UNITED STATES NUCLEAR REGULATORY COMMISSION

Environmental Assessment and Finding of No Significant Impact

For

Amendments to 10 CFR Part 70

April 2000

Division of Fuel Cycle Safety and Safeguards

Office of Nuclear Material Safety and Safeguards

ATTACHMENT 8

Environmental Assessment and Finding of No Significant Impact

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Description of the Planned Action

The Nuclear Regulatory Commission (NRC) is amending its regulations in 10 CFR Part 70 (Part 70), "Domestic Licensing of Special Nuclear Material," to establish a risk-informed, performance-based framework for regulating special nuclear material (SNM) licensees engaged in enriched uranium processing, fabrication of uranium fuel or fuel assemblies, uranium enrichment, enriched uranium hexafluoride conversion, plutonium processing, fabrication of mixed-oxide fuel or fuel assemblies, scrap recovery of special nuclear material, or any other activity involving a critical mass of special nuclear material that the Commission determines could significantly affect public health and safety. This action is being taken in response to a Petition for Rulemaking (PRM 70-7) filed by the Nuclear Energy Institute (NEI). NEI explained, to the Commission, industry's position on the need for revision of NRC regulations, in Part 70, at a July 2, 1996, meeting, and in a subsequent filing, in September 1996, of a Petition for Rulemaking (PRM 70-7). In SECY-97-137, dated June 30, 1997, the staff proposed a resolution to the NEI PRM. That proposed resolution was endorsed by the Commission in an SRM dated August 26, 1997. On July 30, 1998, staff submitted a proposed rule to the Commission in SECY-98-185[1]. In a December 1, 1998 SRM, the Commission disapproved publication of the staff's submittal as a proposed rule. The Commission directed the staff to continue to discuss all relevant documents with stakeholders (Nuclear Energy Institute, Department of Energy, and others) in public, including use of the Internet. Subsequently, staff submitted a revised proposed rulemaking package to the Commission as SECY-99-147, and a proposed rule was published in the Federal Register on July 30, 1999 (FR64:41338). The final rule has been modified in response to the comments obtained during the public comment period. In addition, the accompanying Standard Review Plan has been modified, from that which accompanied the proposed rule, as a result of additional stakeholder interaction, both in public meetings and through use of the Internet. Staff's final rule includes the basic elements of the PRM-70-7, with some modifications.

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1 SECY-98-185, "Proposed Rulemaking - Revised Requirements for the Domestic Licensing of Special Nuclear Material".

The amendments to 10 CFR Part 70 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 and environmental safety and ensure that these items are available and reliable to perform their function when needed. The revised Part 70 would apply to certain facilities that are authorized to process SNM in quantities sufficient to constitute a critical mass (except reactors and gaseous diffusion plants).

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

1. Performance of an Integrated Safety Analysis (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, with the license application; and

5. Flexibility for licensees to make certain changes to their facilities, without prior NRC approval.

These new requirements would apply to licensees engaged in various activities , listed above, including seven currently operating commercial nuclear fuel cycle facilities in the United States. These facilities are already licensed by NRC and subject to the existing requirements in 10 CFR Part 70.

Need for the Action

The amendments to Part 70 are necessary to provide for increased confidence in the margin of safety at SNM facilities that possess more than a critical mass of SNM. In general the new requirements are intended to ensure that workers, the general public, and the environment are protected from radiological and certain chemical hazards associated with plant operations. A near-criticality incident at a low enriched fuel fabrication facility in May of 1991 prompted NRC staff to evaluate its safety regulations for large materials licensees. (See NUREG-1324 and NUREG-1450 for additional details.) As a result of this review, the Commission and the staff recognized the need for revision of its regulatory basis for these facilities and, specifically, those possessing a critical mass of special nuclear material. Although licensee programs at existing SNM processing facilities are adequate to protect the public, more than three decades of experience with fuel fabrication and SNM processing in the U.S. has surfaced systemic deficiencies in licensee safety programs, especially in the areas of configuration management, maintenance, quality assurance, and safety analysis. The weaknesses identified with the current Part 70 regulatory framework parallel these deficiencies. That is, the current Part 70 does not require the identifications of items relied on for safety; does not require licensees to address fire and chemical process safety; does not require the prevention of an inadvertent criticality; does not require the reporting of all significant facility changes to NRC; and does not require implementation of most managerial controls, including maintenance and quality assurance. It is not a risk-informed regulation in that no specific performance objectives are established and no systematic safety analysis is required to demonstrate compliance with such objectives.

