

Honeywell

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April 25, 2018

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Director, Office of Nuclear Material Safety and Safeguards
11555 Rockville Pike
Rockville, MD 20852

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

SUBJECT: HONEYWELL METROPOLIS WORKS SUPPLEMENTAL RESPONSE TO REQUEST FOR
ADDITIONAL INFORMATION FOR CHEMICAL SAFETY

On February 9, 2017 Honeywell Metropolis Works submitted to the USNRC an application for renewal of USNRC Source Materials License SUB-526; the application also included the submittal of an Environmental Report. On November 7, 2017, the USNRC provided to Honeywell Requests for Additional Information (RAI) on the following sections of the License Application:

- Section 6.0 Chemical Safety

Honeywell submitted responses to the Chemical Safety RAIs on February 2, 2018. During a phone call on February 22, 2018 the NRC had additional questions on two of the Honeywell Chemical Safety RAI responses. This letter transmits Honeywell's supplemental responses to RAIs 6-2 and 6-10. To the extent that Honeywell has identified the need for changes to the submitted License Renewal Application (LRA), the enclosed RAI responses include the proposed changes in the form of mark-ups of the affected text.

We hope that you find the enclosed materials to be complete and that our responses are helpful in furthering your review of Honeywell's License Renewal Application. If you have questions or comments regarding this submittal, please contact Mr. Sean Patterson, Regulatory Affairs Manager, at (618) 524-6341.

Sincerely,



FOR
Jeff Fulks
Plant Manager

NMSSDI

Enclosure 1 – Responses to Supplemental RAIs on Section 6.0 Chemical Safety of the MTW License
Renewal Application

Cc: U.S. NRC Region II
Marquis One Tower
Attention: Tilda Liu
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Atlanta, GA 30303

Honeywell Metropolis Works
USNRC Source Materials License SUB-526
Docket No. 40-3392

License Renewal Application
Supplemental Responses to Requests for Additional Information
Section 6.0 – Chemical Safety

RAI 6-2

Section 3.3 of the license renewal application (LRA) states, "Honeywell has conducted an ISA for selected processes."

Describe what the "selected processes" are and how they were selected.

The information is required for the evaluation of the applicant's procedures for protecting health and minimizing the danger to life or property as required under 10 CFR 40.32(c).

Supplemental Response

The ISA Summary describes (in Section 5.3) the processes of concern. This discussion addresses the major processes that are involved in the production of uranium hexafluoride (UF₆) from uranium ore. Process concerns are related to the loss of confinement of UF₆ or hydrofluoric acid (HF). Other concerns include radiation exposure (from uranium ore or compounds), worker safety, public safety, equipment damage and uncontrolled releases of hazardous chemicals to the environment. These incidents could be initiated because of failures in process components, human error, operational errors, or external events (e.g., natural phenomenon events). The processes selected are as follows:

1. Sampling and Storage
 - a. Analysis, weighing and storage of uranium ore concentrates
2. Pre-treatment Facility
 - a. Sulfuric acid leach, ammonia precipitation
 - b. Settling and filtration of uranium-bearing solids
 - c. Processing hard or wet ore
3. Ore Concentrates Preparation
 - a. Calciner
 - b. Blending
 - c. Agglomeration using water, sulfuric acid, magnesium hydroxide, and/or sodium hydroxide and potassium hydroxide
 - d. Drying, crushing and sizing
 - e. Dust collection
4. Reduction

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- a. Reduction of U_3O_8 to UO_2 using hydrogen and fluidizing nitrogen
- b. Off-gas filtration and incineration
5. Hydrofluorination
 - a. Conversion of UO_2 to UF_4 using HF
 - b. Off-gas filtration and scrubbing
6. Fluorination
 - a. Conversion of UF_4 to UF_6 using fluorine
 - b. Product gas filtration
 - c. Fluid-bed material collection and retirement
7. Cold Traps and Off-Gas Cleanup
 - a. UF_6 desublimation
 - b. Off-gas scrubbing and wet process
8. Distillation and Product Packaging
 - a. UF_6 distillation, condensation and packaging
 - b. Off-gas processing
9. Uranium Recovery
 - a. Collection of fluorination solid residues
 - b. Precipitation of waste liquors using KOH and NH_3 .
10. Cylinder Wash Facility
 - a. Cylinder washing using sodium carbonate or sodium hydroxide and potassium hydroxide solution
 - b. Cylinder pressure testing
 - c. Leach liquor filtration

Planned License Renewal Application Revision

In Section 3.3 of the LRA, the first paragraph will be revised to state:

“Honeywell has conducted an ISA for selected processes as described in Section 5.3 of the ISA Summary. This discussion addresses the major processes that are involved in the production of uranium hexafluoride (UF_6) from uranium ore. Process concerns are related to the loss of confinement of UF_6 or hydrofluoric acid (HF). Other concerns include radiation exposure (from uranium ore or compounds), worker safety, public safety, equipment damage and uncontrolled releases of hazardous chemicals to the environment. These incidents could be initiated because of failures in process components, human error or operational errors, or external events (e.g., natural phenomenon).”

