



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

October 28, 2011

Mr. Larry Smith
Plant Manager
Honeywell Specialty Chemicals
P.O. Box 430
Metropolis, IL 62960

SUBJECT: NRC INSPECTION REPORT NO. 40-3392/2011-004 AND NOTICE OF VIOLATION

Dear Mr. Smith:

This refers to the inspections conducted from July 1, 2011 through September 30, 2011, at the Honeywell Specialty Chemicals facility. The purpose of the inspections was to determine whether activities authorized under the license were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of these inspections. On September 22, 2011 and on October 18, 2011, the findings were discussed with you and other members of your staff.

The inspections consisted of examination of activities conducted under your license as they relate to public health and safety to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities in progress, and interviews with personnel.

Based on the results of this inspection, the NRC has determined that six Severity Level IV violations of NRC requirements occurred. The violations were 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/about-nrc/regulatory/enforcement/enforce-pol.html>).

The violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violations are being cited in the Notice because they were identified by the NRC. 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

L. Smith

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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) 997-4418.

Sincerely,

/RA/

Joselito O. Calle, Chief
Fuel Facility Inspection Branch 2
Division of Fuel Facility Inspection

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

Enclosures:

1. Notice of Violation
2. Inspection Report No. 40-3392/2011-004

cc w/encls:
Gary Wright
Emergency Management Agency
Division of Nuclear Safety
Electronic Mail Distribution

L. Smith

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Thank you for your cooperation. If you have any questions, please call me at (404) 997-4418.

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X PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE X NON-SENSITIVE
ADAMS: X Yes ACCESSION NUMBER ML11301A080 X SUNSI REVIEW COMPLETE X FORM 665 ATTACHED

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Letter to Larry Smith from Joselito O. Calle dated October 28, 2011

Subject: NRC INSPECTION REPORT NO. 40-3392/2011-004 AND NOTICE OF VIOLATION

Distribution w/encls:

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NOTICE OF VIOLATION

Honeywell Specialty Chemicals
Metropolis, Illinois

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

During NRC inspections conducted from July 1, 2011 through September 30, 2011, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

1. License Condition 18 of NRC License Number SUB-526 states, in part, that the licensee shall conduct authorized activities in accordance with the statements, representations and conditions (or as revised by change and/or configuration management processes as described, therein), in specific documents including the License Application, dated May 12, 2006.

Section 2.6.1 of the License Application states, in part, that Honeywell shall 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.

- a. Licensee procedure MTW-ADM-HP-0118, External Radiation Exposure Control, Section 4.2.1.2, requires the licensee to establish additional warning devices or barriers and postings in any area where an individual could receive a deep dose equivalent, exceeding 50 mRem in one hour at a distance of 30 centimeters from the surface.

Contrary to the above, on July 14, 2011, the licensee failed to establish additional warning devices or barriers and postings in an area where an individual could receive a deep dose equivalent, exceeding 50 mRem in one hour at a distance of 30 centimeters from the surface. Specifically, a drum storage area located on the South side of the Feed Materials Building contained one 55 gallon drum labeled as green salt with radiation readings exceeding 50 mRem at 30 centimeters from the surface. The actual radiation reading was 60 mr/hr at 30 centimeters from the surface resulting in an area where an individual could receive a deep dose equivalent exceeding 50 mRem in one hour.

- b. Licensee procedure MTW-ADM-HP-0118, External Radiation Exposure Control, Section 4.2.1.3, states in any area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour at a distance of 30 centimeters from the surface will be posted and controlled as a High Radiation Area.

Contrary to the above, on July 19, 2011, the licensee failed to post and control a High Radiation Area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour at a distance of 30 centimeters from the surface. Specifically, fourteen 55-gallon drums were located in the storage facility for filter fine

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bed material with radiation reading exceeding 100 mr/hr at 30 centimeters from the surface. The highest radiation readings were 129 mr/hr at 30 centimeters resulting in a High Radiation Area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour.

These are two examples of a Severity Level IV violation (Section 6.7.d).

2. License Condition 18 of NRC License Number SUB-526 states, in part, that the licensee shall conduct authorized activities in accordance with the statements, representations and conditions (or as revised by the approved configuration management process as described, therein), in specific documents including the License Application, dated May 12, 2006.

Section 2.6.1 of the License Application states, in part, that Honeywell shall 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.

Licensee procedure MTW-SOP-HP-0216, Respirator Fit Testing, Section 5 of Attachment A states, in part, that individuals have been observed many times pulling the respirator away from the face to talk and that they should not pull their respirators away from their face to talk.

Further, Section 10 of the attachment states that respirator users may leave the work area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communications failure, significant deterioration of operating conditions, or any other condition that might necessitate such relief.

Contrary to the above, on September 20, 2011, the NRC inspectors observed three employees, two Shaw contractors and one Honeywell worker, pull their respirators away from their faces to communicate and did not leave the work area. Specifically, this was observed, several times, during maintenance work on the Scrap Material Rotex, where the system was open and the area red light was lit signifying a posted airborne area.

This is a Severity Level IV violation (Section 6.7.d).

3. License Condition 18 of NRC License Number SUB-526, Amendment 8, dated February 28, 2011, states, in part, that the licensee shall conduct authorized activities at the Honeywell Metropolis Works facility in accordance with the statements, representations and conditions (or as revised by the approved configuration management process as described in Item J) in the Safety Determination Report dated May 12, 2006.

Section 2.7.2.3, Fire Water Distribution, of the Safety Demonstration Report, Rev. 10, dated July 19, 2011, states that fire main installation meets the standards of NFPA 24, "Standard for the Installation of Private Fire Service Mains and their Appurtenances"

(Ref. 1), in effect at the time of installation. [Reference 1. NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, National Fire Protection Association, various revisions]

Contrary to the above, the licensee failed to meet the fire main installation standards of NFPA 24, "Standard for the Installation of Private Fire Service Mains and their Appurtenances" in effect at the time of installation, as described in the following examples:

- a. Step 10.10.2.2.1, Section 10.10.2.2 Hydrostatic Test, Chapter 10 Underground Piping of NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances," 2010 Edition, states all piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi (13.8 bar) or 50 psi (3.5 bar) in excess of the system working pressure, whichever is greater, and shall maintain that pressure at ± 5 psi (0.35 bar) for 2 hours.
 - i. On April 29, 2011, the licensee failed to hydrostatically test all piping and attached appurtenances subjected to system working pressure at 200 psi or 50 psi in excess of the system working pressure for 2 hours. Specifically, approximately 30 feet of fire water underground piping was replaced due to identified leaks and a hydrostatic test was not performed. The work was performed under Request For Change (RFC) # 111700217 and three fire impairments on April 25, 27, and 28, 2011.
 - ii. On March 28, 2011, the licensee failed to hydrostatically test all piping and attached appurtenances subjected to system working pressure at 200 psi or 50 psi in excess of the system working pressure for 2 hours. Specifically, fire hydrant #1 replacement, underground isolation valve replacement, and leaking underground piping repair were completed and a subsequent hydrostatic test was not performed. The work was performed under Request For Change (RFC) # 116000098 and two fire impairments on March 14 and 22, 2011.
- b. Step 10.10.2.2.1, Section 10.10.2.2 Hydrostatic Test, Chapter 10 Underground Piping of NFPA 24, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances," 2002 Edition, states all piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi (13.8 bar) or 50 psi (3.5 bar) in excess of the system working pressure, whichever is greater, and shall maintain that pressure at ± 5 psi (0.35 bar) for 2 hours.

In June 2003, the licensee failed to hydrostatically test all piping and attached appurtenances subjected to system working pressure at 200 psi or 50 psi in excess of the system working pressure for 2 hours. Specifically, the HF Mitigation Spray Tower modification with 10-inch underground piping was completed and connected to the existing underground 8-inch fire system main and a hydrostatic test was not performed.

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

4. License Condition 18 of NRC License Number SUB-526, Amendment 8, dated February 28, 2011, states, in part, that the licensee shall conduct authorized activities at the Honeywell Metropolis Works facility in accordance with the statements, representations and conditions (or as revised by the approved configuration management process as described in Item J) in the Safety Determination Report dated May 12, 2006.

