Specialty Materials Honeywell P.O. Box 430 Highway 45 North Metropolis, IL 62960

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August 19, 2005

U.S. Nuclear Regulatory Commission Director, Office of Nuclear Material Safety and Safeguards Attention: Document Control Desk Mail Stop T-8A33, Two White Flint N., 11545 Rockville Pike Rockville, MD 20852-2738 (UPS: 301-415-8147)

Subject: 30-Day Written Follow-up Report to NRC Event Number #41857 Reported 7/20/2005 to NRC Operations Center. Docket No. 04003392, License No. SUB-526

Honeywell Chemicals, Specialty Materials, Metropolis Works (MTW) facility reported to the NRC Operation Center as per 10 CFR 21 a deviation from procedure pertaining to UF_6 cylinder valve installations that may present safety hazards. This letter is a required follow-up report to address specific items required by the regulations.

Report to NRC Event Number #41857 Reported 7/20/2005:

Metropolis Works, Metropolis, Illinois (Uranium Conversion Facility) is reporting a failure to follow procedure related to the installation of valves in UF_6 cylinders.

- During review of quality records for installation of valves in Uranium Hexafluoride cylinders, it was determined that this site was not in compliance with ANSI N 14.1 1971/2001, 'Uranium Hexafluoride Packaging for Transport.' Specifically, personnel were not recording the torque during valve installation as required by paragraph 6.12.6 of ANSI N 14.1 and Section 10 of Honeywell UF₆ Cylinder Quality Assurance Manual. The ANSI standard specifies both a torque and minimum thread engagement for the valves. Even though both parameters are required by the Honeywell procedure, this site was using only the thread engagement for determination of proper valve installation. The issue was identified on July 15, 2005. No full cylinders with questionable valve installation have been shipped since this date. All recipients of cylinders pertaining to this matter were notified of the compliance issue on July 20, 2005. Currently there have been no reports of issues related to valves installed by MTW Honeywell.
- 2. Since identification of the problem the following additional actions have been taken:
 - a. Honeywell has started a review to determine the correlation between thread engagement and torque. Thus far, fourteen cylinders have had valves installed to the proper thread engagement. In every case thus far the thread engagement has correlated with the torque specified by the ANSI standard within the required range of - 200 to 400 ft-lbs. Twenty-six more cylinders will have valves installed to the required thread engagement and the torque will be verified. This statistical sample size gives a 99% confidence level of representing the total Honeywell population of Uranium Hexafluoride cylinders in service. Honeywell Metropolis

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presently has approximately 900 Uranium Hexafluoride cylinders in service. In addition, Honeywell has changed approximately 106 valves in recipient cylinders, and they will be notified of the cylinder numbers and the issue concerning valve torque.

- b. In accordance with the ANSI N 14.1 standard cylinders have been and will continue to be pressure tested to 100 psig after valve installation to assure the valve and valve joint do not leak.
- c. A technical evaluation was made concerning the failure mode if the valves were significantly over-torqued. This evaluation concluded that failure of the valve would occur prior to failure of the cylinder fitting and that failure would be obvious upon visual inspection. As noted previously there have been no reported issues related to valves installed by Honeywell. The probability of valves being significantly under torqued while achieving proper thread engagement appears to be very remote.
- d. Only six personnel are presently authorized to perform valve installations and have been re-trained to ensure they understand and comply with the applicable procedures. In addition as a temporary measure direct supervision will be provided to assure compliance with Honeywell procedures that meet ANSI N 14.1 requirements.
- 3. Based on the above review and actions Honeywell does not consider that a safety hazard exists with the transport and use of cylinders on which valve replacement was performed by Honeywell."

The licensee has notified Region II (J. Henson, D. Hartland and J. Sharkey).

10 CFR 21.21 (d) (4) Written 30-day follow-up report required:

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(i) Name and address of the individual or individuals informing the Commission.

David B. Edwards, Plant Manager, Honeywell MTW License SUB-526, Highway 45 North, Metropolis, IL 62960

(ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

The Honeywell facility in Metropolis, IL is primarily focused on the chemical conversion of uranium ore concentrates into uranium hexafluoride (UF_6) as part of the nuclear fuel cycle. The UF_6 is shipped to enrichment facilities as feedstock to their processes.

The activity that resulted in a failure to comply with ANSI 14.1 requirements was the changing of UF_6 cylinder values at the facility. These UF_6 cylinder value installations were performed without verifying the torque values to ensure a minimum torque of 200 ft-lbs and a maximum torque of 400 ft-lbs.

(iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains a defect.

Honeywell MTW owns and operates the facility at which the valve installations were performed.

(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.
 HON Metropolis failed to comply with ANSI N 14.1 standard and the HON Metropolis procedures for installation of valves in UF₆ cylinders. The use of thread engagement alone for cylinder valve installations resulted in this nonconformance. Both the ANSI N 14.1 standard and the HON Metropolis procedures require both a thread engagement and measured torque value in the range of 200-400 ft.-lbs for valve installations. The valve installation process has and continues to require a 100-psi pressure check of the cylinder following valve installation. No problems related to leaking UF₆ cylinder valves have been reported to the HON Metropolis facility.

HON Metropolis does not believe this nonconformance poses as safety hazard because:

- As stated above, there have been no reported problems related to HON Metropolis cylinder valve installations;
- Valves have been installed with proper thread engagement and pressure checked to 100-psi following the valve installations;
- Test results using thread engagement indicates a very high probability that the torque on the valve was between 200 and 500 ft.-lbs (see details of the test below).
- (v) The date on which the information of such defect or failure to comply was obtained.

