
☐ 20.2203(a)(2)(v)		☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)		

☐ **OTHER** (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact	Phone Number (Include area code)
Gene Surber, Farley Site Licensing Manager	(334) 661-2265

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS		Cause	System	Component	Manufacturer	Reportable to IRIS
X	EI	62	G080	Y						

14. Supplemental Report Expected		15. Expected Submission Date	Month	Day	Year
☑ No	☐ Yes (If yes, complete 15. Expected Submission Date)				

16. Abstract (Limit to 1326 spaces, i.e., approximately 13 single-spaced typewritten lines)

At 0956 CST on February 1, 2023, with Joseph M. Farley Nuclear Plant (FNP) Unit 1 in Mode 1 at 100 percent power, the reactor automatically tripped following a turbine trip signal. The turbine tripped when Maintenance personnel connected portable DC ground detection equipment (DC Scout) to the positive terminal of the "B" train Auxiliary Building battery to locate a DC ground. Connecting the DC Scout created a jumper to the normally open contact of the Turbine Trip Solenoid. Operations stabilized the plant in Mode 3 and removed decay heat via steaming to condenser. Auxiliary Feedwater System (AFW) automatically actuated as expected in response to the reactor trip.

Corrective actions include changes to risk mitigation procedures associated with detecting DC grounds and use of portable ground detection equipment.

This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) due to the automatic actuation of the Reactor Protection System (RPS) and AFW system as listed in 10 CFR 50.73(a)(2)(iv)(B). FNP Unit 2 was not affected during this event.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME		2. DOCKET NUMBER	3. LER NUMBER		
			YEAR	SEQUENTIAL NUMBER	REV NO.
Joseph M. Farley Nuclear Plant, Unit 1	■ 050 ☐ 052	348	2023	- 001	- 00

NARRATIVE

EVENT DESCRIPTION

On February 1, 2023, at 0956 CST, while Joseph M. Farley Nuclear Plant (FNP) Unit 1 was in Mode 1 at 100 percent power, maintenance was conducting troubleshooting to identify the source of an Auxilliary Building (AB) "B" Train DC ground. The ground was identified to be on the negative side of the AB Battery [EIIS / EEIS : EJ / BTRY]. When portable ground detection equipment (DC Scout) was connected to the positive terminal of the AB Battery a loss of Electro Hydraulic Control (EHC) [EIIS: TG] oil pressure occurred which resulted in a turbine trip and subsequent reactor trip. During the forced outage it was determined that the DC ground existed on a cable between the AB and Turbine Building associated with the Turbine Trip Solenoid Valve (20-ET) [EIIS / EEIS: TG / SOL]. The 20-ET solenoid valve is normally closed and energizes to open to dump EHC oil from the turbine throttle valves and governor valves. It was confirmed via troubleshooting that when maintenance connected the DC Scout to the AB Battery terminal it created a jumper in the circuit to energize the 20-ET solenoid.

During the plant trip the "1A" 4 kV non emergency bus [EIIS : EA] failed to transfer to the "1A" 4 kV Startup Transformer [EIIS : EB]. This resulted in the trip of the "A" Reactor Coolant Pump (RCP) [EIIS / EEIS: AB / P]. The "B" and "C" RCPs remained in operation. Additionally, Auxilliary Feedwater System (AFW) [EIIS: BA] autostarted as expected post reactor trip and maintained feedwater flow to the Steam Generators (EIIS: SB). Main Feed Water (MFW) [EIIS: SJ] and the condenser [EIIS: SG] remained available for post trip decay heat removal.

EVENT ANALYSIS

It was determined that previous unrelated work at penetration 07-155-31 had resulted in damage to cable 1UYT0001E [EEIS : CBL4] which feeds the 20-ET solenoid. This damage inside the penetration breach was not visible and had resulted in the AB DC ground alarm. The risk of actuating equipment in the circuit while installing portable ground detection equipment was not known and led to missed opportunities in work planning and risk mitigation. The failure of the bus transfer to occur was determined to be a failure of the Time Delay Drop Out (TDDO) relay [EEIS / EIIS: EI / 62] (Manufacturer: General Electric / Model: 12HGA17C52) associated with the 4 kV bus transfer circuit.

REPORTABILITY AND SAFETY ASSESSMENT

There were no safety consequences as result of this event. The operating crew responded appropriately to the event. This event was within the analysis of the UFSAR Chapter 15. This event is reportable under 10 CFR 50.73(a)(2)(iv)(A) due to the automatic actuation of the Reactor Protection System (RPS) and the AFW system as identified in 10 CFR 50.73(a)(2)(iv)(B).

CORRECTIVE ACTIONS PLANNED OR COMPLETED

1. Repaired grounded cable 1UYT0001E to 20-ET Turbine Trip Solenoid.
2. Revise maintenance and risk procedures for mitigation actions during ground detection activities and while using portable ground detection equipment.
3. Replaced the TDDO relay associated with the 1A 4 kv bus.

PREVIOUS SIMILAR EVENTS

There were no events from the last three years with either the same or similar cause to this event.