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To: OWFN_DO.owf5_po(SECY)
Date: Tue, Dec 21, 1999 10:32 AM
Subject: Release of Solid Materials at Licensed Facilities

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Attention: Rulemaking and Adjudications staff.

I have attached four documents each responding to many of the questions posed in each of the four issues posed in Federal Register Notice dated June 30, 1999, titled 10 CFR 20 Release of Solid Materials at Licensed Facilities: Issues Paper, Scoping Process for Environmental Issues, and Notice of Public Meetings. My response is in bold capital letters following the question or phrase within the issues papers.

My comments can be summarized as follows:

- 1) The scrap metal industry and the public do not want contaminated materials released for unrestricted use;
- 2) DOE appears to be the major proponent of the release of solid materials;
- 3) The public is willing to accept only zero dose from any involuntary exposure due to the release of contaminated solid material, or for that matter from any radiation source from which the exposure is involuntary;
- 4) An alternative to the proposed rule making is a revision of Reg. Guide 1.86. Reg Guide 1.86 has worked quite well for years now or it would have been revisited and changed a long time ago.

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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 meetings. The discussions at the public meetings 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? YES. THE CURRENT CRITERIA IN REG. GUIDE 1.86 IS DETECTION BASED NOT DOSE BASED. PART 20 CRITERIA FOR RELEASE OF OTHER MATERIALS AND STRUCTURES IS DOSE BASED.

As discussed in Section A.1.1, NRC generally uses the 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 THIS APPROACH IS CERTAINLY WORKABLE USING REG. GUIDE 1.86. IT HAS WORKED FOR MANY YEARS NOW AND WOULD CONTINUE TO WORK. THE LIMITATION PRIMARILY OF REG GUIDE 1.86 IS THAT IT DOES NOT ADDRESS VOLUMETRIC CONTAMINATION OF SOLID MATERIALS.**

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 Procedure Act, and developing, as regulatory bases, an environmental analysis 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? **IF NRC IS TO ADVANCE ITS GOAL OF A COORDINATED, COMPATIBLE, AND ADEQUATE NATIONAL RADIATION PROTECTION PROGRAM THEN IT SHOULD PROCEED TO ESTABLISH GENERIC CRITERIA FOR RELEASE OF SOLID MATERIALS.** What are the considerations that should go into making this a decision? **THE PRIMARY NON-TECHNICAL ISSUE OF THE PUBLIC'S ACCEPTANCE OF INVOLUNTARY RISK OR PERCEIVED RISK.**

(1) Does the current system of NRC case-by-case decisions on release of solid materials, using existing guidance, provide an adequate regulatory framework? **I THINK IT DOES. IF IT DID NOT REG GUIDE 1.86 WOULD HAVE BEEN MODIFIED YEARS AGO.** 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? **TECHNICALLY IT COULD BE PROTECTIVE OF PUBLIC HEALTH AND SAFETY. THE ISSUE IS THE PUBLIC'S ACCEPTANCE OF RISK OR PERCEIVED RISK OVER WHICH THEY BELIEVE/FEEL THEY HAVE NO CONTROL.** If a rule is not issued, should Regulatory Guide 1.86 be updated with a set of dose-based values? **THAT WOULD BE AN IMPROVEMENT OVER THE CURRENT GUIDE. ALTERNATIVELY ADD TO REG GUIDE 1.86 CRITERIA FOR RELEASE OF VOLUMETRICALLY CONTAMINATED MATERIALS.**

(2) Should the NRC develop dose-based regulations on release of solid material? **IF NRC IS TO ADVANCE ITS GOAL OF A COORDINATED, COMPATIBLE, AND ADEQUATE NATIONAL RADIATION PROTECTION PROGRAM THEN IT SHOULD ESTABLISH GENERIC CRITERIA FOR RELEASE OF SOLID MATERIALS.** 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? **NO**

