

June 13, 2012

Mr. Larry Smith  
Plant Manager  
Honeywell Metropolis Works  
P.O. Box 430  
2768 North US 45 Road  
Metropolis, IL 62960

SUBJECT: HONEYWELL METROPOLIS WORKS – EXEMPTION FROM THE REQUIREMENTS OF TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS* PART 20 APPENDIX B AND TITLE 10 *CODE OF FEDERAL REGULATIONS* PART 20.1003 TO MODIFY DERIVED AIR CONCENTRATION, ANNUAL LIMIT ON INTAKE, AND ORGAN DOSE WEIGHTING FACTOR VALUES (TAC NO. L32775)

Dear Mr. Smith:

By letter dated October 5, 2011 (Agencywide Documents Access and Management System [ADAMS] Accession Number ML11286A228), Honeywell Metropolis Works (Honeywell) submitted its request for an amendment to its License No. SUB-526 that would allow Honeywell to use adjusted Derived Air Concentration (DAC) and Annual Limit on Intake (ALI) values, and use Tissue Weighting Factors in place of Organ Dose Weighting Factors.

Specifically, in its October 5, 2011 submittal, Honeywell requested an amendment to exempt it from a portion of the requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 20 Appendix B and 10 CFR 20.100—which requires that Honeywell use specific DAC and ALI values as tabulated in Appendix B, and the Organ Dose Weighting Factors listed in 10 CFR 20.1003 for dose assessments. The exemption would allow Honeywell to instead use the DAC and ALI values listed in International Commission on Radiation Protection (ICRP) 68 and the Organ Dose Weighting Factors for dose assessments using ICRP 60 methodology, contained therein. The staff completed its review of the exemption request and found the proposed request acceptable. The exemption hereby granted by the U.S. Nuclear Regulatory Commission (NRC) is documented as Amendment 9 to Honeywell's Materials License No. SUB-526. The amendment revises License Conditions 28 and 29 in Honeywell's license to reflect the exemption the NRC is granting.

A copy of the Safety Evaluation Report is included in Enclosure 1. Enclosure 2 contains Amendment 9 for the Honeywell Material License No. SUB-526, reflecting the revision proposed under this exemption request. Except to the extent that LC 28 and 29 amend SUB-526 to grant the change requested by Honeywell, the exemption neither withdraws any of Honeywell rights under the license, nor imposes new conditions on Honeywell.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records Systems component of ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If there are any questions regarding this action, please contact Mr. Jack Sulima, NRC Project Manager for Honeywell Metropolis Works, at 301-492-3180, or via e-mail to [John.Sulima@nrc.gov](mailto:John.Sulima@nrc.gov).

Sincerely,

**/RA/**

John D. Kinneman, Director  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

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

Enclosures:

1. Safety Evaluation Report
2. Materials License

cc: Bob Stokes, Honeywell

If there are any questions regarding this action, please contact Mr. Jack Sulima, NRC Project Manager for Honeywell Metropolis Works, at 301-492-3180, or via e-mail to [John.Sulima@nrc.gov](mailto:John.Sulima@nrc.gov).

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DOCKET NUMBER: 40-3392

LICENSE NUMBER: SUB-526

LICENSEE: HONEYWELL METROPOLIS WORKS

SUBJECT: SAFETY EVALUATION REPORT: EXEMPTION REQUEST TO  
USE INTERNATIONAL COMMISSION ON RADIOLOGICAL  
PROTECTION 68 METHODOLOGY

## 1.0 BACKGROUND

Honeywell International, Inc., (Honeywell or the licensee) is the holder of Materials License No. SUB-526, which authorizes operation of Honeywell Metropolis Works (MTW) facility. The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC or the Commission) now or hereafter in effect.

The facility holds a license under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 40 last renewed by the NRC on May 11, 2007, as amended. It is located in Metropolis, Illinois, and converts uranium ore concentrates to uranium hexafluoride (UF<sub>6</sub>) via fluoride volatility conversion process. The UF<sub>6</sub> product is used as the feed material for uranium enrichment plants.

