

INSPECTION REPORT

1. LICENSEE OR CERTIFICATE HOLDER/LOCATION INSPECTED: Honeywell International, Inc. P. O. Box 430 Metropolis, IL 62960		2. NRC/REGIONAL OFFICE: U.S. Nuclear Regulatory Commission Region II 61 Forsyth Street, Suite 23T85 Atlanta, GA 30303-8931	
REPORT NO: 2009-002			
3. DOCKET NUMBER: 40-3392	4. LICENSE OR CERTIFICATE NUMBER: SUB-526	5. DATE(S) OF INSPECTION: May 4, 2009 – May 15, 2009	

LICENSEE OR CERTIFICATE HOLDER:

The inspection was an examination of the activities conducted under your license or certificate as they relate to safety and/or safeguards and to compliance with the Nuclear Regulatory Commission (NRC) rules and regulations and the conditions of your license or certificate. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. The inspection findings are as follows:

- 1. Based on the inspection findings, no violations were identified.
- 2. Previous violation(s) closed.
- 3. Reported events reviewed
- 4. The violation(s), specifically described to you by the inspector as non-cited violations, are not being cited because they were self-identified, non-repetitive, and corrective action was or is being taken, and the remaining criteria in the NRC Enforcement Policy, to exercise discretion, were satisfied.
Non-Cited Violation(s) was/were discussed involving the following requirement(s) and Corrective Action(s):

- 5. During this inspection, certain of your activities, as described below and/or attached, were in violation of NRC requirements and are being cited. This form is a NOTICE OF VIOLATION, which may be subject to posting in accordance with 10 CFR 19.11.
(Violations and Corrective Actions)

Please see attached Notice of Violation.

LICENSEE OR CERTIFICATE HOLDER STATEMENT OF CORRECTIVE ACTIONS FOR ITEM 5, ABOVE

I hereby state that, within 30 days, the actions described by me to the inspector will be taken to correct the violation(s) identified. This statement of corrective actions is made in accordance with the requirements of 10 CFR 2.201 (corrective steps already taken, corrective steps which will be taken, date when full compliance will be achieved). I understand that no further written response to the NRC will be required, unless specifically requested.

Title	Printed Name	Signature	Date
LICENSEE/CERTIFICATE HOLDER REPRESENTATIVE			
NRC INSPECTOR	R. Prince/J. Foster/P. Startz	/RA/	6/12/09

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6. INSPECTOR(S): Robert Prince, Jennifer Foster, Paul Startz

7. INSPECTION PROCEDURES USED: 86740, 88025, 88030 and 88035

EXECUTIVE SUMMARY

Summary of Plant Status

The Honeywell Specialty Chemicals (licensee) uranium conversion facility is located on a 1,100 acre site (60 acres within the fence line). The licensee is authorized to possess 150 million pounds of natural uranium ore and to convert this material to uranium hexafluoride (UF₆). The uranium conversion process occurs in the Feed Materials Building (FMB).

Radiation Protection (88030)

- The inspector discussed organizational issues and personnel responsibilities with the Radiation Protection Manager (RPM). No significant organizational changes were made since the last inspection. The inspector verified that the RPM reports to senior management as required by the site license.
- The inspector reviewed selected NRC Form 5 records for completeness and accuracy. Selected bioassay records were also reviewed to evaluate individual internal dose assessments. The inspector noted that the licensee had recently changed to a new dosimeter for monitoring personnel exposures. The new dosimeter affords a lower limit of detection when compared to the previous dosimeter and therefore provides the capability to more precisely monitor low-level personnel exposures. No issues or concerns were identified associated with the monitoring and recording of personnel exposures.
- The inspector reviewed incident reports for selected reportable events and the corresponding evaluations and dose assessments. No regulatory exposure limits were exceeded as a result of these events.
- The inspector reviewed the Semiannual Health Physics Review documents for 2008 and determined that the yearly average FMB airborne radioactivity concentration was higher than that of the previous year. Licensee personnel interviewed determined that the increase in airborne contamination was likely due to additional releases and activities in 2008 such as cleaning various tanks before the start-up of the wet process. The average worker exposure in 2008, however, did not demonstrate an increase over the 2007 levels. No issues were identified.

