10 CFR 50.73

MARIA L. LACAL
Senior Vice President
Nuclear Regulatory and Oversight

Palo Verde
Nuclear Generating Station
P.O. Box 52034
Phoenix, AZ 85072
Mail Station 7605
Tel 623 393 6491

102-07405-MLL/RAC
January 10, 2017

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

Dear Sirs:

Subject: **Palo Verde Nuclear Generating Station (PVNGS) Unit 3**
Docket No. STN 50-530 / License No. NPF 74
Licensee Event Report 2016-001-01

Enclosed please find Licensee Event Report (LER) supplement 50-530/2016-001-01 that has been prepared and submitted pursuant to 10 CFR 50.73. This LER supplement provides the causes and corrective actions determined for the previously reported event that documented a condition prohibited by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.11, Control Room Essential Filtration System (CREFS). The condition resulted in a CREFS air filtration unit being inoperable greater than the LCO Required Action Completion Time.

In accordance with 10 CFR 50.4, copies of this LER supplement are being forwarded to the Nuclear Regulatory Commission (NRC) Regional Office, NRC Region IV, and the Senior Resident Inspector.

Arizona Public Service Company makes no commitments in this letter. If you have questions regarding this submittal, please contact Mark McGhee, Nuclear Regulatory Affairs Department Leader, at (623) 393-4972.

Sincerely,

Lacal, Maria L(Z06149)

Digitally signed by Lacal, Maria L(Z06149)
DN: cn=Lacal, Maria L(Z06149)
Date: 2017.01.10 14:29:44 -07'00'

MLL/RAC/akf

Enclosure

cc: K. M. Kennedy NRC Region IV Regional Administrator
S. P. Lingam NRC NRR Project Manager for PVNGS
C. A. Peabody NRC Senior Resident Inspector PVNGS

NRC FORM 366 (11-2015) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2018

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 and Information Collections Branch (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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
Palo Verde Nuclear Generating Station (PVNGS) Unit 3	05000530	1 OF 5

4. TITLE

Control Room Essential Filtration System Air Filtration Unit Failure Resulting in a Condition Prohibited by Technical Specifications

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
12	24	2015	2016	- 001 -	01	01	10	2017	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
100	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Mark McGhee, Department Leader, Nuclear Regulatory Affairs	623-393-4972

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
D	VI	FLT		Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On July 20, 2016, PVNGS received Unit 3 "B" train (3B) control room essential air filtration unit (AFU) carbon sample test results that exceeded the acceptance criteria of the Technical Specification (TS) Ventilation Filter Testing Program. The Unit 3 control room (CR) staff declared the AFU inoperable and entered TS Limiting Condition for Operation (LCO) 3.7.11, control room essential filtration system (CREFS). The carbon filter replacement and testing was completed, and the Unit 3 CR staff declared the 3B CREFS AFU operable on July 24, 2016.

The investigation determined the 3B CREFS AFU was inoperable since December 17, 2015, which exceeded the Required Action Completion Time for Conditions A and C of LCO 3.7.11 on December 24, 2015 and Condition E during movement of irradiated fuel. The direct cause of this event was exposure of the 3B CREFS AFU carbon filter to a high amount of volatile organic compounds (VOCs) during a CR renovation project. The apparent cause was a lack of knowledge and recognition by PVNGS personnel to identify and properly mitigate the effects of the project on the CREFS AFU resulting in inadequate guidance for controlling all potential sources of VOCs. Applicable change process and work control procedures have been revised to ensure flooring and furniture replacements that could impact the CREFS AFU are evaluated as potential sources of VOCs prior to performing work.

No previous similar events have been reported by PVNGS in the last three years.

NARRATIVE

All times are Mountain Standard Time and approximate unless otherwise indicated.

1. REPORTING REQUIREMENT(S):

This Licensee Event Report (LER) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report a condition prohibited by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.11, control room essential filtration system (CREFS)(EIIS:VI). Palo Verde Nuclear Generating Station (PVNGS) received Unit 3 "B" train (3B) CREFS air filtration unit (AFU) carbon sample test results that exceeded the TS Ventilation Filter Testing Program (VFTP) acceptance criteria on July 20, 2016 for a sample obtained on June 24, 2016.