## 2.0 EXEMPTION REQUEST

10 CFR 20.2301 states that the NRC “may, upon application by a licensee or upon its own initiative, grant an exemption from the requirements of the regulations in this part if it determines the exemption is authorized by law and would not result in undue hazard to life or property.”

By letter dated October 5, 2011, MTW requested an amendment to its Materials License SUB-526 to allow the use of Derived Air Concentration (DAC) and Annual Limit on Intake (ALI) values calculated using the internal dosimetry models specified in the International Commission on Radiological Protection (ICRP), Publication 68. Also, consistent with that methodology, MTW is requesting exemption from the organ dose weighting factors in 10 CFR Part 20.1003 and authorization to utilize the tissue weighting factors in ICRP, Publication 60. The staff categorizes this proposed action as a request for an exemption from the requirements of 10 CFR Part 20.

Specifically, in its October 5, 2011, submittal, Honeywell requested an amendment to exempt it from a portion of the requirements in 10 CFR Part 20 Appendix B and 10 CFR 20.1003, which requires that Honeywell use specific DAC and ALI values as tabulated in Appendix B, and the Organ Dose Weighting Factors listed in 10 CFR 20.1003 for dose assessments. The amendment would allow Honeywell to use the DAC and ALI values listed in ICRP 68 and the Tissue Weighting Factors listed in ICRP 60.

### 3.0 SAFETY EVALUATION

The basic limits on radiation exposures, as well as the minimum radiation protection practices required of any NRC licensee, are specified in 10 CFR Part 20, "Standards for Protection Against Radiation." Part 20 underwent a major revision in the 1980s, and the revised regulation was published as a proposed rule in December 1985. The final rule was published in the Federal Register on May 21, 1991 (56 FR 23391), and became mandatory for all licensees in January 1994. One of the major changes incorporated in the revised Part 20 was the manner in which internal exposure to radioactive materials is regulated. Before the revision, NRC regulated internal exposures by limiting the amounts of radioactive materials that may be taken into the body over specified time periods. The revised Part 20 eliminated regulation based on intakes and now includes regulation based on the dose that resulted from those intakes. The internal dose from intake of radioactive material is referred to in Part 20 as the committed effective dose equivalent (CEDE). The change to regulation of dose instead of intake was prompted in part by similar changes in the recommendations provided by national and international bodies, and also by the desire to end the traditional treatment of internal and external doses as two distinct and separate entities.

Part 20, allows certain adjustments to be made to the parameters of the models used to calculate the internal dose if specific information is available, such as adjustments when the particle size of airborne radioactive material is known, rather than using a default particle size. However, Part 20 also specifies certain protection requirements in terms of the quantities tabulated in Appendix B, the ALI and the DAC, rather than in terms of dose. Thus requirements such as posting of airborne radioactivity areas, monitoring for intakes of radioactive materials, establishment of bioassay programs, and use of respirators are explicitly tied to the measurable quantities rather than to a dose. This approach was taken in order to assure that these criteria would be easy to implement, and not impose an undue calculation burden on a licensee.

The models used in Part 20 to regulate internal dose are those described in ICRP Publications 26 and 30, adopted by ICRP in 1977 and 1978, respectively. Much of the basic structure of these models was developed in 1966, although some of its components and parameters were altered somewhat between 1966 and their formal adoption by ICRP in 1978. In the same year that the Commission approved the final Part 20 rule, ICRP published a major revision of its radiation protection recommendations in ICRP 60. In the several years following this revision, ICRP published a series of reports in which it described the components of an extensively updated and revised internal dosimetry model. These reports include ICRP Publications 60 (1990), 66 (1993), 67 (1993), 68 (1994), 71 (1995), 72 (1995), and 78 (1997). NRC licensees are not permitted to use the revised and updated internal dosimetry models unless an exemption is granted.