DOUBT LICENSEE NEEDS COULD BE ADDRESSED IN AN EXPLICIT AND CONSISTENT MANNER. FOR PUBLIC CONCERNS TO BE ADDRESSED IT IS IMPERATIVE THAT THE PUBLIC UNDERSTAND THAT AN EXPLICIT AND CONSISTENT REGULATORY APPROACH WOULD BE MORE PROTECTIVE OF PUBLIC HEATH AND SAFETY THAN THE CURRENT CASE-BY-CASE METHOD OF EVALUATING RELEASE OF SOLID MATERIALS. Would a rule also meet additional specific regulatory needs such as the specific types of material to be covered, restricted vs. unrestricted use, etc? IN READING THIS ISSUE PAPER IT APPEARS NRC IS INTENT ON INFINITELY SUBDIVIDING THE UNIVERSE OF SOLID MATERIALS THAT SOME DAY MIGHT POSSIBLY BE THE SUBJECT OF A REQUEST FOR RELEASE. I BELIEVE A LIMITED NUMBER OF MATERIALS SHOULD BE SPECIFICALLY ADDRESSED IN A RULEMAKING AND GENERIC CRITERIA ESTABLISHED FOR THE MYRIADS OF MATERIALS USED IN FACILITIES. THE GENERIC CRITERIA SHOULD ALSO ADDRESS CRITERIA FOR RESTRICTED AND UNRESTRICTED USE. KEEPING IN MIND THAT ANY UNRESTRICTED USES INCLUDE THE PUBLIC'S ACCEPTANCE OF INVOLUNTARY RISK.

(3) To what extent would such a rule contribute to maintaining public safety, CONSISTENCY IN THE NATIONAL RADIATION PROGRAM enhancing the effectiveness and efficiency of the NRC, LICENSEES AND NRC STAFF WOULD KNOW THE EXPECTATIONS FOR RELEASE OF SOLID MATERIALS AND ACCEPTABLE METHODS FOR DETERMINING WHETHER THE RELEASE STANDARDS ARE MET WITHOUT REINVENTING THE PROCESS FOR EVERY REQUEST building public confidence, NRC CAN ONLY BEGIN BUILDING PUBLIC CONFIDENCE WHEN NRC UNDERSTANDS THAT THE PUBLIC WILL ONLY ACCEPT INVOLUNTARY RISK OR PERCIEVED RISK THAT IS ZERO and reducing unnecessary regulatory burden? KEEP LICENSEES FROM REINVENTING THE PROCESS OVER AND OVER AGAIN WITH EACH REQUEST TO RELEASE SOLID MATERIALS.

(4) 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? THIS QUESTION IS FOR NRC LICENSEES. I WOULD THINK PROBABLY NOT.

(5) 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? FROM A SMALL/MEDIUM AGREEMENT STATE PERSPECTIVE WITH LIMITED PROJECTED NEED FOR THE RULE, PROBABLY NOT.

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 No.1 is to conduct a rulemaking to include requirements in Part 20 on release of solid material, a rulemaking (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 0.1 mSv/yr (10 mrem/yr), 0.01 mSv/yr (1 mrem/yr), 0.001 mSv/yr (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, lifestyle, and other factors, and averages about 3 mSv/yr (300 mrem/yr) but may vary from 1 to 10 mSv/yr (100 to 1000 mrem/yr); **THESE ARE VOLUNTARY RISK** (b) NRC's public dose limit is 1 mSv/yr (100 mrem/yr), (c) the dose from use of recycled coal ash in concrete block as permitted by EPA can be about 3 percent of natural background (about 0.1 mSv/yr (10 mrem/yr)), (d) a person receives 0.1 mSv (10 mrem) on a round-trip coast-to-coast flight, **AGAIN A VOLUNTARY RISK** and (e) 0.01 mSv/yr (1 mrem/yr) is a level which the National Council of Radiation Protection and Measurements (NCRP) considers a trivial risk. In addition, a 0.01 mSv/yr (1 mrem/yr) value is also the level being considered for release for unrestricted use (or "clearance") in the European community. **I WOULD RECOMMEND LOOKING AT THE NCRP'S 1MREM/YR ESPECIALLY SINCE THAT WOULD ALSO BE CONSISTENT WITH THE EUROPEAN COMMUNITY. NRC JUST MIGHT BE ABLE TO MAKING A CONVINCING CASE THAT IT UNDERSTANDS THE PUBLIC UNWILLINGNESS TO ACCEPT ANY INVOLUNTARY RISK.**

(2) Restrict release of solid materials to only certain authorized uses (see more detail in Issue No. 3). **THIS MAY HAVE SOME MERIT ESPECIALLY FOR SOME MATERIALS OR SOME MORE HEAVILY CONTAMINATED MATERIALS.**

(3) Do not permit either unrestricted or restricted release of solid material that has 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. **JUST BECAUSE THE MATERIAL HAS BEEN IN AN AREA WERE RADIOACTIVE MATERIAL HAS BEEN USED OR STORED DOES NOT AUTOMATICALLY MEAN**

THAT IT IS CONTAMINATED. SURVEY HISTORY OF THE FACILITY AND SURVEYS FOR SURFACE CONTAMINATION SHOULD BE CONSIDERED. USING THIS ALTERNATIVE, WHICH DOES NOT SEEM TO BE VERY COST EFFECTIVE, WITHOUT CONDITIONS USES A LOT OF LLW DISPOSAL FACILITY SPACE UNNECESSARILY.