EXECUTIVE SUMMARY (Continued)

- The inspector observed Health Physics personnel in the field collecting air samples from various fixed sampling locations within the FMB. The inspector noted that air sampling collection and handling techniques were performed in accordance with approved procedures. The inspector reviewed air sample results and the corresponding records for respiratory use for areas of the FMB. The inspector found that respirators were prescribed based on air sample results, visible contamination events, and activities projected to produce elevated airborne contamination in accordance with approved procedures. Plant personnel interviewed stated that the use of respiratory protection was increased over the past year as a precautionary tool for activities projected to produce elevated airborne contamination. The increase in respirator use was noted as a conservative measure as the frequent use of respiratory protection in the FMB would reduce worker internal exposure and protect worker health and safety.
- The inspector observed the respirator fit-testing and the initial respiratory protection training programs. The inspector found that the respirator training and fit-test programs were conducted in accordance with approved procedures. The inspector noted that the prescribed respirators afford adequate protection against airborne radioactive material that may be encountered at the facility.
- The inspector reviewed the most recent contamination survey data for the FMB areas. The inspector noted that surface contamination levels in the FMB on some occasions exceeded the current values specified by the license. This issue was previously identified in Inspection Report 2008-005, dated October 20, 2008. The licensee subsequently submitted a license amendment to address this issue. The inspector discussed the status of the license amendment and related corrective actions with responsible personnel. The licensee used an interim surface contamination limit of 75,000 dpm/100 cm² in conjunction with additional house keeping efforts to minimize contamination levels within the FMB. The licensee hired additional employees to assist in decontamination efforts at the plant and also increased their survey frequency. This issue will continue to be evaluated during future inspections.
- The inspector reviewed weekly average contamination data and trends. The contamination data for the later half of 2008 appeared to be decreasing slightly while the data for the first half of 2009 appeared to have increased slightly. The apparent changes are small enough to suggest that they are not statistically significant. Furthermore, when the data was combined into a single trend, there was not a statistically-significant pattern to the data. The inspectors did observe visible contamination in the FMB in several areas and reported it to the appropriate management. The employees utilize personal protective equipment (PPE) and hand and foot radiation monitors to prevent the spread of contamination outside of the controlled area. No issues were identified.
- In addition to contamination survey data, the inspector determined from the Semiannual Health Physics Review that there were 33 instances of contamination found in uncontrolled areas, such as the lunchroom, in 2008. The contamination levels were above the license action limits that required that the licensee decontaminate the area. The licensee decontaminated the area in accordance with procedures. The results of the licensee bioassay program indicated that these instances have not resulted in a radiological consequence for licensee personnel in these areas. No issues were found.
- The inspector reviewed ALARA Committee Meeting minutes and Housekeeping Meeting minutes and noted that efforts have been initiated to minimize long-term contamination control issues. The inspector reviewed a list of issues that the licensee has identified as potential targets for contamination control measures. The inspector noted that a new seal design was installed on an ore blender to minimize contamination control issues associated with the previous seal design. Licensee personnel stated that engineering and design improvement efforts to improve contamination control measures are ongoing.

EXECUTIVE SUMMARY (Continued)

10 CFR 40.60(b)(1) states that “each licensee shall notify the NRC within 24 hrs after the discovery of an unplanned contamination event that requires, in part, (i) access to the contaminated area, by workers or the public, to be restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area; and, (ii) involves a quantity of material greater than five times the lowest annual limit on intake specified in appendix B of 20.1001-20.2401 of 10 CFR part 20 for the material.”

Through interviews of licensee employees, the inspectors determined that the licensee had experienced 40 unplanned contamination events between October 17, 2008 and March 29, 2009. Only three of these events were reported to the NRC in accordance with 10 CFR 40.60(b). The unreported events are summarized in the table below and for the most part, involved “dust-outs” that consisted of the release of particulate uranium tetrafluoride usually from the hydrofluorination (green salt) production process. These events required the imposition of additional controls, primarily through requiring the use of respiratory protection for periods in excess of 24 hours. Licensee personnel indicated that, in some cases, they were not able to determine the amount of material released and whether the amount of licensed material released was greater than five times the lowest Annual Limit on Intake (ALI) as specified in Appendix B of 10 CFR 20. Five times the lowest annual limit on intake for natural uranium is 3.03 grams.

