REGULATORY ASPECTS OF MIXED WASTE

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1. BACKGROUND

Mixed waste is waste that satisfies the definition of low-level radioactive waste in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) and contains hazardous waste that is either: 1) listed as a hazardous waste in 40 CFR 261, Subpart D; or 2) causes the waste to exhibit any of the characteristics identified in 40 CFR 261, Subpart C. Low-level radioactive waste is defined in the LLRWPAA as radioactive material that is not high level waste, spent nuclear fuel, or byproduct material, as defined in Section 11e(2) of the Atomic Energy Act of 1954, and is classified as low-level waste by the U.S. Nuclear Regulatory Commission (NRC).

Various statutes at least partially address mixed waste. Briefly they are:

1. The Atomic Energy Act (AEA) of 1954: This law established the Atomic Energy Commission (now NRC) as the Federal agency having responsibility for the regulation of source, special nuclear, and byproduct material.

2. The Solid Waste Disposal Act (SWDA) of 1965: This was the first Federal solid waste statute. It was enacted for the primary purpose of improving solid waste disposal methods.

3. The Resource Conservation and Recovery Act (RCRA) of 1976: This amendment to the SWDA was enacted as a framework for the management of both hazardous and non-hazardous waste.

4. Hazardous and Solid Waste Amendments (HSWA) to RCRA (1984): These amendments to RCRA established the Land Disposal Restrictions treatment standards for waste before land disposal and schedules under which the Environmental Protection Agency (EPA) must develop these treatment standards.

5. The Low-Level Radioactive Waste Policy Amendments Act of 1985: Established deadlines for States and Compacts to develop new disposal capacity for low-level radioactive waste.

2. DUAL REGULATORY RESPONSIBILITY

NRC and NRC Agreement States regulate the commercial use and disposal of source, byproduct, and special nuclear material, as defined in the AEA. EPA and EPA Authorized States regulate the storage, treatment, and disposal of materials that contain hazardous chemical components, as defined in RCRA. Mixed waste, because it contains both a radioactive component and a hazardous component, is subject to the requirements of both the AEA and RCRA. This dual regulatory responsibility has evoked comments from the Federal, State and private sectors, based, in part, on the idea that there may be inconsistencies in the specific requirements of RCRA and the AEA. Although no literal inconsistencies have been found between the requirements of RCRA and the AEA to date, NRC recognizes that there may be concerns about the application of NRC and EPA regulatory requirements. NRC considers dual regulation to be unnecessarily burdensome and wasteful. However, without further legislation, dual regulation of mixed waste will continue. In response to an inquiry by Congressman Morris Udall, NRC Chairman Carr outlined this position on dual regulation, but recognizing the constraints imposed by current legislation, stated "It is our hope that the joint approach to the mixed waste issue that we and the EPA have established will lead to the successful development and operation of mixed waste disposal facilities as the States move forward to carry out their responsibilities under the LLRWPAA of 1985. We are committed to making this approach work. If the joint approach proves unsuccessful, however, it may well be that further legislative consideration of this matter will be necessary to achieve the objectives of the LLRWPAA."

The NRC and EPA staffs have been working to resolve the issues of concern that generators and storage, treatment, and disposal facility operators have about the application of both agencies' regulatory requirements to mixed waste. To this end, NRC and EPA are developing joint guidance documents, hosting workshops for Federal and State regulators, and sponsoring the development of a national profile on mixed waste volumes, characteristics, and treatability.

3. OVERVIEW OF JOINT NRC/EPA GUIDANCE

There are presently six guidance documents that have been published or are being developed by the NRC and EPA staffs. The concept of joint guidance documents arose early in the NRC/EPA interactions as a methodology by which those areas of overlapping regulatory responsibility could be addressed. A description and the present status of each guidance document follow.

3.1 Published Guidance

- "Guidance on the Definition and Identification of Commercial Mixed Low-Level Radioactive and Hazardous Waste--This guidance was first published for comment in April 1987, and the final guidance was published in October 1989. It is intended to help commercial waste generators identify mixed low-level waste. It provides the generator with a definition of mixed waste and a step-wise system to determine if the waste meets this definition.

