



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

November 16, 2015

EN 51283  
NMED No 150426  
EA-15-217

Mr. Jim Pritchett  
Plant Manager  
Honeywell Metropolis Works  
P.O. Box 430  
Metropolis, IL 62960

SUBJECT: HONEYWELL METROPOLIS WORKS – NUCLEAR REGULATORY  
COMMISSION INSPECTION REPORT 40-3392/2015-008 AND NOTICE OF  
VIOLATION

Dear Mr. Pritchett:

This letter refers to the apparent violation that was identified during follow-up of an event involving a uranium hexafluoride leak that occurred in the Feed Materials Building on August 1, 2015. The details of the follow-up inspection are documented in Nuclear Regulatory Commission (NRC) Inspection Report 40-3392/2015-007.

Based on the information developed during the inspection and further evaluation to determine the potential risk, the NRC has determined that a Severity Level IV violation of NRC requirements occurred (VIO 40-3392/2015-008-01). The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding it are described in detail in NRC Inspection Report 40-3392/2015-007. The violation involved the failure to follow procedure which, in part, required that where line breaking was followed by a period of down time, breaks in the system be properly capped with blind flanges for the duration of the out-of-service period. The violation was evaluated in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at (<http://www.nrc.gov/aboutnrc/regulatory/enforcement/enforce-pol.html>).

The violation was determined to be more than minor and similar to the example in the *NRC Enforcement Policy*, paragraph 6.2.d.2, as an example of a failure of safety systems or controls that occurs such that an acceptable safety margin was not maintained, but the failure does not result in a Severity Level I, II, or III violation. NRC staff noted that there were no workers in the area during the release, and responders donned appropriate personnel protective equipment. However, NRC staff determined that had a worker been in the immediate vicinity of the release point at the outset of the release and not wearing respiratory protection, a significant intake of uranium hexafluoride could have occurred if the worker did not evacuate in a timely manner. Enclosure 2 provides a basis for our conclusion that a worker would not have received a significant exposure had the worker been present and evacuated in a timely manner. The

apparent violation (AV) documented in Inspection Report 40-3392/2015-007(AV 40-3392/2015-007-02) is considered closed.

The violation is being cited in the Notice because it was self-revealing. You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the Public without redaction.

Thank you for your cooperation. If you have any questions, please call me at (404) 997-4629.

Sincerely,

*/RA/*

Marvin D. Sykes, Chief  
Project Branch 1  
Division of Fuel Facilities Inspection

Docket No. 40-3392  
License No. SUB-526

Enclosures:

1. Notice of Violation
2. Worker Consequence Calculation

cc: (See page 3)

The violation is being cited in the Notice because it was self-revealing. You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room and in the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Thank you for your cooperation. If you have any questions, please call me at (404) 997-4629.

Sincerely,

*/RA/*

Marvin D. Sykes, Chief  
 Projects Branch 1  
 Division of Fuel Facility Inspection

Docket No. 40-3392  
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 ADAMS:  Yes      ACCESSION NUMBER: ML15320A149       SUNSI REVIEW COMPLETE       FORM 665 ATTACHED

OFFICE	RII:DFFI	RII:DFFI					
SIGNATURE	/RA/	/RA/					
NAME	MRead	DHartland					
DATE	11/5/2015	11/6/2015					
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

cc:

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## NOTICE OF VIOLATION

Honeywell Metropolis Works  
Metropolis, Illinois

Docket No. 40-3392  
License No. SUB-526  
EA-15-257

During an NRC inspection conducted on August 2-14, 2015, a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is described below:

License Condition 18 of NRC License No. SUB-526, Amendment No. 11, states, in part, that the licensee shall conduct authorized activities at the Honeywell Metropolis Works Facility in accordance with the statements, representations and conditions of the license application dated May 12, 2006, as supplemented by letters dated March 20, 2007, May 12, 2008, July 12, 2010, and February 15, 2011.

