

March 31, 1999

FOR: The Commissioners

FROM: William D. Travers /s/
Executive Director for Operations

SUBJECT: PUBLICATION OF AN ISSUES PAPER ON RELEASE OF SOLID MATERIALS (CLEARANCE), IN THE *FEDERAL REGISTER*, FOR PUBLIC COMMENT AND FOR USE AT PUBLIC MEETINGS

PURPOSE:

To inform the Commission of the staff's intent to publish, for comment, an issues paper in the *Federal Register* on release of solid materials from licensed facilities. Note that the *Federal Register* notice uses a more general title that refers to "release of solid materials" rather than "clearance." This issues paper will also form the basis for discussion at public meetings to be held later this year.

BACKGROUND:

In a Staff Requirements Memorandum (SRM) dated June 30, 1998 ([Attachment 1](#)), the Commission directed the staff to promulgate a dose-based regulation for clearance of materials having residual radioactivity. In response to the SRM, the staff sent the Commission a paper ([SECY-99-028](#)) on January 27, 1999, which discussed the staff's plans for conducting rulemaking on clearance. In particular, [SECY-99-028](#) indicated that the staff plans to supplement the standard rulemaking process by conducting enhanced participatory rulemaking activities, including facilitated public meetings, before the start of the formal rulemaking process to solicit early public input on the major issues of the rulemaking. To support the enhanced activities, [SECY-99-028](#) noted that the staff was preparing an issues paper to be used as a starting point for discussions at the public meetings.

DISCUSSION:

The staff has completed an issues paper to be published for public comment in the *Federal Register* ([Attachment 2](#)). The issues paper will also be used to provide background for discussion of major issues at the public meetings to be held later this year. A similar process was used successfully for the public meetings for the recently completed license termination rule. The issues paper discusses, in a broad way, whether the U.S. Nuclear Regulatory Commission (NRC) should proceed with rulemaking and, if a rulemaking does proceed: (1) what rulemaking alternatives should be considered and how human health impacts, environmental impacts, economic factors, and other existing international and national criteria should be factored into decision-making regarding the alternatives; (2) whether some form of restrictions on future use of materials released from the facility should be considered in a rulemaking; and (3) what materials should be covered in a rulemaking. The issues paper presents alternative approaches, as well as specific items for discussion under each issue. As noted above, the *Federal Register* notice uses a more general title that refers to "release of solid materials" rather than "clearance." This title is being used because the international reference to clearance is generally "release for unrestricted use," whereas this paper also addresses issues related to potential restricted use of materials.

The staff intends to publish the issues paper in the *Federal Register* in April 1999 and to request written and electronic comments on the paper. The publication of the issues paper will be delayed until after the facilitation team has begun its initial contacts with potential workshop participants. Initial contacts will begin once the facilitation assistance contract is in place, anticipated for mid-April. The staff also intends to announce its plans to hold public meetings later this year on the issues discussed in the paper. It is planned that four public meetings will be held beginning in August 1999. The dates and locations of these meetings will be announced in a second *Federal Register* notice.

The staff briefed the Interagency Steering Committee on Radiation Safety (ISCORS) on the status of this rulemaking effort at an ISCORS meeting in March 1999. In addition, the EPA has been invited to participate on the NRC's Working Group and assist in development of the technical basis to support rulemaking efforts. The ACNW was provided a briefing of staff activities regarding this rulemaking on March 24, 1999; EPA staff was invited to attend this briefing.

COORDINATION:

This paper has been coordinated with the Office of the General Counsel, which has no legal objection. The Office of the Chief Financial Officer has reviewed this Commission Paper for resource impacts and has no objection. The Office of the Chief Information Officer has reviewed the paper for information technology and information management implications and concurs in it. A public announcement will be issued by the Office of Public Affairs when the request for Comments on the issues paper is filed with the Office of the *Federal Register* ([Attachment 3](#)).

original /s/ by
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Attachments: 1. SRM Dated June 30, 1998
2. FRN Containing Requests for Comments on Issues Paper
3. Press Release

ATTACHMENT 2

[7590-01-P]

NUCLEAR REGULATORY COMMISSION
10 CFR Part 20
Issues Related to Release of Solid Materials at Licensed Facilities

AGENCY: Nuclear Regulatory Commission.

ACTION: Request for comment.

SUMMARY: The Nuclear Regulatory Commission (NRC) is considering a rulemaking that would set specific requirements on releases of solid materials in order to establish a regulatory framework more consistent with existing NRC requirements on air and liquid releases. The NRC is seeking early public input on the major issues associated with such a rulemaking. To aid in that process, the NRC is requesting comments on the issues discussed in this notice.

DATE: Submit comments by November 15, 1999. Comments received after this date will be considered if it is practicable to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Submit comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Attention: Rulemaking and Adjudications staff.

Deliver comments to 11555 Rockville Pike, Rockville, Maryland, between 7:30 am and 4:15 pm on Federal workdays.

You may provide comments via the NRC's interactive rulemaking website through the NRC home page (<http://www.nrc.gov>). This site provides the capability to upload comments as files (any format), if your web browser supports that function. For information about the interactive rulemaking website, contact Ms. Carol Gallagher, (301) 415-5095 (e-mail: CAG@nrc.gov).

Copies of any comments received may be examined at the NRC Public Document Room, 2120 L Street NW (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Frank Cardile, telephone: (301) 415-6185; e-mail: fpc@nrc.gov, Office of Nuclear Material Safety and Safeguards, USNRC, Washington DC 20555-0001,

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I. Background

Unlike for air and liquid releases, the Commission currently has no specific requirements regarding release of solid materials. Solid materials include metals, concrete, soils, equipment, furniture, etc., present at licensed nuclear facilities. To provide consistency in its regulatory framework for releases of all materials, the Commission is considering a rulemaking that would set specific requirements for release of solid materials.

The NRC is supplementing its standard rulemaking process by conducting enhanced public participatory activities, including facilitated public meetings,

before the start of any formal rulemaking process, to solicit early and active public input on major issues associated with release of solid materials.

As a first step, the NRC has prepared an issues paper which describes issues and alternatives related to release of solid materials. The intent of this paper is to foster discussion about these issues and alternatives before a rulemaking to set standards would begin. The content of the issues paper is contained in Section III.

