

Blending of Low-Level Radioactive Waste

Recently, industry has expressed increased interest in blending certain types of low-level radioactive waste (LLW) in order to lower the overall concentration of radioactivity and make the waste more suitable for disposal. This interest prompted NRC Chairman Gregory B. Jaczko to direct the staff to develop a policy paper for the Commission to address issues related to blending.

On Oct. 13, 2010, the Commission directed the staff to improve and strengthen the agency's standards for blending of LLW. The goal is to make NRC's regulation of LLW blending more risk-informed, performance-based, and in general more consistent with the agency's overall policy for regulating the nuclear industry.

Background

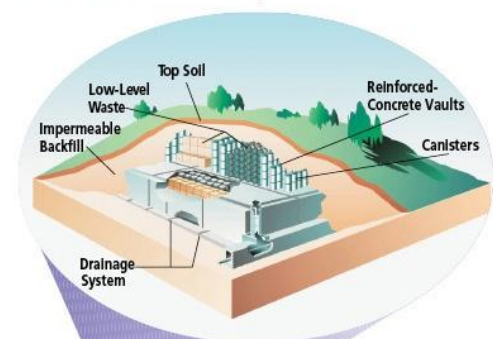
Low-level radioactive waste is classified at the time of disposal according to its radioactivity and the measures necessary to protect the public and the environment from unnecessary exposure after disposal. Most LLW (about 95 percent) is Class A, the lowest concentration category. Remaining radioactive wastes are either Class B or Class C, depending on their radioactivity. (Concentration is the total amount of radioactivity divided by the weight or volume of the waste.)

In July 2008, the LLW disposal facility at Barnwell, S.C., closed to much of the nation. This left waste generators in 36 states with no disposal options for their Class B and Class C wastes. To help mitigate the impact of Barnwell's closing, industry has proposed approaches for blending higher activity LLW (Class B and Class C) with lower-activity waste (Class A) to form a Class A mixture that can be disposed of at EnergySolutions' Clive, Utah, disposal facility. This facility accepts only Class A waste and is open to the entire country. (A third LLW disposal site, operated by U.S. Ecology in Richland, Wash., accepts Class A, B and C wastes from 11 states in the Northwest and Rocky Mountain regions.)

NRC regulations do not prohibit blending to lower the waste classification, nor do they explicitly address the issue. The agency in the past has issued guidance that discourages blending to lower waste classification in some circumstances, but acknowledges that blending may be appropriate if it reduces worker exposure to radiation or increases operational efficiency.

Blending of LLW means mixing wastes of different concentrations to form a homogeneous mixture for disposal in a licensed LLW disposal facility. It does not mean mixing

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LLW with non-radioactive waste, a practice known as “dilution.” And it does not imply release of radioactive waste to the general environment, either to municipal landfills or to consumer products. Because of the need for a homogeneous mixture, the wastes under consideration for blending are primarily resins and filters used to clean contaminated water at commercial nuclear power plants.

The Commission’s Direction

The staff is developing new regulations to address disposal of blended waste. The new position will be *risk-informed*, meaning it will be tied to how LLW blending might affect the protection of public health and safety. And it will be *performance-based*, in that it will require blended waste to meet the limits of radiation exposures at the disposal facility and limits on how much the radioactivity concentration may vary (i.e., how well-mixed it must be).

The new regulations will also ensure that the safety of large-scale blended waste be evaluated before disposal. “Large-scale blending” means mixing of waste from multiple generators at a separate location (such as a waste-processing facility) prior to disposal.

In addition to the new regulation to address disposal of blended LLW, NRC is taking three other regulatory actions:

- Publish regulatory guidance that addresses the characteristics of large-scale blended waste needed to ensure its safe disposal, including how uniform, or well-mixed, the waste must be.
- Update its “Policy Statement on Low-Level Waste Volume Reduction.” Since its publication in 1981, nuclear facility operators have made significant progress in reducing LLW volumes. The revised Policy Statement will recognize this progress and acknowledge that other factors may be used in determining how nuclear facilities manage their LLW.
- Issue guidance to Agreement States¹ on how to evaluate proposals to blend large quantities of waste until the staff guidance is updated. Agreement States should conduct case-by-case evaluations in the meantime. The guidance will also indicate to States that entities wishing to pursue large-scale blending should be advised that NRC guidance on blending is undergoing revisions, and it may be advisable for them to wait until it is published in a final form.

Public Involvement

The NRC will aggressively solicit public and stakeholder input on the proposed regulations and guidance. Several public meetings will be conducted, and the draft rule language and guidance will be published for comment. Schedules for development of the rule and guidance, including meetings and public comment periods, will be posted on the NRC website at <http://www.nrc.gov/waste/llw-disposal/llw-pa/llw-blending.html>, and larger public meetings will be announced in press releases.

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¹ Agreement States are the 37 states that have signed agreements with the NRC, under which the States license and regulate commercial uses of radioactive materials, including low-level waste disposal.