Section 2.7.2.5, Standpipes, of the Safety Demonstration Report, Rev. 10, dated July 19, 2011, states, in part, that the standpipes located in the Feed Materials Building (FMB) have and maintain a minimum pressure of 65 psig. These standpipes are part of the main fire water distribution system.

Contrary to the above, on and before September 1, 2011, the licensee failed to maintain a minimum 65 psig fire water pressure for the standpipes located in the FMB. Specifically, the licensee failed to demonstrate that the standpipes had a minimum pressure of 65 psig during the surveillance "Testing of HF Mitigation Spray Towers and HF Vaporizer Spray Rings," MTW-SAF-IP-0028. The fire protection standpipe header pressure on the sixth floor of the FMB read 50 psig when the spray nozzles were opened. The less than 65 psig standpipe header pressure during mitigation tower spray activities was unknown to the licensee and as a result, no fire impairments or compensatory actions were taken.

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

5. License Condition 18 of NRC License Number SUB-526, Amendment 8, dated February 28, 2011, states, in part, that the licensee shall conduct authorized activities at the Honeywell Metropolis Works facility in accordance with the statements, representations and conditions (or as revised by the approved configuration management process as described in Item J) in the Safety Determination Report dated May 12, 2006.

Section 2.7.2.2, Fire Water Pressure, of the Safety Demonstration Report, Rev. 10, dated July 19, 2011, states, in part, a 1000 GPM pump provides pressure (approximately 100 psig) for the fire mains. Automatic operation of the pump activates an alarm in the Powerhouse. If both the electrical and diesel motors fail, process water will pressurize the system through a check valve arrangement at a pressure of approximately 65 psig.

Contrary to the above, on September 17, 2010, the licensee failed to demonstrate that the process water will pressurize the fire water system through a check valve arrangement at a pressure of approximately 65 psig. Specifically, the licensee performed a fire hydrant flow test for all hydrants. For #6 and #8 hydrants, process water was used for the testing and was supplied by deep well pumps 1 and 2. Both hydrants' residual pressure readings for the test were 58 psig.

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

6. License Condition 18 of NRC License Number SUB-526, Amendment 8, dated February 28, 2011, states, in part, that the licensee shall conduct authorized activities at the Honeywell Metropolis Works facility in accordance with the statements, representations and conditions (or as revised by the approved configuration management process as described in Item J) in the Safety Determination Report dated May 12, 2006.

Section 2.7.2.6, Fire Extinguishers, of the Safety Demonstration Report, Rev. 10, dated July 19, 2011, states that Honeywell maintains appropriate supplies of portable fire extinguishers. These are distributed and maintained in accordance with NFPA 10 "Portable Fire Extinguishers" (Ref. 2.). [Reference 2, NFPA 10, Portable Fire Extinguishers, National Fire Protection Association, 2002]

Step 5.2.1, Section 5.2, Fire Extinguisher Size and Placement for Class A Hazards, of NFPA 10, "Portable Fire Extinguishers", Edition 2002, states, in part, that fire extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table 5.2.1, except as modified by 5.2.2. Table 5.2.1, Fire Extinguisher Size and Placement for Class A Hazards, states the maximum travel distance to the extinguisher for all three hazard occupancy levels (low, moderate, and high) is 75 feet.

Contrary to the above, on and before September 1, 2011, the licensee failed to meet the maximum travel distance of 75 feet for Class A fire extinguishers. Specifically, the licensee could not demonstrate the fire extinguishers located in the FMB were located at a maximum travel distance of 75 feet. In addition, three fire extinguishers on the basement and fifth floors of the FMB were not present or moved from designated locations and there was no fire extinguisher assigned for the third floor mezzanine level.

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

Pursuant to the provisions of 10 CFR 2.201, Honeywell Specialty Chemicals 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 28th day of October, 2011

U.S. NUCLEAR REGULATORY COMMISSION
REGION II

INSPECTION REPORT

Docket No.: 40-3392

License No.: SUB-526

Report No.: 40-3392/2011-004

Licensee: Honeywell International, Inc.

Facility: Metropolis Works (MTW)

Location: Metropolis, IL 62960

Dates: July 1 through September 30, 2011

Inspectors: Richard Gibson, Senior Fuel Facility Inspector
Cynthia Taylor, Senior Fuel Facility Inspector
Nicole Coover, Fuel Facility Inspector
Mike Miller, Senior Resident Inspector, Paducah
Regina Russell, Resident Inspector, Paducah

Approved by: Joselito O. Calle, Chief
Fuel Facility Inspection Branch 2
Division of Fuel Facility Inspection

Enclosure 2

Executive Summary

Honeywell Specialty Chemicals Inspection Report 40-3392/2011-004

Routine, announced and unannounced inspections were conducted in the area of, radiation protection (a regional initiative), operational safety, permanent plant modifications, annual and triennial fire protection, resumption of normal operation after a strike, and routine site operations at the Honeywell Specialty Chemicals facility. The inspection involved observation of work activities, a review of selected records and procedures, interviews with plant personnel, and a review of the plant activities. The inspections identified the following aspects of the program as outlined below:

Radiation Protection

- The licensee adequately implemented the radiation protection program consistent with the license and regulatory requirements. (Paragraph 2.a)
- Radiation protection procedures were reviewed, approved, and implemented in accordance with regulations and license requirements. (Paragraph 2.b).
- Radiation protection instruments and equipment were calibrated and operated in accordance with the applicable license requirements and procedures. (Paragraph 2.c).
- The exposure control program was implemented in a manner to maintain doses ALARA. Exposures were less than the occupational limits in 10 CFR 20.1201. The inspectors concluded that the licensee's respiratory protection program was adequate. (Paragraph 2.d).
- Radiological safety postings were properly utilized to communicate potential hazards and protective equipment requirements to workers. (Paragraph 2.e).
- Two examples of a violation of NRC's requirements were identified which include failure to establish additional warning devices or barriers and postings in an area where an individual could receive a deep dose equivalent, exceeding 50 mRem in one hour at a distance of 30 centimeters, and failure to post and control a High Radiation Area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour at a distance of 30 centimeters. (Paragraph 2.f).
- Based on records review and interviews, the inspectors concluded that the licensee's ALARA program was properly implemented. (Paragraph 2.g).

Operational Safety

- The inspectors reviewed the implementation of selected plant features and procedures and their management measures to ensure they were able to perform their intended safety function. (Paragraph 3.a).

Permanent Plant Modifications

- The plant modifications that were reviewed by the inspectors were adequately evaluated for safe operations. The licensee implemented adequate management measures to ensure all safety related changes would be maintained. However, one unresolved item, URI 40-3392/2011-004-02, Consequence Category Designation for Hydrofluorinator Accident Sequence 2, was identified. (Paragraph 4.a).

Fire Protection (Annual and Triennial)

- The inspectors performed an annual and triennial fire inspection of the Feed Materials Building (FMB) and Sampling Plant. The inspectors identified three violations. The first violation was for the failure to meet the maximum travel distance of 75 feet for Class A fire extinguishers. The second violation had three examples and was for the failure to hydrostatically test all piping and attached appurtenances, subjected to system working pressure, at 200 psi or 50 psi in excess of the system working pressure for 2 hours on April 29, 2011, March 28, 2011, and in June 2003. The third violation was failure to maintain a minimum 65 psig fire water pressure for the standpipes located in the FMB. (Paragraph 5.a).
- The inspector reviewed Unresolved Item (URI) 40-3392/2009-05-04, failure to ensure adequate pressure was available for the fire suppression system. The inspectors identified a violation for the failure to demonstrate that the process water would pressurize the fire water system through a check valve arrangement at a pressure of approximately 65 psig. (Paragraph 5.a).

Resumption of Normal Operations After a Strike

- The licensee developed and implemented a return to work plan for the returning workers to ensure orderly and safe plant operations. A training matrix was developed identifying all health and safety, and job specific training requirements for each operations and maintenance positions. (Paragraph 6.a).
- A violation was identified for workers pulling respirators away from face in order to communicate in a red light lit area signifying a posted airborne area. (Paragraph 6.a).