(4) Other alternative(s)--Other appropriate alternatives may be determined during the rulemaking process.

(5) Other decision making factors, (i.e., non-dose based criteria).

Factors in Decision making

Principal factors in making decisions regarding the alternatives include human health and environmental impacts, cost-benefit considerations, impacts on other industries, resource conservation, 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, impacts on radiation sensitive industries, 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 impacts associated with mining, fabrication, 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.

NRC recently published a draft report for comment on radiological assessments for clearance of equipment and materials from nuclear facilities, NUREG-1640 (2 volumes). The report provides dose factors for both surficial and volumetric radioactivity and compares them with results from Regulatory Guide 1.86 and from EPA values, European Community recommended clearance levels and IAEA draft clearance levels.

Most of the aforementioned policies, guidelines, recommendations and standards are dose based and thus are intended to be protective of public health and safety. In addition to protection of public health and safety, the U.S. Atomic Energy Act, as amended, also charges the NRC with protection of property. Some industries may be adversely affected by materials that are cleared based upon dose based standards because of sensitivity to radiation effects from the cleared

material e.g., the film and electronic industries and the metal recycling industry which performs radiation monitoring of metal scrap to detect and protect itself from radioactive sources accidentally mixed with scrap.

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 report similar to NUREG-1640 which is accessible on EPA's website at <http://www.epa.gov/radiation/cleanmetals/publications.htm>. While some of the analysis and approaches in 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 that require Federal agencies, in their rulemakings, to 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 licensed facilities, as well as surveys at non-licensed facilities that may use or receive released solid materials, to verify that permissible release levels have been met; (2) the potential for having to respond to contamination alarms at facilities handling released material; (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. The ability to measure radioactivity depends on both the amount and type of radioactive material. In particular, a rulemaking alternative that would require survey instrumentation to verify that there is no dose above natural background could be extremely difficult, if not impossible, to implement because of the variation in natural background and the limited capability of field survey instruments to detect such low levels.

Other international, national, and State standards: In considering rulemaking alternatives, the NRC would also consider requirements, guidelines, 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 individual dose level is acceptable regarding release of solid materials from licensed facilities for unrestricted use? **AS STATED IN ISSUE # 1 NCRP'S 1 MREM/YR SHOULD BE AN ACCEPTABLE STANDARD.** Should release of solid materials for unrestricted use be permitted at a dose level (for example, 0.1, 0.01, or 0.001 mSv/yr [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? **ALSO AS STATED IN ISSUE # 1 THE PUBLIC IS NOT ACCEPTING OF ANY INVOLUNTARY EXPOSURE ABOVE BACKGROUND** Or, should release of solid materials not be permitted if they are potentially contaminated from the use of licensed radioactive material? **JUST BECAUSE THE MATERIAL HAS BEEN IN AN AREA WERE RADIOACTIVE MATERIAL HAS BEEN USED OR STORED DOES NOT AUTOMATICALLY MEAN THAT IT IS CONTAMINATED. SURVEY HISTORY OF THE FACILITY AND SURVEYS FOR SURFACE CONTAMINATION SHOULD BE CONSIDERED.**

(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, such as 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 be exposed.

(ii) In considering other environmental impacts, what impacts, both radiological and non-radiological, 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 non-radiological 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? To what extent is there a potential that a single scrap facility would handle inputs of

released solid materials from several different licensed facilities? **THE POTENTIAL IS PROBABLY QUITE HIGH. SCRAP IS OFTEN COLLECTED BY SMALL OPERATORS WHO DELIVER AND SELL THE SCRAP TO REGIONALLY LOCATED SCRAP RECYCLERS WHO THEN SELL THE SCRAP TO REPROCESSORS. THE RECYCLERS AS WELL AS THE REPROCESSORS ACQUIRE SCRAP FROM SIZABLE GEOGRAPHIC AREAS, MANY TIMES FROM BEYOND THE STATE IN WHICH THEY ARE LOCATED..**

(4) What societal impacts should be considered and how should they be factored into the environmental evaluation? **SOCIETY'S ACCEPTANCE OF THE RISK IS GOING TO BE PIVOTAL.** 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.