II. Request for Written and Electronic Comments and Plans for Public Meetings

The NRC is soliciting comments on the items presented in the issues paper. Comments may be submitted either in writing or electronically as indicated under the ADDRESSES heading. In addition to providing an opportunity for written comments, the NRC plans to hold facilitated public meetings later this year on the issues discussed in the paper. The NRC anticipates holding four public meetings in four different geographical locations, beginning in August 1999 and extending through early November. The dates and locations of these meetings will be announced in a later *Federal Register* notice. This issues paper provides background and topics of discussion on the major issues that will be the subject of the public meetings. The written public comment period will extend until after the last public meeting is held.

Based on the comments received both in written and electronic form, and at the public meetings, the Commission will then be in a position to evaluate whether to proceed with development of a proposed rule or take some other regulatory action. If the Commission decides to proceed further with a proposed rulemaking, any proposed rules will be published in the *Federal Register* for public review and comment.

III. Issues Paper on Release of Solid Materials at Licensed Facilities

INTRODUCTION

To provide consistency in its regulatory framework for releases of materials, the Commission is considering a rulemaking that would set specific requirements for release of solid materials. This paper describes issues and alternatives related to the release of solid materials and is intended to foster discussion about these issues and alternatives before a rulemaking would begin.

Section A of this issues paper describes some general considerations related to rulemaking, potential Commission actions, and the enhanced participatory process. Section B of the paper discusses the major issues that would be associated with a rulemaking and also discusses various alternatives for proceeding.

A. BACKGROUND

A.1 CURRENT NRC POLICIES

A.1.1 Inconsistency of NRC regulations covering releases from licensed facilities

The NRC has the statutory responsibility for the protection of health and safety related to the use of source, byproduct, and special nuclear material under the Atomic Energy Act. A principal method of meeting this responsibility is through the body of regulations codified in Title 10, Chapter I, of the Code of Federal Regulations (10 CFR, Chapter I). The regulations in 10 CFR, Chapter I, have been developed using a rulemaking process that provides the opportunity for public review and comment under the Administrative Procedure Act and includes the analysis of costs and benefits and environmental impacts, and considers factors related to paperwork reduction. Agreement States administer equivalent programs applying equivalent regulations.

The Commission's regulations that set standards for protection of the public against radiation appear in 10 CFR Part 20. These regulations limit the radiation exposure (or "dose") that a member of the public can receive from the operation and decommissioning of a nuclear facility, and also require that doses received are "as low as is reasonably achievable (ALARA)". The NRC has used the criteria on public dose limits and ALARA requirements in Part 20 (Sections 20.1301 and 20.1101, respectively) to establish limits in Table 2 of Appendix B of Part 20 on the amount of radioactivity in gaseous and liquid releases that may be released from a nuclear facility to the environment.

However, unlike the regulations applicable to gaseous and liquid releases from a licensed nuclear facility, there are no current specific criteria in Part 20 governing releases of solid materials by licensees, although there are some regulations⁽¹⁾ that cover the release of certain materials. Therefore, if a licensee requests approval of release of solid material, the NRC must consider the request on a case-by-case basis using existing regulatory guidance, license conditions, NRC Branch Technical Positions, etc.

The Commission recently amended its regulations in Part 20 (Subpart E) to establish criteria for unrestricted use of facility structures and lands at a decommissioned site (*Federal Register*, July 21, 1997). Subpart E of Part 20 is focused on protection of persons entering and using decommissioned structures and lands at a site after a nuclear facility terminates its NRC license, but does not address release of solid material.

A.1.2 Solid materials potentially available for release.

Solid materials include metals, building concrete, onsite soils, equipment, furniture, etc., that are present at, and/or used in, licensed nuclear facilities during routine operations. Most of this material will have no radioactive contamination, although some materials can have radioactive contamination either on their surfaces or distributed within their volumes. Contamination can be distributed in the volume of materials because: (1) they are relatively porous (e.g., soil) allowing contamination to spread into the material; (2) they become radioactive through activation; or (3) a recycling process (e.g., metal melting) can cause contamination that was previously on the surface of a piece of equipment to become distributed throughout its volume. The amount of contamination that a material has, if any, depends largely on the type of licensee involved and its location in the facility:

- a) For most NRC licensees, solid materials have no contamination because these licensees use sealed sources in which the radioactive material is encapsulated. These include small research and development facilities, people who use licensed gauges in their business, etc.
- b) For other licensees (which includes nuclear reactors, manufacturing facilities, larger educational or hospital laboratories, etc.), material generally falls

into one of three groups based on its location or use in the facility:

- 1) **Clean or unaffected areas of a facility** - the material in these areas would likely have no radioactive contamination resulting from licensed activities. Such areas could include hospital waiting rooms, university office space in a laboratory, or metal ventilation ducts in the control room of a reactor facility.
- 2) **Areas where licensed radioactive material is used or stored** - the material in these areas can become contaminated although the levels may likely be very low, or it may have none, because of contamination control procedures required at facilities licensed by the NRC. This could include material in certain laboratory areas in a university or hospital, or in certain buildings of a reactor facility.
- 3) **Material used for radioactive service in the facility, or located in contaminated areas or in areas where activation can occur** - These materials generally have levels of contamination that would not allow them to be candidates for release unless they are decontaminated.

A.1.3 Current NRC case-by case review of licensee requests for release of solid material

Even though the NRC does not currently have specific criteria in Part 20 covering release of solid materials, licensees have made, and will likely continue to make, requests for release of solid material when it becomes obsolete or defective or when their facility is decommissioned. For material from clean or unaffected areas, knowledge of site radiological history is an important factor in determining whether the material is contaminated. The NRC complies with the requirements of Part 20 by evaluating requests for release on a case-by-case basis using either [Regulatory Guide 1.86](#) , "Termination of Operating Licenses for Nuclear Reactors," or other case-specific criteria.

(a) **Regulatory Guide 1.86.** This guide, which was developed by the Atomic Energy Commission in 1974, provides a table of *Acceptable Surface Contamination Levels* for various radionuclides, including natural and enriched uranium, transuranics, and fission products. These surface contamination levels are stated in terms of measurable radioactivity levels (observed disintegrations per minute per 100 square centimeters of surface area), the values of which were based principally on the capabilities of readily available instrumentation at the time the guide was developed. Regulatory Guide 1.86 does not contain dose criteria. For some situations, the NRC will incorporate the values in the table in Regulatory guide 1.86 into the license conditions of a facility.