RAI 6-10

Neither the LRA nor the ISA Summary, Rev. 14, discusses whether the ISA systematically considers all acute chemical exposure pathways. The table in Section 6.3.5 of the ISA Summary acknowledges the potential for serious burns from skin contact. However, the HF toxicity

discussion on page 6-9 of the ISA Summary, as well as the acute chemical exposure standards, do not discuss or allude to non-inhalation exposure. The NRC staff notes that there have been non-inhalation exposure events at Honeywell MTW and other fuel cycle facilities in the past.

Clarify whether the ISA considers all acute chemical exposure pathways.

The information is required for the evaluation of the applicant's procedures for protecting health and minimizing the danger to life or property as required under 10 CFR 40.32(c).

Supplemental Response

MTW's original response included liquid HF in the discussion. However, the main concern at the MTW is a release of UF₆ resulting in an intake of gaseous HF. As indicated in our original response below, a dermal or ocular issue was considered and is less severe than inhalation for gaseous HF.

Original Response

Honeywell MTW has considered chemical exposures, including acute chemical exposure pathways as required by the OSHA and the US Environmental Protection Agency in accordance with 29 CFR 1910.119 for the hazardous chemicals used at the site, including Hydrogen Fluoride (HF). SUB-526 License Renewal Application, Revision 0, Section 6.0, pg. 6-1 states:

"Honeywell implements a PSM Program consistent with the requirements of 29 CFR 1910.119 (Ref. 1). The PSM Program includes the fourteen program elements required by 29 CFR 1910.119 and addresses the following hazardous chemicals:

- *Hydrogen (below the PSM threshold quantities);*
- *Aqueous Ammonia; and*
- *Anhydrous Hydrofluoric Acid*

Because uranium hexafluoride can react to form hydrofluoric acid, it is considered in the PSM program.

The MTW PSM applicability document provides a complete listing of the chemicals, processes, and the areas impacted by the PSM program."

The ISA considers applicable MTW acute chemical exposure pathways. Dermal and ocular exposure to HF is considered at Honeywell MTW, as indicated in the ISA Summary Revision 14, pg. 6-9 which states:

"Skin exposure to concentrated liquid HF will result in aggressive chemical burns. Burns from exposure to dilute solutions (1-20%) of hydrofluoric acid (aqueous HF) or moderate concentrations of vapor may not be immediately painful or visible. Symptoms of skin

exposure include immediate or delayed throbbing, burning pain followed by localized destruction of tissue and blood vessels that may penetrate to the bone. Exposure to liquid forms of HF is not expected at the facility.

Ocular exposure to HF causes a burning sensation, redness and secretion. Splashes of aqueous hydrofluoric acid to the eye rapidly produce conjunctivitis, keratitis and more serious destructive effects but these are not expected at the facility."

While anhydrous and liquid HF are used at Honeywell MTW, these forms of HF are regulated by OSHA in accordance with the NRC/OSHA memorandum. Gaseous HF is under NRC jurisdiction because it is produced from releases of UF₆ (the reaction of UF₆ with moisture in the air). A review of available literature on acute exposure to gaseous HF does not reveal any broadly accepted guidelines for dermal or ocular exposure. The effects of dermal and ocular exposure to gaseous HF appear to be significantly less severe than the effects of dermal and ocular exposure to liquid HF. The Toxicological Profile for Fluorides, Hydrogen Fluoride, and Fluorine (Exh. AES000077, U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, September 2003) identified the effects of acute ocular and dermal exposure to gaseous HF as follows:

- Very mild eye irritation for exposures between 0.5 ppm and 4.5 ppm for 1 hour
- Mild eye irritation for exposures of 3 ppm for 6 hours
- Slight eye irritation for exposures of 10 ppm for greater than 15 minutes
- Mild eye irritation for exposures of 30-50 ppm for 3 minutes
- Marked eye irritation for exposures of 100 ppm for < 1 minute
- Smarting of the skin for exposures of 122 ppm for 1 to several minutes

The data is limited to acute ocular exposures which result in irritation only (i.e., equivalent to Category 1, Low Consequence Severity Category defined in ISA Summary).

Analysis of the other data in the Toxicological Profile for Fluorides, Hydrogen Fluoride, and Fluorine indicates the most severe effects of acute exposure to gaseous HF are experienced by the respiratory tract. As such, the inhalation limits set in the MTW ISA Summary for acute HF exposure bound any dermal or ocular limits for the type of acute exposure expected at MTW.

Planned License Renewal Application Revision

None