

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 2, 1995

MEMORANDUM: George Cunningham, Technical Director

COPIES: Board Members

FROM: Steven Stokes

SUBJECT: Staff Comments on the Site Evaluation Survey for Low-Level Waste Management

- 1. Introduction.** This document describes the Defense Nuclear Facilities Safety Board's (Board) staff comments and observations related to the Site Evaluation Survey for Low-Level Waste Management (LLW). This survey is designed to assess vulnerabilities within the Department of Energy's (DOE) LLW system in response to [Recommendation 94-2](#) and will be used by both site and Headquarters personnel to discover and evaluate any potential vulnerabilities.
- 2. Summary.** The Board's staff finds that the survey will not fully evaluate DOE's LLW system; will not meet the goals identified by DOE in their implementation plan; and therefore, not meet the intent of Recommendation 94-2 with regard to a comprehensive, complex-wide survey of LLW vulnerabilities. The major issue associated with the current survey is the limited scope. This is especially true for waste generation, treatment and storage activities. A more comprehensive scope is described by the waste management system illustrated in [Enclosure 2](#) (Figures 1-6). These scope limitations make it difficult to understand how DOE will meet its initial objective—the identification of vulnerabilities associated with DOE's management of low level radioactive waste. For example, it is the staff's observation that DOE has limited its survey of generators to a relatively small portion of their LLW activities and overlooks activities and wastes that most likely present the most significant vulnerabilities. Similar scope limitations exist for treatment and storage activities. Overall, the lack of sufficient scope for the survey limits DOE's ability to fully assess LLW vulnerabilities in a systematic manner.
- 3. Background.** Recommendation 94-2 requested that DOE conduct a comprehensive review of LLW issues. Specifically, the recommendation asked that:

"A comprehensive complex-wide review be made of the low-level waste issue similar to the review the Department conducted regarding spent nuclear fuel. As with spent fuel, the objective of such review could be the establishment of the dimensions of the low-level waste problem and the identification of corrective actions to address safe disposition of past, present, and future volumes."

In the final implementation plan submitted by DOE, they committed to conduct a complex-wide review of low-level radioactive waste treatment, storage, and disposal sites to identify environmental, safety, and health vulnerabilities. This review was to have four objectives:

- Identify environmental, safety, and health vulnerabilities associated with DOE's management of low-level radioactive waste.
- Form the basis for an integrated and planned set of actions by field management to correct the identified vulnerabilities.
- Prompt development of new requirements for managing LLW.
- Establish a process and methodology for periodic reviews in the future as a means to assure compliance with approved requirements.

compliance with approved requirements.

DOE has chosen a format for the review similar to that used for the spent fuel vulnerabilities assessment. The approach consists of two teams of qualified personnel assessing each facet of the LLW program from a site and headquarters perspective. The site teams will conduct their reviews first, then DOE's teams will validate field findings as well as develop their own. The assessment tool consists of a series of questions that will assist qualified team members in the identification of vulnerabilities/issues associated with LLW management.

The staff's review of the questionnaire was based primarily upon the assumption that the complex-wide review would be comprehensive and would meet the objectives established in the final implementation plan.

4. **Discussion/Observations.** The following comments are both general and specific and related to the final draft of the complex wide review site evaluation survey for LLW management dated August 24, 1995.

a. General comments.

1. In order to meet DOE's initial objective, identification of DOE's vulnerabilities associated with LLW management, the scope of the questions for generator, storage, and treatment facilities needs to be much broader. -The scope would be broadened to include all wastes in all phases of the LLW management system. See suggestions on expansion of scope below (under Generator? Treatment, and Storage Facilities).
2. The survey is weakly referenced, does not reference requirements or guidance consistently (does not differentiate between the two), and appears to reference some requirements incorrectly. For example, DOE Order 5820.2A, Chapter 3 is used to reference Criterion G. 1.:

"Management of LLW and MLLW in a generator accumulation area addresses area capacity, the length of time waste is held, and the Waste Acceptance Criteria (WAC) of treatment, storage' and disposal facilities."

There are no requirements in DOE Order 5820.2A, Chapter 3, that constrain the length of time LLW can be held in an accumulation area. Therefore, this reference is inappropriately cited.

Specific references could be included so that the personnel completing the survey can fully understand what to assess a potential vulnerability against. For example, DOE Orders, Nuclear Regulatory Commission (NRC) regulations, and other sources are cited as the basis for a criterion. However, the level of the citation is so high, i.e., 10 CFR 61, that the reader is left wondering what specific requirements are appropriate. Additionally, since NRC regulations are not requirements for DOE LLW facilities, their status would be clearly addressed. That is, are they to be considered requirements or guidance for purposes of this survey?

3. There are numerous questions throughout the survey that can be simply answered yes, no, or not applicable (N/A) without explanation. In order to ensure the Assessment Working Group has sufficient information to determine whether actual or potential vulnerabilities

Group has sufficient information to determine whether actual or potential vulnerabilities exist, the opportunity for simple yes, no, or N/A responses could be eliminated from the survey. Some (but; by no means all) examples where yes, no, or N/A responses are currently possible include G1.1.1, G1.1.3, S1.1.2, S1.2.4, T1.1.2, T1.2.3, D1.2.2, and D4.1.3.