(b) **Allowance of release if there are no detectable levels of radioactive contamination from licensed activities above background in the material.** Regulatory Guide 1.86 only addresses materials having surface contamination; it does not cover volumetric contamination. For some situations, the NRC allows release of volumetrically contaminated solid material if survey instrumentation does not detect radioactivity levels above background. This does not mean that the material is released without any radioactive contamination present on, or in, it; instead, it means that the material may be released with very low amounts of contamination that is not detectable with appropriate survey instruments. This method provides inconsistent and generally unsatisfactory licensing guidance because different survey instruments have different levels of detection. This can lead to disagreements and confusion over permissible levels of release and nonuniform levels of protection.

(c) **Use of 10 CFR 20.2002.** Licensees may request specific approval to dispose of materials containing low levels of licensed material in other than a licensed low-level waste disposal site in accordance with requirements in [10 CFR 20.2002](#). Section 20.2002 requires licensees to describe the material to be released and evaluate the doses that would result. Use of this approach requires case-specific NRC review and evaluation of the situation. This approach would likely not be appropriate for evaluating the increased amounts of material that could be available for release during decommissioning.

A.2 NRC ACTIONS TO ADDRESS INCONSISTENCY IN RELEASE STANDARDS BY CONSIDERING RULEMAKING ON RELEASE OF SOLID MATERIALS.

A.2.1 Commission direction to consider rulemaking

As noted in Section A.1.3, case-by-case technical reviews, while protective of public health and safety, can cause inconsistencies and confusion. With the potential for increased licensee requests for release of solid materials as more facilities near decommissioning, the Commission, on June 30, 1998, directed its staff to consider rulemaking to establish a dose-based standard for release of solid materials so that licensee considerations of, and NRC review of, disposition of slightly contaminated solid materials are conducted in a consistent manner that protects public health and safety. The Commission also directed the NRC staff to include an opportunity for enhanced public participation, including use of NRC's Internet home page to solicit comments. This issues paper is the first step in soliciting views on major issues in this area.

A.2.2 Potential Alternative Courses of Action

Prior to conducting a rulemaking, the NRC generally considers alternative courses of action. Two broad alternatives that the NRC could consider are not doing a rulemaking (i.e., continue with the current practice of case-by case reviews) or developing a rulemaking for release of solid materials. If the NRC decided to proceed with rulemaking, it could:

- (1) Permit release of solid materials for unrestricted use if the potential doses to the public from unrestricted use of the material were less than a specified level determined during the rulemaking process. Unrestricted use could result in recycle or reuse of the material in consumer products or industrial products, or disposal of the material as waste in landfills. Release of solid materials for unrestricted use is also referred to as "clearance", but for the purposes of this issues paper, the term "unrestricted use" is generally used.
- (2) Restrict release of solid materials to only certain authorized uses. For example, future use of the material could be restricted to only certain industrial uses where the potential for public exposure is small.
- (3) Do not permit either unrestricted or restricted release of solid material that had radioactive service in the facility or had been located in an area where radioactive material has been used or stored, and instead require all such materials to go to a licensed low-level waste (LLW) disposal facility.

In evaluating these alternatives, the NRC would consider potential human health and environmental impacts and economic aspects associated with each alternative.

A.3 CURRENT POLICIES OF INTERNATIONAL AGENCIES, OTHER FEDERAL AGENCIES, AND STATE GOVERNMENTS REGARDING RELEASES OF SOLID MATERIALS

In considering rulemaking alternatives, the NRC would consider policies and precedents set by other nations and international agencies, by other Federal agencies and by States.

International Efforts. There is considerable effort by other nations and by international agencies, such as the International Atomic Energy Agency (IAEA), to set standards in this area. Consistency with standards set by other nations and international agencies is important because materials can be both imported and exported between the U.S. and other countries and differing standards could create confusion and economic disparities in commerce.

The IAEA is an agency of the United Nations made up of member states from a number of countries which develops, by consensus, various broad radiation standards for matters where there are international implications. The NRC, EPA, and DOE generally provide input and review in development of IAEA standards.

The generally accepted term in the international community for release of materials for unrestricted use is "clearance." The IAEA is currently in the process of revising its report on clearance levels for publication as Safety Series guidance for its member states (IAEA-TECDOC-855, *Clearance Levels for Radionuclides in Solid Materials*). This report was published in draft in January 1996 for a three-year trial use by the IAEA's member countries. This report contains levels of radionuclides in solid materials that may be released for unrestricted use, or "cleared." The basis for the proposed clearance levels is a level of constraint of 1 millirem per year (mrem/yr) of exposure of members of the public from 'likely' exposure scenarios and 10 mrem/yr from 'unlikely' scenarios.

One intended application of IAEA's proposed clearance levels is related to international trade, for example the import and export of scrap metals.

U.S. Environmental Protection Agency (EPA). The EPA, although not a regulator of licensees, is responsible for setting generally applicable environmental standards for radioactive materials under the Atomic Energy Act. The NRC, in regulating its licensees, implements environmental standards that EPA promulgates in the area of radiation protection. In the absence of EPA standards in a particular area, for example in the area of release of solid materials, the NRC has the authority to set radiation protection standards for its licensees. This can cause potential problems with the finality of NRC licensing decisions if EPA later issues standards in a particular area that are different from regulations that NRC has previously issued. Thus, it is important for the NRC to closely involve EPA in developing its standards.

In addition, as noted later in Section B.1, the EPA has completed studies on environmental impacts of clearance of materials. The NRC and EPA have, and plan to continue to have, coordinated efforts in this area to ensure that effective and consistent release standards are established, while minimizing duplication of effort. Accordingly, the EPA will not only be an important participant in the NRC rulemaking workshops, but the NRC also plans to consult extensively with EPA throughout the rulemaking process.

In setting generally applicable environmental standards, EPA sets standards for a wide range of materials, including those which contain naturally occurring radioactive materials that have been enhanced as a result of man-made processes. For example, the ash from burning of coal in power plants has concentrated levels of uranium. This coal ash is generally permitted to be used in building materials; the concentrated uranium in the coal ash can result in small radiation doses to the general public as a result of its use. This EPA standard could be viewed as a precedent or benchmark for possible NRC release levels.

