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Perry Nuclear Power Plant  
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April 9, 2020  
L-20-055

10 CFR 50.73(a)(2)(i)(B)  
10 CFR 50.73(a)(2)(v)(C)

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

SUBJECT:  
Perry Nuclear Power Plant  
Docket No. 50-440, License No. NPF-58  
Licensee Event Report Submittal

Enclosed is Licensee Event Report (LER) 2020-001, "Combustible Gas Mixing Compressor was declared Inoperable due to Degraded Thermal Overloads resulting in Technical Specification Violation". There are no regulatory commitments contained in this submittal.

If there are any questions or if additional information is required, please contact Mr. Glendon Burnham, Manager – Regulatory Compliance, at (440) 280-7538.

Sincerely,

A handwritten signature in black ink, appearing to read "Frank R. Payne", with a stylized flourish at the end.

Frank R. Payne

Enclosure:  
LER 2020-001

cc: NRC Project Manager  
NRC Resident Inspector  
NRC Region III Regional Administrator

Enclosure  
L-20-055

LER 2020-001



## 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. Lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto: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; e-mail: [oir\\_submission@omb.eop.gov](mailto:oir_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.

1. Facility Name	2. Docket Number	3. Page
Perry Nuclear Power Plant	05000-440	1 OF 3

4. Title
Combustible Gas Mixing Compressor Inoperability resulting in a Technical Specification Violation

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
03	06	2020		2020-001-00		05	04	2020		05000
									Facility Name	Docket Number
										05000

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(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 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)	<input type="checkbox"/> 73.71(a)(4)
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"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<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"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<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	Telephone Number (Include Area Code)
Hali Jenkins – Regulatory Compliance	440-280-6378

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

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES
D	BB	RLY	C770	Y					

## 14. Supplemental Report Expected

☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No

## 15. Expected Submission Date

Month	Day	Year

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

On February 3, 2020, while performing testing on Combustible Gas Mixing Compressor (CGMC) B it tripped on thermal overload approximately 20 seconds after start. The trip resulted in Inoperability for the B compressor. Troubleshooting determined that the overload relay was degraded. On March 6th, 2020 it was discovered that a procedure inadequacy for overload relay testing resulted in a past inoperability of the CGMC B from November 1, 2019 to February 14, 2020. This is in violation of Technical Specification 3.6.3.3, which requires restoration within 30 days or be in in mode 3 within 12 hours. Due to instances of inoperability of CGMC A during this time period, this also resulted in a loss of safety function for the system.

The direct cause was determined to be a degraded overload relay. The apparent cause was determined to be inadequate procedural guidance for testing the overload relay. The procedure was revised for clarification of testing this type of overload relay.

The safety significance of this event is considered very small in accordance with the Regulatory Guidance. This event is reported in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant technical specifications, and 10 CFR 50.73(a)(2)(v)(C) as an event or condition that could have prevented the fulfillment of a safety function of the Combustible Gas Mixing System.

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
Perry Nuclear Power Unit 1	05000- 440	YEAR 2020	SEQUENTIAL NUMBER 001	REV NO. 00

**NARRATIVE**

Energy Industry Identification System (EIS) codes are identified in the text as [XX].

**INTRODUCTION**

On February 3, 2020, while the plant was at 100 percent rated thermal power, surveillance testing was being performed on the Combustible Gas Mixing Compressor (CGMC) B [BB]. CGMC B tripped on thermal overload [RLY] approximately 20 seconds after start. The local panel had High Motor Amp S/D alarm locked in after the trip. The trip resulted in Inoperability for the B compressor under Technical Specification (TS) 3.6.3.3, Condition A, Combustible Gas Mixing System, at 2150 on February 3, 2020. Troubleshooting determined that the overload relay was degraded. The overload relay was replaced, and post maintenance testing was satisfactory for CGMC B. TS 3.6.3.3 was met on February 14, 2020 at 1210 when CGMC B was returned to OPERABLE.

