

March 10, 2003

MEMORANDUM TO: Carl J. Paperiello, Deputy Executive Director  
Materials, Research  
and State Programs

THRU: Martin J. Virgilio, Director  
Office of Nuclear Material Safety  
and Safeguards

FROM: Robert C. Pierson, Director **/RA/**  
Division of Fuel Cycle Safety  
and Safeguards

SUBJECT: REGULATORY AUTHORITY OVER CHEMICAL HAZARDS AT  
FUEL CYCLE FACILITIES

PURPOSE:

The purpose of this memorandum is to reiterate the Nuclear Regulatory Commission's (NRC's) role concerning safety regulation of hazardous chemicals at NRC-licensed fuel cycle facilities. After the events of September 11, 2001, NRC initiated actions at licensed fuel cycle facilities that may be causing a perception that NRC is changing its regulatory position regarding safety regulation of hazardous chemicals. This memorandum is to reaffirm the staff's application of 10 CFR Part 70 for regulation of hazardous chemicals at NRC-licensed fuel cycle facilities.

BACKGROUND:

During the 1980s, the Environmental Protection Agency (EPA) and OSHA developed programs to control chemical and other non-radiological hazards. In February 1992, OSHA issued requirements, in 29 CFR Part 1910.119, "Process Safety Management (PSM) of Highly Hazardous Chemicals." In June 1996, because of the "*Clean Air Act Amendments of 1990*," Section 112(r), EPA promulgated Title 40 CFR Part 68, which details the "Risk Management Plan" (RMP) program for hazardous chemicals. These regulations apply to any plant or facility in the United States, including NRC-licensed fuel cycle facilities, that have hazardous chemical inventories that exceed the listed threshold quantities and concentration thresholds for chemicals listed by each agency. Presently, two low-enriched fuel fabrication facilities are required to follow EPA's-RMP and OSHA's-PSM because they store in excess of 10,000 pounds of anhydrous ammonia.

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DISCUSSION:

Since October 2000, NRC has used 10 CFR Part 70, Subpart H, for evaluating and regulating risks associated with chemical accidents and their impact on licensed material. NRC regulation for chemical safety, as provided in 10 CFR 70.62(c), focuses on the following items: (1) radiological hazards related to the processing of licensed material; (2) chemical hazards of licensed material and hazardous chemicals produced from licensed material; and (3) facility hazards that could affect the safety of licensed materials and thus present an increased radiological risk.

The phrase "hazardous chemicals produced from licensed material" used in 10 CFR Part 70, Subpart H, is defined at 10 CFR 70.4 as:

Substances having licensed material as precursor compound(s) or substances that physically or chemically interact with licensed materials; and are toxic, explosive, flammable, corrosive, or reactive to the extent that they can endanger life or health if not adequately controlled. These include substances commingled with licensed material, and include substances such as hydrogen fluoride, which is produced by the reaction of uranium hexafluoride and water, but do not include substances prior to the process addition to licensed material or after the process separation from licensed material. (emphasis added)

To provide information on which chemicals NRC does regulate according to Subpart H, the following examples are provided. Item (1) above covers radiological aspects and is generally understood. An example corresponding to Item (2) above would be uranium hexafluoride which reacts with moisture in the air to produce uranyl fluoride and hydrofluoric acid. Another example of Item (2) would be the release of nitric acid that would result during a dissolution operation where an excess amount of nitric acid is added to uranium oxide. An example of Item (3) above would be a spill of aqueous ammonia due to overfilling of a mixing vessel containing both liquid ammonia and uranyl fluoride which would increase radiological risk. In the consequence analyses that licensees perform as part of their Integrated Safety Analyses, potential accident sequences involving chemicals listed above in Items (1) through (3) will need to be evaluated. NRC staff will review the accident sequences and consequences included in the licensees' safety analyses to verify that hazardous chemical consequences produced from licensed material meet regulatory requirements and that facility hazards that could affect licensed material and increase radiological risk have been addressed.

Examples of chemicals that NRC would not provide safety regulation for are, chlorine that is used for disinfecting cooling or drinking water, or anhydrous ammonia that is used to provide a source of hydrogen via thermal/catalytic cracking, unless within the scope of Item (1), (2), or (3), above. In such cases, these chemicals are regulated by OSHA and EPA. For chemicals that are not covered by PSM or RMP regulations, OSHA and EPA rely on the General Duty Clause.

The operating environment for every industry using hazardous materials changed after the events of September 11, 2001. To provide assurance that NRC licensees are implementing appropriate protective measures to address the current threat environment, NRC has issued Interim Compensatory Measure orders to high-enriched fuel cycle facilities, uranium enrichment

facilities, a uranium conversion fuel cycle facility, and low-enriched fuel cycle facilities. These orders were based, in part, on the potential threat NRC regulated chemicals present to licensed material and activities subject to NRC regulation and are consistent with the Part 70 regulatory approach discussed above.

CONCLUSION:

NRC has maintained its responsibility for the safety and security of licensed material and plant conditions that could affect licensed material and increase radiological risk. NRC has not changed its safety regulation of hazardous chemicals at licensed fuel cycle facilities as a result of the orders issued in the wake of terrorist acts committed on September 11, 2001.

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\* see previous concurrence

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