



Ernest J. Kapopoulos, Jr.
Vice President
Harris Nuclear Plant
5413 Shearon Harris Road
New Hill NC 27562-9300

919.362.2502

January 9, 2014
Serial: HNP-14-001

10 CFR 50.73

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

Shearon Harris Nuclear Power Plant, Unit 1
Docket No. 50-400

Subject: Licensee Event Report 2013-004-00 Operation Prohibited by Technical Specifications

Ladies and Gentlemen:

Duke Energy Progress, Inc. submits the enclosed Licensee Event Report 2013-004-00 in accordance with 10 CFR 50.73 for the Shearon Harris Nuclear Power Plant, Unit 1, which describes a condition prohibited by Technical Specifications. The prohibited condition involved the waste gas system which exceeded the required action time allowed for Limiting Condition for Operation (LCO) 3.11.2.5. The cause analysis for this event is not yet complete. The root cause evaluation results and corrective actions associated with this event will be provided in a supplement to this report.

This document contains no regulatory commitments. Please refer any questions regarding this submittal to Dave Corlett at (919) 362-3137.

Sincerely,

Ernest J. Kapopoulos, Jr.

Enclosure: LER 2013-004-00

cc: Mr. J. D. Austin, NRC Sr. Resident Inspector, Harris Nuclear Plant
Mr. A. Hon, NRC Project Manager, Harris Nuclear Plant
Mr. V. M. McCree, NRC Regional Administrator, Region II

IEZZ
NRR

bc:

INPO* (via e-mail to lerevents@inpo.org)

Mr. H. D. Brewer

Mr. D. A. Cummings

Mr. V. D'Souza

Mr. J. W. Donahue

Mr. J. D. Dufner

Mr. J. M. Griffin

Mr. D. L. Griffith

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Mr. L. R. Plisco

Mr. G. Preston

Mr. R. T. Repko

Mr. L. A. Reyes

Mr. J. C. Warner

Mr. F. L. Womack

HNP NOS NTA

Licensing File(s)

Nuclear Records

*INPO requires an MSWord version of the Report in addition to the PDF copy sent.