Date	Reason for Area Restriction	Total Time Area was Restricted (hours)
10/17/2008	Dust collector dust out	45.5
10/29/2008	Precaution*	50.5
11/3/2008	Precaution*	48.7
11/28/2008	Spar Hopper dust out	40.5
12/1/2008	Precaution*	38.3
12/3/2008	Precaution*	74.0
12/4/2008	Precaution*	88.0
12/6/2008	#2 AC Crusher dust out	48.5
12/9/2008	High air sampler reading	48.8
12/9/2008	High air sampler reading	239.9
12/14/2008	Precaution*	268.7
12/21/2008	Precaution*	141.8
12/21/2008	UF ₄ dust out	150.5
12/26/2008	Blender dust out	29.5
12/27/2008	Precaution*	93.3
1/1/2009	Dust outs on 1 st and 4 th floors	47.0
1/6/2009	Precaution – 2 nd floor*	141.3
1/6/2009	Precaution – 2 nd floor/ Distillation Side*	41.2
1/9/2009	Precaution*	77.7
1/20/2009	Elevated air sampler reading	144.0
2/2/2009	“B” Top Hydrofluorinator Drawoff Leg – dust out	57.2
2/2/2009	Elevated air sample reading	118.0
2/6/2009	Elevator dust out	35.2
2/15/2009	Elevated air sample readings	98.8
2/16/2009	Elevated air sample readings	72.2
2/17/2009	Precaution*	52.0
2/22/2009	Elevated air sample readings	96.5
2/27/2009	Precaution*	97.3
3/5/2009	Dust out	122.8

EXECUTIVE SUMMARY (Continued)

3/5/2009	Ore blender – dust out	42.5
3/5/2009	Precaution*	144.5
3/6/2009	Elevated air sample readings	24.0
3/9/2009	Precaution*	28.3
3/18/2009	Blender dust out	49.8
3/19/2009	#2 AC Crusher	25.0
3/22/2009	Green salt drain line leak	31.0
3/24/2009	Green salt dust out	129.5

The term “precaution” was used by the licensee to identify those cases where the licensee did not know if the imposition of additional restrictions was for a planned or unplanned event. The licensee considered two scenarios for the events which were characterized as precautionary. In the first case, operators in the FMB initiated the respiratory protection requirement when an unplanned contamination event was observed. In the second case, the control room initiated the respiratory protection requirement as a precaution before maintenance activity such as a line break was initiated. Since the licensee was not able to differentiate which of these two scenarios triggered the restrictions, the licensee conservatively assumed that the initiating event was unplanned and the event was therefore reportable.

Interviews of licensee personnel revealed that the licensee did not have an effective process for identifying reportable events. For example, licensee personnel had not recognized 5 ALI was equal to 3.03 grams of natural uranium and had not incorporated a reportability limit into their process based on the quantity of released material. Upon reviewing the available data, licensee staff concluded that they were unable to determine the actual amount released in the majority of examples. Given that a “dust out” event could easily be expected to involve the release of more than 3.03 grams of material, and the actual mass released was unknown, the licensee conservatively assumed that the material released in each of the 37 events was greater than 3.03 grams.

The internal exposure dose information did not demonstrate a relationship with the reportable events for either the average monthly Committed Effective Dose Equivalent (CEDE) or the CEDE of the maximally exposed individual at the facility for each month. The internal dose data from the bioassay program suggest that the unreported unplanned contamination events did not have a significant adverse impact on safety at the plant. The inspectors concluded that the failure to report 37 unplanned contamination events that involved more than 5 ALI of natural uranium and the imposition of additional restrictions for more than 24 hours was an apparent violation (VIO 040-3392/ 2009-002-01).

Radioactive Waste Management (88035)

- Records associated with the tracking and storage of radioactive waste and radioactive materials were reviewed. The inspector interviewed responsible personnel concerning the inventory and management of onsite radioactive material. The inspector noted that responsible personnel adequately maintained a current inventory of the various types of radioactive material in storage and that the inventory accurately reflected radioactive material storage locations. Responsible personnel maintained an updated inventory that tracked the amount of uranium present on site to ensure compliance with license possession limits.