EPA is currently active in the development of standards for import into the U.S. of materials cleared in other countries. EPA has been working with the International Atomic Energy Agency (IAEA) and the U.S. Department of State in these efforts.

U.S. Department of Energy (DOE). The DOE operates a number of nuclear facilities. Although not licensed by the NRC, the DOE faces issues concerning the disposition of materials from its facilities similar to those faced by NRC licensees.

In response to these needs, DOE has developed criteria for release of solid materials. These criteria generally endorse the numerical criteria of [Regulatory Guide 1.86](#) . The DOE criteria are contained in DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, dated February 8, 1990 (and revised in 1993) and in the *Draft Handbook for Controlling Release for Reuse or Recycle of Non-Real Property Containing Residual Radioactive Material* (June 1997).

If the NRC issues a regulation containing criteria for release of solid materials, decisions would have to be made as to whether DOE would adopt the standards in the NRC regulation.

State governments. Thirty States have entered into Agreements with the NRC to assume regulatory authority over byproduct, source, and small quantities of special nuclear material. "Agreement States" generally use NRC guidance such as that contained in Regulatory Guide 1.86 or similar guidance, in their regulatory programs.

In a related matter, Section 2901(a) of the Energy Policy Act of 1992 (Section 276(a) of the Atomic Energy Act) grants State governments (Agreement and non-Agreement States alike) the authority to regulate the disposal of low-level radioactive waste if the NRC exempts such waste after the enactment of Act. Several States and locales have, both prior to and subsequent to, passage of the Act established prohibitions against the disposal of radioactive material in landfills. The implications of Sec. 276(a) on NRC's potential alternative courses of action noted in Section A.2 above are unclear and may depend on the ultimate nature of any rulemaking that NRC undertakes.

A.4 PREVIOUS COMMISSION EFFORTS TO ADDRESS RELEASE OF SOLID MATERIALS

The Commission previously sought to address considerations related to release of solid materials as a part of its issuance of a Below Regulatory Concern (BRC) Policy Statement on July 3, 1990 (55 FR 27522). The BRC Policy was a general statement of Commission policy and was intended to provide a broad decision framework for formulating rules or making licensing decisions to exempt from regulatory control certain practices involving small quantities of radioactive material. The BRC Policy was envisioned to have applicability in NRC rulemaking and guidance in four principal areas, one of which was setting a standard for release of solid materials for recycle. The Commission decided that a more extensive public involvement process in establishing these areas would be beneficial and hence instituted a moratorium on the BRC Policy in July 1991. Subsequently, in October 1992, the U.S. Congress enacted the Energy Policy Act of 1992 which revoked the BRC Policy Statement.

The NRC's current efforts differ from those associated with the BRC Policy in several ways. Unlike the broad policy-setting approach of the BRC policy, the NRC's current effort is focused on considering establishment of specific requirements for release of solid materials, which protect public health and safety, consistent with the existing framework of requirements in Part 20 for gaseous and liquid releases. Also, unlike the BRC Policy which was issued without detailed technical basis or public comment, the procedure for a rulemaking on release of solid materials would be carried out under all the procedural requirements of the Administrative Procedures Act (APA). As discussed in Section A.2, this would include a full assessment of potential scenarios and pathways for radiation exposure and an evaluation of the environmental impacts and cost-benefit basis of alternative approaches. In addition, as a supplement to the normal APA process, the NRC would enhance participation in the rulemaking process through workshops for interested parties. Any decisions made regarding release of solid materials at this time would be made through rulemaking not through a policy statement.

A.5 POTENTIAL NRC ACTIONS, ENHANCED PUBLIC PARTICIPATION AND PUBLIC MEETINGS, AND PREPARATION OF ISSUES PAPER

Generally, NRC's procedure in rulemaking is for the NRC staff to develop a proposed rule for Commission consideration, publication of the proposed rule for public comment, consideration of the comments by the NRC staff, preparation of a final rule for Commission approval, and publication of the final rule. As directed by the Commission, the NRC staff plans to enhance public participation in this process by conducting workshops for interested parties before any rulemaking would begin. The workshops are planned to elicit informed discussions of options and approaches and the rationale for them. Although these workshops are not designed to seek "consensus" in the sense that there is agreement on the issues, the workshops are to be conducted at a very early stage of rulemaking to involve interested parties and the public with the following objectives: (a) to ensure that the relevant issues have been identified; (b) to exchange information on these issues; and (c) to identify underlying concerns and areas of disagreement, and (d) where possible, approaches for resolution. The NRC staff also plans to enhance participation by providing website access to this issues paper and the ability to submit comments on the issues paper by e-mail.

If, following this early exchange of ideas (including workshop comments and comments filed by other means such as internet responses and written comments), the Commission decides to proceed with rulemaking, other rulemaking documents will be prepared. Specifically, the NRC would evaluate the implications of a rule with regard to the National Environmental Policy Act (NEPA). NRC conducts these evaluations as specified in 10 CFR Part 51, which contains requirements on preparing environmental analyses, including the content of an environmental statement and the public process involved in developing the scope of an environmental statement. In addition, the NRC would prepare a Regulatory Analysis to evaluate costs versus benefits of a rule consistent with Executive Order 12291 and the Commission's regulatory analysis guidelines in NUREG/BR-0058. The NRC would also publish guidance to provide licensees with information on how to demonstrate compliance with the regulation. These documents would be made available on NRC's website.

B. ISSUES FOR DISCUSSION

The Commission believes that the issues and alternatives discussed below provide a broad look at matters related to the consistency of its regulations on standards for release of solid materials from nuclear facilities. Therefore, the Commission is soliciting comments and information on these issues before proceeding. These issues, and other relevant and substantial issues identified by interested parties, will serve as the basis of discussion at the public workshops. The workshop discussions will be used by the NRC staff in deciding upon an appropriate course of action.

Issue No. 1 - Should the NRC Address Inconsistency in its Release Standards by Considering Rulemaking on Release of Solid Materials?