On March 6, 2020, as a result of the investigation into the February 3<sup>rd</sup> event it was determined that the procedural guidance for testing was inadequate. Based on the procedural guidance being inadequate it was determined that when the thermal overload relay was tested in November of 2019 it was in a degraded condition when it was returned to operability.

**EVENT DESCRIPTION**

On February 3, 2020, while performing surveillance testing, CGMC B tripped on thermal overload approximately 20 seconds after start. The local panel had High Motor Amp S/D alarm locked in after the trip. The trip resulted in Inoperability for the B compressor under Technical Specification (TS) 3.6.3.3, Condition A, Combustible Gas Mixing System, at 2150 on February 3, 2020. Troubleshooting, performed for the CGMC B motor, determined that the overload relay was degraded. The overload relay was replaced, and post maintenance testing was satisfactory for CGMC B. TS 3.6.3.3 was met on February 14, 2020 at 1210 when CGMC B was returned to OPERABLE.

Surveillance testing is performed once per 92 days. A review of the past three years was performed, and a similar issue was identified. A Condition Report documented CGMC B tripping on thermal overload on November 1, 2019, during testing. TS 3.6.3.3, Condition A was entered at 0915 on November 1, 2019. A work order reset the overload relay and ran the compressor successfully on November 1, 2019, with normal amperages and voltages. The overload relay was also bench tested on November 4, 2019 with satisfactory results. TS 3.6.3.3 was met on November 4, 2019 at 1411.

On March 6, 2020, as a result of the investigation into the February 3, 2020 trip it was determined that inadequate procedural guidance is why the degraded thermal overload relay passed testing during the previous trip in November of 2019. Therefore, based upon this new information, CGMC B was determined to be inoperable from November 1, 2019 at 0915 to February 14, 2020 at 1210. This is in violation of TS 3.6.3.3, which requires restoration within 30 days, or be in in mode 3 within 12 hours.

This issue is reportable under 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by the plant's technical specifications. During this same time period the opposite train, CGMC A, was also inoperable at various times for surveillance testing. This results in a reportable loss of safety function per 50.73(a)(2)(v)(C) as an event or condition that could have prevented fulfillment of the safety function.

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

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**1. FACILITY NAME**

Perry Nuclear Power Unit 1

**2. DOCKET NUMBER**

05000-440

**3. LER NUMBER****YEAR**

2020

**SEQUENTIAL  
NUMBER**

001

**REV  
NO.**

00

**NARRATIVE****CAUSE**

The direct cause was determined to be a degraded overload relay. The apparent cause was determined to be inadequate procedural guidance for testing the overload relay.

**EVENT ANALYSIS**

A Probabilistic Risk Assessment (PRA) evaluation was performed for the November 1, 2019 to February 14, 2020 Combustible Gas Mixing Compressor B Inoperability event. The Combustible Gas Control System is not modeled in the PRA. The Combustible Gas Control System's function is to protect the Containment vessel following a core damage event. As such, inoperability of the Mixing Compressor B would have no effect on core damage frequency. The Combustible Gas Mixing Compressors, Hydrogen Recombiners, and Hydrogen Igniters, are used to control hydrogen while the hydrogen concentration is below the Hydrogen Deflagration Overpressure Limit in the Containment and Drywell. If the hydrogen concentration is above the Hydrogen Deflagration Overpressure Limit, then Containment Spray and Containment Venting are utilized to reduce Containment hydrogen concentrations. As the Hydrogen Ignition System, the Hydrogen Recombiners, Containment Spray, and Containment Venting were not compromised by this event and provide defense-in-depth for mitigation of hydrogen and combustible gas accumulation in the Containment, this demonstrates that the risk impact of the Combustible Gas Mixing Compressor B Inoperability is very small.

**CORRECTIVE ACTIONS**

The procedure was revised for clarification of testing this type of overload relay.

**PREVIOUS SIMILAR EVENTS**

None

**COMMITMENTS**

None