EXECUTIVE SUMMARY (Continued)

- The inspector observed radioactive material storage and staging areas. The inspector noted that uranium-bearing radioactive material in storage consisted primarily of feed material, hard ore, KOH drums, and filter fines. The inspector noted that the physical condition of many storage containers had deteriorated to the point that the metal had rusted through. Due to the nature of the radioactive material, consisting of un-enriched natural uranium, a review of radiological survey data and effluent monitoring data the inspector determined that there was no immediate impact on the health and safety of the public resulting from the deteriorated storage containers. The inspector discussed the situation with licensee personnel and noted that the licensee had various initiatives underway to address long term storage of radioactive material. The inspector noted that these measures included a plan to process KOH drums by the year 2016. Equipment including a drum compactor and drum shredding unit were recently acquired. The inspector noted that the drum compactor unit is operational while the drum shredder unit is undergoing initial start-up and testing. This equipment will be utilized to process hard ore and other material containers and empty drums currently in storage.
- Through discussions with licensee personnel and plant observations the inspector noted that the licensee had reduced the quantity of miscellaneous materials present during previous inspections on outside storage pads. These items included such materials as used equipment and components, scrap metal, and discarded drums. The inspector noted that these improvements were initiated as part of the licensee's efforts to improve housekeeping in plant buildings and storage areas.
- Procedures adequately described the responsibilities and roles of personnel responsible for the preparation, packaging, and transport of radioactive waste shipments.
- Selected radioactive waste shipment manifests were reviewed for completeness and accuracy. Manifest correctly reflected the classification, quantity, and labeling requirements for the respective shipment. Discussions with personnel responsible for certifying that waste shipments are prepared in accordance with DOT regulatory requirements indicated that personnel were knowledgeable of their responsibilities and regulatory requirements.
- The inspector reviewed training and qualification records for individuals responsible for the radioactive material transportation program. Training records were current and adequately covered DOT and associated regulatory training requirements.
- No findings of significance were identified.

Transportation (86740)

- The inspector observed activities associated with the preparation and transport of UF₆ cylinders. Responsible personnel were knowledgeable of their responsibilities and procedural requirements associated with the shipment of UF₆ cylinders.
- The inspector observed personnel while they performed surveys on transportation vehicles and UF₆ cylinders and outer packaging prior to shipment. Radiation and contamination levels were verified to be in accordance with DOT shipping limits. The inspector interviewed personnel responsible for performing surveys for outgoing shipments and found that individuals were knowledgeable of regulatory requirements. The inspector reviewed associated paperwork for the shipments observed and for shipments made in the previous few months. No issues or safety concerns were identified.

EXECUTIVE SUMMARY (Continued)

Maintenance and Surveillance (88025)

- The inspector reviewed the circumstances associated with the repair of the secondary "A" green salt dust collector and associated partial replacement of a drain pipeline that allowed gravity removal of accumulated green salt powder from the filter housing. Green salt powder was filtered out and collected within the filter housing by the secondary filter elements and gradually fell to the bottom of the filter housing during regeneration cycles. The gravity transfer of powder out of the bottom of the filter housing was controlled by a rotary valve. This type of valve was known by licensee personnel to leak and a pipeline blind was normally kept in place to maintain maximum performance of the dust collector.

Prior to beginning maintenance activities to repair the system, the drain pipe blind below the filter housing was removed to allow removal of the accumulated green salt. Operations staff completed efforts to remove green salt from the housing and prepared the system for maintenance by implementing equipment lock-out/tag-out (LOTO) permit number GRNSLT-03675. The inspector noted that someone had added a written note onto permit 03675 to reinstall the pipe blind next to the rotary valve. However the blind was not installed in accordance with the hand written note. After maintenance had completed the removal of a section of the powder drain pipeline approximately 50 feet below the filter housing, the licensee reported that approximately 100 pounds of green salt fell out of the filter housing, through the rotary valve, and out of the pipeline covering the men and contaminating much of the building. This incident was reported to the NRC as event #44938 on March 24, 2009 and is captured on the Honeywell corrective action program as incident report 09-0925. Honeywell completed a root cause analysis and forwarded a 30 day written follow-up report. The report indicated that the rotary valve was electrically locked out, but failed to contain the uranium powder within the filter housing. The root cause analysis specifically stated that the decision to not install the blind was based on an assumption that the rotary valve would be sufficient to block the flow path. This assumption was not consistent to plant knowledge that the rotary valve could in fact, be reasonably expected to leak. The root cause report also stated that the special bioassay results of the personnel potentially affected by this event indicated that there were no significant uptakes of radioactive material and all employee internal doses were less than 10 millirem.

