



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
ADVISORY COMMITTEE ON NUCLEAR WASTE  
WASHINGTON, D.C. 20555-0001

March 21, 2000

The Honorable Richard A. Meserve  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Dear Chairman Meserve:

**SUBJECT: REGULATORY APPROACHES FOR CONTROL OF SOLID MATERIALS  
(CLEARANCE RULE)**

The Advisory Committee on Nuclear Waste (ACNW) received a briefing from the NRC staff on the status of Regulatory Approaches for Control of Solid Materials (Clearance Rule) on December 16, 1999. In addition, the Committee reviewed the NRC published Issues Paper [FRN (6/30/99)] on release for unrestricted use of solid materials with small amounts of radioactivity and has held public meetings on the subject. Additional meetings are planned.

Recommendations

On the basis of information received to date, the ACNW makes the following recommendations:

1. The ACNW recommends that any regulations about the control and release of radioactive contaminated materials be based on radiation dose rather than on precedent, such as might be derived from the exemption of coal ash from regulation.
2. The ACNW recommends that criteria be established that will provide a consistent and rational basis for regulating materials with similarly low levels of radioactivity. It is especially important that consistency be based on dose not radioactivity content of material because of self-shielding by the material.

Discussion

At the present time, there are neither NRC nor Environmental Protection Agency regulations for control of most slightly contaminated solids. NRC makes its decisions on a case-by-case basis as licensees seek to release solid materials. The lack of release criteria could lead to potentially inconsistent release levels, and consequently to nonuniform levels of protection.

Draft NUREG-1640, which is out for comment, provides guidance for clearance of materials and equipment but does not set criteria for a rule. It does, however, relate radioactivity on or in material or equipment to radiation dose. Steel, copper, aluminum, concrete, as well as equipment, were studied for potential reuse. An intrinsic problem in carrying out the

measurements of radioactivity in these and other materials is the difficulty of measuring radioactivity at very low levels and, more specifically, measuring the levels within materials (because of self-shielding by the material) in addition to levels on their surfaces.

We believe that regulations should be based on dose. The fact that coal ash is exempted from regulation and that the dose from uranium and thorium and their daughters in the ash has been discussed as a possible precedent for setting a dose limit for other materials should not be used to provide guidance for regulation. The radiation exposure paths from ash are very different from the radiation exposure paths from many slightly contaminated materials, such as steel, aluminum, copper, and other metals.

International groups, such as the International Atomic Energy Agency and the Commission of European Communities, have suggested 1 mrem/year as an acceptably low dose limit. European countries may adopt this standard.

There is an obvious need for reliable and sufficiently accurate methods of measuring or calculating the radioactivity inside materials (i.e., volumetric versus areal). With materials such as metals, the radioactivity within the body of the material should be identified because there is the possibility that the material will be remelted and mixed with either fresh or recycled contaminated metals and thus bring internal radioactivity to the surface. During melting, slag may form that concentrates radioactivity, providing a potential mechanism for increased dose.

The Committee believes the outlined proposal by the NRC staff provides adequate protection of the public health and safety. Some representatives of the steel and scrap industries oppose unrestricted use of slightly contaminated materials on the grounds that consumers might not want such products. The concern might be justified on the basis of as low as reasonably achievable. The Committee does not believe that this is a safety issue. Considering the potentially large amounts of contaminated materials imported from countries that may currently allow recycle, it is difficult to see how use of contaminated steel, scrap, and other materials can be controlled in the long run.

### Conclusion

The costs of segregating and disposing of slightly contaminated materials will still be large relative to the perceived health benefits obtained even if a suitably low permissible dose is chosen. Therefore, we believe that recycling and reuse of slightly contaminated material is a reasonable course of action, subject to adoption of a dose limit and rational and consistent criteria that address both national and international issues.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. John Garrick', written in a cursive style.

B. John Garrick  
Chairman

**References:**

1. U. S. Nuclear Regulatory Commission, NUREG-1640, Vols. 1 and 2, "Radiological Assessments for Clearance of Equipment and Materials From Nuclear Facilities," Draft Report for Comment, March 1999.
2. Nuclear Regulatory Commission, 10 CFR Part 20, Proposed Rules, "Release of Solid Materials at Licensed Facilities: Issues Paper, Scoping Process for Environmental Issues, and Notice of Public Meetings, *Federal Register*, Vol. 64, No. 125, June 30, 1999.