Implementation of Return to Work After Strike

- The resident inspectors assigned to the Paducah resident office made routine visits to the Honeywell site. The inspectors determined the Honeywell's strike/lock-out transition plan for the return of the workers was being implemented as scheduled and the training for the returning workers was effective. For those workers who had returned to the specific

operations, the inspectors noted the interactions between the returning workers and the replacement workers at the facility were appropriate and conducive to the transitions to normal plant operations. (Paragraph 7.a).

Attachment:

Partial Listing of Persons Contacted

List of Items Opened, Closed and Discussed

Inspection Procedures Used

List of Documents Reviewed

REPORT DETAILS

1. Summary of Facility Activities

The Honeywell Specialty Chemicals (licensee) uranium conversion facility is located on a 1,100 acre site (60 acres within the fence line) near Metropolis, IL. 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). During the inspection, operations were normal.

2. Radiation Protection (IP 88030)

a. Radiation Protection (RP) Program

(1) Scope and Observations

The inspectors reviewed the RP program to determine the adequacy of the RP health and safety function. The inspectors discussed organizational changes and personnel responsibilities with the Health Physics (HP) manager. There have been no major organizational changes since the last inspection. The inspectors verified the RP Program was independent of operations with the HP manager reporting to the Nuclear Compliance Director. The inspectors determined from review and discussions with licensee representatives the changes that were made to the RP program since the last inspection to improve efficiency. Some of those changes were: 1) increase the time for frisking out from the hand and foot monitors; 2) change the threshold limits for the bioassay action level to be more restrictive; 3) change the surface contamination levels for the controlled areas in the procedure to be more restrictive; and 4) improve the revision of HP procedures, internal auditing and dose assessment.

The inspectors reviewed multiple samples of the licensee corrective action reports (ITCA – Incident Tracking and Corrective Actions) related to radiation safety issues and determined that the findings were appropriately documented in accordance with the licensee's program and established procedures.

(2) Conclusion

The licensee adequately implemented the radiation protection program consistent with the license and regulatory requirements. No findings of significance were identified.

b. Radiation Protection Procedures

(1) Scope and Observations

The inspectors reviewed the following RP procedures to determine that details specified in the procedures were consistent with regulations and license requirements:

- MTW-SOP-HP-0220, "Calibration of the Tenelec XLB Series 4 and 5," Rev. 3
- MTW-SOP-HP-0231, "Operation and Test of the Ludlum Model 490 IP Hand and Shoe Monitor," Rev. 1
- MTW-SOP-HP-0230, "Calibration and Test of Portable Radiation Detection Instruments"

- MTW-SOP-HP-0213, "Kinetic Phosphometric Determination of Uranium and Calibration," Rev. 3
- MTW-SOP-HP-0232, "Smear and Radiation Dose Surveys," Rev. 5
- MTW-ADM-HP-0118, "External Radiation Exposure Control," Rev. 1
- MTW-SOP-HP-0120, "Sealed Sources Leak Testing and Analysis," Rev. 0
- MTW-SOP-HP-0216, "Respirator Fit Testing," Rev. 3

Through interviews with responsible staff, the inspectors determined that RP procedures were reviewed and updated when necessary and contained the appropriate level of detail for the operations involved.

(2) Conclusion

Radiation protection procedures were reviewed, approved, and implemented in accordance with regulations and license requirements. No findings of significance were identified.

c. Instruments and Equipment

(1) Scope and Observations

The inspectors examined selected portable survey instruments and fixed monitoring equipment to determine operability and calibration status. The inspectors reviewed records associated with the calibration of portable survey instruments and hand-and-foot monitors. Calibration and functional performance check procedures were found to be current and adequate. The inspectors reviewed calibration and check sources for appropriate configuration and to confirm suitability of sources for their intended function. Calibrations of survey instruments were performed by an off-site contractor. The inspectors reviewed selected calibration records for accuracy and completeness.

(2) Conclusion

Radiation protection instruments and equipment were calibrated and operated in accordance with the applicable license requirements and licensee procedures. No findings of significance were identified.

d. Exposure Controls

(1) Scope and Observations

The inspectors reviewed selected personnel exposure data to verify that exposures were maintained as low as reasonably achievable (ALARA) and within the limits of 10 CFR 20.1201. The licensee's dosimeter provider was certified by the National Voluntary Laboratory Accreditation Program. Table 1 below displays the occupational exposure data for calendar years (CYs) 2008, 2009, 2010, and the first quarter of 2011.

Table 1 – Occupational Exposure Data

Year	Deep Dose Equivalent (DDE)-rem	Committed Effective Dose Equivalent (CEDE)-rem	Total Effective Dose Equivalent (TEDE)-rem	Collective TEDE (person-rem)
2008	1.085	1.442	1.707	117
2009	0.595	1.243	1.741	161
2010	0.526	1.557	1.642	197
*2011	0.392	1.752	1.991	70

*Denotes first quarter exposure data for calendar year 2011.

The inspectors discussed with the HP manager the upward trend in the occupational exposures for the first quarter of 2011. The licensee determined that the upward trend was attributed to the increase in the number of monitored individuals, the unplanned release of feed material from equipment, operation of substandard equipment, maintenance activities, and work practices. Health Physics discussed the upward trend with management during their scheduled ALARA committee meetings and decided to put into place administrative controls to address the issue.

The inspectors reviewed the licensee's bioassay program associated with the evaluation of worker intake of uranium and the adequacy of personnel exposure assessments. The inspectors reviewed procedures and documentation associated with bioassay exposure calculations. Personnel were knowledgeable of the procedures for preparing and processing urine samples for uranium analysis. The licensee analyzed urine samples on site using the Kinetic Phosphoresce Analyzer (KPA). The inspectors interviewed personnel responsible for the review and maintenance of bioassay exposure records and found the individuals to be knowledgeable of program requirements.

The inspectors reviewed elements of the licensee's program relating to the use and maintenance of respiratory protection equipment. The licensee's respirators were for single use only and staff members responsible for maintenance of this equipment disassemble, clean, and rebuild the respirators prior to reuse. The respirators were supplied by Mine Safety Apparatus (MSA) and certified by the National Institute for Occupational Safety and Health (NIOSH). Based on field observations and discussions with responsible personnel, the inspectors determined that the respiratory protection equipment was adequately maintained and handled in accordance with approved procedures. Provisions to ensure that only qualified individuals use respiratory protection equipment were adequate and implemented in accordance with approved procedures.

(2) Conclusion

The exposure control program was implemented in a manner to maintain doses ALARA. Exposures were less than the occupational limits in 10 CFR 20.1201. The inspectors concluded that the licensee's respiratory protection program was adequate. No findings of significance were identified.

e. Posting, Labeling, and Control

(1) Scope and Observations

The inspectors reviewed radiological signs and postings within the controlled areas and to entrances leading into the controlled areas to determine compliance with regulatory requirements. Radiological areas were posted in accordance with license conditions and accurately reflected radiological conditions in the areas. The inspectors walked down the FMB and determined it was adequately posted and controlled.

(2) Conclusion

Radiological safety postings were properly utilized to communicate potential hazards and protective equipment requirements to workers. No findings of significance were identified.

f. Surveys

(1) Scope and Observations

The RP program was reviewed to determine if surveys were effective in the identification of airborne particulates and surface contamination. The inspectors reviewed and determined that the licensee has established schedules for periodic surveys of work areas. The inspectors reviewed selected survey results for accuracy and completeness. Procedures associated with the scheduling and performances of radiological surveillance activities were found to be adequate.

The inspectors walked down the floors of the FMB and the outside areas while performing random radiation surveys of posted boundaries and on the surface of equipment and containers to verify that the surveys were in accordance with procedures. The inspectors identified a 55-gallon drum labeled as green salt located in a staging area on the south side of the FMB with a surface radiation reading of 100 mr/hr and 60 mr/hr at 30 centimeters from the surface. The drum was removed from the staging area and transferred to the FMB and was determined to contain filter fine bed material and not green salt.

License Condition 18 of NRC License No. SUB-526 states, in part, that the licensee shall conduct authorized activities in accordance with the statements, representations and conditions (or as revised by change and/or configuration management processes as described, therein), in specific documents including the License Application, dated May 12, 2006.