  The guidance allows the generator to determine the status of the waste, based on his knowledge of the materials and processes involved in the waste generation, or by testing the waste.

- "Combined NRC/EPA Siting Guidelines for Disposal of Mixed Low-Level Radioactive and Hazardous Waste--This guidance was published in June 1987 to address the concern that confusion about mixed waste disposal siting requirements could hinder development of future low-level waste disposal sites and compliance with the milestones established under the LLRWPAA. By combining the existing technical requirements, standards, and guidance of both agencies, NRC and EPA formulated 11 guidelines intended to help States and compacts develop siting plans for low-level waste disposal facilities that may receive mixed waste. These guidelines address the geologic and hydrologic characteristics of a site, identify technical as well as legal disqualifying features for potential sites, specify that a disposal site should provide a stable foundation for engineered containment structures, and place primary emphasis, for

determination of site suitability, on ensuring that the long term performance objectives of 10 CFR 61 will be met.

- "Joint NRC/EPA Guidance on a Conceptual Design Approach for Commercial Mixed Low-Level Radioactive and Hazardous Waste Disposal Facilities"--This guidance offers a conceptual design that satisfies EPA's prescriptive requirements for liners and leachate collection systems and NRC's performance requirements for the minimization of contact of the waste with water. A design of this type should be able to satisfy the long-term stability requirements of NRC and the 30-year maintenance requirements of EPA. This guidance was published in August 1987.

3.2 Guidance Documents Under Development

- "Requirements for Mixed Waste Storage"--This guidance will address the problems imposed by EPA's hazardous waste storage requirements and the provisions in generators' radioactive materials licenses that may allow for the decay of radioactive material as an acceptable method of disposal, as well as the provisions of the generators' As Low As Reasonably Achievable (ALARA) Program. A first draft is under review by NRC and EPA.

- "Procedures for Mixed Waste Characterization"--This guidance will address the special procedures necessary for hazardous waste characterization and the need to consider occupational exposures during testing. The final review of the first draft is underway at EPA.

- Licensing/Permitting Mixed Waste Disposal Facilities--This guidance will be developed for the purpose of allowing an individual to submit a single application for both an NRC license and an EPA permit. The intent of such guidance would be to develop a single permitting or licensing process for mixed waste facilities. A scope of work document has been developed by EPA, but, to date, a publication target has not been established.

A guidance document on the inspection of mixed waste disposal facilities, which has been under development, is in the process of being rewritten as an EPA inspectors' handbook for radioactive materials.

4. WORKSHOPS

NRC and EPA have sponsored and will continue to sponsor workshops and meetings to inform Federal and State regulators of the requirements of RCRA and the AEA and of the issues involved in mixed waste management. A description of current and planned workshops follows.

- EPA Permit Writers' Workshops--These workshops are primarily for EPA permit writers and inspectors, but are open to NRC and State personnel, as well. The workshops are directed toward those individuals who routinely deal with mixed waste issues on a daily basis. To date these workshops have been held in Santa Fe, NM, on November 27-28, 1989; Chicago, IL, on March 6-7, 1990; Washington, D.C., on May 14-15, 1990; Denver, CO, on June 19-20, 1990; Buffalo, NY, on July 31-August 1, 1990; and Oakland, CA, on September 5-6, 1990. Workshops included site visits to Los Alamos and Argonne National Laboratories, the Rocky Flats Plant, and the West Valley Demonstration Project.

- NRC Regional Inspectors' Workshops--These workshops are currently under development at NRC. The focus of these workshops will be to familiarize NRC inspectors with the requirements of RCRA, so that they will understand the problems associated with mixed waste management. The workshops should provide NRC inspectors with enough knowledge of RCRA to recognize a potential hazardous waste problem at the NRC licensees' facility and alert their EPA counterparts to the potential problem. A similar arrangement exists with the Occupational Safety and Health Administration.

- NRC Agreement State Regulators' Workshops--NRC is providing and will continue to provide speakers at workshops sponsored by Agreement State regulatory agencies. The next state workshop at which NRC has been requested to provide a speaker is being held by the State of Florida on November 27-29, 1990.