Although the dose per unit intake calculated using the new models does not differ by more than a factor of about two from the values in Part 20 for most radionuclides, the differences are substantial for some—particularly for the isotopes of thorium, uranium, and some of the transuranic radionuclides. For example, for inhalation of insoluble thorium-232 ( $^{232}\text{Th}$ ), the CEDE per unit intake calculated using the revised ICRP lung model is a factor of about 15 times lower than that in Part 20. Because protective measures are based on hazard, and since hazard is proportional to dose, Part 20 requires significantly more protective measures when using  $^{232}\text{Th}$  than would be warranted based on the revised models. This is MTW's primary concern, and it has requested that it be allowed to use DAC and ALI values based on the dose coefficients listed in ICRP 68 and the tissue weighting factors listed in ICRP 60.

### Authorized by Law

This action changes the methodology by which the licensee assesses the internal dose of its workers and staff to an improved method that is recommended by the international scientific community. This exemption does not change, in any way, the NRC dose limits with which the licensee must comply for its workers and/or members of the public. The NRC staff has determined that granting of the licensee's proposed exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the exemption is authorized by law.

### No Undue Hazard to Life or Property

The underlying purpose of 10 CFR Part 20 is to ensure that occupational workers and members of the public are protected from radiation; that their doses, as a result of licensed activities, are within prescribed limits; and that their doses are as low as reasonably achievable (ALARA). This exemption is in accordance with the ALARA principle, international standards on radiation protection, and does not conflict with established NRC dose limits. No new accident precursors are created by this exemption to allow modification to the values used to assess internal dose. In view of the above, there is no significant increase in the risk to workers or members of the public as a result of this action. Therefore, there is no endangerment to life or property.

## 4.0 ENVIRONMENTAL REVIEW

The applicant has committed to adequate environmental protection measures, including (1) environmental and effluent monitoring and (2) effluent controls to maintain public doses ALARA as part of the radiation protection program. The NRC staff concludes that the applicant's conformance to its application and license conditions provides adequate assurance of the protection of the health and safety of the workers and public, is adequate to protect the environment, and complies with the regulatory requirements imposed by the Commission in 10 CFR Parts 20, 40, and 51.

The basis for this conclusion is documented in an Environmental Assessment (EA) which was prepared in support of the proposed amendment (ADAMS Accession Number ML11333A064). On May 18, 2012 a Federal Register Notice was published (77 FR 29697 to 29698) which contained the EA, and a Finding of No Significant Impact.

## 5.0 CONCLUSION

Based on the review and evaluation of the of the information Honeywell MTW provided in its amendment request dated October 5, 2011, the staff concludes that the exemption would continue to provide adequate protection of public health, safety, and safeguards. Therefore, the staff concludes that the proposed exemption is acceptable and consistent with the requirements of 10 CFR 20.2301 and 10 CFR 40.14 (a).

## 6.0 LICENSE AMENDMENT

Two (2) license conditions have been added to Honeywell's Material License No. SUB-526 (LC-28 and LC-29) to reflect the NRC granting an exemption from parts of 10 CFR 20 Appendix B and 10 CFR 20.1003:

“Notwithstanding the Derived Air Concentration (DAC) and Annual Limit on Intake (ALI) listed in Appendix B to 10 CFR Part 20, the licensee may use adjusted DAC values and adjusted ALI values listed in International Commission on Radiological Protection (ICRP) Publication 68 (Annals of the ICRP, Volume 24, No. 4).”

“Notwithstanding the organ dose weighting factors in 10 CFR Part 20.1003, the licensee may use the tissue weighting factors listed in ICRP Publication 60 (Annals of the ICRP, Volume 21, No. 1-3) for effective dose assessments listed in ICRP Publication 68 methodologies.”

PRINCIPAL CONTRIBUTOR

Gregory Chapman