The date this issue was identified by MTW was July 15, 2005.

(vi) In case of a basic component which contains a defect or fails to comply, the number and location of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part.

Honeywell Owned Cylinders:

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HON Metropolis, IL- 431

USEC, Paducah, KY- 255

Urenco (Europe)- 373

Eurodif (France)- 67

In-Transit to Enrichment Facilities-72 (all routed to Urenco)

In-Transit to HON-Metropolis- 24 (from Urenco)

Customer owned cylinders with HON Metropolis valve changes (2000-2005):

Urenco –	107
Eurodif –	2
Tenex –	127

Note: All recipients of affected cylinders have been notified.

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action, and the length of time that has been or will be taken to complete the action.

Upon identification of the issue, all cylinder shipments with HON Metropolis valve installations were suspended. A team was formed to evaluate the situation and define a path forward. The actions taken by the team included:

- Notification of all recipients of cylinders with valve installations not in compliance with the ANSI standard. This was completed by ConverDyn, the marketing agent for HON-Metropolis UF₆ conversion services. This action began on July 20, 2005 with notifications to USEC, Urenco and Eurodif, and was completed on August 12, 2005 when contact was made with Tenex.
- Procure indicating torque devices to be used on cylinder valve installations.
 Responsibility: John Tennison Manager of Maintenance. Action completed on July 20, 2005.
- A Preventive Maintenance Program will be established for the maintenance and integrity of the torque devices to ensure compliance with applicable procedures and standards. Craig Flannery Project Engineer is responsible for this action and target completion date is September 30, 2005. In the interim, all torque devices will be maintained properly and calibrated in accordance with the manufacturer's recommendations.
- The personnel authorized to perform the valve installations have been re-trained to ensure understanding and compliance with applicable procedures. Training was completed by Ed Duff – Training Specialist on August 7, 2005. Ongoing training has been modified to include emphasis on adherence to both the thread engagement and torque requirements.
- Implemented valve change initiative to ensure compliance with ANSI N 14.1 standard and HON Metropolis procedures for all subsequent cylinders to be filled at or shipped from the site. Valve changes were performed on full UF₆ cylinders at HON-Metropolis to ensure compliance with ANSI standards regarding cylinder valve installations and to ensure compliance for shipment of cylinders. Management oversight was present during the revalving of these cylinders to ensure compliance with procedures and standards associated with this activity. This initiative is the responsibility of Rich Allshouse, QA Supervisor. Through August 18, 2005, valve changes have been completed on 105 cylinders and 2 remain to be changed. It is estimated that the remaining 2 cylinders will have valve replacements on or before Monday, August 22, 2005.

Site Study

The site conducted a study to determine the limits and variation in the former non-compliant practice of cylinder valve installations using thread engagement, and to better understand the safety implications of the non-compliant practice. The study was based on valve installations on 33 cylinders using the non-compliant practice of thread engagement and "feel" of the operator, while utilizing an indicating torque device to measure the actual ft-lbs for each installation. The valve installation operator was shielded from viewing the torque values during this test. The results of the test were:

In achieving the proper thread engagement, the torque values ranged from 280 - 475 ft.-lbs.

Chart 1 below shows the Process Capability while Chart 2 is a bar chart summarizing the torque values obtained in the blind study.

Three of the thirty-three test cylinders had more than 400 ft-lbs of torque applied to insert their valve up to the point where 9 threads were engaged. If a normal distribution is assumed, 16.2% of the cylinders are likely to have greater than 400 ft-lbs of torque applied and 0.18% are likely to have less than 200 ft-lbs of torque applied. It is possible that no cylinder in the population would have less than 200 ft-lbs of torque applied due to the test procedure and experience of the personnel installing the valves.

There is a large spike in the distribution at 300 ft-lbs and another small spike at 475 (2 data points); otherwise the distribution looks normal.



Chart 2



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Study Conclusion

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Safety is a paramount consideration in deciding whether to feed a full cylinder of natural UF_6 from Metropolis to the enrichment process. Assuming that the test data is representative of the conditions under which the cylinders in question were filled by Metropolis personnel and assuming that the data is representative of a normally distributed population, then the following conclusions can be drawn:

Torque, foot-pounds	Probability, %
200	0.18% probability of valve torque below 200 ft-pounds
400	16% probability of exceeding 400 ft-pounds
500	0.17% probability of exceeding 500 ft-pounds
600	0.00005% probability of exceeding 600 ft-pounds

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

This report is being shared with the U.S. Department of Transportation. Also, this report will be shared with all recipients of cylinders with valve installations that were not in compliance with ANSI N 14.1 standards.

HON-Metropolis does not consider this nonconformance a safety hazard for full or heeled, empty cylinders. (See discussion in section (iv) above.)

For further questions regarding this issue, please contact Mr. Bruce Vandermeulen, Manager-QA/Supply Chain at 618-524-6222.

Sincerely,

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David B. Edwards Plant Manager

Cc: U.S. Nuclear Regulatory Commission, Region II (UPS: 404-562-4700) Attention: Mr. Douglas Collins Sam Nunn Atlanta Federal Center 23 T85, 61 Forsyth Street, S.W. Atlanta, GA 30303-8931

U.S. Nuclear Regulatory Commission Attention: Mr. Michael Raddatz Fuel Cycle Licensing Branch, Mail Stop T-8A33 Two White Flint North, 11545 Rockville Pike Rockville, MD 20852-2738

D. Mays T. Plunkett, Dir. Integrated Supply Chain, MTO (UPS: 301-415-6334)