

**UNITED STATES NUCLEAR REGULATORY
COMMISSION**

Environmental Assessment and Finding of No Significant Impact

For

Amendments to 10 CFR Part 40

September 2010

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Description of the Planned Action

The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend its regulations in Title 10 of the *Code of Federal Regulations* (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 (UF₆).

This action is being taken in response to Staff Requirements Memorandum (SRM) for SECY-07-0146, dated October 10, 2007, directing the NRC staff to pursue rulemaking to require new applicants and existing licensees for Part 40 fuel cycle facilities authorized to possess UF₆ inventories greater than 10,000 kilograms (or alternative threshold quantity) to meet integrated safety analysis (ISA) requirements similar to those in Part 70, Subpart H.

The NRC staff subsequently looked at threshold limits and decided that quantities of UF₆ 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 UF₆. Specifically, in an accident scenario involving 2000 kg of UF₆, approximately 453 kg (1000 lb) of hydrogen fluoride (HF) vapor could be produced.

The proposed amendments to 10 CFR Part 40 are intended to provide for increased confidence in the margin of safety at fuel cycle facilities by ensuring that licensees systematically identify items (i.e., structures, systems, equipment, components and personnel activities) necessary for protection of health, safety and the environment. The new ISA requirements would be similar to requirements found in Part 70 Subpart H, which apply to fuel

fabrication and enrichment facilities. In the rulemaking, NRC would assert jurisdiction over all applicants and licensees that may possess 2000 kg or more of UF₆.

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. 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 would not apply to licensees currently undergoing decommissioning.

Need for the Action

The amendments to Part 40 are necessary to provide for increased confidence in the margin of safety at Part 40 fuel cycle facilities that are authorized to possess 2000 kilograms (kg) or more of UF₆

The two primary alternatives to be considered are: 1) Alternative 1-no-action, and 2) Alternative 2- the proposed rule revision.

Alternative 1

Under the *status quo* no-action alternative, the NRC would retain the current Part 40 as it is. Licensees currently required by license condition to perform an ISA would continue to do so. In addition, per the Commission's direction in SRM-M070308B, dated March 22, 2007, any new applicants seeking authorization to possess 2000 kilograms or more of UF₆ are required to meet the performance requirements in Part 70, Subpart H, as part of the licensing basis for the application review. Thus, this option is not entirely no-action. Although no rulemaking would be pursued, a Standard Review Plan (SRP) would still be used under this alternative, in accordance with NRC policy, to promote licensing consistency and uniformity and provide standards for the quality and completeness of the ISA. The NRC uses SRPs to provide guidance to the staff for review and evaluation of license applications. In addition to promoting uniformity and consistency in licensing reviews, SRPs help make information about regulatory reviews widely available and improve communication and understanding of the staff review process. An SRP provides guidance and compliance is not mandatory. Thus, applicants could dispute the need for performing a comprehensive and systematic ISA.

Alternative 2

Option 2 is the NRC's proposal to modify 10 CFR Part 40 by adding a new subpart as described in the proposed rule. The proposed requirements are briefly summarized below. They are discussed in detail in the Statement of Consideration and Regulatory Analysis. The new part 40 subpart would apply to the subset of 10 CFR part 40 licensees authorized to possess 2000 kg or more of UF₆, and would contain requirements aimed at increasing NRC's confidence in the margin of safety at such facilities. Option 2 is a risk-informed, performance-based regulatory approach that includes: (1) the identification of appropriate performance

criteria; (2) the performance of an ISA to identify potential accidents at the facility and the level of protection needed to prevent or mitigate accidents that exceed such criteria; (3) the implementation of management measures to ensure that any items relied on for safety (IROFS) are available and reliable to perform their function when needed; and (4) adding an additional evaluation criterion for applicants who submit an evaluation in lieu of an emergency plan under § 40.31(j). In addition, in order to ensure confidence in the margin of safety, a licensee would be required to maintain its safety basis by evaluating planned changes in its operations or facility to determine if NRC pre-approval of the changes is required.

The new approach is generic, i.e., it covers all types of potential incidents and IROFS identified and described in the ISA summary, and establishes a time frame for reporting that is scaled according to the risk. The new reporting requirements would supplement the reporting requirements currently in the existing § 40.60 and elsewhere in the regulations (e.g., 10 CFR Part 20).

Environmental Impacts of Proposed Alternatives

Alternative 2

The potential environmental impacts of Alternative 2, the planned 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, the planned 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 Part 40 fuel cycle facilities authorized to possess 2000 kilograms or more of UF₆.

Alternative 2 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. Specifically, the planned action will require that licensees:

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;
- (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 Part 20 of this chapter; 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, with the license application 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.

6. Apply for NRC pre-approval only for certain changes to its safety program and facility.

7. Submit an emergency plan or evaluation, in addition to § 40.31(j)(1)(i), showing that an acute chemical exposure from licensed material or hazardous chemicals produced from licensed material due to a release, would result in neither irreversible nor mild transient health effects to a member of the public offsite.

The benefits of the planned action in reducing the likelihood of potential accidents and mitigating their impacts are real although not readily quantifiable. As discussed in the Regulatory Analysis, the implementation of the planned 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. Quantification of these benefits was not performed because

of the lack of available risk information (i.e., baseline data relating to the number, impact, severity, and consequences of accidents involving UF6). Therefore, negative and positive impacts in this environmental assessment are assessed qualitatively.

Alternative 1

The first alternative, Alternative 1-no action or status quo, does not provide increased confidence in the margin of safety because it fails to provide a risk-informed performance based regulatory framework. The existing Part 40 contains no requirement for licensees to perform an ISA to identify potential accidents and the items relied on for safety. Further, without such a risk-informed, performance-based regulatory framework and the consistency fostered by the planned action, a large amount of licensee and NRC resources could be consumed by continuing the existing licensing approach. The impact of the first alternative is a likelihood of adverse consequences which could have been anticipated and prevented had proper requirements been in place. Although it is possible that licensees would have already identified the possibility of such accidents and have effective controls in place, this outcome cannot be reliably expected because the regulatory framework is not in place to require such outcomes. Under this no action alternative, the result would be a potentially higher risk of accidents with significant consequences, with additional NRC staff and licensee resources expended for subsequent investigations and enforcement.

Summary

The potential environmental impacts of the planned action are expected to be positive and are preferable to the no action, status-quo alternative. The planned action accomplishes the greatest gain in protecting the environment for the administrative resources expended.

Environmental Justice

NRC is committed to complying with Executive Order (EO) 12898 -- Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898), dated February 11, 1994, in all its actions. No significant environmental impacts have been identified, and the NRC staff has determined that there are no disproportionately high and adverse effects or impacts on minority or low-income populations. Consequently, further evaluation of environmental justice concerns, as outlined in EO 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 these proposed amendments will not be a major Federal action significantly affecting the quality of the human environment, and therefore an environmental impact statement is not required. The determination of this environmental assessment is that there will be no significant environmental impact from this action. NRC has also determined that there are no disproportionate, high, and adverse impacts on minority and low-income populations. In the letter and spirit of EO 12898, NRC is requesting public comments on any environmental justice considerations that may be related to this rulemaking action. NRC uses the following working definition of "environmental justice:" the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, culture, income, or educational level with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.