- National Host State Meetings

On May 16-17, 1990, the first meeting of States that will host low-level radioactive waste disposal facilities was held in Washington D.C. In addition to representatives of the Host States, the meeting was attended by representatives of the NRC, EPA, the Low-Level Radioactive Waste Forum, disposal site operators, and contractors. The meetings was largely an information exchange forum between the States and Federal regulators. The meetings provided EPA and NRC with suggestions on future guidance, and it was suggested that another meeting be held in 6 months.

5. NATIONAL MIXED WASTE SURVEY

In May 1990, a request was received by NRC and EPA from the Host State Technical Coordinating Committee (TCC) to compile a profile on the volume and characteristics of commercially generated mixed wastes. The TCC believed that this information is needed to help States, Compact officials, private developers, and Federal agencies plan and develop treatment and disposal facilities for mixed waste. NRC agrees with the TCC position and thinks that current information on mixed waste quantities and characteristics is inadequate. In July 1990, NRC met with EPA, DOE, and Oak Ridge National Laboratories (ORNL) to discuss ORNL's capability to conduct this type of survey. As a result of this meeting, and continued discussions between NRC, EPA, and DOE, a Standard Order for DOE Work was submitted to ORNL in August, outlining the Scope of Work (SOW). The purpose of the survey, as stated in the SOW, is to reduce uncertainties with respect to the volumes, characteristics, and treatability of commercially generated mixed waste. NRC intends to coordinate this activity with the TCC, on a routine basis, so that the end result of the study is responsive to the needs of the TCC members. Results of the survey will be published as a NUREG and will be available for use by the public. The survey is divided into three phases. The tasks and subtasks associated with each phase of the survey are detailed below.

Phase 1 of the survey will consist of an evaluation of existing data on mixed waste volumes and characteristics, to determine if these data are adequate to use as the basis for a national mixed waste profile. Phase 1 will include a literature search for data on mixed waste, focusing primarily on results from past mixed waste survey reports. A summary of problems on results from past mixed waste survey reports. Phase 1 will also identify the basis for determining the adequacy of the data, identify the data parameters and information configurations for a mixed waste profile, and propose a method of compiling the existing data, if it is determined that the existing data are adequate to meet the stated objectives of the survey.

Phase 2 of the survey will be implemented if it is determined that the specifications of the computer database, and a description of the data from previous surveys are not adequate to compile a national mixed waste profile.

Phase 2 of the survey consists of three tasks. The first task involves the development of a data collection plan. This will include a formal statement of the objective and scope of the plan, a description of the approach and method of data collection, a description of the type of data to be collected, an estimate of the impact on the survey population (needed for Office of Management and Budget clearance), a description of the specifications of the computer database, and a description of the data analysis to be performed. The second task will be to develop the tool or tools needed to collect the data. This task will require a proposal of the data parameters, information configuration and the tool(s) to be used to conduct the survey. It will also require that the tool(s) be tested on a limited sample population and, if needed, a revision of the tool(s) before finalization. The third task will be the actual collection and analysis of the survey data. Presently the survey population size and makeup are being evaluated and, as such, cannot be outlined here.

Phase 3 of the survey will consist of the preparation of a national mixed waste profile report. This report, which will be published in NUREG form, will identify mixed waste volumes and characteristics, treatment technologies, and organizations offering these waste treatment technologies. It is estimated that the entire project will take between 12 and 18 months to complete.

The preceding sections have described the activities that NRC and EPA have undertaken to address the issues surrounding mixed waste. The following outlines current mixed waste uncertainties and summarizes the future mixed waste activities as envisioned by NRC.

6. PRINCIPAL MIXED WASTE UNCERTAINTIES

- Volume of Mixed Waste--Information on the volume, characteristics, and treatability of mixed waste needs to be updated and correlated to assist those individuals making decisions on future mixed waste disposal needs. Issues such as the total volume of mixed waste that must be disposed of complicate the siting of disposal facilities and storage and disposal of waste within compacts. Until this type of information is readily available, coordination of plans for disposal facilities on a national scale may be delayed. It is expected that the survey outlined above will satisfy this need.