Section 2.6.1 of the License Application states, in part, that Honeywell shall 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.

Licensee procedure MTW-ADM-HP-0118 requires the licensee to establish additional warning devices or barriers and postings in any area where an individual could receive a deep dose equivalent, exceeding 50 mRem in one hour at a distance of 30 centimeters from the surface.

Contrary to the above, on July 14, 2011, the licensee failed to establish additional warning devices or barriers and postings in an area where an individual could receive a deep dose equivalent, exceeding 50 mRem in one hour at a distance of 30 centimeters from the surface. Specifically, the inspectors identified a 55-gallon drum labeled as green salt located in a staging area on the south side of the FMB with radiation levels of 60 mr/hr at a distance of 30 centimeters from the surface resulting in an area where an individual could receive a deep dose equivalent, exceeding 50 mRem in one hour.

From review of exposure records and discussion with licensee representative, the inspectors determined that the staging area was not normally frequented by the workers and a deep dose exposure to a worker exceeding 50mr/hr in one hour may not have occurred.

Subsequent to the radiation surveys performed by the inspectors, the licensee performed a plant wide radiation survey and identified fourteen 55-gallon drums with radiation levels greater than 100 mRem at 30 centimeters from the surface. The highest reading was 129 mRem at 30 centimeters. The drums were located in the storage area of the posted storage facility for filter fine bed material; however, the area was not posted as a high radiation area in accordance with the approved procedure. The drums were removed from the storage area and secured in a posted high radiation area trailer.

License Condition 18 of NRC License No. SUB-526 states, in part, that the licensee shall conduct authorized activities in accordance with the statements, representations and conditions (or as revised by change and/or configuration management processes as described, therein), in specific documents including the License Application, dated May 12, 2006.

Section 2.6.1 of the License Application states, in part, that Honeywell shall 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.

Licensee procedure MTW-ADM-HP-0118, External Radiation Exposure Control, Section 4.2.1.3, states that any area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour at a distance of 30 centimeters from the surface will be posted and controlled as a High Radiation Area.

Contrary to the above, on July 19, 2011, the licensee failed to post and controls a High Radiation Area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour at a distance of 30 centimeters from the surface. Specifically, fourteen 55-gallon drums were located in the storage facility for filter fine bed material with radiation reading exceeding 100 mr/hr at 30 centimeters from the surface. The highest readings were 129 mr/hr at 30 centimeters resulting in a High Radiation Area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour.

From review of exposure records and discussion with licensee representative, the inspectors determined that the storage area was not normally frequented by the workers and a deep dose exposure to a worker exceeding 100mr/hr in one hour may not have occurred.

(2) Conclusion

Two examples of a violation of NRC's requirements were identified which include failure to establish additional warning devices or barriers and postings in an area where an individual could receive a deep dose equivalent exceeding 50 mRem in one hour at a distance of 30 centimeters and failure to post and controls a High Radiation Area where an individual could receive a deep dose equivalent exceeding 100 mRem in one hour at a distance of 30 centimeters. These two examples of a violation will be tracked as (VIO 40-3392/2011-04-01).

g. ALARA

(1) Scope and Observations

The licensee's ALARA program was reviewed to determine if the program and ALARA goals were developed and implemented in accordance with the license. On a quarterly basis, the licensee conducted ALARA Committee meetings detailing ALARA goals and exposure summaries to identify undesirable trends. In cases where exposures were elevated, consideration was given to ways for reducing exposures. The inspectors interviewed the HP supervisor assigned responsibility for the ALARA evaluations and assessments. The licensee had implemented many ALARA initiatives to raise the awareness about ALARA practices among plant operators and floor managers.

(2) Conclusion

Based on records review and interviews, the inspectors concluded that the licensee's ALARA program was properly implemented. No findings of significance were identified

3. **Operational Safety (IP 88020)**

a. Inspection Scope and Observations

The inspectors walked down plant features and procedures (PFAPs) and reviewed piping and instrumentation diagrams (P&IDs) in the FMB and the Tank Farm including PFAP 8, PFAP 20, PFAP 36, and PFAP 39. The inspectors discussed the PFAPs with the control room operators and determined that they were in place and available to perform their intended safety function. The inspectors observed shift turnovers, control room activities and operations personnel while performing routine duties. The inspectors found that the operators were knowledgeable of their responsibilities and were adequately trained and qualified to perform their assigned duties. The inspectors also observed assistant operators completing the operator check sheet for Ore Preparation, Green Salt and Fluorination. The inspectors noted that the assistant operators were knowledgeable of the various component operational indicators and required operational ranges for various components and instruments.

The inspectors reviewed the following procedures to determine if administrative PFAPs were in place to ensure that they could perform their intended function.

- MTW-SOP-ORE-0200, "ORE Preparation Operation," Rev. 12
- MTW-SOP-F2N-0200, "Fluorination Operation," Rev. 23
- MTW-ARO-GSO-0401, "Green Salt Alarm Response," Rev. 6
- MTW-SOP-TFO-0210, "HF Unloading Operations," Rev. 8
- MTW-ADM-OPS-0121, "Management of Plant Features and Procedures," Rev. 9
- MTW-SOP-GSO-0200, "Green Salt Operations," Rev. 13
- MTW-EOP-TFO-0600, "Tank Farm Emergency Operations," Rev. 2
- MTW-EOP-GSO-0600, "Green Salt Emergency Operations," Rev. 3
- MTW-TRN-OGQ 1-0001 "Tank Farm Operator on-the-job Training Guide," Rev 5

Through interviews with responsible staff, the inspectors determined that the PFAP procedures were reviewed and updated when necessary and contained the appropriate level of detail for the operations involved.

The inspectors reviewed preventative maintenance plans (PMPs) and observed the Instrumentation and Electrical technicians perform PMs to ensure that the licensee was testing the function of PFAPs throughout the plant. The PMPs included 24206 the PM for the A Fluorinator furnace, R-417 A-Fluorinator pressure testing; 21626 the PM for the Hydrogen Fluoride (HF) Rail Car Unloading System (RV-652 and PC-651 valves); and 2565 the PM for the HF Tanks Inert Gas.

b. Conclusion

The inspectors reviewed the implementation of selected PFAPs and their management measures to ensure they were able to perform their intended safety function. No findings of significance were identified.

4. **Permanent Plant Modifications (88070)**

a. Inspection Scope and Observations

The inspectors performed a review of the integrated safety analysis (ISA) changes and permanent plant modifications (PPMs) that were made during the last year and submitted to the NRC as required by Condition 20 of the license application. The licensee identified 27 PPMs in their annual submittal. The inspectors reviewed four change request (CR) packages identified as RFC101631820, RFC 101802013, RFC 101801932, and RFC 101632280. The packages included facility changes encompassing changes to alarm settings, set point changes, valve changes and calibrations. Inspectors reviewed packages to determine if the modifications were performed and authorized according to the applicable procedures and regulations. The CRs reviewed also included revisions to procedures, technical basis documents, and temporary operating procedures.

The inspectors also reviewed the modifications to ensure that any potential modifications to an accident sequence were properly accounted for and addressed. The inspectors walked down and reviewed the PPMs to verify that the "as built" drawings agreed with

the field configuration. For the reviewed PPMs, the inspectors verified that operating procedures were updated to reflect the modifications and that training on the modifications was provided, as necessary. The inspectors verified that the licensee had management measures in place to ensure that PFAPs affected by facility changes were capable of performing their intended safety function before approving the modification for operation.

Configuration Change RFC101631820 involved changes to the A-Bottom Hydrofluorinator. On January 7, 2011, the A-Bottom Hydrofluorinator located inside the Feed Materials Building (FMB) experienced an overheating event (eMOC 101631782 and 101631820) caused by the melting of electrical heaters inside one of the four Hydrofluorinator reactors. The licensee stated that heat removal capability was impaired both inside and outside the vessel. However, the reactor vessel was not damaged. Because of the event, the licensee made several configuration changes that included an enhanced ability to detect this sort of incident in the future. The changes included additional shell temperatures indications, operational alarms for high temperatures, and revised startup, operating, and response procedures. The changes also addressed the ability of automatic functions to mitigate the incident for heat removal associated with potentially low fluidization activities.