4. Irrespective of whether it is now located or will in the future be located in an accumulation, holding, storage, or disposal area all LLW would be considered in this effort. In fact, in the view of the Board's staff, it is likely to be those wastes not found in accumulation, holding, storage, or disposal areas that are most likely to represent vulnerabilities.
5. Questions on what has been discovered by *Environment, Safety, and Health Appraisals/Assessments* are included only for storage and treatment facilities. Presuming such appraisals/assessments provide useful information, they also need to be evaluated for generator and disposal facilities.
6. Questions on completed *Environment, Safety, and Health Appraisals/ Assessments* fail to address the issue of the adequacy or applicability of such appraisals/assessments. The scope of such questions need to be expanded to assess the strengths, weaknesses, and applicability of each appraisals/assessments as it relates specifically to LLW management. Reliance on the assumption that all past appraisals/assessments produced high-quality results specifically addressing LLW issues may result in a failure to identify vulnerabilities.
7. Questions on design and monitoring requirements for storage in both accumulation areas at generator and treatment facilities need to be incorporated in the generator, treatment, and storage sections.
8. Questions on the ability to meet the WAC need to be incorporated in the generator, treatment, and-storage sections. These questions could include references to characterization and packaging.
9. Questions on waste handling procedures need to be incorporated in- the generator, treatment, and storage sections.

b. *Specific Comments.*

Generator Facilities

1. The current scope of questions on Generator Facilities is inadequate because it only addresses the area of *Management and Oversight*. At a minimum, it needs to be expanded to include the areas of *Waste Characterization and Packaging*, *Design and Construction*, and *Operations and Maintenance*. See [Enclosure 2, Figure 2](#) for the full scope of generator facility issues that might be considered.
2. The scope of *Management and Oversight* questions is inadequate because it is limited to the management of accumulation areas. -It needs to be expanded to cover all wastes that have been produced, are being produced, and will be produced by the generator irrespective of whether any of these wastes have or will reside in an accumulation area. Potential non-accumulation area wastes may include:

- Wastes being generated that are either untreatable, not capable of being disposed, or fail to meet a disposal area WAC (e.g., low-level alpha contaminated wastes).
- Wastes abandoned in situ for which there is no current treatment or disposal path forward (e.g., at the Hanford B-Plant there are buried High-Efficiency Particulate Air (HEPA) filter banks for which there is no disposal plan and current thinking is to abandon them).

Extant radioactive materials having a high probability of being classified as waste in the future.

Each of these categories represents a potential vulnerability to be evaluated.

3. Other Generator facility topical areas requiring an assessment and not covered in the current survey questions include:

- Design and monitoring criteria for waste handling, storage, and processing.
- Waste handling and management conduct of operations.
- Safety basis requirements (e.g., Safety Analysis Report (SAR), Technical safety Requirements (TARS), Operations Safety Reports (OSRs), etc.) related to waste.

The ability to characterize and certify waste.

Storage Facilities

1. The scope for storage facilities is inadequate because it is limited to **Management and Oversight** and **Environment, Safety, and Health Appraisals/Assessments**. At a minimum, the scope needs to be expanded to include the areas of **Design and Construction**, and **Operations and Maintenance**. See [Enclosure 2, Figure 4](#) for the full scope of storage facility issues that might be considered.
2. Other areas with potential for identifying vulnerabilities and not covered in the current survey questions for Storage facilities include:
 - Conduct of operations
 - Safety basis requirements (e.g., SAR, TARS, OSRs, etc.).

Treatment Facilities

1. The scope for storage facilities is inadequate because it is limited to **Management and Oversight** and **Environment, Safety, and Health Appraisals/Assessments**. At a minimum, the scope needs to be expanded to include the areas of **Design and Construction**, and **Operations and Maintenance**. See Enclosure 2, Figure 3 for the

Construction, and *Operations and Maintenance*. See Enclosure 2, Figure 3 for the full scope of storage facility issues that might be considered.

2. In the creation of sections on *Design and Construction*, and *Operations and Maintenance* for treatment facilities, questions on the treatment process need to be included. At a minimum, these questions would address process design, equipment, control, and hazards management.
3. The scope of questions for treatment facilities under the heading of *Management and Oversight* is inadequate because it is limited to the management of holding areas. It needs to be expanded to include the management of treatment processes.

Planned/Active - Disposal Facility

1. Although the scope of coverage for disposal facilities appears reasonable, it may be beneficial to review [Enclosure 2, Figure 5](#) for the full scope of disposal facility issues that might be considered.
2. *Planned* facilities do not include facilities in the design phase—only facilities in some stage of construction prior to receipt of waste. Thus, in most cases, for design vulnerabilities identified under D4.0, it would be too late to readily make corrections. The design of facilities not yet constructed needs to be assessed. In order to do so, facilities in the process of being designed for which construction has not yet begun need to be identified via appropriate survey questions. It may be appropriate to also question whether a decision to construct/not construct may represent a vulnerability, (i.e., the adequacy of the quantity of planned future disposal space at a particular site needs to be evaluated).
3. There are no current questions addressing Environmental Safety and Health (ES&H) vulnerabilities associated with the interaction/interrelation of planned/active facilities with nearby or contiguous inactive facilities. Such questions need to be added.
4. Certain questions seem either to require less than the fully adequate response needed to determine whether actual or potential ES&H vulnerabilities exist or, alternatively, they fail to require a description of compensatory measures where the response clearly indicates an actual or potential vulnerability exists. Examples of these include: D1.4.1, D2.4.6, D4.1.1, D4.1.2, D4.1.6, D4.1.7, D4.2.2, and D4.4.3.

Inactive Disposal Facility (to be developed)

1. Many/most of the questions asked for planned/active facilities appear applicable to inactive facilities as well.
2. This section when developed needs to incorporate lessons learned from all applicable comments made for planned/active disposal facilities.
3. The potential for needing to exhume or otherwise take remedial action at inactive disposal

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3. The potential for needing to exhume or otherwise take remedial action at inactive disposal facilities would be addressed.