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NUCLEAR ENERGY INSTITUTE

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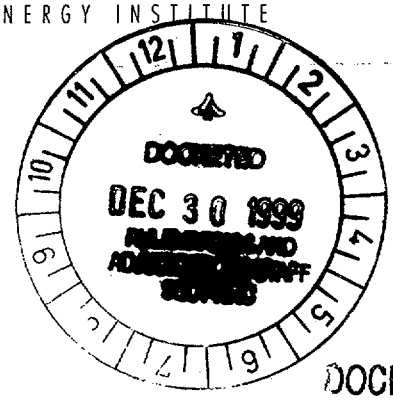


December 22, 1999

Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

DOCKET NUMBER
PROPOSED RULE PR 20
(64FR35090)

**ATTN:** Rulemaking and Adjudication Staff

**SUBJECT:** Release of Solid Materials at Licensed Facilities: Issues Paper, Scoping Process for Environmental Issues, and Notice of Public Meetings -- 64 *Federal Register* 35090 -- June 30, 1999

Dear Madam:

The Nuclear Energy Institute[1] (NEI) is pleased to comment on the aforementioned paper in response to a request for public and stakeholder input in an October 19, 1999 *Federal Register* notice. The comment period for this document was extended to December 22, 1999 (64 *Federal Register* 56274).

Nuclear energy provides 20% of our nation's electricity without producing $SO_x$, $NO_x$, $CO_2$[2] and other chemical compounds that contribute to acid rain, ozone, haze, greenhouse effects and other environmental concerns. Radioactive materials are used in the diagnosis and treatment of over 10 million Americans annually. Researchers also use radioactive materials to find cures for debilitating diseases such as AIDS and cancer.

Nuclear technologies provide significant economic and employment benefits to the United States. An economic study[3] conducted in 1995 by the Management Information Services, Inc., found that these benefits nationally produced 4.4 million jobs, $421 billion in sales, and $79 billion in tax revenues to federal, state and local governments.

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[1] NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

[2] Calculations utilizing Energy Information Administration (EIA) generation data indicate the nuclear energy production in this country from 1973-1998 have avoided the atmospheric discharge of 39.5 million short tons of $NO_x$, 90.5 million short tons of $SO_x$, and 2,363.8 million metric tons of carbon.

[3] The Untold Story: The Economic Benefits of Nuclear Technologies. Prepared by Management Information Services, inc. for Organizations United. P.O. Box 65766, Washington D.C. 20035.

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jobs, $421 billion in sales, and $79 billion in tax revenues to federal, state and local governments.

Operators of nuclear facilities that provide these benefits must move materials and equipment in and out of these facilities on a routine basis. The clearance of potentially contaminated solid materials constitutes a current and on-going concern for existing operations.

The Nuclear Regulatory Commission (NRC) currently regulates the release of potentially contaminated solid materials through a combination of inconsistent regulations[4], guidance[5], and through case-by-case exception. Although this approach ensures public protection, it does not provide the clear, consistent regulation that exists for controlling release of potentially contaminated liquid and gaseous effluents from such facilities.

The NRC is considering a rulemaking to set standards for the clearance and release of solid materials and equipment having residual radioactivity. NEI commends this NRC initiative and recommends development of a dose-based standard for the release of potentially contaminated solid materials from nuclear facilities. The standard should be dose-based to account for the radiological characteristics of the released material with a clear nexus to public health. It should also be risk-informed, practical and measurable so as to be meaningful to the public and easily implemented by the industry without undue burden. A clearance standard in the range of a few mrem/year would meet these criteria.

For perspective, the Environmental Protection Agency (EPA) has determined that a radiation dose of up to 4 mrem/year from our drinking water is "safe" and up to 10 mrem/year from the air we breath is "clean." The EPA has also approved the recycling of fly ash as an additive for concrete. All federal construction projects require the use of fly ash in concrete to promote the recycling of this material.

EPA found that the addition of fly ash to concrete used for building construction could result in an increase in dose to members of the public who reside or work in those buildings. This increased public exposure is due to natural radionuclides concentrated in the fly ash and could result in exposures of 10 mrem/year. Although these public exposures are 10 times higher that the clearance levels proposed by International Atomic Energy Agency (IAEA) and the European Commission, EPA determined that the benefits of recycling this material outweighed the potential public dose.

The NRC clearance standard should be developed in a formal rulemaking process with full opportunity for stakeholder involvement. NEI recognizes the efforts already expended by the agency to ensure ample opportunity for public input early in the process. If the NRC ultimately develops a clearance standard, it must be unequivocal in its support of the standard as being safe and fully protective of

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[4] See SECY-99-098, Publication of Issues Paper on Release of Solid Materials (Clearance), section A.1 Current NRC Policies.