While reviewing the change and the incident, the inspectors questioned the consequence designation of Category 1 (low) for this particular accident sequence. The consequence designation along with the Likelihood Category of (3), not unlikely, identified the risk value as an acceptable risk with no PFAP designation. However, the inspectors questioned the Category 1 (low) designation given the amount of material, and its proximity to the workers. Specifically, the inspectors asked to review the analysis that justified the acceptable risk designation but the licensee was unable to provide the documentation at the time of the inspection. This was identified as an unresolved item (URI), Consequence Category Designation for Hydrofluorinator Accident Sequence 2.

b. Conclusion

The plant modifications that were reviewed by the inspectors were adequately evaluated for safe operations. The licensee implemented adequate management measures to ensure all safety related changes would be maintained. No findings of significance were identified. However, URI 040-3392/2011-004-002, Consequence Category Designation for Hydrofluorinator Accident Sequence 2 was identified.

5. **Fire Protection (Annual-88055 and Triennial- 88054)**

a. Inspection Scope and Observations

The inspector performed an annual and triennial fire protection review of the FMB and Sampling Plant to evaluate the existing fire protection capability from a programmatic design-based and risk-informed perspective. For the two buildings, the inspector reviewed the Materials License, SUB-526 Amendment 8, the Safety Demonstration Report (SDR), Revs. 8 through 10, the Integrated Safety Analysis Summary, Rev. 2, and the two Fire Hazard Analyses, dated December 7, 1994 and May 25, 1998. In addition, the inspector reviewed the applicable National Fire Protection Association (NFPA) codes that the licensee had committed to in their license and SDR.

The inspectors also reviewed programs, procedures, modifications, surveillances, maintenance, functional tests, drawings, and corrective action incident reports for the fire protection system to ensure that designated programs met license requirements and were adequate to preclude or mitigate the consequences of a fire. The inspection included interviews of site personnel and plant walk downs of the firefighting equipment located on the site, and specifically in the powerhouse, the FMB, and the Sampling Plant.

The inspectors reviewed the following programs: program for control of combustibles, including hot work permits and associated work activities; program for material condition, design, and qualification testing of passive fire protection; program for compensatory measures for out-of service, degraded or inoperable fire protection equipment, systems or features; program for emergency operating actions required to mitigate the adverse effects of a fire; and the program for maintenance and facility changes for applicable codes and license requirements. During the inspection, the inspectors did not evaluate the adequacy of the fire detection or suppression capability because the two buildings inspected, FMB and Sampling Plant, did not contain detection or suppression systems.

The inspectors reviewed the two changes made to Section 2.7.2, Fire Control Systems, of the SDR, from Rev. 8 to 10. The specific changes made during these revisions were the removal of Step 2.7.2.5, Hose Houses, from Rev. 9. The licensee removed all hose houses from the site during the last year. The hose houses were used as a place to store additional fire equipment and gear for external fire departments responding to a site fire. To account for this change, the licensee developed a Mutual Assistance Agreement document between the licensee and the city of Metropolis and Massac County fire departments. Both of the applicable fire chiefs were interviewed as part of the inspection to determine their understanding of the agreement and their response actions in the event of a licensee fire. Although some of the agreement items had not been completed at the time of the inspection due to the workers strike, the inspectors determined that the external fire departments would respond to the site if a fire larger than an incipient size would occur.

The second change made to the SDR was Section 2.7.2.6, Standpipes, from Revs. 8 to 9. The specific change was the minimum standpipe pressure in the FMB from 75 psig to 65 psig. The inspectors reviewed the documentation to support the change in pressure, which also corresponded to the minimum residual pressure designated in NFPA 14, Standpipe and Hose System, Edition 1970, which the licensee committed to in site procedure, MTW-SAF-LP-0008, "Fire Protection Systems and Maintenance."

The inspectors also reviewed the internal fire response for an incipient fire event. The inspectors interviewed emergency response team (ERT) members, reviewed fire extinguisher training and attendance sheets for both employees and contractor personnel, and reviewed fire extinguisher locations and associated maintenance. The inspectors determined that the training provided was adequate for the site to respond to an incipient fire. However, as part of the incipient fire response review, the inspectors identified that the licensee only trained ERT members on the use of fire extinguishers and not on the use of standpipes and fire hoses, which were located in the FMB and Sampling Plant. Section 5.2.2 of NFPA 10, "Portable Fire Extinguishers," Edition 2002, states that "up to one-half of the complement of fire extinguishers as specified in

Table 5.2.1 shall be permitted to be replaced by uniformly spaced 1-1/2 inch hose stations for use by the occupants of the building. Where hose stations are so provided, they shall conform to NFPA 14, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems.”

In addition to the ERT members not being trained on the use of fire hoses, the inspectors determined from interviews and documentation reviews that the FMB standpipes were not maintained in all cases as required in Chapter 7, Tests and Maintenance, of NFPA 14, Standpipe and Hose System, Edition 1970. As a result, the standpipes were not credited as part of the requirement for 75 feet maximum travel distance to extinguisher, under NFPA 10 “Portable Fire Extinguishers,” Edition 2002, section 5.2.2.

During the inspection, the licensee could not demonstrate the Class A fire extinguishers located in the FMB were located at a maximum travel distance of 75 feet. In addition, three fire extinguishers on the basement and fifth floors of the FMB were not present or moved from designated locations and there was no fire extinguisher assigned for the third floor mezzanine level. The Fire Protection Supervisor stated that in some occasions, fire watches had moved the fire extinguishers to where the hot work was occurring. The licensee provided drawings that average area coverage was evaluated for the fire extinguishers but the evaluation did not take into account the physical obstructions located in the FMB floors and did not evaluate for NFPA 10 compliance of 75 feet maximum travel distance. The failure to meet the maximum travel distance of 75 feet for Class A fire extinguishers was considered a violation of NRC requirements, VIO 40-3392/2011-04-04.

The inspectors determined that the failure to meet the maximum travel distance of 75 feet for Class A fire extinguishers was of low safety significance because the ERT members were trained operators that were familiar with the plant layout and where extinguishers locations were designated. However, because ERT members were no longer trained to use the existing standpipe hose reels, the significance of having an adequate number of properly spaced extinguishers was emphasized.

During the inspection, the inspectors also reviewed passive and active fire protection features including a review of surveillances, procedures, work packages, fire impairments, and other documentation. The plant walk downs verified material condition, operational lineup, design of fire suppression (standpipes), fire water supply and distribution system, and manual firefighting equipment, as they applied to the code of record and the license requirements.

License Condition No 18, in License Number SUB-526, Amendment 8, states, in part, that the licensee shall conduct authorized activities in accordance with the statements, representations and conditions in the SDR. Section 2.7.2.3, Fire Water Distribution, of the SDR, Rev. 10, states that fire main installation meets the standards of NFPA 24, “Standard for the Installation of Private Fire Service Mains and their Appurtenances” in effect at the time of installation. Step 10.10.2.2.1 of NFPA 24, Editions 2010 and 2002, states that all piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi or 50 psi in excess of the system working pressure, whichever is greater, and shall maintain that pressure at ± 5 psi for two hours. However, during interviews with the licensee and a review of design modification

documents, maintenance work packages, known as Request For Change (RFC), and the fire impairment log, the inspectors identified three examples when the licensee failed to perform hydrostatic testing after fire main piping installation occurred.

Contrary to the above, on April 29, 2011, the licensee failed to meet the fire main installation standards of NFPA 24 in effect at the time of installation when the licensee replaced approximately 30 feet of fire water underground piping due to identified leaks and a hydrostatic test was not performed. The work was performed under RFC # 111700217 and three fire impairments on April 25, 27, and 28, 2011. The failure to hydrostatically test all piping and attached appurtenances, subjected to system working pressure, at 200 psi or 50 psi in excess of the system working pressure for two hours was considered a violation (VIO) of NRC requirements, VIO 40-3392/2011-04-05.