(5) How should the impacts upon industries that have special concerns about the presence of radioactivity in materials, e.g., film, electronic, and metal recycling, be considered and factored into decision making? **THE METAL RECYCLING INDUSTRY HAS ALREADY EXPERIENCED CONSIDERABLE EXPENSE DUE TO RADIOACTIVE MATERIAL IN SCRAP. ANY RELEASE OF SOLID MATERIALS THAT INCREASES THEIR VULNERABILITY AND FISCAL BURDEN SHOULD BE AVOIDED. JUST BECAUSE ONE INDUSTRY HAS SPENT LARGE SUMS OF MONEY DEALING WITH UNWANTED RADIOACTIVE MATERIAL IT DOES NOT MAKE SENSE TO SPREAD THE BURDEN TO OTHER INDUSTRIES WITH RELEASE OF SOLID MATERIAL FOR UNRESTRICTED USE. THIS IS TO BE AVOIDED.**

(B) Cost-benefit Considerations

(1) As noted above, Executive Order 12291 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? **THE ENVIRONMENTAL IMPACTS WIN EVERY TIME!**

(2) What are the major economic costs associated with release of solid materials into commerce? **PURCHASE OF RADIATION DETECTION INSTRUMENTATION TO HELP INSURE THAT UNWANTED RADIOACTIVE MATERIAL IS NOT RECEIVED; TRANSPORTATION COST OF RETURNED SHIPMENTS; DISPOSAL COST BY THIRD PARTIES (AND THERE WILL BE EVEN THOUGH THE MATERIAL WAS**

RELEASE FOR UNRESTRICTED USE)

(3) What are the major economic costs associated with landfill disposal of material released for unrestricted use? **TRANSPORTATION OF RETURNED MATERIAL IN WHICH RADIOACTIVE MATERIAL WAS DETECTED. LANDFILLS IN GEORGIA ARE PROHIBITED FROM ACCEPTING RADIOACTIVELY CONTAMINATED WASTE.** Would problems be encountered in this material going to a landfill? **THE LANDFILL OPERATORS WOULD NOT ACCEPT THE WASTE. TO DO SO WOULD BE A VIOLATION OF THEIR ENVIRONMENTAL PERMIT.**

(4) What economic risks are associated with release of solid materials for unrestricted use? **CLEAN-UP AND DISPOSAL COST RESULTING FORM THE MELTING OF A RADIOACTIVE SOURCE.** 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 radiation survey at that point? **IT HAPPENS DAILY!! THIS INDUSTRY HAS BEEN BURNED TOO MANY TIME ALREADY.** What means could minimize such economic risks? **RELEASING THE MATERIAL TO A LICENSED FACILITY.**

(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? **RECYCLING OF THE RADIOACTIVE GOLD SEED IN THE 1920'S/1930'S MAY BE A GOOD MODEL FOR THE WAY MATERIAL CAN BE RECYCLED IN THE ENVIRONMENT. ADD TO THE MODEL THE INTRODUCTION OF NEW MATERIAL EACH YEAR AND YOU SHOULD BE ABLE TO GET AN ESTIMATE OF THE POTENTIAL FOR BUILDUP IN COMMERCE OVER TIME.** should such a buildup be estimated? **YES** 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? **THE POTENTIAL IS PROBABLY GREAT, FOR PUBLIC CONCERN IF NOTHING ELSE.**

(C) **Implementation Considerations**

(1) What is the capability of surveying 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? **?????** Are these survey capabilities readily available to licensees? **????** Should there also be provisions for survey capability at receiving facilities and what should be the nature of those provisions? **ONLY FOR LICENSEES WHO RECEIVE CONTAMINATED SOLID MATERIAL. NON-LICENSEES SHOULD NOT HAVE TO BE BURDENED WITH PURCHASING DETECTION EQUIPMENT TO PROTECT THEMSELVES. IF THEY HAVE TO THE REGULATORY SYSTEM HAS LET THEM DOWN.** 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? **NO.**

(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? **YES, VIA ROUTINELY CONDUCTED SURVEYS WHICH WERE CONDUCTED DURING THE PLANTS OPERATIONAL PHASE.**