[5] See IE Circular No. 81-07: Control of Radioactively Contaminated Material and IE Information Notice No. 85-92: Surveys of Wastes Before Disposal from Nuclear Reactor Facilities.

advocacy for the protectiveness of NRC regulations, public trust and confidence will be impaired.

NRC's technical basis document, draft NUREG-1640, focuses on the recycling of metals and the recycling or disposal of concrete. Iron and steel recycling issues have also dominated all four public workshops. NEI consistently stated that the vast majority of our members activities involve materials in the form of tools and equipment released for reuse or waste materials released for disposal in industrial or municipal landfills. Only during decommissioning will significant amounts of metal be available for release, and these metals can be aggressively cleaned and monitored prior to release.

Further, the international implications of a clearance standard, in particular for steel recycling must also be considered. Any clearance standard developed by the NRC should be harmonized with international standards to avoid any adverse impacts on world trade. NRC should continue to work closely with the International Atomic Energy Agency (IAEA) and should incorporate international standards and existing research into its deliberations on an appropriate standard.

NRC should set aside draft NUREG-1640 during the implementation of a standard and endorse ANSI N13.12, "Surface and Volume Radioactivity Standards for Clearance," as a Regulatory Guide if found acceptable. This voluntary consensus standard is endorsed by the Health Physics Society, is consistent with the philosophy and approach of the IAEA, and should be considered by the NRC as was intended by Public Law 104-113 *"National Technology and Transfer Act of 1995"* and by the OMB Circular A-119, *"Federal Participation in the Development and Use of Voluntary Consensus Standards."*

NEI has established an Executive Task Force to solicit input from its industry members on this important topic. The attached comments reflect the Task Force's input and perspective gained from participation in all four of the NRC-sponsored public workshops.

Thank you for the opportunity to comment on this very important issue. If you have any questions, please contact me at (202-739-8109) or Paul Genoa at (202) 739-8034.

Sincerely,

Lynnette Hendricks

Lynnette Hendricks
LXH/

Enclosure: Discussion of Issues Associated with the Release of Solid Materials at Licensed Facilities

# Comments of the Nuclear Energy Institute
# On NRC Issues Paper:
# Releases of Solid Materials at Licensed Facilities

## B. Issues for Discussion

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

**Response:** Yes.

During the operation and decommissioning of nuclear facilities, personnel, materials and equipment enter and depart the facility on a routine basis. Criteria to support licensee evaluations regarding the clearance of potentially contaminated solid materials are a fundamental component of the basic infrastructure necessary to support the beneficial uses of nuclear technology.

Although the existing criteria provided in various NRC regulations, NRC guidance documents, and through case-by-case exception ensure public protection, they do not provide the same quality of regulation that exists for controlling release of potentially contaminated liquid and gaseous facility effluents.

The regulations in 10 CFR Part 20 contain specific criteria for the release to the environment of gases or liquids containing some radioactivity from a nuclear facility. In addition, 10 CFR 50, Appendix I – Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion "As Low as Reasonably Achievable" for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents, addresses the release of radioactive material in liquid and gaseous effluents to unrestricted areas. For consistency, criteria should also be established for the release of solid materials at dose levels consistent with the levels in 10 CFR 50, Appendix I.

The current solid material regulatory scheme lacks consistency as a result of its application of quantitative unrestricted release limits to some licensees, a "no detectable activity" unrestricted clearance standard to others, and a "no licensed material" criteria for power reactors. The current scheme is also inconsistent in the treatment of solid materials with the potential for surface as opposed to volumetric contamination.

The current scheme lacks stability in that guidance documents and enforcement practices have changed over time without the stabilizing influence of the

rulemaking process. It is an inefficient use of resources to apply the "no detectable activity standard," which mandates the disposal of insignificantly contaminated materials at 10 CFR Part 61 approved disposal facilities, or to process alternatives to 10 CFR Part 61 disposal on a case-by-case exception basis.

For 10 CFR Part 50 licensees a situation is created whereby good faith efforts to follow NRC guidance on meeting the existing regulations may not be sufficient to ensure full technical compliance with the "no licensed material" standard. When such situations occur licensee resources and management attention are diverted and public and employee confidence in the licensee's programs for control of potentially contaminated solid materials is reduced.

The existing NRC approach to controlling the release of solid materials has had a negative effect on public trust and confidence. When the public observes the level of effort and resources expended by a licensee to adhere to the NRC's "no licensed material" criteria, it could lead to the misperception that *"this material must really be dangerous at any level—right down to the atom."* Clearly, fostering this public perception was not intended and is contrary to the ICRP/NCRP principles, which are the foundation of 10 CFR Part 20.

