

July 21, 1999

**FOR:** The Commissioners

**FROM:** William D. Travers /s/  
Executive Director for Operations

**SUBJECT:** EVALUATION AND PROPOSED REVISION OF THE NUCLEAR FUEL CYCLE FACILITY SAFETY INSPECTION PROGRAM

**PURPOSE:**

To inform the Commission about the staff's evaluation and proposed revision of the Agency's nuclear fuel cycle facility safety inspection program and related changes.

**DISCUSSION:**

The staff is evaluating and proposing revisions to the baseline safety inspection program that applies to ten nuclear fuel cycle facilities. The facilities include two gaseous diffusion plants, two highly enriched uranium fuel fabrication facilities, five low-enriched uranium fuel fabrication facilities, and one uranium hexafluoride (UF<sub>6</sub>) production facility. These facilities possess large quantities of materials that are potentially hazardous (i.e., radioactive, toxic, and/or flammable) to the workers, public, and environment.

This initiative resulted from the staff's fundamental reviews of its regulatory program, as part of the "reinventing government" process and consideration of lessons learned, from several U. S. Nuclear Regulatory Commission (NRC) initiatives for improving regulatory oversight, including process improvements for oversight of reactors. In this regard, the staff's initiative to evaluate and propose revisions to the safety inspection program comports with:

- NRC's Strategic Plan (i.e., the Agency's mission, vision, goals, good regulation principles, and philosophy);
- The Commission's "White Paper on Risk-Informed and Performance-Based Regulation";
- [SECY-99-100](#) (March 11, 1999), "Framework for Risk-Informed Regulation in the Office of Nuclear Material Safety and Safeguards";
- Commission expectations for more objective, reliable, and predictable indications of performance;
- The risk-informed, performance-based proposed rule: "[10 CFR Part 70, Domestic Licensing of Special Nuclear Material](#)"; and
- NRR's initiative to improve the reactor oversight process.

The goals are to have objective indications of acceptable and changing safety performance relative to licensees controlling hazards to acceptable levels of risk; increase stakeholder confidence in NRC; increase regulatory effectiveness and efficiency; and optimize regulatory burden. In this regard, the staff plans to revise the fuel cycle facility safety inspection program to use: 1) a more risk-informed, performance-based approach to focus on the more significant risks at fuel cycle facilities; 2) more objective safety performance indicators (PIs) with accompanying performance thresholds; 3) "third-party" (e.g., fire and nuclear insurer inspections) safety inspections; and 4) NRC inspections. The PIs, together with risk-informed inspection findings, are intended to provide an objective and reliable basis to determine if a fuel cycle facility is safe, to identify cost-efficient safety improvements, and to provide early indications of declining safety performance. In addition, the Licensee Performance Review (assessment) process, which evaluates PIs and inspection findings, will be enhanced based on a better understanding of the most important safety features of the facility's "as-exists" configuration and operations, and using more risk-informed PIs and inspection findings. This will facilitate clear and predictable regulatory decisions such as determining overall safety performance; identifying needed changes in Agency inspection emphasis; and supporting enforcement actions. Corresponding changes in the enforcement program are also under consideration.

A task force consisting of two teams will evaluate and propose inspection program revisions: 1) a program framework development team consisting of branch chiefs from Headquarters and certain regions responsible for fuel cycle facility inspection activities; and 2) an inspection procedure writing team consisting of fuel facility inspectors. Where appropriate, lessons-learned from NRR's ongoing improvement of the reactor oversight process will be used by the teams. The activities of the task force will be closely integrated and both teams will interface with stakeholders through public notifications and meetings to provide opportunities to exchange information and receive feedback. Based on lessons learned from NRR's ongoing revision of the reactor oversight program, a communication plan is being prepared for meaningful, effective, and efficient involvement of internal and external stakeholders. Public meetings are planned to exchange views concerning the inspection program, its revision, and implementation. A public workshop is planned to inform fuel cycle facility licensees and other interested stakeholders concerning implementation of the revised inspection program. Inspector training is planned to implement the revised inspection program.