(3) How should criteria for release of solid material be incorporated into NRC's regulations, i.e., should they be expressed as a dose criteria and/or be expressed as concentration values in different media based on specified dose objectives and standard models for exposure? **YES, A DOSE BASED CRITERIA AND WHERE APPROPRIATE AS CONCENTRATION VALUES IN LIMITED MEDIA BASED ON A SPECIFIED DOSE OBJECTIVE AND STANDARD MODELS FOR EXPOSURE.**

(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.? **NRC ADOPTED REGULATIONS SHOULD BE COMPATIBLE.** How should efforts by the EPA to set import screening guidelines be considered? **????**

(b) How should guidelines of other U.S. agencies, e.g., DOE and EPA, be considered? **YES, THEY SHOULD BE CONSIDERED AND NRC'S CRITERIA FOR RELEASE OF SOLID MATERIAL SHOULD NOT ADD APPRECIABLY TO THE POTENTIAL FOR ADDITIONAL EXPOSURE OF THE PUBLIC.** To what degree should standards set by NRC be consistent with other EPA standards, such as those for recycled coal ash (see Section A.2.2.3)? **EPA ALLOWS AN EXPOSURE OF APPROXIMATELY 3% OF BACKGROUND (10 MR/YR) ASSUMING NRC USED NCRP TRIVIAL AMOUNT OF EXPOSURE THE NRC CRITERIA WOULD BE 1MR/YR .** With regard to issues of finality of NRC licensing decisions, what potential problems could occur if EPA later issues standards for release of solid materials different from an NRC regulation? **VERY EXPENSIVE SECOND ROUND CLEAN UPS IF EPA'S STANDARDS ARE MORE RESTRICTIVE THAN NRC RULES.**

(c) How should recommendations made by U.S. standards setting bodies, such as the National Council on Radiation Protection and Measurements (NCRP), be considered? **CONSIDERED AND INCORPORATED INTO NRC REQUIREMENTS WHEN APPROPRIATE TO THE MISSION OF NRC. IN THIS CASE NCRP'S TRIVIAL DOSE SEEMS TO FIT NICELY WITH NRC'S MISSION.**

(d) How should standards set by U.S. industry groups, such as the American National Standards Institute (ANSI), be considered? **CONSIDERED AND INCORPORATED INTO NRC REQUIREMENTS WHEN APPROPRIATE TO THE MISSION OF NRC.** Are industry standards currently available, or anticipated during the time frame for this rulemaking, that could be adopted in lieu of or in addition to NRC requirements on release of solid materials? ??????????

(e) Should NRC simply adopt the standards in 1(a), 1(b), or 1(c), and their associated health risk level, rather than conduct analyses of its own? **NRC IS GOING TO HAVE TO CONDUCT THEIR OWN ANALYSIS OTHERWISE THE OPPORTUNITY TO TAKE THOSE STEPS TOWARD BUILDING PUBLIC TRUST ARE LOST. IF NRC'S ANALYSIS SUPPORTS NCRP'S TRIVIAL EXPOSURE SOME PUBLIC CREDIBILITY MAY BE GAINED.**

(f) What are the economic and other impacts of having NRC standards different from standards that may be set by international agencies, EPA, or other national bodies? **\$\$\$ AND MORE \$\$\$ AND RED TAPE AND AGGRAVATION.**

(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 CATEGORY "C".** Compatibility refers to the extent to which Agreement State radiation control programs are consistent with NRC's program for the regulation of Atomic Energy Act radioactive materials to ensure that an adequate and coherent nationwide effort is collectively established for regulation of such materials.

(2) Should existing NRC standards, including the public dose limit of 1 mSv/yr (100 mrem/yr) in 10 CFR 20.1301, and Subpart E of Part 20 which contains a dose criterion of 0.25 mSv/yr (25 mrem/yr) for release of decommissioned structures and lands, be considered in setting allowable doses for release of solid material for unrestricted use? **NO, BECAUSE THE EXPOSURE TO RELEASED SOLID MATERIAL IS INVOLUNTARY WHILE EXPOSURE AT DECOMMISSIONED STRUCTURES AND LANDS IS VOLUNTARY.** 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 0.25 mSv/yr (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 in an 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 slightly contaminated solid material from nuclear facilities to disposal at municipal solid waste landfills. Solid material with higher levels of radioactive contamination would continue to be handled as radioactive waste and be disposed of at licensed facilities. 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 the recycling 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 State and local governments 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 use restriction, but it could be removed from the landfill and sold as scrap or reused.

