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Docket No.: 50-364

NL-19-1338

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

Joseph M. Farley Nuclear Plant - Unit 2
Licensee Event Report 2019-003-00
Manual Reactor Trip due to 2C Reactor Coolant Pump High Vibration Indication

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 2.

This letter contains no NRC commitments. If you have any questions regarding this submittal, please contact Gene Surber at (334) 814-5448.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "CKV", written over a horizontal line.

Charles Kharri
Vice President – Farley

CK/tec/scm

Enclosure: Unit 2 Licensee Event Report 2019-003-00

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 2
Licensee Event Report 2019-003-00
Manual Reactor Trip due to 2C Reactor Coolant Pump High Vibration Indication**

Enclosure

Unit 2 Licensee Event Report 2019-003-00

**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/>)

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 Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollect.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. Facility Name Joseph M. Farley Nuclear Plant, Unit 2	2. Docket Number 05000 364	3. Page 1 OF 3
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4. Title Manual Reactor Trip due to 2C Reactor Coolant Pump High Vibration Indication.
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5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
09	21	2019	2019	- 003	- 00	11	12	2019	Facility Name	Docket Number 05000

9. Operating Mode 1	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)	
10. Power Level	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	
100	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)		

12. Licensee Contact for this LER	
Licensee Contact Tom Campbell, Licensing Engineer	Telephone Number (Include Area Code) 334-814-4587

13. Complete One Line for each Component Failure Described in this Report									
Cause D	System AB	Component P	Manufacturer W351	Reportable to ICES Y	Cause	System	Component	Manufacturer	Reportable to ICES
14. Supplemental Report Expected					15. Expected Submission Date				
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No					Month Day Year				

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On September 21, 2019, at 0744 CDT, while operating at 100% power, Farley Nuclear Plant (FNP) Unit 2 received a vibration alarm on the 2C Reactor Coolant Pump (RCP). Operators entered the applicable Annunciator Response Procedure (ARP). At 0800 CDT, the Control Room Operators manually tripped Unit 2 due to indicated vibrations on the 2C RCP exceeding procedural limits. The post-trip response was normal. All trains of Auxiliary Feed Water pumps actuated normally due to low Steam Generator (SG) levels post trip. Operators took appropriate action to stabilize the unit in Mode 3.

The investigation determined the most likely cause for the RCP vibration indication was the temporary in-phasing of the various contributing frequencies. The ARP contained insufficient information to allow the Control Room Operators to determine if the indications represented an actual vibration condition that threatened RCP operation. The Control Room Operators tripped the reactor based on available indications per the guidance of the ARP. Corrective Actions included revising the ARP to enhance the guidance for vibration conditions that require action to protect the RCP.

This event is reportable under 10CFR50.73(a)(2)(iv)(A) due to manual actuation of systems listed in 10CFR50.73(a)(2)(iv)(B). FNP Unit 1 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/>)

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Joseph M. Farley Nuclear Plant, Unit 2	05000-	2019	003	00

NARRATIVE**A. Event Description:**

On September 21, 2019, at 0744 CDT, while operating at 100%, Farley Nuclear Plant (FNP) Unit 2 received annunciator alarm HH4 - RCP VIB TRBL - Reactor Coolant Pump (RCP) [EIS:AB/P] Vibration Alarm [EIS:IV/V]. Operators entered the Annunciator Response Procedure (ARP) and dispatched the System Operator (SO) to investigate. At 0748 CDT, the SO reported 2C RCP vibration readings for the vertical shaft at 15 mils sustained and spiking to a maximum value of 17 mils. The last recorded vertical shaft vibration taken earlier in the shift was 8 mil. At 0800 CDT, the Control Room Operators manually tripped the Unit 2 reactor due to 2C RCP vibration readings in excess of the limits in the ARP. This action manually initiated a Reactor Protection System (RPS) actuation [EIS:JC].

Following verification of immediate operator actions for the reactor trip, the 2C RCP was secured and actions were taken for the loss of forced flow in the C reactor coolant loop [EIS:AB/P]. The post-trip response was normal. All trains of the Auxiliary Feed Water system [EIS:BA] actuated as expected due to Lo-Lo (< 28% NR level) SG level. Control Room Operators took appropriate action to stabilize the unit in Mode 3.

B. Cause of Event:

The Investigation determined there was no single issue that caused the vertical shaft probe indication to exceed 15 mils. Based upon the vibration data obtained subsequent to the manual reactor trip, the most likely cause was the temporary in-phasing of the various contributing frequencies (i.e., all vibration sources in phase and modulated above their common amplitude). Less likely causes would be unexpected or atypical energy inputs into the system from such things as cable motion/disturbances, EMI/RFI pickups, local bus grid voltage degradations, minor cavitation, RCS system fluid dynamics, or other energy sources that would be difficult to ascertain with the current instrumentation. Post trip equipment inspections identified no issues with vibration probes, and a subsequent 2 hour run of the 2C RCP with additional monitoring equipment showed no unacceptable mass unbalance, structural looseness, or misalignment.

The primary reason for tripping the Unit 2 reactor was the insufficient guidance in the ARP. It should have provided the Control Room Operators with the information necessary to determine if the alarm was an actual condition that required action to protect the RCP, and guidance to assess the rate of rise of the vibrations based on the indications.

C. Safety Assessment:

When the Control Room Operator manually initiated the reactor trip, all systems responded as designed. The RPS actuated as designed, and all Control Banks and Safety Banks fully inserted into the core. All systems responded as required and there were no adverse effects on the health and safety of the public, the safety significance is low and no loss of safety function occurred. No dose limits were challenged.

D. Corrective Actions:

The ARP's were revised to provide clarity in response to a RCP Vibration Trouble alarm such as criteria for differentiation/discrimination of valid/invalid alarms, and additional guidance to determine an accurate rate of rise of vibration. Additionally, an enhanced vibration monitoring plan was implemented to monitor for previously unidentified issues following 2C RCP startup. No issues were identified with the 2C RCP using the enhanced vibration monitoring plan.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Joseph M. Farley Nuclear Plant, Unit 2	05000- 364	YEAR 2019	SEQUENTIAL NUMBER 003	REV NO. 00

NARRATIVE**E. Similar Events:**

There have been no actual events at FNP indicating a current concern in system operation. The following similar events over the last three years at FNP were identified. All are related to equipment deficiencies.

LER 2019-002-00 – 05/01/2019

At 16:43 CDT on May 1, 2019, with FNP Unit 2 in Mode 2 with power in the Intermediate Range, the reactor was manually tripped. Operators manually tripped the reactor during Low Power Physics Testing due to a misaligned rod. The trip was not complex with all systems responding normally. Operations stabilized the plant in Mode 3. Decay heat was removed by the Steam Generator Atmospheric Relief Valves due to Main Steam Isolation Valves being closed during Low Power Physics Testing.

LER 2016-006-00 – 11/08/2016

On November 8, 2016, FNP Unit 1 was reducing power to remove the main generator from service. The 1A steam generator feed pump did not respond to control steam generator levels as expected when the miniflow valve was opened per procedure. Steam generator levels lowered due to lower feed flow, and at 1331 CST, the reactor was manually tripped from 32% power to prevent reaching the low steam generator level automatic reactor trip setpoint.

LER 2016-008-00 – 11/27/2016

At 2357 CST on November 26, 2016, while Unit 1 was operating at 100% reactor power, the main generator began to experience voltage and load swings which were caused by a problem with the main generator. The unit was manually tripped at 0026 CST on 11/27/16 to protect the generator from potential damage.