The investigation determined the 3B CREFS AFU was inoperable since December 17, 2015, which exceeded the Required Action Completion Time for Conditions A and C of LCO 3.7.11. December 24, 2015 is the event date when the LCO Required Action Completion Time expired. The investigation also determined irradiated fuel was moved in the Unit 3 spent fuel pool on multiple occasions with the operable CREFS train not in the essential filtration mode, which did not meet the requirements of Condition E of LCO 3.7.11.

2. DESCRIPTION OF STRUCTURE(S), SYSTEM(S) AND COMPONENT(S):

The control room (CR) heating, ventilation, and air conditioning (HVAC) system (HJ) consists of normal and essential systems that provide suitable environmental conditions for the CR complex for all normal and abnormal operations. This system is required to maintain temperatures to support a comfortable environment for CR personnel as well as provide adequate cooling to plant equipment, protect the CR staff from intrusion of poisonous gases, smoke, or airborne radioactivity, and ensure the CR area has appropriate conditions for prolonged occupancy through the duration of postulated events. These functions are achieved through the use of one normal ventilation system and two redundant safety systems.

The CR HVAC system includes the CREFS, which consists of two separate, seismically-qualified, redundant essential flow trains. Each flow train consists of an AFU with a series of filters to process intake airflow and recirculate air flow to the CR envelope. Low leakage ductwork and dampers are provided to minimize unfiltered air in-leakage. The CR post-accident habitability requirements are met by either CREFS train.

The B train CREFS shares ductwork with the CR normal (non-essential) ventilation system and both serve the inverter room and communication room during non-emergency conditions. The normal air handling unit ductwork, inverter room, and communication room are automatically isolated from the B train CREFS upon a control room essential filtration actuation signal.

The A train CREFS does not supply the inverter room or the communication equipment room, nor does it share ductwork with the normal ventilation or B train CREFS except for the final CR outlet ducts.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Palo Verde Nuclear Generating Station (PVNGS) Unit 3	05000530	2016	- 001	- 01	3 OF 5

NARRATIVE

The CREFS AFUs are each designed with a fan, pre-filter, two high-efficiency particulate air (HEPA) filters, and a carbon adsorption filter. The purpose of the carbon filter is to filter out radioiodine during postulated accident situations via a chemical reaction between the iodine and the activated carbon. The carbon is tested every 18 months in accordance with TS Surveillance Requirement (SR) 3.7.11.2 and TS Program 5.5.11, VFTP. This surveillance requirement involves sending a representative carbon sample to a laboratory for testing per ASTM D3803-1989, Standard Test Method for Nuclear-Grade Activated Carbon.

TS LCO 3.7.11 requires two CREFS trains be operable during Modes 1, 2, 3, 4, 5, 6, and during movement of irradiated fuel assemblies. The Required Action for Condition A, for a single inoperable train for reasons other than an inoperable CR envelope boundary, specifies restoration of the inoperable train within 7 days. Condition C requires entry into Mode 3 if the Required Action is not completed. Additionally, if the Required Action for Condition A is not met, Condition E requires the operable CREFS train be placed in essential filtration mode or immediate suspension of irradiated fuel movement if an operable CREFS train is not immediately placed in the essential filtration mode.

3. INITIAL PLANT CONDITIONS:

On December 24, 2015, PVNGS Unit 3 was in Mode 1 (Power Operation), at 100 percent power, normal operating temperature, and normal operating pressure. There were no other structures, systems, or components out of service that contributed to these events.

4. EVENT DESCRIPTION:

On June 24, 2016, a carbon sample was obtained from the 3B CREFS AFU in accordance with TS SR 3.7.11.2 and the VFTP and sent offsite for testing per ASTM D3803-1989. On July 20, 2016, PVNGS received the carbon sample test results that exceeded the TS VFTP acceptance criteria. Unit 3 CR staff declared the 3B CREFS AFU inoperable and entered TS LCO 3.7.11, CREFS.