The second example occurred on March 28, 2011, when the licensee replaced fire hydrant #1, replaced the underground isolation valve, and repaired the leaking underground piping, however, a hydrostatic test was not performed. The repair work was performed under RFC # 116000098 and two fire impairments on March 14 and 22, 2011. The failure to hydrostatically test all piping and attached appurtenances after maintenance was considered another example of violation VIO 40-3392/2011-04-05.

The third example occurred in June 2003, when the licensee completed the HF mitigation spray tower modification. The new 10-inch underground piping was connected to the existing 8-inch underground fire system main and a hydrostatic test was not performed. The failure to hydrostatically test all piping and attached appurtenances after the modification installation was considered another example of violation VIO 40-3392/2011-04-05.

The inspectors determined that the failure to hydrostatically test all piping and attached appurtenances, subjected to system working pressure, at 200 psi or 50 psi in excess of the system working pressure for two hours, was of low safety significance because the fire hydrant flow test results performed in 2010 and the 2011 system operational parameters during fire pump operations indicated that the fire main system maintained at least normal system pressure. However, Step 3.3.14.3, Hydrostatic Test, under Chapter 3, Definitions, for NFPA 24, Edition 2010, states, a test of a closed piping system and its attached appurtenances consisting of subjecting the piping to an increased internal pressure for a specified period of duration is to verify system integrity and leak rates. In 2011, the licensee had experienced several fire main piping leaks that were repaired as stated above, however no testing was completed to validate system integrity.

During the inspection, the inspectors observed the weekly fire pump surveillance, as documented on the Plant Loss Prevention Inspection sheet, and the Testing of HF Mitigation Spray Towers and HF Vaporizer Spray Rings surveillance, MTW-SAF-IP-0028. The inspectors observed the operator adequately perform the fire pump run and subsequent system monitoring with no issues identified. During the HF mitigation spray towers surveillance, the inspectors observed the fire system standpipe pressure indicator on the sixth floor of the FMB. The FMB standpipe pressure indicator read 98 psig during the fire pump run and prior to the opening of the HF mitigation spray towers.

During the performance of the HF mitigation spray towers surveillance, the FMB sixth floor standpipe pressure dropped to 50 psig and returned to 90 psig following the completion of the HF mitigation spray tower surveillance.

Section 2.7.2.5, Standpipes, of the SDR, Rev. 10, states, in part, that the standpipes located in the FMB have a minimum pressure of 65 psig. These standpipes are part of the main fire water distribution system. Contrary to the above, on and before September 1, 2011, the licensee failed to demonstrate that the standpipes located in the FMB had a minimum pressure of 65 psig during the surveillance "Testing of HF Mitigation Spray Towers and HF Vaporizer Spray Rings," MTW-SAF-IP-0028. The failure to maintain a minimum 65 psig fire water pressure for the standpipes located in the FMB was considered a VIO of NRC requirements, VIO 40-3392/2011-04-06.

The inspectors determined that the failure to maintain a minimum 65 psig fire water pressure for the standpipes located in the FMB was of low safety significance because the amount of time that the pressure was less than the minimum requirement of 65 psig, which equated to less than five minutes for the observed surveillance on September 1, 2011. However, the licensee was not aware of the overall fire main system effects with respect to the HF mitigation spray tower system design, such that three open spray towers equated to 1200 GPM spray flow from a 1000 GPM fire pump. The fire system effect of less than 65 psig FMB standpipe header pressure during mitigation tower spray activities was unknown to the licensee and as a result, no fire impairments or compensatory actions were taken. The HF mitigation spray tower modification installation was completed in 2003.

b. Conclusion

The inspectors performed an annual and triennial fire inspection of the FMB and Sampling Plant. The inspectors identified three violations. The first violation was for the failure to meet the maximum travel distance of 75 feet for Class A fire extinguishers, VIO 40-3392/2011-04-04. The second violation had three examples and was for the failure to hydrostatically test all piping and attached appurtenances, subjected to system working pressure, at 200 psi or 50 psi in excess of the system working pressure for two hours on April 29, 2011, March 28, 2011, and in June 2003, VIO 40-3392/2011-04-05. The third violation was failure to maintain a minimum 65 psig fire water pressure for the standpipes located in the FMB, VIO 40-3392/2011-04-06.

The inspectors reviewed the open Unresolved Item (URI) 40-3392/2009-05-04, failure to ensure adequate pressure was available for the fire suppression system. The inspectors identified a violation for the failure to demonstrate that the process water would pressurize the fire water system through a check valve arrangement at a pressure of approximately 65 psig, VIO 40-3392/2011-04-07.

6. **Resumption of Normal Operations After a Strike (92712)**

a. Inspection Scope and Observations

The inspectors reviewed the licensee's return to work plan and discussed the implementation of the plan with licensee management. The inspectors also reviewed details associated with actions in progress necessary to implement the plan. The

licensee plan adequately addressed steps to discourage or eliminate conflict between the returning workers and the replacement workers. Also, the plan adequately addressed the placement of returning workers, a training matrix identifying all health and safety, and job specific training requirements, and any actions necessary to ensure that the plant continue to operate safely. Normal production activities were ongoing during the transition of the returning workers returning to the plant.

The inspectors reviewed the licensee's operator and maintenance training and qualification program for the returning workers. The inspection consisted of a review of documentation including lesson plans, procedures, and completed qualification packages. Observations of training activities included classroom and examination sessions and evaluation of training activities performed in the field.

The inspectors reviewed the training schedule for the returning workers to be trained on their specific job. The inspectors reviewed training documents, attended classroom training, and observed facility field walk downs (on-the-job training) with the first group of returning workers consisting of maintenance workers, ore preparation, potassium hydroxide and wet process, sampling plant, yard, environment protection, and power house operators. The second group of returning workers consisted of distillation and fluorination operators. Training materials consisted of flow charts of the specific operating areas, P&IDs, instructions specific to work, and procedures. The inspectors determined that the training materials were adequate.

The inspectors reviewed procedures and related documentation associated with the training and qualification program. Procedures adequately addressed the administrative aspects of the training and qualification program. Details addressing the conduct of training, remedial training requirements, and necessary measures to successfully progress through the various stages of the training and qualification program were incorporated in approved procedures. The inspectors reviewed a sampling of completed qualification packages for completeness and accuracy.

The inspectors reviewed and discussed final exams and task performance evaluation (TPE) of the returning workers. In addition, the inspectors observed TPE of workers performing system walk down utilizing a checklist while being observed by a supervisor and/or other individual qualified in the specific task area. The workers were required to demonstrate knowledge of the location of system components, critical monitoring instrumentation, and indicators monitoring system operability status. The workers had to be familiar with operating parameters and knowledgeable of system checklist performance requirements. The inspectors noted that the workers were required to complete the system checkout with no assistance from the evaluator.

During a field walk down in distillation, the inspectors observed three employees, two Shaw contractors and one Honeywell worker, pull their respirators away from their faces to communicate while re-placing the cover on the Scrap Material Rotex located on the second floor of the FMB. The second floor of the FMB was on red light to signify a posted airborne area. The proper use of respirators is described in MTW-SOP-HP-0216, "Respirator Fit Testing."

License Condition 18 of NRC License No. SUB-526 states, in part, that the licensee shall conduct authorized activities in accordance with the statements, representations and conditions (or as revised by the approved configuration management process as described, therein), in specific documents including the License Application, dated May 12, 2006.

Section 2.6.1 of the License Application states, in part, that Honeywell shall 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.

Section 5 in Attachment A of Procedure MTW-SOP-HP-0216 states, in part, that individuals have been observed many times pulling the respirator away from the face to talk, "Do not pull your respirator away from your face to talk."

Section 10 in Attachment A of Procedure MTW-SOP-HP-0216 states that respirator users may leave the work area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communications failure, significant deterioration of operating conditions, or any other condition that might necessitate such relief.

Contrary to the above, on September 20, 2011, the NRC inspectors observed three employees, two Shaw contractors and one Honeywell worker, pull their respirators away from their faces to communicate and did not leave the work area. Specifically, this was observed during maintenance work on the Scrap Material Rotex, where the system was open and the area red light was lit signifying a posted airborne area.

b. Conclusion

The licensee developed and implemented a return to work plan for the returning workers to ensure orderly and safe plant operations. A training matrix was developed identifying all health and safety, and job specific training requirements for each operations and maintenance positions.

