June 23, 2009

MEMORANDUM TO: Chairman Jaczko
Commissioner Lyons
Commissioner Klein
Commissioner Svinicki

FROM: Michael F. Weber, Director **/RA/**
Office of Nuclear Material Safety
and Safeguards

SUBJECT: STATUS OF PART 40 RULEMAKING TO INCORPORATE INTEGRATED SAFETY ANALYSIS REQUIREMENTS SIMILAR TO PART 70 SUBPART H

This memorandum provides the Commission with an update on the staff's efforts to establish a threshold for requiring an Integrated Safety Analysis (ISA) for conversion and deconversion facilities licensed under 10 CFR Part 40, "Domestic Licensing of Source Material."

BACKGROUND

The primary hazard to public health and safety associated with conversion and deconversion facilities is the chemical risks associated with the licensed material and the chemicals used in the conversion and deconversion processes. The source material, in the form of uranium hexafluoride (UF_6), can react spontaneously with water vapor to produce hydrogen fluoride (HF) which could result in a hazardous exposure to HF. The uranium compounds involved in this reaction form particulates which do not propagate far from the location of a spill; but the HF produced in the reaction forms a toxic gas which can impact areas both onsite and offsite. The potential to release large quantities of HF prompted NRC staff to consider the need for an ISA at these facilities.

In the Staff Requirements Memorandum (SRM) M070308B, "Staff Requirements - Briefing on NMSS Programs, Performance, and Plans," dated March 22, 2007, the Commission directed the staff to propose options for implementing ISA requirements in Part 40 similar to those in Part 70 Subpart H. As a result, the staff developed SECY-07-0146, "Regulatory Options for Licensing New Uranium Conversion and Depleted Uranium Deconversion Facilities." This document proposed thresholds for uranium tetrafluoride (UF_4), UF_6 and HF which could result in a hazardous exposure to HF. Facilities which exceeded the thresholds would be licensed by the NRC and required to complete an ISA.

CONTACT: Matt A. Bartlett, NMSS/FCSS
(301) 492-3119

In the SRM-SECY-07-0146, dated October 10, 2007, "Staff Requirements Memorandum – Regulatory Options For Licensing New Uranium Conversion and Depleted Uranium Deconversion Facilities," the Commission directed the staff to establish appropriate thresholds for UF_4 and UF_6. The Commission also supported excluding certain conversion and deconversion facilities from the requirements for an ISA, including facilities undergoing decommissioning and those already licensed by Agreement States, e.g., Aerojet Ordinance Inc. (Aerojet) in Tennessee. The Commission did not indicate support for establishing a separate threshold for HF which is stored or used onsite (i.e., the HF not produced directly from licensed activities).

DISCUSSION

Consistent with the Commission's direction to establish appropriate thresholds for UF_4 and UF_6, the staff sought input from stakeholders in a public workshop held February 22, 2008. The staff further evaluated the hazards at conversion and deconversion facilities and established a threshold quantity of licensed material based on the amount of HF that could be produced in processing or during an event. In February 2009, this evaluation resulted in revising the technical basis for rulemaking.

The staff determined that an appropriate threshold for requiring an ISA would be that amount of licensed material from which 450kg (1000 lbs) of HF could be produced. This quantity of HF is consistent with the thresholds established by the Environmental Protection Agency's Risk Management Program and Occupational Safety and Health Administration's Process Safety Management for implementing additional safety analysis.

The staff evaluated several proposed thresholds of UF_6 which have the potential, under various conditions, to release 450kg of HF. Initially, in SECY-07-0146, the staff proposed a threshold of 10,000 kg of UF_4 or UF_6, which is about the quantity of UF_4 or UF_6 in a full 14 ton cylinder. However, the staff has since determined that an adequate technical basis for these values was difficult to justify.

As the staff evaluated input from various stakeholders and examined published literature, the threshold for UF_6 was revised downward to 2,000 kg. For UF_6, the staff determined that a threshold based on stoichiometry is reasonable because UF_6 is reactive under ambient and near ambient conditions and will interact with water vapor rapidly and spontaneously to produce HF and UO_2F_2. In an accident scenario involving a fire, the reaction rate would increase. The staff also considered a similar stoichiometric calculation for determining a threshold for UF_4. However, UF_4 is far less reactive than UF_6 and under ambient conditions reacts slowly, i.e. days to months[1], with water to produce small quantities of HF.

The staff was unable to locate specific technical information on UF_4. The staff does not believe, at this time, there is sufficient information available to establish a technically defendable threshold of UF_4 for requiring an ISA. If additional information becomes available that warrants establishing a UF_4 threshold for an ISA, developing additional guidance, or revising current regulations, the staff will communicate with the Commission on an appropriate path forward.

