

**ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT FOR THE  
FINAL RULE AMENDING 10 CFR PART 40**

**Domestic Licensing of Source Material – Amendments/Integrated Safety Analysis**

**Office of Federal and State Materials and Environmental Management Programs**

**U.S. Nuclear Regulatory Commission**

**April 2012**

**THE PROPOSED ACTION**

The U.S. Nuclear Regulatory Commission (NRC or Commission) is amending its regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 40, "Domestic Licensing of Source Material," to establish a regulatory framework for analyzing the risk of potential accidents at facilities possessing significant quantities of uranium hexafluoride (UF<sub>6</sub>).

This action is being taken in response to a Staff Requirements Memorandum (SRM) on SECY-07-0146 (NRC's Agencywide Document Access and Management System (ADAMS) Accession No. ML072830536), dated October 10, 2007, directing the NRC staff to pursue rulemaking to require new applicants and existing licensees for 10 CFR Part 40 fuel cycle facilities authorized to possess UF<sub>6</sub> source material inventories greater than 10,000 kg (or an alternative threshold quantity) to meet integrated safety analysis (ISA) requirements similar to those in 10 CFR Part 70, Subpart H.

The NRC staff subsequently looked at threshold limits and decided that quantities of UF<sub>6</sub> source material greater than 2000 kg represented a significant quantity. This reduction from 10,000 to 2000 kg was based in part on the chemical hazard associated with accident scenarios involving UF<sub>6</sub>. Specifically, in an accident scenario involving 2000 kg of UF<sub>6</sub>, approximately 453 kg (1000 lb) of hydrogen fluoride (HF) vapor could be produced.

The amendments to 10 CFR Part 40 are intended to provide increased confidence in the margin of safety at fuel cycle facilities by requiring licensees and applicants who are authorized, or may be authorized, to possess 2000 kg or more of UF<sub>6</sub>, to identify items relied on for safety (*i.e.*, structures, systems, equipment, components and personnel activities) that will be protective of health, safety and the environment. The new ISA requirements are similar to the existing 10 CFR Part 70, Subpart H regulations, which apply to fuel fabrication and enrichment facilities authorized to possess special nuclear material in quantities sufficient to form a critical mass.

This rulemaking adds safety performance requirements with the following major elements:

1. Performance of an ISA to identify potential accidents at the facility and the items relied on for safety;
2. Identification of appropriate consequence and likelihood criteria and items relied on for safety to prevent or mitigate accidents that exceed the established criteria;
3. Establishment of management measures to ensure that items relied on for safety are available and reliable to perform their function when needed;
4. Submission of an ISA summary; and
5. Flexibility for licensees to make certain changes to their facilities, without prior NRC approval.

These new requirements do not apply to licensees whose facilities are in the decommissioning process.

## **THE NEED FOR THIS ACTION**

The amendments to 10 CFR Part 40 are necessary to provide for increased confidence in the margin of safety at 10 CFR Part 40 fuel cycle facilities that are authorized to possess 2000 kg or more of UF<sub>6</sub>.

## **ENVIRONMENTAL IMPACTS OF THIS ACTION**

The potential environmental impacts of this action are those which arise from the additional licensee efforts that may be required to perform an ISA and implement the safety-related performance requirements, and the benefits to the public health and safety and the environment. Using a risk-informed regulatory framework, this action establishes specific performance objectives and requires licensees to conduct an ISA to demonstrate compliance with these objectives. Adherence to the new performance objectives, which include the establishment of consequence criteria and corresponding likelihood goals, is expected to lessen potential impacts on workers, members of the public, and the environment from accidents at 10 CFR Part 40 fuel cycle facilities authorized to possess 2000 kg or more of UF<sub>6</sub>.

This action has positive effects on environmental protection, *i.e.*, its implementation is expected to decrease the likelihood of worker, public, and environmental exposure to radioactive and hazardous materials as a result of an accident. Among its requirements, this rulemaking action specifies that licensees must:

1. Provide protection against accidents with the following consequences so that their occurrence would be highly unlikely:

- (a) An acute worker dose of 1 Sv (100 rem) or greater total effective dose equivalent;

(b) An acute dose of 0.25 Sv (25 rem) or greater total effective dose equivalent to any individual located outside the controlled area;

(c) An intake of 30 mg or greater of uranium in soluble form by any individual located outside the controlled area; and

(d) An acute chemical exposure to an individual from licensed material or hazardous chemicals produced from licensed material that:

(i) Could endanger the life of a worker; or

(ii) Could lead to irreversible or other serious, long-lasting health effects to any individual located outside the controlled area.