Items for Discussion

(1) Should the NRC consider restrictions on future use of solid materials as an alternative to unrestricted use (similar to the license termination rule)? **YES, AND PRIMARILY THOSE MATERIALS WITH HIGHER LEVELS OR CONCENTRATIONS OF CONTAMINATION.**

(2) If so, what types of restricted uses should be considered? **RESTRICT THE USE TO NON-PRIMARY CONSUMERS PRODUCTS. YOUR EXAMPLES OF STEEL I-BEAMS ARE GOOD EXAMPLES. OTHER EXAMPLES, CONTAMINATED METAL MADE INTO LOW LEVEL WASTE DISPOSAL CONTAINERS, WOOD PRODUCTS RECYCLED TO CARDBOARD USED IN COMMERCIAL PACKAGING, AND COPPER RECYCLED INTO ELECTRICAL WIRES USED FOR OTHER THAN RESIDENTIAL AND OFFICE APPLICATIONS.**

(3) What types of controls could restrict use to assure that the material would not be released for unrestricted use? **TRANSFER TO AUTHORIZED RECIPIENTS.** Would these controls be reasonable? **SURE, FOR EXAMPLE THE NUCLEAR POWER INDUSTRY COULD SET UP COMPANIES SPECIFICALLY TO RECYCLE SCRAP FROM THEIR FACILITIES. THAT WAY THE NUCLEAR POWER INDUSTRY COULD MAINTAIN CONTROL TO ENSURE THE APPROPRIATE DISPOSITION OF THE PRODUCTS FROM RECYCLE.** Would it be necessary to license processing of the material for the first use in order to assure protection of public health and safety? **THAT VERY WELL MAY BE THE CASE, ESPECIALLY FOR THE MORE CONTAMINATED MATERIALS AND COULD BE HANDLED AS JUST STATED.** 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? **YES,** 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? **OR THE NRC EXERCISES JURISDICTION VIA THE NUCLEAR POWER COMPANIES AS DISCUSSED ABOVE.**

(4) How long would the use be restricted? **IT WOULD DEPEND ON THE HALF-LIFE OF THE ISOTOPE, BUT FOR SHORT AND MEDIUM HALF-LIFE ISOTOPES THROUGH THE FIRST USE AS LONG AS FIRST USE LIFE TIME IS TYPICALLY APPROXIMATELY TEN HALF LIVES.** What radionuclides, and associated time periods for radioactive decay, would be reasonable to consider as candidates for restricted use? **COBALT 60 FOR 50 YEARS, CESIUM 137 IN LESSER CONCENTRATIONS FOR 50 TO 60 YEARS. THE RULE HERE BEING THAT AT THE END OF ITS USEFUL LIFE THE CONCENTRATION WOULD BE NO GREATER THAN THAT RELEASED**

INITIALLY. I.E., WOULD NOT INCREASE THE RADIATION EXPOSURE TO THE PUBLIC MORE THAN 1 MREM ABOVE BACKGROUND, ASSUMING THE NCRP TRIVIAL RISK IS FOLLOWED IN THE RULE MAKING. IF OTHER EXPOSURE IS ASSUMED THEN USE IT. What would happen to the material when it reached the end of its useful restricted life? RELEASE FOR UNRESTRICTED USE

(5) If restrictions were placed on future use of materials, would the NRC need to be involved in continued regulation or tracking of the material? **ONLY UP UNTIL FIRST USE.** Would States need to be involved? **STATES WOULD HAVE TO BE KNOWLEDGEABLE OF THE USE/LOCATIONS OF USE TO RESPOND TO ANY CONCERNS EXPRESSED BY THEIR CITIZENS.** 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? **AS NOTED THE SUBPART E OF 10 CFR PART 20 SHOULD BE WORKABLE.** 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 should there be in decisions concerning restricted use of materials? Should it be similar to the method used in the license termination rule where licensees are required to seek advice from affected parties when proposing a site for restricted use? Note that Subpart E of 10 CFR Part 20 (Section 20.1403) also contains requirements for licensees to 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 and uses. Can a meaningful public involvement process be developed for setting restrictions on future material use in specific licensing cases? **I DOUBT IT!!**

(7) How should considerations and predictions of future public uses of materials and the restrictions on those materials be developed to provide credible approaches for restricted use?