As discussed in Section A.1.1, NRC uses the criteria on public dose limits and ALARA requirements in Part 20 to establish limits on releases from nuclear facilities during routine operations and decommissioning. Currently, Part 20 contains specific criteria on the amount of radioactivity in gaseous and liquid releases that may be released from a nuclear facility to the environment. NRC also has requirements in Subpart E of Part 20 on unrestricted use of decommissioned lands and structures. However, NRC currently has no specific requirement in its regulations on limits for release of solid materials.

Alternatives:

The NRC has the following two broad options related to the issue of inconsistency of its regulations on release standards and licensee requests for release of solid materials: (1) continue the current practice of handling of licensee requests for release of solid materials on a case-by-case basis, or (2) include requirements in Part 20, as part of a consistent regulatory framework for evaluating releases of all materials, that would allow it to make decisions on licensee requests for release of solid materials that are protective of public health and safety:

(1) No NRC Rulemaking: Continue Current Practice of Handling Licensee Requests for Release on a Case-by-Case Basis.

Under this option, no NRC rule would be prepared. Licensees will still continue to make requests for release of solid materials. As discussed in Section A.1.3, in order to comply with the requirements of Part 20, NRC evaluates licensee requests on a case-by-case basis using regulatory guidance, branch positions, license conditions, etc. One basis for review has been NRC staff guidance in Regulatory Guide 1.86, which was originally published in June 1974 by the Atomic Energy Commission (AEC). Regulatory Guide 1.86 contains a table of acceptable total and removable surface levels for various radionuclides, including natural and enriched uranium, transuranics, and fission products, which are stated in terms of measurable radioactivity levels,

but does not contain specific dose criteria. Regulatory Guide 1.86 has been used to evaluate unrestricted release of solid materials whose surfaces are slightly radioactive; it does not cover material with volumetric contamination. In addition to Regulatory Guide 1.86, Section A.1.3 notes that NRC also uses other case-specific criteria, such as the detection capability of instrumentation, and certain specific rule sections, in its evaluation of requests for release of solid materials.

(2) **Develop a Proposed Rule.**

In this option, the NRC would proceed with rulemaking to supplement its gaseous and liquid release standards in Part 20 by developing dose-based regulations limiting releases of solid material to provide a consistent regulatory framework protective of public health and safety. This would involve conducting a rulemaking under the Administrative Procedures Act, and developing, as regulatory bases, an environmental evaluation under NEPA and an analysis of costs and benefits in a Regulatory Analysis. Based on Commission direction discussed in Section A.2.3, a rulemaking would use an enhanced participatory process involving early public input and website access to rulemaking documents.

Specific Items for Discussion:

Should the NRC continue with the current practice of making decisions on a case-by-case basis, or should it proceed to develop a proposed rule that would establish generic criteria for release of solid materials? What are the considerations that should go into making such a decision?

(1) Does the current system of NRC case-by-case decisions on release of solid materials, using existing guidance, provide an adequate regulatory framework? Can volumetric contamination in small amounts be released in a manner similar to that done for small amounts of surface contamination on materials that have been released to unrestricted areas under the criteria in Regulatory Guide 1.86? If a rule is not issued, should Regulatory Guide 1.86 be updated with a set of dose-based values?

(2) Should the NRC develop dose-based regulations on release of solid material? Would a rule allow the NRC to better address volumetric contamination in solid materials in an explicit and consistent regulatory manner that meets both licensee needs and public concerns? Would a rule also meet additional specific regulatory needs such as the specific types of material to be covered, restricted vs. unrestricted use, etc?

(3) Would issuance of an NRC rule on release of solid material definitively resolve licensee questions regarding finality of NRC release decisions if EPA, which has authority to set generally applicable environmental standards in this area, promulgates a rule at a later date?

(4) Substantial NRC resources would be needed to conduct the complex safety, environmental, and regulatory analyses required to support a rulemaking. Without a regulation, the NRC will have to review the anticipated increase in requests for release of solid materials on a case-by-case basis which could mean less efficient and less consistent reviews. Would potential savings in resources by having a regulation in place offset the resources spent on rulemaking?

Issue No. 2 - If NRC Decides to Develop a Proposed Rule, What are the Principal Alternatives for Rulemaking that Should be Considered, and What Factors Should be Used in Making Decisions Between Alternatives?

If the answer to Issue #1 is to conduct a rulemaking to include requirements in Part 20 on release of solid material, a rulemaking process (including the development of technical basis information, evaluation of environmental impacts and cost-benefit analyses, and the public review and comment process) would be conducted to evaluate potential rulemaking alternatives.

Rulemaking Alternatives:

Potential alternatives for rulemaking in this area are:

(1) **Permit release of materials for unrestricted use if the potential dose to the public from the material are less than a specified level determined during the rulemaking process** - In this alternative, a licensee could release for unrestricted use ("clearance") material that meets the permissible level in the standards. Potential alternative dose levels resulting from unrestricted use of the material could include doses of 10 mrem/yr, 1 mrem/yr, and 0.1 mrem/yr above background, as well as no dose above background. To provide some perspective on these levels: (a) the dose from natural background to people in the U.S. can vary widely based on the area of the country where people live and is on average about 300 mrem/yr; (b) NRC's public dose limit is 100 mrem/yr, (c) the dose from use of recycled coal ash in concrete block as permitted by EPA can be about 5% of natural background (about 15 mrem/yr), (d) a person receives 10 mrem on a round-trip coast-to-coast flight, and (e) 1 mrem/yr is a level which the National Council of Radiation Protection (NCRP) considers a trivial risk. A 1 mrem/yr value is also the level being considered unrestricted use (or "clearance") in the European community.

(2) **Restrict release of solid materials to only certain authorized uses** (see more detail in Issue No. 3).

(3) **Do not permit either unrestricted or restricted release of solid material that had radioactive service in the facility or been in an area where radioactive material has been used or stored** - In this alternative, all such materials in the facility would be required to go to a licensed LLW disposal facility.

(4) Other alternative to be determined during the rulemaking process.

Factors in decision-making:

Principal factors in making decisions regarding the alternatives could include human health and environmental impacts, cost-benefit considerations, the

capability to survey the material to assure that it meets permissible levels, existing international, national, and State standards, and other factors raised during the rulemaking process.