A VIO was identified for workers pulling respirators away from face in order to communicate in a red light lit area signifying a posted airborne area. This will be tracked as VIO 40-3392/2011-04-03.

7. **Implementation of Return to Work After Strike (92711)**

a. Inspection Scope and Observations

The resident inspectors assigned to the Paducah resident office made routine visits to the Honeywell site. The purpose of the inspections was to evaluate the efficiency of Honeywell's strike/lock-out transition plan for the return of the workers and to evaluate the effectiveness of the training for the returning workers and the transitions to normal plant operations. The inspectors performed control room and plant observations and inspected ongoing operations activities and evaluated the interface between the returning workers and the replacement workers at the facility.

The inspectors evaluated Honeywell's operations organization to ensure the returning worker training program was conducted in accordance with approved plans and procedures. The inspectors evaluated the training coordination and the adherence to the schedule for the conduct of the training and testing. The inspectors observed the classroom training sessions, the in-the-field job familiarization and system updates, the written examinations, and performance based skills testing.

The inspectors observed the written examinations of the sampling plant, tank farm/yard operators, and the green salt operators. The inspectors evaluated the performance based testing of the environment protection and ore preparation workers. The inspectors reviewed completed training packets for ore preparation assistant operator position. The inspectors verified the workers who were deficient in a testing area were provided additional training and re-testing. In the control room, the inspectors observed the interactions between the green salt replacement workers and the returning workers who were in their on-site familiarization training phase. During product cylinder switching, movement, and weighing, the inspectors evaluated the interactions between the distillation replacement workers and the returning workers who were in the on-the-job training phase. The inspectors observed the conduct of operations in the sampling plant area and the tank farm/yard area where both the replacement and returning personnel were conducting work simultaneously. The inspectors evaluated the material condition and housekeeping of plant areas visited.

b. Conclusion

The resident inspectors made routine visits to the Honeywell site. The inspectors determined the Honeywell's strike/lock-out transition plan for the return of the workers was being implemented as scheduled and the training for the returning workers was effective. For those workers who had returned to the specific operations, the inspectors noted the interactions between the returning workers and the replacement workers at the facility were appropriate and conducive to the transitions to normal plant operations. No findings of significance were identified.

8. Follow-up on Previously Identified Issues

- a. **(Discussed)** Inspector Follow-up Item (IFI) 40-3392/2010-005-01 tracking the licensee's progress converting all PFAP related PMPs to LR-1; URI 40-3392/2010-005-02 failure to declare a cylinder rupture as a high consequence event; URI 40-3392/2009-005-01 PFAP 37 and PFAP 38 were not independent of each other; and URI 40-3392/2009-005-03 multiple discrepancies between ISA and the ISA Summary.

The inspectors reviewed and discussed the open items above with the licensee to determine if corrective actions were implemented and effective. The licensee indicated that corrective actions for the open items were not completed and that they will be included in the revision of their ISA. These items will remain open.

- b. **(Closed)** URI 40-3392/2009-05-04 for failure to ensure adequate pressure was available for the fire suppression system. The URI documented that the licensee had not confirmed that when the fire pump was out of service and the process water was used for fire protection purposes, there was enough pressure to meet the minimum pressure requirements of 75 psig for the FMB standpipes and 65 psig for the Laboratory

standpipes as specified in Section 10.2.7 of the MTW ISA. At the time of the inspection, the licensee did not have sufficient information to demonstrate that when using process water for fire purposes there was enough pressure to meet the pressure demand of standpipes located at the FMB and Laboratory. [NOTE: The minimum pressure requirement of 75 psig for the FMB standpipes had been changed to a minimum of 65 psig in the Safety Demonstration Report, from Rev. 8 to 9, as documented in this inspection report. In addition, since the URI was created in 2009, the ISA has been revised and no longer contained section 10, Fire Protection and External Events, which had contained the URI referenced section 10.2.7, Standpipes. These requirements were now addressed in the Safety Demonstration Report.]

During the follow-up for this URI, the inspectors reviewed the fire hydrant flow test performed by the licensee in 2010. During the surveillance, the licensee utilized the fire pump to supply water to hydrants #1 through #5 and used process water, supplied by deep well pumps 1 and 2, for hydrants #6 and #8. The residual pressure readings for both #6 and #8 hydrants, at ground level, were 58 psig. The licensee did not identify from the 2010 fire hydrant flow test results that the 58 psig residual pressure readings from the process water supply confirmed that when the fire pump was out of service and the process water was used for fire protection purposes, there was not enough pressure to meet the minimum pressure requirements of 65 psig for the FMB standpipes.

Section 2.7.2.2, Fire Water Pressure, of the SDR, Rev. 10, states, in part, that a 1000 GPM pump provides pressure (approximately 100 psig) for the fire mains. Automatic operation of the pump activates an alarm in the Powerhouse. If both the electrical and diesel motors fail, process water will pressurize the system through a check valve arrangement at a pressure of approximately 65 psig. Contrary to the above, on September 17, 2010, the licensee failed to demonstrate that the process water would pressurize the fire water system through a check valve arrangement at a pressure of approximately 65 psig. The failure to demonstrate that the process water would pressurize the fire water system through a check valve arrangement at a pressure of approximately 65 psig was considered a VIO of NRC requirements, VIO 40-3392/2011-04-07. URI 40-3392/2009-05-04 is closed to violation, VIO 40-3392/2011-04-07.

9. Exit Meeting

The inspection scope and results were summarized on September 22, and October 18, 2011, with Larry Smith, Plant Manager, and other members of the licensee's staff. Although proprietary information was reviewed during this inspection, proprietary information is not included in this report.

ATTACHMENT

1. LIST OF PERSONS CONTACTED

M. Abel, Health Physics Specialist
S. Anderson, Training
J. Assad, CAP Administrator
T. Barnes, Maintenance Manager
B. Bass, Maintenance Engineer
D. Bilski, Security Manager
B. Burgess, Health Physics Specialist
D. Duty, Fire Protection Specialist
M. Greeno, Regulatory Affairs Manager
L. Litinski, Regulatory Affairs
D. Palmer, Operations Manager
S. Patterson, Health Physics Supervisor
L. Smith, Plant Manager
B. Stephenson, Emergency Response
B. Stokes, Health Physics Manager
R. Thomas, Environmental Supervisor
M. Wolf, Nuclear Compliance Director

Other licensee employees contacted included operation, management staff, engineers, HP-technicians, security and office personnel.

2. INSPECTION PROCEDURES USED

IP 88030	Radiation Protection
IP 88020	Operational Safety
IP 88070	Permanent Plant Modifications
IP 88054	Fire Protection (Triennial)
IP 88055	Fire Protection (Annual)
IP 92712	Resumption of Normal Operation After a Strike
IP 92711	Implementation of Return to Work After Strike

3. ITEMS OPENED, CLOSED, AND DISCUSSED

<u>Item</u>	<u>Status</u>	<u>Description</u>
IFI 40-3392/2010-005-01	Discussed	Tracking the licensee's progress converting all PFAP related PMPs to LR-1
URI 40-3392/2010-005-02	Discussed	Failure to declare a cylinder rupture as a high consequence event
URI 40-3392/2009-005-01	Discussed	PFAP 37 and PFAP 38 were not independent of each other
URI 40-3392/2009-005-03	Discussed	Multiple discrepancies between ISA and ISA Summary

VIO 40-3392/2011-004-01	Opened	Failure to establish controls from exposure of an area exceeding 50 mRem in one hour and an area exceeding 100 mRem in one hour
URI 40-3392/2011-004-02	Opened	Consequence Category Designation for Hydrofluorinator Accident Sequence 2 was identified
VIO 40-3392/2011-004-03	Opened	Failure to properly wear respirators while working in a red light area signifying a posted airborne area
VIO 40-3392/2011-004-04	Opened	Failure to meet the maximum travel distance of 75 feet for Class A fire extinguishers
VIO 40-3392/2011-004-05	Opened	Failure to hydrostatically test all piping and attached appurtenances, subjected to system working pressure, at 200 psi or 50 psi in excess of the system working pressure for 2 hours
VIO 40-3392/2011-004-06	Opened	Failure to maintain a minimum 65 psig fire water pressure for the standpipes located in the FMB
VIO 40-3392/2011-004-07	Opened	Failure to demonstrate that the process water would pressurize the fire water system through a check valve arrangement at a pressure of approximately 65 psig
URI 40-3392/2009-05-04	Closed	Failure to ensure adequate pressure was available for the fire suppression system