NRC FORM 366 (10-2010)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013 <small>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/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.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.</small>						
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)											
1. FACILITY NAME Shearon Harris Nuclear Power Plant, Unit 1					2. DOCKET NUMBER 05000400		3. PAGE 1 of 4				
4. TITLE Operation Prohibited by Technical Specification Due to Exceeding Hydrogen and Oxygen Concentrations in the Waste Gas System											
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	
11	11	2013	2013 – 004 – 00			01	09	2014	None	None	
9. OPERATING MODE 5		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"/> 20.2201(d) <input type="checkbox"/> 20.2203(a)(1) <input type="checkbox"/> 20.2203(a)(2)(i) <input type="checkbox"/> 20.2203(a)(2)(ii) <input type="checkbox"/> 20.2203(a)(2)(iii) <input type="checkbox"/> 20.2203(a)(2)(iv) <input type="checkbox"/> 20.2203(a)(2)(v) <input type="checkbox"/> 20.2203(a)(2)(vi)			<input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 20.2203(a)(3)(ii) <input type="checkbox"/> 20.2203(a)(4) <input type="checkbox"/> 50.36(c)(1)(i)(A) <input type="checkbox"/> 50.36(c)(1)(ii)(A) <input type="checkbox"/> 50.36(c)(2) <input type="checkbox"/> 50.46(a)(3)(ii) <input type="checkbox"/> 50.73(a)(2)(i)(A) <input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(ii)(A) <input type="checkbox"/> 50.73(a)(2)(ii)(B) <input type="checkbox"/> 50.73(a)(2)(iii) <input type="checkbox"/> 50.73(a)(2)(iv)(A) <input type="checkbox"/> 50.73(a)(2)(v)(A) <input type="checkbox"/> 50.73(a)(2)(v)(B) <input type="checkbox"/> 50.73(a)(2)(v)(C) <input type="checkbox"/> 50.73(a)(2)(v)(D)			<input type="checkbox"/> 50.73(a)(2)(vii) <input type="checkbox"/> 50.73(a)(2)(viii)(A) <input type="checkbox"/> 50.73(a)(2)(viii)(B) <input type="checkbox"/> 50.73(a)(2)(ix)(A) <input type="checkbox"/> 50.73(a)(2)(x) <input type="checkbox"/> 73.71(a)(4) <input type="checkbox"/> 73.71(a)(5) <input type="checkbox"/> OTHER <small>Specify in Abstract below or in NRC Form 366A</small>
10. POWER LEVEL 000											
12. LICENSEE CONTACT FOR THIS LER											
FACILITY NAME Dave Corlett, Manager, Regulatory Affairs								TELEPHONE NUMBER (Include Area Code) 919.362.3137			
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		
X	WE	AC	Teledyne	Y							
14. SUPPLEMENTAL REPORT EXPECTED <input checked="" type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input type="checkbox"/> NO						15. EXPECTED SUBMISSION DATE			MONTH 02	DAY 28	YEAR 2014
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)											
<p>On November 11, 2013, during degassing operations at Harris Nuclear Plant (HNP) the 'C' waste gas decay tank was sampled via surveillance procedure RST-202 which was not properly implemented. Sample results of 'C' WGDT measured hydrogen and oxygen concentrations to be 0.88 percent and 4.03 percent, respectively. However, RST-202 included a note that the hydrogen concentration should be assumed to be greater than 4 percent with an inoperable hydrogen analyzer. Therefore, the entry condition for Technical Specification Limiting Condition for Operation 3.11.2.5 was met, and required immediate suspension of all additions of waste gas to the system, reduction of oxygen to less than or equal to 4 percent by volume, then reduction of oxygen to less than or equal to 2 percent within 48 hours. HNP was in this condition for 30 calendar days until oxygen in the 'C' WGDT was reduced to below 2 percent on December 11, 2013.</p> <p>The root cause evaluation is not complete. The final results of the root cause evaluation will be provided in a supplement to this report. This event is considered to have no safety significance as an engineering evaluation determined that this condition did not generate any combination of explosive gases in the system.</p>											

NRC FORM 366A (10-2010)	LICENSEE EVENT REPORT (LER) CONTINUATION SHEET	U.S. NUCLEAR REGULATORY COMMISSION
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NARRATIVE**Background**

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

The waste gas system (WGS) [WE] consists of a series of tanks, two compressor skids and two hydrogen recombiner skids ('A' skid in long term shutdown). The system is designed to collect and process gases from various plant tanks which contain large amounts of hydrogen. Due to the flammability of hydrogen when in the presence of oxygen, levels must be established to prevent inadvertent ignition of the gas mixture. The system is normally operated in high pressure mode which consists of a recirculation loop that can accept purge gas from the selected tank.

Waste gas is pumped through a compressor, an outlet oxygen analyzer, and then into one of eight waste gas decay tanks (WGDTs). Unless transferring contents of one WGDT to another, only one WGDT is aligned to the WGS flow path at any given time. Pressure in the WGDT will then drive the waste gas flow to the hydrogen recombiner skid. In the recombiner skid, waste gas will flow through the first set of hydrogen and oxygen analyzers before passing through the recombiner. Following the recombination of hydrogen and oxygen to create water, the moisture is separated and the waste gas is sent through a second set of hydrogen and oxygen analyzers, located downstream of the recombiner. Following the analyzers, the waste gas is then drawn into the compressor suction piping, completing a recirculation loop.

Due to water intrusion, the hydrogen and oxygen analyzers were declared inoperable and samples were being taken from the in-service WGDT to monitor hydrogen and oxygen concentrations via surveillance procedure RST-202 as directed by plant procedure PLP-114. RST-202 was not properly implemented, which resulted in exceeding the required action time allowed by TS Limiting Condition for Operation (LCO) 3.11.2.5 between November 11, 2013, and December 11, 2013.