PVNGS engineering personnel questioned the departure of the test results from the expected carbon efficiency trend and a second carbon sample was obtained on July 20, 2016 and sent offsite for testing. The results of this test also exceeded the TS VFTP acceptance criteria. An emergent change-out of the carbon filter began on July 22, 2016. The carbon filter replacement and testing was completed, and the Unit 3 CR staff declared the 3B CREFS AFU operable on July 24, 2016.

An offsite laboratory performed a radioiodine test analysis and determined volatile organic compounds (VOCs) were the direct cause of the CREFS carbon failure. Additional offsite laboratory testing was performed and the results confirmed that a CR renovation project that occurred in December 2015, which included carpet and furniture replacements, was the primary contributor to the failure. The current plant change process addresses impacts from painting, welding, and solvent use in areas that could impact the CREFS AFU carbon filter, but the process does not address flooring or furniture changes as potential VOC sources.

The investigation determined the 3B CREFS AFU became inoperable on December 17, 2015, when the 3B CREFS AFU was operated and exposed to the VOCs created by the CR renovation project. December 24, 2015, is the event date when the LCO Required Action Completion Time for Conditions A and C of LCO 3.7.11 expired. Irradiated fuel was moved in the Unit 3 spent fuel pool on multiple

occasions with the operable CREFS train not in the essential filtration mode, which did not meet the requirements of Condition E of LCO 3.7.11.

The Unit 3 “A” train CREFS AFU was not susceptible to VOC contamination because it was not operated during the CR renovation.

The CR renovation project has been performed in each of the three PVNGS units. The carbon filters for the Unit 1 and Unit 2 “A” and “B” trains of CREFS AFUs have been tested since the discovery of this condition with satisfactory results.

5. ASSESSMENT OF SAFETY CONSEQUENCES:

This event did not result in a potential transient more severe than those analyzed in the Updated Final Safety Analysis Report (UFSAR) or result in an abnormal release of radioactive materials to the environment. There were no actual safety consequences as a result of this event and the event did not adversely affect the health and safety of the public. The redundant train 3A CREFS AFU was not removed from service while the 3B CREFS AFU was inoperable.

The nuclear safety risk significance associated with the subject condition was minimal. The degraded CREFS AFU filtration capability impacts design basis requirements regarding CR staff dose in design basis accidents. However, the condition has minimal impact on actual risk due to: (1) the remaining margin in the filters capable of limiting doses from design basis events to those which will not create acute health effects and (2) the availability of portable air breathing devices to minimize the dose impacts from elevated CR airborne radionuclides in design basis and beyond design basis events. In addition, the likelihood of events creating radioactive releases capable of causing acute health effects to the CR staff assuming no CREFS AFU capability is very small (< 2E-6 per year) based on the probabilistic risk assessment model results.

The event would not have prevented the fulfillment of a safety function and the condition did not result in a safety system functional failure as defined by 10 CFR 50.73 (a)(2)(v).

6. CAUSE OF THE EVENT:

The direct cause of the 3B CREFS AFU carbon filter failure was exposure to a high amount of VOCs from a CR renovation project.

The apparent cause of this event was a lack of knowledge and recognition by PVNGS personnel to identify and properly mitigate the effects of a CR renovation project on the CREFS AFU resulting in inadequate guidance for controlling all potential sources of VOCs.

7. CORRECTIVE ACTIONS:

As an immediate corrective action, the CREFS AFU carbon filter bed was replaced and testing was completed. The CREFS AFU was declared operable on July 24, 2016.

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REV NO.	
Palo Verde Nuclear Generating Station (PVNGS) Unit 3	05000530	2016	- 001	- 01	5 OF 5

NARRATIVE

To address the apparent cause, applicable change process and work control procedures have been revised to ensure flooring and furniture replacements that could impact the CREFS AFU are evaluated as potential sources of VOCs prior to performing work.

8. PREVIOUS SIMILAR EVENTS:

No similar conditions have been reported by PVNGS in the last three years.