Human health and environmental impacts: In assessing potential rulemaking alternatives, NRC would consider a broad range of possible impacts, both radiological and non-radiological. These could include evaluation of radiation dose to individuals from release of solid materials, assessment of collective doses to different population groups from the release, transportation, processing and disposal impacts, impacts on biota, land use impacts, and societal impacts. Some of these impacts may be competing. For example, a lower dose criterion would result in less material available for release (and instead sent to a LLW disposal site) which, in turn, would lower the radiation dose impact to the public from exposure to that material. However, the lower dose criterion could cause an increase in other impacts, for example those non-radiological impacts associated with mining and transport of fresh metal to replace that sent to a LLW disposal site. Because these impacts would take place over different time periods and expose different populations, a precise comparison is difficult. Nevertheless, the decision-making process could consider these impacts separately and also consider the net collective impact for these disparate factors.

As a first step in assessment of impacts, the NRC has issued a draft report for comment that provides a technical basis for determining potential doses to individuals from a wide range of potential scenarios by which members of the public could come in contact with material that had been released for unrestricted use (or "cleared") from licensees ("Radiological Assessment for Clearance of Equipment and Material from Nuclear Facilities", NUREG-1640, February 1999). The report contains an analysis of material flow models based on an evaluation of the recycle/reuse industry in the U.S. and of potential scenarios by which a member of the public could reasonably expect to be exposed. Solid materials that are candidates for release that are evaluated in the report include iron/steel, copper, aluminum, and concrete. The EPA has issued a similar report which is accessible on EPA's website at <http://www.epa.gov/radiation/cleanmetals/publications.htm> **EXIT** NEI . While some of the analysis approaches of the EPA report are different from NRC's report, the overall results from the EPA and the NRC reports are similar.

Cost-benefit considerations: Executive Order 12291 contains provisions requiring that, in their rulemakings, Federal agencies consider cost-benefit evaluations of alternative courses of action. Consistent with Executive Order 12291, NRC has established guidelines for preparing regulatory analyses of alternative courses of action in support of its rulemaking decisions (NUREG/BR-0058). Benefits would generally derive from the net reduction in environmental impacts discussed above. Costs which could be included in a regulatory analysis could include: (1) the costs of alternative courses of action, including surveys at the nuclear facility to verify that permissible release levels have been met; (2) the potential for having to respond to "false positive" alarms at scrap facilities, (3) economic impact on recycle/scrap/manufacturing processes; (4) replacement metal production; and (5) alternative options for disposing of the material.

Implementation considerations: A potential concern with implementation of a proposed rule is the capability to measure radioactive contamination corresponding to the very low alternative dose levels discussed above. In particular, a rulemaking alternative which would require survey instrumentation to verify that there is no dose above natural background could be extremely difficult to implement because of the variation in natural background and the capability of survey instruments to detect such low levels.

Other international, national, and State standards: In considering rulemaking alternatives, the NRC would also consider policies and precedents set by international agencies, other Federal agencies, or States. Consistency with standards set by other countries and international agencies is important because materials can be both imported and exported between the U.S. and other countries and differing standards could create confusion and economic disparities in commerce.

Items for discussion:

(A) Human health and environmental impacts:

(1) What dose level is acceptable regarding release of solid materials from licensed facilities for unrestricted use? Should release of solid materials for unrestricted use be permitted at a dose level (for example, 10, 1.0, or 0.1 mrem/yr, or no dose, above background (or other dose)) which is established in rulemaking based on a balancing of risks from various alternatives? Or, should release of solid materials not be permitted if they had been used for radioactive service or been in areas where licensed radioactive material was used or stored?

(2) How should environmental impacts be balanced and what types of impacts should be considered in decision-making?

i) In considering radiological impacts from materials released for unrestricted use in the public sector, what pathways of exposure to people, in addition to those already considered in NUREG-1640, should be considered? As noted above, NUREG-1640 contains a technical basis for determining potential doses to individuals from a wide range of potential scenarios by which members of the public could come in contact with material that had been released for unrestricted use. The report contains an analysis of material flow models based on an evaluation of the recycle/reuse industry in the U.S. and of potential scenarios by which a member of the public could reasonably expect to be exposed.

ii) In considering other environmental impacts, what impacts, both radiological and nonradiological, should be considered? Such impacts could include mining of new metals to replace metals that could be potentially released but which are sent to a LLW disposal site, production of metal products, transportation of materials, etc.

iii) How should net environmental impacts from all the radiological and nonradiological impacts be balanced?

(3) What is the potential for exposures to multiple sources of material released for unrestricted use, and what are ways in which persons could be exposed to multiple sources? How should potential for exposure to multiple sources be considered in setting an acceptable dose level?

(4) What societal impacts should be considered and how should they be factored into the environmental evaluation? For example, material released for unrestricted use from nuclear facilities could result in concern, confusion, or fear if the public either does not clearly understand that the risk is small or does not accept the risk.

(B) Cost-benefit considerations:

(1) As noted above, Executive Order 129221 requires Federal Agencies to consider cost-benefit in its consideration of rulemaking alternatives. NRC uses NUREG/BR-0058 as its guideline in analysis of the cost-benefit of regulatory alternatives. In using NUREG/BR-0058:

i) How should economic factors be incorporated into rulemaking decisions, including costs of survey methods and appropriate instruments to measure very low levels of volumetrically contaminated material, economic risks associated with release of solid materials, costs of decontamination, ALARA issues, etc.

ii) How should economic impacts be balanced against net environmental impacts?

(2) What are the major economic costs associated with release of solid materials into commerce?

(3) What are the major economic costs associated with landfill disposal of material released for unrestricted use? Would problems be encountered in this material going to a landfill?

(4) What economic risks are associated with release of solid materials for unrestricted use? For example, what are the risks (and associated costs) that materials released from a nuclear facility could be rejected at a melter or scrap yard based on a survey at that point? What means could minimize such economic risks?

(5) What is the potential for buildup of radioactivity in commerce as a result of continued release of solid material for unrestricted use over time? How should such a buildup be estimated? What is the potential that this buildup could contribute significantly to either the net environmental impact, to economic impacts on general commerce, or to public concern?

(C) Implementation considerations

(1) What is the capability to survey materials (both for surface and volumetric contamination) at the different alternative dose levels being considered, and what effect would that have on setting a standard? What economic impact would the use of different or advanced survey techniques have on the facilities releasing the material and the facilities accepting the material for reuse or recycle? How can surveys be designed to prevent releasing material in excess of permissible levels? Over what volume or mass of material should surveys be performed in assessing compliance with release levels? Should materials of varying concentration levels be combined, and, if so, how?