During the NRC inspection, the inspector determined that some experienced production personnel knew that the rotary valve leaked, knew that the pipeline blind was always installed because the rotary valve leaked, and likely added the hand written message to reinstall the blind prior to maintenance beginning work. Licensee personnel initiated LOTO permit #03676 about 20 minutes after the event to install the pipeline blind. The inspector concluded that in this latter case, licensee personnel installed the pipeline blind to maintain maximum performance of the dust collector after having previously declined to install the blind prior to personnel working on the system. The inspector determined that licensee decisions did not violate their safety procedures, this event illustrated that as applied in this case, the licensee's decision-making process did not result in a decision that demonstrated that nuclear safety was an overriding priority.

EXECUTIVE SUMMARY (Continued)

- The inspector accompanied two maintenance mechanics who demonstrated the weekly inspection of bridge crane CR-400ME, equipment # 1038888. The bridge crane is designated as safety related equipment due to its function of lifting cylinders filled with liquid UF₆. Specifically, the filled cylinders are lifted from one of several filling stations and placed on the scales near the rollup door to allow final weighing and solidification of the contents prior to moving the cylinder to an outside location. The inspector reviewed mechanical and electrical inspection records and noted discrepancies for the inspection of lifting slings, one pair of long slings used to lift a large shroud that covers the cylinder during filling operations and another pair of short slings used to lift test weights. Some maintenance mechanics were unaware that the long pair is normally attached to the shroud and are somewhat hidden from view; and had mistakenly believed that the short pair was actually the long pair. This mistaken identity resulted in occasional lapses of inspecting the long pair of slings. These lapses were determined to be minor because the slings were not used for lifting UF₆ cylinders. This finding was forwarded to the maintenance manager for follow-up corrective action. The inspector determined that weekly mechanical and electrical inspections described in the licensee's maintenance program for the actual bridge crane were appropriate and properly completed.
- The inspector reviewed recent repair activities associated with the failure of Reductor "B" reaction vessel and the associated work order #70271449. The Reductor suffered a burn-through failure. The licensee cut out the section of the reactor wall surrounding the 3" hole and shipped the sample to a laboratory for a failure analysis examination. The laboratory analysis results described in report # HON002157 indicated that localized overheating of approximately 1300°F likely led to the burn-through of the vessel wall. The vessel wall was manufactured from 304L stainless steel approximately 5/8" thick. Additional dye penetrant inspection during repairs indicated that the vessel wall located approximately 12 inches away from the hole was adequate for the installation of a welded patch. The welding contractor completed repairs. The licensee entered the failure event into their corrective action program as incident report 09-1026 and initiated a cause analysis investigation. The inspector determined that information contained in the failure analysis report and subsequent inspection activities performed by the welding contractor were relevant and adequate for completing vessel repairs.
- No other issues or safety concerns were identified.

Exit Meeting Summary

The inspection scope and results for the Radiation Protection, Radioactive Waste Management, and Transportation were summarized on Friday, May 8, 2009, with Mr. Tillman and members of his staff. A subsequent exit meeting was conducted on May 15, 2009, to discuss the results of the Maintenance & Surveillance inspection.

Key Points of Contact

<u>Name</u>	<u>Title</u>
M. Tillman	Plant Manager
M. Greeno	Acting Regulatory Affairs Manager
T. Barnes	Nuclear Services Leader
M. Bagwell	Environmental Analyst
M. Marti	Principal Chemical Engineer (inventory)
B. Muiter	Training Leader
E. Robinson	Senior Process Control Engineer
S. Patterson	Health Physics Supervisor
R. Stokes	Radiation Safety Program Manager
S. Grabil	Maintenance Manager

EXECUTIVE SUMMARY (Continued)

List of Items Opened, Closed, Discussed

<u>Item Number</u>	<u>Status</u>	<u>Description</u>
VIO 40-3392/2009-02-01	Open	<p>The inspector determined that 37 unplanned contamination events were not reported within 24 hours to the NRC between October 17, 2008, and March 29, 2009. In the 37 unplanned contamination events, the contaminated area was restricted to workers for more than 24 hours by imposing additional radiological controls; in this case the requirement of respiratory protection. The material released was greater than five times the lowest annual limit on intake as specified in appendix B of 10 CFR part 20 for the material. Five times the lowest annual limit on intake for natural uranium is 3.03 grams. This is contrary to 10 CFR 40.60.</p>