Development of a safe, practical, dose-based standard would be in the best interest of the public and licensees because it would enhance public perception and reduce the regulatory burden on licensees. Additionally, a measurable standard will provide licensees the needed incentive to adopt high sensitivity, automated release monitors.

***Specific Items for Discussion***

*(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?*

**Response:** The current system does not provide an adequate regulatory framework. It is inconsistent in application, burdensome to implement, and creates a perception of risk that undermines public trust and confidence.

Materials that have a potential to contain volumetric contamination have been safely released and can be released safely in the future using the appropriate

criteria. The key to success is a criterion for release that is measurable and verifiable under practical survey protocol.

The NRC, along with a number of Agreement States, have approved licensee requests for the release of solid materials on a case-by-case basis, and these materials have been safely released. The NRC has established a basis for proceeding with the proposed rulemaking, draft NUREG 1640, which is available for public comment. Volumetric contamination release criteria have in effect already been determined (NUREG-0472, Table 4.12-1, Detection Capabilities for Environmental Sample Analysis, NUREG/CR-5569 HPPOS-072 and 073, IE Circular No. 81-07, IN 85-92, and various enforcement actions).

However, the rulemaking should not be based on the lower limits of detection (LLD) of available commercial or research grade instrumentation, but rather on the potential dose to the public. The selection of instrument-based criteria 30 years ago resulted in the inadequate framework we are trying to remedy today.

Should a rulemaking not be pursued at this time, an update of Regulatory Guide 1.86 would not address all concerns unless it applied to all licensees and covered all materials? NEI recommends that the NRC pursue a formal rulemaking with full public participation.

*(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?*

**Response:** NEI recommends that the NRC pursue a formal rulemaking with full public participation. Through the rulemaking process the NRC can best incorporate stakeholder input into the development of release criteria for all materials. The rulemaking approach will best address the needs of the licensee and the concerns of the public.

Subsequent rulemaking may be required to address restricted release options other than those inherent restrictions associated with disposal at industrial or municipal landfills. While NEI can envision restricted release scenarios similar to those being pursued by the French in the form of a dedicated metal recycle facility; an acceptable "unrestricted release criteria" must first be developed. Once developed, the radiological characteristics of a material at the end of its period of restriction must be judged against the previously determined "unrestricted release criteria." Because of this fundamental property of the

"unrestricted release criteria," the discussion of appropriate restricted release scenarios may be premature.

*(3) To what extent would such a rule contribute to maintaining public safety, enhancing the effectiveness and efficiency of the NRC, building public confidence, and reducing unnecessary regulatory burden?*

**Response:** The development of a safe, practical, dose-based standard, consistent with the approach in 10 CFR Part 50 Appendix I dose-based regulations, should establish clear criteria for demonstrating that releases of solid material from a licensee are less than the 10 CFR Part 20 dose limits to members of the public and meet the ALARA principle.

If the NRC establishes a standard for the release of solid materials which is logically consistent with those in place for liquid and gaseous releases, the public will more easily grasp the logic incorporated in the series of NRC regulations designed to fully protect public health and safety and the environment. Such a standard, if appropriately crafted, will reduce the compliance burden currently shouldered by the nuclear industry.

*(4) Would issuance of a 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?*

**Response:** Not necessarily. Similar to the NRC and EPA dispute over decommissioning standards, licensees may still be subject to dual regulation and the uncertainty of Superfund interpretations by the EPA. This dispute has resulted in a significant loss of trust in the agencies by the public. Close interaction between the agencies on this issue will hopefully reduce the potential for this negative outcome. In addition, it is hard to imagine the EPA finding fault with the NRC at the low exposure values under consideration. By comparison, the EPA already allows up to 4 mrem/year in the water we drink and up to 10 mrem/year in the air we breathe.

*(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?*

**Response:** Yes. With the uncertainty in access to future low-level radioactive waste disposal facilities and the current and anticipated decommissioning of

nuclear facilities, requests for release of solid materials will likely increase. Further, a safe, practical standard would save NRC resources, as compliance would be easily verifiable. Finally, the cost of developing the rule could be substantially reduced by building on the extensive technical basis that already exists in the international community (ICRP, IAEA & CEC) as well as nationally (NCRP, EPA, & DOE).