A top-down approach will be used to develop an inspection program framework. This approach will start with a desired outcome, identify performance goals to achieve the outcome, and then identify specific objectives and information needs to meet each performance goal. This framework will start at the mission level. Part of NRC's mission is to ensure that fuel cycle facilities are operated in a safe manner (i.e., acceptable risk for the worker, public, and environment). Probabilistic risk assessments are not required for fuel cycle facilities; however, licensees have performed safety analyses that vary in scope and content. In the absence of an Integrated Safety Analysis (ISA) and identification of items relied on for safety, as would be required in the

proposed revision of 10 CFR Part 70, staff will rely heavily on available safety analysis, facility operating experience, performance reviews, and engineering judgment for safety insights concerning the root causes (precursors) for failure to control hazards to acceptable levels of safety. These available safety insights will be used to identify the most important elements, in strategic performance areas, that form the foundation (cornerstones) for meeting the Agency mission. Future implementation of the currently proposed revision of 10 CFR Part 70 (i.e., performance of ISAs) will provide additional insights. The cornerstones will serve as the fundamental building blocks for the inspection program. Acceptable performance in these cornerstones will provide reasonable assurance that the NRC mission is satisfied.

Where available, PIs with accompanying performance thresholds will be selected as a means for measuring the performance of key attributes in each of the cornerstone areas. The extent of NRC actions will be graded based upon the relative deviation from the PI threshold. These thresholds will correspond to levels of performance (performance bands) requiring minimum inspection (baseline); performance that could result in increased inspection; performance that will require increased inspection or other forms of NRC engagement (e.g., management meetings, Commission meetings, Orders, etc.); and performance that is unacceptable. For areas of performance where a PI is not available or sufficient, the staff will conduct supplemental inspections as part of the baseline inspection program.

The baseline inspection program, together with PI information, will be the Agency's mechanism to remain cognizant of risks and conditions impacting risks at fuel cycle facilities. The program will obtain a minimum level of factual information concerning licensee performance in: 1) controlling hazards to acceptable levels of risks; 2) identifying and resolving safety performance issues; and 3) reporting PI data (complete, accurate, and timely). PIs, along with baseline inspections, are intended to provide sufficient data to assess performance in the risk-significant areas of each cornerstone. PIs are not intended to provide complete coverage of every safety aspect of fuel facility configuration, hazards, or activities. Objective performance evaluation thresholds are intended to help determine the level of regulatory activities/engagement (e.g., additional inspection, enforcement, changes in requirements, etc.) commensurate with performance in each cornerstone area.

Risk-informed baseline inspection procedures will be developed for inspectable areas within each cornerstone. Inspectable areas will be selected based on risk significance (i.e., important for meeting a cornerstone objective as derived from a combination of operating experience, deterministic insights, and regulatory requirements). The scope of inspection will be modified based on the associated PIs. When an indicator exists, the more comprehensively the indicator measures an area and indicates acceptable performance, the less extensive will be the scope of inspection. Supplemental inspections, which will be discretionary or reactive, and in addition to baseline inspections, will be conducted in response to declining performance, events, or issues of a generic or facility-specific nature.

#### RESOURCES:

Resources required in the short term to evaluate and propose revisions to the fuel cycle facility safety inspection program were not budgeted. The staff plans to reprogram resources from the inspection program by reducing the number and extent of inspections on lower risk activities that are currently required by Manual Chapter and thereby included in the Master Inspection Plan for FY99 to have resources to evaluate and develop proposed revisions to the inspection program. Two FTEs are projected to be available in fiscal year 2000 due to USEC's postponement of AVLIS, and will be reprogrammed for use in completing revision and implementation of the safety inspection program.

#### COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objections to its content.

The Office of the Chief Information Officer has reviewed this Commission paper for information technology and information management implications and has no objections.

The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections.

original /s/ by  
William D. Travers  
Executive Director for Operations

CONTACT: Walter Schwink, NMSS/FCSS  
301-415-7253