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Science, Engineering, and Management Services

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Dear Dr. Meck:

Enclosed you will find a copy of our second revision of the Outline for Options for Regulating the Clearance of Materials and Equipment. This second revision is based on your mark-up and our telephone discussion earlier today. Let me know if you have any further changes. I can be reached at 301-946-8088.

Sincerely,

Clyde Jupiter
President

Enclosure

cc: Dr. Reginald Gotchy, SAIC



DRAFT
(Second Revision)

OUTLINE

**Options for Regulating the Clearance of
Materials and Equipment**

**Prepared for the
United States Nuclear Regulatory Commission
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1. INTRODUCTION

1.1 Purpose

- 1.1.1 The purpose of the following is to provide technical support and analysis of the options the Commission might consider in a rulemaking on clearance of materials and equipment.

1.2 Rationale that rulemaking is needed

- 1.2.1 No uniform basis exists for the release of contaminated material

The present clearance process using Reg. Guide 1.86 is not codified; nor is it dose- or risk-based. It only addresses clearance of solid material having surface contamination; volumetric contamination is not addressed.

- 1.2.2 Present regulations do not encompass all situations.

10 CFR Part 20, et. al., Radiological Criteria for License Termination is silent on the disposition of material and equipment from decommissioning.

- 1.2.3 There is a need for additional controls in international trade (import-export) activities. To help achieve consistency in international standards for regulating clearance of materials and equipment, consider the IAEA's interim report Clearance Levels for Radionuclides in Solid Materials - Application of Exemption Principles.

- 1.2.4 Anticipation of potential NRC regulation of DOE clearance of materials and equipment.

2. BACKGROUND

2.1 Precedents affecting NRC clearance of materials and equipment

- 2.1.1 EPA's June 1997 preliminary Cost-Benefit Analysis and Radiation Protection Standards for Scrap Metal
- 2.1.2 EPA's July 1997 draft Technical Support Document - Evaluation of the Potential for Recycling of Scrap Metals from Nuclear Facilities

- 2.1.3 NRC's 10 CFR Part 20, et. al., Radiological Criteria for License Termination
- 2.2 **Results of analysis of pathways, scenarios, uncertainties and dose assessment for the reuse and recycle of material and equipment from decommissioning**

2. REGULATORY STRATEGIES

- 2.1 **Conform with the EPA Standard and implement it with a rule and regulatory guide**
- 2.2 **Promulgate a different uniform basis for regulating the clearance of material and equipment**

Discuss Pros and Cons of the Above

3. FACTORS AFFECTING THE TIMING OF THE RULEMAKING PROCESS

Elaborate on the relevant factors; then, given those factors, develop reasonable options, such as:

- 3.1 **Expedite the rulemaking**
- 3.2 **Pursue a normal rulemaking proceeding**
- 3.3 **Delay rulemaking until specific events or milestones occur (e.g., issuance of EPA standard; evaluation of results of the DOE closed cycle recycling experience; resolution of the litigation of NRC's decommissioning rule)**

Discuss Pros and Cons of the Above

4. OPTIONS FOR APPROACH OF REGULATING THE CLEARANCE OF MATERIALS AND EQUIPMENT

- 4.1 **Options on the Scope of Regulatory Control of Contaminated Materials and**

Equipment

- 4.1.1 **Baseline approach** - Maintain the status quo: Continue to use Reg. Guide 1.86 to clear solid material having surface contamination; dispose of material having volumetric contamination.

Consider industry environment, practices, and economics (with particular comments on activities of the Association of Radwaste Metal Recyclers and the International Scrap Recycling Industry)

Consider experience of foreign metal recyclers (e.g., Germany)

Consider stakeholder concerns

- 4.1.2 **Open Cycle** - Regulation of the unrestricted release of material and equipment

- 4.1.3 **Restricted Cycle** - Restrict releases of material or equipment for a first user; do not provide subsequent regulatory oversight beyond the first use.

Examples include release of materials for long-term use in structures not easily accessible to the public, such as structural components of bridges and tunnels.

- 4.1.4 **Closed Cycle** - Restrict reuse or recycle so that the material or equipment is always in the possession of a licensee.

Discuss Pros and Cons of the Above

4.2 Options on the Basis of Regulation

- 4.2.1 **Dose-Based Regulation** - The rule would limit annual doses of individuals offsite due to releases from licensed activities (e.g., recent decommissioning rule; recent NRC rule limiting non-power reactor licensee off-site doses to the public to 10 mrem/yr due to effluents from operations).

- 4.2.2 **Risk-Based Regulation** - The rule would limit the lifetime risk of adverse health effects due to releases from licensed activities (e.g., EPA Superfund release criteria: 10^{-4} to 10^{-6})

lifetime cancer incidence risk).

- 4.2.3 **Activity-Based Regulation** - The rule would limit the surface contamination and/or volumetric concentration of radioactivity that could be released (Bequerel or Curie concentrations on or in solids, as in 10 CFR Part 20 restricted air and water release concentration tables)

For surface contamination only, an option is to update or revise Reg. Guide 1.86; volumetric contamination should also be addressed.

- 4.2.4 **Exemption-Based Regulation** - The rule would exempt specified quantities of certain radioactive materials from NRC regulations.

Discuss Pros and Cons of the Above

4.3 Options on kinds of materials and equipment to be encompassed in NRC's rule

4.3.1 Only to iron and steel

4.3.2 Only to metals

4.3.3 To all materials

Discuss Pros and Cons of the Above

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