(2) What different survey methods should be used for assuring that materials from different areas of a facility, and having different potential for contamination, meet the criteria of a dose-based standard? For example, should the survey of solid materials from areas known to be free of contamination rely upon knowledge of facility radiological history and knowledge of plant processes, and, if so, how?

(D) Other considerations including international, national, and State guidelines:

(1) With regard to international, national, and State standards:

(a) How should guidelines on unrestricted release, or "clearance," set by international standards-setting bodies such as the IAEA and International Commission on Radiological Protection (ICRP), as well as those set by other countries, be considered in setting a level for release of material from NRC-licensed facilities in the U.S.? How should efforts by the U.S. Department of State and the EPA to set import standards be considered?

(b) How should guidelines of other U.S. agencies, e.g., DOE and EPA, be considered? How should standards set by NRC be consistent with other generally applicable EPA standards, as for example as related to those for recycled coal ash (see Section A.2.2.3)? With regard to issues of finality of NRC licensing decisions, what potential problems if EPA later issues standards for release of solid materials different from an NRC regulation?

(c) How should recommendations made by U.S. standards setting bodies, such as the National Council on Radiation Protection and Measurements (NCRP), be considered?

(d) How should standards set by U.S. industry groups, such as the American National Standards Institute (ANSI), be considered?

(e) Should NRC simply adopt the standards in 1a, 1b, or 1c, and their associated health risk level, rather than conduct analyses of its own?

(f) What are the economic impacts of having NRC standards different from standards that may be set by international agencies, EPA, or other national bodies?

(g) What compatibility categories, as described in NRC's "Policy Statement on Adequacy and Compatibility of Agreement State Programs," published September 3, 1997 (62 FR 46517), and in NRC's Management Directive 5.9, "Adequacy and Compatibility of Agreement State Programs," should be assigned to any rule on release of solid materials? Compatibility refers to the extent that Agreement State radiation control programs are consistent with NRC's program for the regulation of Atomic Energy Act radioactive materials to ensure that a coherent nationwide effort is collectively established for regulation of such materials.

(2) Should existing NRC standards, including the public dose limit of 100 mrem/yr in [10 CFR 20.1301](#), and Subpart E of Part 20 which contains a dose criterion of 25 mrem/yr for release of decommissioned structures and lands, be considered in setting allowable doses for release of solid material for unrestricted use? A consideration in this question is that there are different circumstances between Subpart E and the issues being discussed in this paper. For example, Subpart E limits the dose from the single release of structures and land at a site to 25 mrem/yr. In contrast, unrestricted release of the materials considered in this issues paper could involve periodic releases over the facility lifetime at a dose level to be set in the rulemaking.

Issue No. 3 - If NRC Decides to Develop a Proposed Rule Containing Criteria for Release of Solid Materials, Could Some Form of Restrictions on Future Use of Solid Materials be Considered as an Alternative?

As discussed in Section A.2.2, release of solid materials for unrestricted use would allow them to be recycled or reused in consumer products or industrial products, or be disposed of in solid waste landfills. A potential alternative could involve limiting release of solid materials by restricting their future use to some authorized use.

Alternatives:

Potential alternatives for restricted use of solid materials could include:

(1) Restrict the first use of solid material to certain authorized uses.

In this alternative, the release of radioactive material would be restricted to certain authorized uses to ensure that it is processed into one or more specific products. For example, material could be recycled for use for some industrial product such as steel beams that would be designated for use in a foundation or structural support for a bridge or monument. Because of uncertainties related to controlling potential uses of the material after it leaves a licensee's facility, it may be necessary to require that processing of the material for the first use be done under a specific license issued by the NRC. This alternative might be beneficial for materials contaminated by nuclides having short to moderate half-lives, allowing substantial reduction in contamination due to radioactive decay within the lifetime of the structure in which it is placed. This alternative would probably not be applicable for all materials (e.g., wood products and some metals such as copper). End user certification could be difficult to enforce.

2) Restrict release of solid material to permitted disposal.

This alternative would restrict the release of solid material from nuclear facilities to disposal at municipal solid waste landfills. Municipal solid waste landfills are issued permits by State regulatory authorities in accordance with 40 CFR 258, "Criteria for Municipal Solid Waste Landfills" as well as other State and local regulations. The rationale for this alternative is that exposure pathways at landfills can be fairly well defined and quantified, and that many of the pathways of potential exposure associated with recycle of metal into consumer products or industrial products would not be present. Additional restrictions could involve disposal at industrial solid waste facilities rather than at sanitary waste landfills.

Issues associated with this alternative include the fact that additional NRC and/or EPA rulemaking may be required to implement this alternative. For example, the definitions of solid waste and/or byproduct material (or associated regulations) might need to be revisited to allow disposal at solid waste landfills of material having residual radioactivity. Several States currently have prohibitions against the disposal of radioactive material in landfills which would make this alternative less feasible. An additional issue is the possibility that material could be sent to a landfill under a restricted use, but that it could be removed from the landfill and sold as scrap.

Items for Discussion:

(1) Should the NRC consider restrictions on future use of solid materials as an alternative to unrestricted use (similar to that which was done for the license termination rule)?

(2) If so, for what types of restricted uses could the material be considered?

(3) What types of controls could reasonably be placed on the process of restricting use to assure that the material would not be released for unrestricted use? Would it be necessary to license processing of the material for the first use in order to assure protection of public health and safety? For example, if iron/steel were to be restricted to use in bridge support, should the company processing the steel into bridge supports be licensed by the NRC? Or could sufficient restrictions be placed on the processing company to assure that the steel went where it was supposed to without the company having an NRC license?

(4) How long would the material be able to be restricted? What radionuclides, and associated time periods for radioactive decay, would be reasonable to consider as candidates for restricted use? What would happen to the material when it reached the end of its useful restricted life?

(5) If restrictions were placed on future use of materials, would the NRC need to be involved in continued regulation of the material? Would States need to be involved? Or could a mechanism for institutional control, similar to that used in the license termination rule be used to assure the continued restricted use of materials? Note that Subpart E of 10 CFR Part 20 ([Section 20.1403](#)) contains requirements regarding acceptable dose levels for restricted use, allowable institutional controls and financial arrangements, etc.