Section 2.6.1 of the license application requires the licensee to establish a process to identify those process operations that require procedural guidance to ensure proper execution and require that these process operations be conducted in accordance with approved procedures.

Step 6.4 of Licensee procedure MTW-SAF-LS-0007, Line Breaking/Equipment Opening, requires, in part, personnel ensure hazards are controlled if a system is to be left unattended after it is opened. Furthermore, it requires that where line breaking is followed by a period of down time, such as the replacement of equipment, properly cap the breaks in the system with blind flanges for the duration of the out-of-service period.

Contrary to the above, on July 31, 2015, the No. 4 Low Boiler Condenser (LBC) was left unattended after it was opened, and hazards were not properly controlled. Specifically, line breaking on the No. 4 LBC was followed by a period of down time, and the blind flanges used to cap the breaks in the system were not properly secured. This provided a release pathway for uranium hexafluoride and contributed to the event on August 1, 2015.

This is a Severity Level IV violation (Section 6.2).

Pursuant to the provisions of 10 CFR 2.201, Honeywell Metropolis Works is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, Region II, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time. If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 16<sup>th</sup> day of November, 2015

### WORKER CONSEQUENCE CALCULATION

NRC staff reviewed the increase in risk to the workers during the release on August 1, 2015. The approach for determining the potential inhalation hazard from the uranium hexafluoride (UF<sub>6</sub>) release at Honeywell was two-fold because there are consequences associated with both uranium and hydrogen fluoride (HF) intake. Based on the assumptions in the licensee's Integrated Safety Analysis (ISA) Summary and training provided to workers, NRC staff assumed that there was a high probability that any workers that had been in close vicinity of the release would have evacuated the area of concern within 10 seconds. Therefore, the staff evaluated the dose to the worker during a 10 second exposure time.

The average release rate over the 86 minute release was 63.3 grams of uranium per minute. Based on the pressure spike in the vacuum line, staff estimated that the release rate over the first 10 seconds was 168 grams of uranium per minute. Staff assumed that the breathing rate of a worker was 1.2 cubic meters per hour, as defined in 10 CFR 20.1003. Staff also assumed that all the uranium released in the first 10 seconds was contained in a 10 cubic meter sphere as indicated in video footage of the release. For the uranium consequence calculation, staff also assumed that all uranium remained suspended rather than reacting with the moisture in the air.

Volume of spherical plume at 10 sec (m <sup>3</sup> )	10
Release rate (g/min)	168.0
Grams of U in sphere at 10 sec (g)	28.0
Concentration in sphere at 10 sec (g U/m <sup>3</sup> )	2.80
Average concentration in sphere over 10 sec (g U/m <sup>3</sup> )	1.40
Average normal inhalation rate (m <sup>3</sup> /min)	0.02
U-intake in 10 sec (g)	<b>0.0047</b>

NRC staff determined from the simplified intake calculation and the conservatisms built into the values that the 4.7 mg of uranium estimated uptake was significantly below the threshold value of 10 mg of uranium for an intermediate consequence as defined in the Honeywell ISA Summary.

For the HF calculation, NRC staff compared calculated concentrations to the HF concentration limits as defined in licensee's ISA Summary. The ISA Summary limits are based on Acute Exposure Guideline Levels (AEGs) and experimental data. An intermediate consequence was defined as a worker being exposed to a concentration of 137 milligrams per cubic meter for one minute. Staff calculated the average concentration of HF in a 10 cubic meter sphere over the first 10 seconds of the release to be 280 milligrams per cubic meter. Although 137 milligrams per cubic meter in one minute cannot be compared to 280 milligrams per cubic meter for 10 seconds, concentrations would need to be exponentially higher at shorter times to result in the same consequence. Therefore, staff qualitatively determined that workers in the area of the release would not have received a significant intake of HF as long as they evacuated within 10 seconds of detection.