- Storage, Treatment, and Disposal of Mixed Waste--Concerns exist over the compatibility of EPA storage requirements for RCRA wastes with NRC's requirements for storage of nuclear wastes. There are also concerns over the time prohibitions on the storage of waste, unless an EPA permit is possessed by the generator, and waste inspection requirements (see below). Concerns also exist over the possibility of increased exposures, due to EPA treatment requirements, and the problem of the current lack of a licensed and permitted mixed waste disposal facility. The latter is usually attributed to the high cost of facility permitting and operation, which may result in high generator costs for waste disposal.

- Sampling of Mixed Waste--Concerns exist over the possibility of increased exposures due to the EPA requirements for waste characterization. RCRA does not specifically require testing for a hazard determination. The generator may apply his knowledge of the materials and the process that produced the waste to determine if the waste would be considered hazardous. If sufficient information is not known about the waste, the generator would then be required to test the waste. Concerns also exist over the sample size, as this may also cause increased exposures. These concerns should be addressed in the joint guidance on waste characterization.

- The Toxicity Characteristic Leaching Procedure--EPA recently announced in the Federal Register the adoption of the Toxicity Characteristic Leaching Procedure (TCLP) as the test for the characteristic of toxicity (55 FR 11796, March 29, 1990). This test may lead to increased exposure through, 1) exclusion of the Structural Integrity Procedure and the requirement for particle size reduction, 2) additional handling during preliminary testing and 3) the increased number of samples that may need to be taken for the preliminary testing. The requirement for particle size reduction may also provide additional surface available for the leaching of hazardous material. EPA may allow the use "cold analogs," which may help reduce exposures, and the adoption of a "cage insert" may remove the need to perform particle size reduction.

- Inspections of Stored Waste--As indicated above, concerns exist about the EPA inspection requirements for stored mixed waste. Presently, waste containers must be inspected on a weekly basis, and tanks must be inspected on a daily basis. Remote inspection procedures, such as the use of television monitors, may resolve this issue and should be addressed in the aforementioned joint storage guidance.

- Revised EPA Siting Guidelines--EPA is currently revising its guidelines on the siting requirements for disposal facilities. Since these revisions have not, to date, been reviewed by NRC, technical requirements cannot be discussed here. However, these requirements are intended to specify criteria for the acceptable location of new and existing treatment, storage, and disposal facilities, and the development of location standards to be used in evaluating these potential sites.

- Land Disposal Restrictions--HSWA requires that hazardous waste be treated before land disposal. The test to determine if the waste has been adequately treated to allowable limits is the TCLP. As discussed above, concerns exist due to the increased handling of the waste that may occur with this test.

- Inconsistency Determinations--As previously stated, to date, no literal inconsistencies have been identified between the provisions of the AEA and RCRA. In the event that an inconsistency is found, Section 1006(a) of RCRA defers authority to the AEA.

As described above, NRC and EPA are involved in numerous activities to address the concerns generators have about mixed waste disposal, storage, treatment, and disposal. In summary, these activities include 1) sponsoring workshops on mixed waste management for Federal and State regulators, 2) developing joint guidance documents addressing mixed waste issues, and 3) conducting a national mixed waste survey. In addition to these activities, a letter was sent to EPA Administrator Reilly by NRC Chairman Carr on June 21, 1990, outlining NRC's preferred approach to the resolution of differences between the two agencies, relating to EPA regulatory initiatives directed at activities licensed or regulated by NRC. This letter proposed the establishment of a senior level task force to focus on specific interface issues. Such a task force could provide substantial additional improvements in resolving many of the mixed waste issues facing waste generators today.

7. REFERENCES

1. K. M. Carr, Chairman, U.S. Nuclear Regulatory Commission, letter to M. K. Udall, Representative, U.S. Congress, January 19, 1990.

2. R. A. Alvarado, Convener, Host State Technical Coordinating Committee, letter to W. K. Reilly, Administrator U.S. Environmental Protection Agency, May 14, 1990.

3. K. M. Carr, Chairman, U.S. Nuclear Regulatory Commission, letter to W. K. Reilly, Administrator, U.S. Environmental Protection Agency, June 21, 1990.