(6) What type of public involvement in decisions concerning restricted use of materials should there be? Should it be similar to the method used in the license termination rule where licensees are required to seek advice from affected parties when placing a site into restricted use? Note that Subpart E of 10 CFR Part 20 ([Section 20.1403](#)) also contains requirements regarding the specific areas which licensees must seek advice on from affected parties and also the methods to be used in obtaining that advice. A potential problem in establishing a public involvement process for restricted use of materials is that (unlike license termination of buildings or a site where affected parties in a community can be fairly readily identified for a restricted site in a

community) material leaving the site could be sent for restricted use in different areas. Can this potential problem be addressed so as to include a public involvement process for setting restrictions on future material use in specific licensing cases?

(7) How should considerations and predictions of future public usages of materials and the restrictions on those materials, which could be difficult to make, be developed so as to provide credible approaches for restricted use?

(8) What dose should be permitted for material released for restricted use? Should the same alternative dose levels as for unrestricted use (see Issue #2) also be considered for restricted use, or should some other value, either higher or lower, be considered? By way of comparison, the allowable dose in Subpart E of Part 20 for restricted use of released lands and structures is the same as for unrestricted use.

(9) What specific problems are associated with restricting materials to landfill disposal?

Issue No. 4 - If NRC Decides to Develop a Proposed Rule, What Materials Should be Covered?

A rule developed by the NRC could cover selected materials (for example, certain metals such as iron and steel) or could be a broad rule encompassing all materials. Any alternatives chosen for consideration would be dependent on information available on the various materials. Currently, the NRC has developed the following technical background information:

(1) An analysis of individual doses resulting from unrestricted release of steel, aluminum, copper, and concrete (draft NUREG-1640, February 1999) has recently been completed. These materials were analyzed because they were considered to represent those most likely to become available and to also represent most of the volume of material available for release from NRC-licensed facilities into the public sector.

(2) Discussions with licensees have indicated that there are large quantities of soil with very low amounts of radioactive contamination that are available for release. Although NUREG-1640 does not include specific analyses for soil, work done previously for the license termination rule provides baseline technical information on individual dose factors and environmental analysis for soil which could be adapted for use for this application. This previous work includes NUREG-1496, "Generic Environmental Impact Statement on Radiological Criteria for License Termination," NUREG/CR-5512, "Residual Radioactive Contamination from Decommissioning," and NUREG-1549, "Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination."

(3) The NRC does not have similar analyses completed for other materials needing disposition and potentially available for release.

Alternatives:

Alternative rule approaches could be:

(1) Apply rule to only a select group of solid materials, including certain metals (steel, aluminum, copper) as well as concrete and soil.

(2) Apply rule to a wider group of materials to also include other materials under license including sludge, sewage, wood, glass, and others.

(3) Apply rule to a select group of materials (Alternative 1) and conduct rulemaking on other materials in Item 2 at a later time.

Specific Items for Discussion.

(1) Should the NRC proceed with a rulemaking covering all materials, with the option of conducting further rulemaking at a later time for certain of the materials if the impact is too great?

i) Is it appropriate to proceed with just certain materials, including steel, aluminum, copper, concrete, and soil, so that rulemaking can be done in a timely manner using the information developed for these materials in NUREG-1640 as input to the environmental analyses and regulatory analyses, needed to support a rulemaking? Would experience gained with the rule on steel, aluminum, copper, concrete, and soil, be useful in dealing with other materials later?

ii) Would issuing a rule now for only certain materials noted in Alternative #1 limit NRC's capability to deal effectively with requests for release that could be made in the future for other materials? Other similar materials, such as sludges, slag, asbestos, etc., could also potentially be the subject of requests for release. To help answer that question, how many and what types of materials are licensees actually requesting release for today?

iii) Should the NRC perform additional analyses at this time of individual doses resulting from other materials potentially available for release to support rulemaking decisions for these materials even if it impacts the schedule for rulemaking for release of steel, aluminum, copper, and concrete?

(2) What other materials would be the candidates for rulemaking? Do analyses for these materials currently exist?

(3) If the NRC proceeds with rulemaking limited to certain materials indicated in

Alternative 1, how should it handle requests for release of other materials, i.e., should it proceed with a subsequent rulemaking for other materials, and, if so, how and when should it proceed with this later rulemaking? Should the additional materials be released under existing guidelines until the subsequent rule is developed, or should the release of these materials be postponed until a rulemaking is conducted?

(4) What are the implications for Alternatives 1, 2, and 3, i.e., what would be associated costs, effective survey methods for different materials, and dose impacts of the alternatives?

(5) Should the NRC rulemaking be extended to cover materials at DOE facilities? If so, how should that be done?

Dated at Rockville, Maryland, this _____ day of _____ 1999.

For the Nuclear Regulatory Commission
William D. Travers,
Executive Director for Operations.

ATTACHMENT 3

D R A F T
(For SECY paper)

NRC SEEKS PUBLIC COMMENTS ON ISSUES RELATED
TO RELEASE OF SOLID MATERIALS FROM LICENSED FACILITIES

The Nuclear Regulatory Commission is seeking public comment on issues associated with the release of solid materials having very small amounts of residual radioactivity.

The agency is considering revising its regulations to establish requirements for release of these materials. The NRC currently decides on licensee requests for release of solid materials on a case-by-case basis, although it already has release limits in place for air and liquid emissions.

A document entitled "Issues Related to Release of Solid Materials from Licensed Facilities" will be published shortly in the *Federal Register*. NRC is issuing it to foster public discussion about the issues and alternatives involved before the start of any formal rulemaking process. Copies of the paper will also be available from Roberta Gordon, Rulemaking and Guidance Branch, U.S. Nuclear Regulatory Commission 20555, 301/415-7555, and electronically from the NRC's Internet web page at <http://www.nrc.gov/about-nrc/regulatory/rulemaking.html>.

The issues paper is also intended as a starting point for discussion at four public meetings to solicit early public input on major issues associated with the release of solid materials. NRC plans call for the meetings to be held in August through November. Specific dates and locations will be announced later.

1. For example, 10 CFR 20.2005, 35.92, and 36.58(e).