(8) What dose should be permitted for material released for restricted use? **1 MREM/YEAR. I.E. NCRP'S TRIVIAL RISK** Should the same alternative dose levels as for unrestricted use (see Issue No.2) also be considered for restricted use, or should some other value, either higher or lower, be considered? **YES.** 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, provided the controls remain effective.

(9) What specific problems are associated with restricting materials to landfill disposal? **REGULATORY PROBLEMS WITH LANDFILL PERMITS; PUBLIC PERCEPTION OF THE GOVERNMENT AND INDUSTRY CONTAMINATING THE ENVIRONMENT.**

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 also to represent most of the volume of slightly contaminated material available for release from NRC-licensed facilities into the public sector, other than soil.

(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 slightly contaminated materials potentially available for release.

Alternatives

Alternative rule approaches could be that the rule would apply to--

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

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

(3) a select group of materials (Alternative 1) and conduct rulemaking on other materials in Alternative 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 materials if the impact to all affected parties, including the regulators, is too great or the analysis too complicated or time consuming?

BITING OFF A SMALL PORTION AT A TIME MAY BE LESS PAINFUL FOR NRC AND GIVE NRC MUCH NEEDED EXPERIENCE IN RULE MAKING WHERE THE RULE MAKING IS FIRST AND FOREMOST SENSITIVE TO THE PUBLIC'S PERCEIVED RISK. A STRAIGHT TECHNICALLY VALID RULE MAKING WILL END IN FAILURE AND POSSIBLY CONGRESSIONAL INTERVENTION ONCE AGAIN.

(i) Is it appropriate to proceed with 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, and associated analyses as described above, as input to the environmental analyses and regulatory analyses? **THIS MAY MAKE SENSE FROM A PURELY TECHNICAL PERSPECTIVE, BUT IF THE PUBLIC'S PERCEIVED RISK IS NOT PARAMOUNT IN THE RULE MAKING THEN PROCEEDING WITH EITHER LIMITED MATERIALS OR A MUCH BROADER LISTING OF MATERIAL WILL FAIL.** Would experience gained with the rule on steel, aluminum, copper, concrete, and soil be useful in evaluating requirements for release of other materials later? **IF THAT EXPERIENCE INCLUDES THE PUBLIC'S PERCEIVED RISK THEN, YES.**

(ii) Would issuing a rule now for only certain materials noted in Alternative No.1 limit NRC's capability to deal effectively with requests for release that could be made in the future for other materials? **PROBABLY, BECAUSE THE FOLLOWING LISTED MATERIALS ARE NOT PERCEIVED TO BE SIMILAR TO METALS AND WOOD. THESE MATERIALS WOULD BE PERCEIVED AS HAVING A GREATER POTENTIAL FOR CONTAMINATING THE ENVIRONMENT.** 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 or are anticipated over the next decade?

(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? **WHAT DOES IT MATTER IF NRC DOES NOT ENTER A RULE MAKING WITH THE PUBLIC'S PERCEIVED RISK FIRST AND FOREMOST IN ITS MIND.**

(2) What other materials would be the candidates for rulemaking? Do analyses for these materials currently exist or are they under development?

(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? **NO NRC SHOULD NOT PROCEED WITH A SUBSEQUENT RULEMAKING FOR THESE OTHER MATERIALS.** 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? **THE RELEASE OF MATERIAL SHOULD BE DONE UNDER EXISTING GUIDELINES.** If the rulemaking establishes dose objectives for release and implements those objectives through tables of values for specific materials, should the dose objective also be used to guide case-specific release of other materials through licensing actions or exemptions? **THAT WOULD BE ADDITIONAL INFORMATION AVAILABLE AND IT WOULD BE PRUDENT TO USE IT IN CONJUNCTION WITH CURRENT GUIDELINES.**

(4) What would be the associated costs, effective survey methods, and dose impacts of the alternatives? ??????

(5) Should the NRC rulemaking be extended to cover materials that may be released from nuclear facilities operated by the DOE? **YES. DOE EXIST IN THE SAME WORLD WIDE ECOSYSTEM AS NRC AND AGREEMENT STATE LICENSEES. WHY IGNORE THE CONTRIBUTION TO THE ENVIRONMENT OF THE CONTAMINATED MATERIALS THAT MAY BE RELEASED FORM DOE FACILITIES?**