2. Provide protection against accidents with the following consequences so that their occurrence would be unlikely:

(a) An acute worker dose of 0.25 Sv (25 rem) or greater total effective dose equivalent;

(b) An acute dose of 0.05 Sv (5 rem) or greater total effective dose equivalent to any individual located outside the controlled area;

(c) A 24-hour averaged release of radioactive material outside the restricted area in concentrations exceeding 5000 times the values in Table 2 of Appendix B to 10 CFR Part 20; or

(d) An acute chemical exposure to an individual from licensed material or hazardous chemicals produced from licensed material that:

(i) Could lead to irreversible or other serious, long-lasting health effects to a worker; or

(ii) Could cause mild transient health effects to any individual located outside the controlled area.

3. Submit a summary of the ISA and keep the summary and other ISA documentation updated.

4. Identify and maintain items relied on for safety to ensure that they are available and reliable to perform their function when needed.

5. Report events that affect public health and safety or the environment, or that relate to the loss or degradation of items relied on for safety.

By requiring ISAs which evaluate potential accident sequences, including their consequences and likelihood of occurrence, this action is expected to reduce the frequency and severity of accidents at affected licensed facilities. The reduction should translate into fewer accident-related injuries, fewer exposures to workers, reduced cleanup, and less environmental contamination. The NRC has accordingly concluded that there will be no significant radiological or non-radiological environmental impacts associated with implementation of the rule's requirements. Existing NRC requirements limiting releases of offsite radiological effluents are not affected by this rulemaking and continue to apply, and the 10 CFR Part 40 revisions do not affect the existing 10 CFR Part 20 occupational and public dose limits. This rulemaking will not result in any significant change in the types, or significant increase in the amounts, of any effluents that may be released offsite. There will be no significant increase in individual or cumulative public or occupational radiation exposure associated with this rulemaking action. Similarly, this rule is not expected to result in any significant increase in the potential for or consequences from radiological accidents.

Regarding potential non-radiological impacts, implementation of the rule's requirements does not have a significant impact on the environment. The ISA rule does not require construction of new structures. This action does not affect any historic sites, and does not affect non-radiological effluents of licensed facilities. Therefore, there is no significant non-radiological environmental impact associated with this rulemaking action.

## **ALTERNATIVES TO THIS ACTION**

Under the *status quo* no-action alternative, the NRC would have made no changes to the current 10 CFR Part 40. The one licensee currently required by license condition to perform an ISA would have remained subject to this license-specific requirement. In addition, in accordance with SRM-M070308B (ADAMS Accession No. ML070820023), dated March 22, 2007, new applicants seeking authorization to possess 2000 kilograms or more of UF6 would continue to be required to meet the performance requirements in 10 CFR Part 70, Subpart H, as part of the licensing basis for the application review. Therefore, this option is not entirely no-action. Although no rulemaking would have been pursued, the ISA requirements in 10 CFR Part 70 would have still been used under this alternative in accordance with SRM-M070308B.

## **ALTERNATIVE USE OF RESOURCES**

There are no irreversible commitments of resources determined in this assessment.

## **AGENCIES AND PERSONS CONTACTED**

Other than the States, no agencies or persons outside the NRC were contacted in connection with the preparation of this environmental assessment. The NRC requested the views of the States in preparing this environmental assessment, but did not receive any comments from the States in this regard. As part of this rulemaking action, the draft environmental assessment was made available for public comment in May 2011. No comments were received on the draft environmental assessment.

## **ENVIRONMENTAL JUSTICE**

The NRC is committed to complying with Executive Order (E.O.) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, dated February 11, 1994, in all its actions. No significant environmental impacts have been identified regarding this action, and the NRC staff has determined that this action has no disproportionately high and adverse effects or impacts on minority or low-income populations. Consequently, further evaluation of environmental justice concerns, as outlined in E.O. 12898, is not warranted.

## **FINDING OF NO SIGNIFICANT IMPACT**

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that the rule amendments are not a major Federal action significantly affecting the quality of the human environment, and that a finding of no significant impact is appropriate. Therefore, preparation of an environmental impact statement is not warranted.