In summary, the existing regulations do not explicitly require a comprehensive, systematic and integrated analysis to identify hazards, such as criticality, fire, chemical releases, and their potential for causing accidents that could affect workers, the public and the environment. Nor do the existing regulations require the identification of items relied on for safety and the measures to assure their availability and reliability to perform their function when needed. There is a need, therefore, to revise the existing regulations to include these features so as to provide increased confidence in the margin of safety and in the availability and reliability of the items relied on for safety to perform their function when needed. The Commission believes such revisions to Part 70 constitute a risk-informed, performance-based approach in which the items relied on for safety and the measures to assure their

continuous availability and reliability are selected commensurate with the risk.

The two primary alternatives to be considered are: 1) Alternative 1-no-action, and 2) Alternative 2- the proposed rule revision and development of a standard review plan (SRP).

Alternative 1

Alternative 1 is the status-quo, no action alternative that reflects the current Part 70 requirements including the current license conditions requiring ISAs in most, but not all, of the licenses which have been renewed. Prior to the addition of the ISA license conditions, NRC was criticized in House Report 100-167 for concentrating on radiological hazards and largely for ignoring other hazards. Under Alternative 1, those licensees required to perform an ISA would continue to do so. An SRP could be developed to promote some consistency and uniformity and provide standards for the quality and completeness of the ISA. However, in addition to current inconsistencies among licensees under Alternative 1, there are other licensees that are not performing ISAs at all. Therefore, even with a revised SRP, there would continue to be inconsistencies between the individual licensees.

Alternative 2

Alternative 2 is the Commission's decision to modify 10 CFR Part 70 by adding a new subpart, "Additional Requirements for Certain Licensees Authorized to Possess a Critical Mass of Special Nuclear Material," that consists of 10 CFR 70.60 to 70.74. This new subpart includes requirements aimed at increasing NRC's confidence in the margin of safety. It will also establish consistency in the manner that affected licensees are regulated. These new requirements, although briefly discussed above, are discussed in detail in the Statement of Consideration and Regulatory Analysis to the proposed Part 70.

Environmental Impacts of Proposed Alternatives

Alternative 2

The potential environmental impacts of Alternative 2, the planned action, are those which

arise from the additional effort licensees may require to perform an ISA and implement the safety-related performance requirements[2], 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 integrated safety analysis (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 the SNM processing facilities.

Alternative 2, the planned action, has positive effects on environmental protection, i.e., it will 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; or
   (c) an intake of 30 mg or greater of uranium in a 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

2 Administrative burdens associated with the proposed revisions to Part 70 are discussed in detail in the Regulatory Analysis of the rule.

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;

(d) an acute chemical exposure to an individual form 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. Limit by assuring that under normal and credible abnormal conditions, all nuclear processes are subcritical.
4. Submit, with the license application a summary of the ISA and keep the summary and other ISA documentation updated.
5. Identify and maintain items relied on for safety to ensure that they are available and reliable to perform their function when needed.
6. 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.
7. Apply for NRC pre-approval only for certain changes to its safety program and facility.

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 risk information, i.e., baseline data relating to the number, impact, severity, and consequence of accidents, that was available. 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. There are no specific performance objectives in the existing

rule, and there is no requirement for licensees to perform a safety analysis 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 to implement the existing requirements. The impact of the first alternative is a likelihood of more incidents of environmental significance 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 Alternative, licensees would have considerable freedom in deciding which accidents are significant and should be protected against, the method of determining which items would be relied on for safety, and which measures would assure the continuous availability and reliability of these items.

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 because the planned action accomplishes the greatest gain in protecting the environment for the administrative resources expended. This conclusion may be summarized from Table 1 below.

TABLE 1: ENVIRONMENTAL IMPACTS OF PROPOSED ALTERNATIVES

	Effect on Increase Confidence in Margin of Safety	Will Address Safety Deficiencies Previously Identified	Environmental Impact
Alternative 1-no action	less than Alternative 2	less than Alternative 2	less than Alternative 2
Alternative 2: Planned action	increase	yes	reduced likelihood of accident and increased mitigation of potential environmental consequences.

Environmental Justice

NRC is committed to complying with Executive Order 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 Executive Order 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 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 requested public comments on any environmental justice considerations that may be related to this rule. No comments were received in response to this request. 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.

List of Agencies and Persons Contacted

Nuclear Energy Institute
General Electric Company
Westinghouse Electric Company
U.S. Department of Energy

References

NUREG-1324, *Proposed Method for Regulating Major Material Licensees*, US NRC, February 1992.

NUREG-1450, *Potential Criticality Accident at the General Electric Nuclear Fuel and Component Manufacturing Facility, May 29, 1991,* US NRC, August 1991.

Regulatory Analysis for Revisions to 10 CFR Part 70, US NRC, March 2000

Environmental Analysis for Proposed Amendments to 10 CFR Part 70, US NRC, June 1999

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