Prior to this event, Unit 1 was in Mode 5 with the waste gas system recombiner not in service, as the waste gas hydrogen and oxygen analyzers were not functional.

This condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), as an event or condition that is prohibited by Technical Specifications.

Event Description

The HNP Technical Specification (TS) requirement for the waste gas system is as follows:

TS 3.11.2.5: The concentration of oxygen in the GASEOUS RADWASTE TREATMENT SYSTEM downstream of the hydrogen recombiners shall be limited to less than or equal to 2 percent by volume whenever the hydrogen concentration exceeds 4 percent by volume.

On November 11, 2013, during degassing operations at 9:03 pm, the 'C' WGDT (in-service tank) was sampled via surveillance procedure RST-202 as directed by plant procedure PLP-114, however RST-202 was not properly implemented. Sample results of 'C' WGDT measured the hydrogen and oxygen

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NARRATIVE (continued)

concentrations to be 0.88 percent and 4.03 percent, respectively. However, the surveillance procedure included a note that the hydrogen concentration should be assumed to be greater than 4 percent with an inoperable hydrogen analyzer. This would have resulted in sample results of hydrogen greater than 4 percent and oxygen at 4.03 percent in the 'C' WGDT. Therefore, the entry conditions for TS Limiting Condition for Operation 3.11.2.5 were met for the concentration of oxygen in the waste gas system exceeding 2 percent when the hydrogen concentration exceeded 4 percent by volume. The action statement required immediate suspension of all additions of waste gas to the system, reduction of the oxygen concentration to less than or equal to 4 percent by volume, then reduction of the oxygen concentration to less than or equal to 2 percent within 48 hours. HNP was in this condition for 30 calendar days until the oxygen concentration in the 'C' WGDT was reduced to below 2 percent on December 11, 2013 at 3:30 pm.

The hydrogen and oxygen analyzers are manufactured by Teledyne. The model numbers for the hydrogen analyzers (HAIC-1118B and HARC-1104B) are 237A-0-20-1X and 237A-0-20-2X respectively. The model number for oxygen analyzers (OAI-1101 and OAIC-1112B) is 327RA, and for OARC-1119B it is 317RA.

Causal Factors

The root cause evaluation is not complete. Once the evaluation is complete, a supplemental report will be issued containing the root cause for this event.

Corrective Actions

Procedure use and adherence training is being provided to both operations and chemistry personnel. In addition, a standing instruction has been issued that states that all waste gas inputs will be secured when oxygen concentration exceeds 2 percent by volume, and all active and inactive portions of the WG system including the WGDTs, whether in service or isolated, have to be verified to contain less than 2 percent oxygen by volume.

The root cause evaluation is not complete. Once the evaluation is complete, a supplemental report will be issued containing additional corrective actions for this event.

Safety Analysis

At the time when the 'C' WGDT was observed to contain greater than 4 percent oxygen, the 'A' WGDT, contained greater than 4 percent hydrogen. The sample results of the 'A' WGDT (November 10, 2013, 4:15 pm) measured hydrogen levels at 5.4 percent and oxygen at less than 0.5 percent. A lowering pressure trend in this tank, indicated that the isolation valve for this tank leaked while oxygen was greater than 2 percent in other portions of the waste gas system. However, an engineering evaluation determined that this condition did not generate any combination of explosive gases in the system.

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NARRATIVE (continued)

Additional Information

A review of the HNP corrective action and record management databases for the past 5 years identified similar occurrences in which the hydrogen analyzer was inoperable and the incorrect hydrogen concentration was recorded in RST-202. However, no violations of TS 3.11.2.5 were identified.

The root cause evaluation is not complete and an extent of condition review will be included as part of the evaluation.

As stated previously, Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

This report contains no regulatory commitments.