4. **LIST OF DOCUMENTS REVIEWED**

- Self Assessment Final Report dated April 18-May 11, 2011
- PI&D Diagram, Green Salt Hydrofluorination System
- MTW –ADM-PRO-0120, Management of Change, Rev. 8
- Incident Report IR-10-1797, HF Storage tank Outlet Rupture Disks
- Incident Report IR-10-0393, A Bottom Hydrofluorination Restart Activities
- MTW-SOP-GSO-0200, Green Salt Operation, Rev. 10
- MTW -ARP-GSO-0401, Green Salt Alarm Response, Rev. 5
- MTW-ADB-REG-0122, Right of Approval For Changes Impacting the NRC Licensing Documents, Rev. 4
- Materials License, Honeywell International, INC. SUB-526, Amendment 8
- Integrated Safety Analysis Summary, Renewal of Source Materials License SUB-526, dated 06/17/2010, Rev. 2
- Safety Demonstration Report for USNRC Source Materials License SUB-526, Docket 40-3392, Revs. 8, 9, and 10
- Fire Hazard Analysis, Metropolis Works, dated December 7, 1994
- Fire Hazard Analysis, Metropolis Works, dated May 25, 1998
- MTW-SAF-LP-0001, Rev. 2, Fire Pre-Plan Guide – Fire Emergency and Prevention
- MTW-SAF-LP-0007, Rev. 3, Placement and Maintenance of Portable Fire Extinguishers
- MTW-SAF-LP-0008, Rev. 6, Fire Protection Systems and Maintenance
- MTW-SAF-LP-0010, Rev. 3, Fire System Impairment Control and Notification

- MTW-SAF-LP-0004, Rev. 2, Flammable Liquids Fire Hazards
- MTW-SAF-LP-0006, Rev. 2, No Smoking Practices
- MTW-SAF-LP-0005, Rev. 3, Fire Hazards In Use of Oxygen and Flammable Gases
- MTW-SAF-LP-0002, Rev. 2, Fire Hazards
- MTW-SAF-LS-0005, Rev. 10, Hot Work Permits
- MTW-SAF-LP-0003, Rev. 3, Transmitting Fire Alarms
- MTW-ADM-REG-0110, Rev. 0, Corrective Action Program
- MTW-SAF-IP-0028, Rev. 1, Testing of HF Mitigation Spray Towers and HF Vaporizer Spray Rings
- MTW-SAF-LP-0009, Vents, Relief Devices and Automatic Devices, Rev. 2
- Fire Extinguisher Inspection Route, dDated 08/29/2011
- Fire Extinguisher Master Inventory List, dated 08/29/2011
- Request For Change (RFC) #116000098, Completion Date 03/28/2011, and supporting documentation for RFC
- RFC #116000388, Completion date 07/28/2011, and supporting documentation for RFC
- RFC #111700217, Completion date 05/23/2011, and supporting documentation for RFC
- RFC #107602436, Completion date 04/05/2011, and supporting documentation for RFC
- Fire Impairment Log, Entries 06/10/2008 to 05/14/2011, and associated available Fire Impairment Tags
- Hot Work Permits, 40 from 01/01/2011 to 08/29/2011
- Portable Fire Extinguisher Training Course 2011, attendance sheets and summary of training provided (Innovative Safety Solutions and First-Line Fire Extinguisher Co.)
- Process Description Metropolis HF Mitigation, April 2002
- Process Description Metropolis HF Mitigation, April 2002
- Project Overview and Objective Metropolis HF Mitigation, April 2002
- MTW-CHK-0028A, Fire and Chemical Mitigation Systems Checklist, dated 8/3/2011, 8/11 & 8/12/2011, 8/19/2011, 8/26/2011
- MTW Deep Well Pumps Daily Inspection, dated 8/26/2011, 8/27/2011, and 8/28/2011
- Honeywell Metropolis Works Pre-Fire Plan, 29-Feed Materials Building
- Fire Hydrant Flow Test Results #1-6, and 8, FireHydrant.org, dated 10/18/2010
- Fire Pump Test, Premier Fire Protection, dated 05/05/2011
- Loss Prevention Report, Global Risk Consultants, dated December 6-7, 2010
- Plant Loss Prevention Inspection, Dated 08/26/2011
- 2011 Fire Hose Test, dated 4/12/2011
- Pressure Relief Valve Repair & Test Report, Tri-State Valve & Instrument Co., K1008680, dated 9/3/2010
- Mutual Assistance Agreement Between Honeywell Fluorine Products in Metropolis, IL. And the County and City Emergency Services, City of Metropolis, dated 10/14/10, and Massac County Fire District Board, dated 10/14/2010
- Metropolis Works Organizational Chart

Drawings Reviewed

- MTW-1520, Sheet 1 of 1, Rev. N, Metropolis Works Fire Water Lines Plot Plan
- MTW-2484, Rev. N, Feed Material Building South Pad East Equipment Map
- MTW-2485, Rev. L, Feed Material Building South Pad West Equipment Map
- MTW-2486, Rev. Y, Feed Material Building Basement Equipment Map
- MTW-2487, Rev. X, Feed Material Building 1st Floor Equipment Map
- MTW-2488, Rev. T, Feed Material Building 2nd Floor Equipment Map
- MTW-2489, Rev. X, Feed Material Building 3rd Floor Equipment Map
- MTW-2490, Rev. V, Feed Material Building 4th Floor Equipment Map
- MTW-2491, Rev. U, Feed Material Building 5th Floor Equipment Map
- MTW-2492, Rev. Z, Feed Material Building 6th Floor Equipment Map
- EM-999-2041, Rev. AA, Sample Plant Equipment Map First Floor
- MTW-2042, Rev. K, Sample Plant Equipment Map Second Floor and Roof
- MTW-1785, Rev. F, Sample Plant Equipment Map Third Floor
- EL-180-0712, Sheet 1 of 1, Rev. X, MTW Electrical Distribution
- AD-968, Sheet 1 of 2, Six (6) HF Mitigation Monitor Assemblies
- MTW-437632, Sheet 1 of 3, Rev. E, P & I Diagram HF Mitigation System
- MTW-515600, dated 08/14/69, Piping Diagram Well Water and Fire Lines
- MTW-515809, dated 05/22/69, Piping Diagram – Service and Fire Lines Distill Area
- MTW-510314, dated 02/69, Arrgt. Fire Protection Sys. – Process Bldg
- MTW-510027-03, Sheet 3 of 4, Rev. G, Power House P&ID Fire Water

Work Orders Reviewed

70465499, 70441948, 70447015

Incident Report Reviewed

IR-10-2855, IR-11-1901, IR-11-1813, IR-11-1964, IR-11-1904, IR-11-1891, IR-11-1492, IR-11-1381, IR-11-1380, IR-11-1368, IR-11-1118, IR-11-0954, IR-11-0787, IR-11-0510, IR-11-0351, IR-11-0237, IR-11-0104, IR-10-3268, IR-10-3268, IR-10-3218, IR-10-3196, IR-10-3177, IR-10-2855, IR-10-2832, IR-10-2583, IR-10-2566, IR-10-2349, IR-10-2030, IR-10-2027, IR-10-1987, IR-10-1895, IR-10-1882, IR-10-1861, IR-10-1831, IR-10-1806, IR-10-1610, IR-10-1551, IR-10-1514, IR-10-1405, IR-10-1270, IR-10-1259, IR-10-0999, IR-10-0971, IR-10-0866, IR-10-0767, IR-09-3961, IR-09-3925, IR-09-3889, IR-09-3391, IR-09-3190, IR-09-2916, IR-09-2654, IR-09-2544, IR-09-2417