



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

ACNWR-0089

PDR

March 31, 1993

Mr. James M. Taylor
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Taylor:

SUBJECT: SOURCE TERM AND OTHER LOW-LEVEL WASTE CONSIDERATIONS

On March 23-24, 1993, the Advisory Committee on Nuclear Waste (ACNW) convened a working group meeting to discuss data being collected on the characteristics of low-level radioactive waste (LLW). The primary purpose of this meeting was to gain a better understanding of the LLW source term, emphasizing those characteristics of the waste that, upon disposal, might influence public health and safety. Participating in the meeting were members of the NRC staff, processors of LLW, operators of the three existing LLW disposal facilities, and representatives from the Low Level Waste Forum, the Electric Power Research Institute, the Idaho National Engineering Laboratory (INEL), and four states in which methods for disposing their LLW are under consideration. This matter was also discussed during the 52nd ACNW meeting, held on March 24-25, 1993. Through this letter, we share with you some of our findings, observations, and conclusions.

SOURCE TERM

1. We have been concerned that data on LLW emplaced in a disposal facility may be insufficient to evaluate the potential for radionuclide releases. We understand that one of the guiding criteria in the development of the Uniform Low-Level Radioactive Waste Manifest System was to provide data considered essential to the conduct of performance assessments of disposal facilities. It may be that further refinements of the Manifest System will be required to satisfy additional needs for data. Owing to the site-specific data requirements for estimating the release and transport of radionuclides from disposal facilities, the staff should ensure that the data being collected through the Manifest System can be used for analyses covering the full range of environments likely to be found in the various LLW disposal facilities. Also, we urge that the practice by the NRC staff to provide definitive

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guidance to several of the states in the design of LLW source term surveys be continued.

2. Improvements have been made in the methods that are available for estimating the quantities of certain key radionuclides (for example, ^{129}I) that are present in LLW. Although, in prior years, the concentrations of radionuclides estimated to be present at below detectable levels were recorded at the levels of detection, empirical scaling factors have been developed that result in significant improvements in the quality of such estimates. The program of the NRC staff to encourage submission, review, and approval of a topical report on this matter should be expedited. Once the topical report has been approved, implementation of the new scaling factors should be encouraged. There also continues to be a need for much better recording of the bases for the quantities of specific radionuclides present in LLW. One item of information that should be included in the Manifest System is whether such quantities are based on measurements or estimates.
3. Although better source term data will be useful as indicators of trends in the generation of LLW, such data will be beneficial in many other ways. These include their application in facility sizing and design, transportation studies, waste processing, occupational health and safety assessments, and cost evaluations. Although source term data will, at best, continue to have accompanying uncertainties, these uncertainties will often be smaller than those associated with the data in the environmental transport models used in performance assessments. Thus, attention needs to continue to be given to improving both the models and the data used for assessing environmental transport.

OTHER CONSIDERATIONS

1. There is a need to provide better guidance to LLW facility developers on the characterization of sites for LLW disposal facilities, in terms of both screening such sites and conducting detailed evaluations of those that are undergoing further consideration. The data resulting from site characterization may be equal in importance to those on the source term. The NRC staff should institute an aggressive program of regulatory support to the states involved in such activities.
2. There is an increasing trend on the part of LLW generators to send the waste to treatment facilities for processing before disposal. Such processes include incineration, super-compaction, and smelting. These processes provide not only the desirable volume reduction but, in some cases, enable the waste to be converted into inert forms by, for example, vitrification of the ash from incineration. These processes

hold promise for more definitive performance assessments of LLW disposal facilities with the attending increases in confidence about the protection of the health and safety of the public.

3. The Performance Assessment Center at INEL maintains a library of computer codes and performance assessment methodologies, and its staff is available to assist the states in health and safety assessments of proposed LLW disposal facilities. The NRC staff should encourage the states to take advantage of this resource. This is especially true in light of the fact that many different approaches are currently being used by the individual states in conducting performance assessments. Another incentive for using the Performance Assessment Center is that both LLW disposal facility developers and regulators often see performance assessments as a discrete component of the LLW disposal process, not as an essential part of disposal facility evaluation. This situation needs to be recognized by the NRC and Agreement States. We understand that appropriate guidance is being incorporated into the LLW Performance Assessment Development Program Plan being prepared by the NRC staff.
4. The representative from Texas indicated that the state had developed a system whereby radioactive wastes containing radionuclides with half-lives less than 300 days, or having external exposure rates of less than 0.01 mSv/year (1 mrem/year), can be sent to a municipal sanitary landfill for disposal subject to certain restrictions. This has resulted in considerable savings with no apparent detrimental health effects.
5. On December 28, 1990, the NRC staff issued a request that the nuclear power plant utilities report any mishaps that occur in the management and disposal of LLW such as, for example, failures in the solidification of ion exchange resins. The NRC staff should be encouraged to tabulate and report this information.
6. Several participants in the working group meeting were concerned that the individual states and compacts are not acting to reduce the number of LLW disposal facilities under consideration. With the trend toward waste compaction and incineration and the application of techniques to reduce the generation of LLW, the number of disposal facilities required may be reduced even further. Although correcting this situation is not the responsibility of the NRC, an overabundance of disposal facilities, each operating on a part-time basis, could lead to health and safety problems.

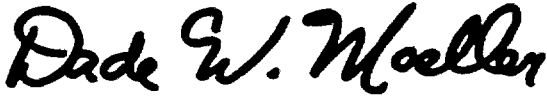
Mr. James M. Taylor

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As may be noted from the comments above, the working group meeting proved to be stimulating and informative. We will continue to follow these and related topics.

Sincerely,

A handwritten signature in black ink that reads "Dade W. Moeller". The signature is written in a cursive style with a large, prominent initial "D".

Dade W. Moeller
Chairman