For facilities that require an ISA, the staff intends to incorporate criteria similar to Part 70.22(i), "Contents of applications," regarding emergency planning, that would require either an

1. Kozak, M., et al., *Performance Assessment of the Proposed Disposal of Depleted Uranium as Class A Low-Level Waste*, FIN A1764, Sandia National Laboratory, Albuquerque, NM, December 16, 1992. (ML073550309)

emergency evaluation or an emergency plan. The staff also plans to consider whether to incorporate in the draft rulemaking, a backfit provision for Part 40 licensees. A similar provision was included with the original Part 70 ISA requirements. In addition, the Nuclear Energy Institute proposed incorporating a backfit provision during the Part 40 Rulemaking Public Workshop held on February 22, 2008. If added, the provisions would be similar to the current requirements in Part 50.109 and Part 70.76.

CONCLUSION

The staff has determined that a single threshold of 2,000 kg of UF_6 is appropriate for establishing a conversion and deconversion plant as a major facility. A facility meeting this criterion would be licensed by the NRC and obligated to comply with the new Part 40 ISA requirements. The facilities which will be affected by the new rule include Honeywell International Inc., Metropolis, Illinois, and the proposed International Isotopes, Inc., facility to be located near Hobbs, New Mexico.

Consistent with Commission direction, facilities undergoing decommissioning and current Agreement State licensees, such as Aerojet, would remain within their current regulatory framework and would not be affected by the new ISA requirements.

The effort to develop a sufficient technical basis, with appropriate thresholds, that focuses on major fuel cycle facilities was more challenging than originally envisioned. As a result, the initial schedule for completing the rulemaking is no longer attainable. Based on the staff's revised technical basis in February 2009, the Office of Federal and State Materials and Environmental Management Programs (FSME) has requested a rebaselining of the rulemaking schedule. FSME will submit a separate request to rebaseline the schedule to reflect a draft rule completion date of one year after FSME has accepted the revised technical basis, now being developed by the Office of Nuclear Material Safety and Safeguards. The final rule completion date will be set two years from the acceptance date of the revised technical basis. The rebaselining also allows sufficient time to incorporate backfit provisions into this rulemaking effort, if applicable.

cc: SECY
OEDO
OGC
OCA
OPA
CFO

emergency evaluation or an emergency plan. The staff also plans to consider whether to incorporate in the draft rulemaking, a backfit provision for Part 40 licensees. A similar provision was included with the original Part 70 ISA requirements. In addition, the Nuclear Energy Institute proposed incorporating a backfit provision during the Part 40 Rulemaking Public Workshop held on February 22, 2008. If added, the provisions would be similar to the current requirements in Part 50.109 and Part 70.76.

CONCLUSION

The staff has determined that a single threshold of 2,000 kg of UF6 is appropriate for establishing a conversion and deconversion plant as a major facility. A facility meeting this criterion would be licensed by the NRC and obligated to comply with the new Part 40 ISA requirements. The facilities which will be affected by the new rule include Honeywell International Inc., Metropolis, Illinois, and the proposed International Isotopes, Inc., facility to be located near Hobbs, New Mexico.

Consistent with Commission direction, facilities undergoing decommissioning and current Agreement State licensees, such as Aerojet, would remain within their current regulatory framework and would not be affected by the new ISA requirements.

The effort to develop a sufficient technical basis, with appropriate thresholds, that focuses on major fuel cycle facilities was more challenging than originally envisioned. As a result, the initial schedule for completing the rulemaking is no longer attainable. Based on the staff's revised technical basis in February 2009, the Office of Federal and State Materials and Environmental Management Programs (FSME) has requested a rebaselining of the rulemaking schedule. FSME will submit a separate request to rebaseline the schedule to reflect a draft rule completion date of one year after FSME has accepted the revised technical basis, now being developed by the Office of Nuclear Material Safety and Safeguards. The final rule completion date will be set two years from the acceptance date of the revised technical basis. The rebaselining also allows sufficient time to incorporate backfit provisions into this rulemaking effort, if applicable.

cc: SECY
OEDO
OGC
OCA
OPA
CFO

DISTRIBUTION:

EDO r/f	NMSS r/f	FSME r/f	E. Lohr, FSME
M. Delligatti, FSME	R. Bavol, FSME,	N. Simonian, FSME	T. Stokes, OGC
J. Hull, OGC	NMSSRecordsMgmt	RidsNmssOd	RidsEdoMailCenter
RidsSecyCorrespondence			

ML091740121

OFC	NMSS	NMSS	Tech Ed	OGC	NMSS
NAME	MBartlett	CGibbs	QTE	TBD	THiltz
DATE	5/27/09	5/11/09	5/12/09	6/01/09	6/01/09
OFC	NMSS	NMSS	FSME	NMSS	
NAME	MBailey	DDorman	MThaggard	MWeber	
DATE	6/2/09	5/28/09	5/29/09	6/08/09 & 6/23	

OFFICIAL RECORD COPY