Perhaps the greatest saving could be realized by endorsing the American National Standards Institute (ANSI) N13.12 (1999), "Surface and Volume Radioactivity Standards for Clearance." This voluntary consensus standard is endorsed by the Health Physics Society, is consistent with the philosophy and approach of the IAEA, and should be considered by the NRC as was intended by Public Law 104-113 *"National Technology and Transfer Act of 1995"* and by the OMB Circular A-119, *"Federal Participation in the Development and Use of Voluntary Consensus Standards."*

***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?***

***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? 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? Or, should release of solid materials not be permitted if they are potentially contaminated from the use of licensed radioactive material?*

**Response:** The standard should be dose-based to account for the differing radiological characteristics of various radioisotopes that could be released. It must be fully protective of public health and the environment today as well as for future generations. It must consider the potential for accumulation in the environment and for the potential exposure of members of the public to multiple sources. It also must be practical to implement and verifiable by inspection. NEI is convinced by the existing body of national and international knowledge that these requirements can be met.

A standard of zero radiation or zero radiation above background is impossible to implement. It can not be measured in absolute terms and ignores the reality that radiation is a fundamental part of the world we live in. It is a natural part of the air we breath, the water we drink, the food we eat, and the earth we live on. In addition, our natural background radiation levels vary widely in space and time. These variations may be as much as two orders of magnitude and may completely obscure annual exposures of a few millirem.

An acceptable standard would ensure that individual doses are ALARA and would include the potential impact from the liquid and gaseous effluent pathways. For power reactor licensees, 10 CFR 50, Appendix I, defines the criteria for demonstrating doses are ALARA for those pathways. The acceptable dose rate should also be consistent with 10 CFR 20 and 40 CFR 190. Consistent with the criteria in 10 CFR 50, Appendix I, along with levels being considered by the international community, a dose level between 1 and 5 mrem/year is appropriate.

Restricting the release of any materials based solely on the potential for contamination is inappropriate. Such an approach is not based on the protection of health or the environment, is wasteful of valuable resources, and runs counter to all pollution prevention principles. This type of approach has the real potential to harm society by eliminating or significantly increasing the cost of goods and services provided by the use of nuclear technologies while providing no commensurate protection of public health or the environment.

*(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.*

**Response:** Disposal scenarios (e.g., on-site and off-site landfills, on-site and off-site land farming, incineration, etc.) should be considered as well as recycle/reuse scenarios. These scenarios should include the complete range of materials that are routinely released from facilities. Because the same pathway

analysis is used for disposal of all materials at a landfill (source-term is more important then the materials), the supporting calculations could be simplified.

*(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.*

**Response:** The proposed rulemaking should establish that the radiological, environmental, and economic benefits associated with a standard outweigh the related impacts associated with implementing the rule.

*(iii) How should net environmental impacts from all the radiological and non-radiological impacts be balanced?*

**Response:** The analysis must show a net benefit to justify a rulemaking. The analysis should be conducted in accordance with existing requirements as done with similar rules such as the Radiological Criteria for License Termination. However it should be noted that conducting collective dose estimates based on trivial exposures to large populations is contrary to the recommendations of the NCRP, the Health Physics Society, and should be avoided.

*(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?*

**Response:** The potential for exposures to multiple sources of material released to unrestricted areas can not be ruled out. However, based on the conservatism built into the calculations and the fact that any dose standards are likely to be significantly less than the 10 CFR 20 dose limits to a member of the public (100 mrem/year TEDE), detailed analysis of the contributions from multiple sources is unnecessary. Supporting this assessment, draft NUREG 1640 stated that because the average member of the critical group is identified and protected, the dose factor for the typical member of the public would be essentially zero.

*(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.*

**Response:** The NRC's responsibility is to protect the public safety and health and the environment. Any standard established by the NRC must achieve this objective. However, public confidence in federal agencies with regard to radioactive materials issues is not high. The NRC must stand solidly behind any release standard it might develop. The agency must be unequivocal in its conviction that the standard is safe and must be willing to defend this position publicly in clear and unambiguous terms. To do less could undermine public confidence and do real economic harm to licensees.

*(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?*

**Response:** The agency should give due consideration to these issues if it proceeds with a standard that includes the recycling of potentially contaminated steel. The standard should be established to ensure that any real or measurable impacts are avoided or mitigated in some fashion. Fortunately, the range of impacted industries is small and can be evaluated. Further, the concerns tend to focus on the recycling of steel. To avoid the impact, the standard for recycling in certain situations could be set at a level lower than where the impact is observed or calculated (where film fogs or scrap monitors are set to detect the presence of orphaned sources.)

It becomes quite a different story when the impacts are intangible and perception based. While it is sometimes said that perception is reality, public perceptions can change with time. They are also easily influenced. The NRC can be most effective in reducing these impacts by continuing to follow an open public process that addresses public concerns as they are identified. In addition, by developing a safe, practical standard that is consistent with international radiation protection principles, enforcing that standard, and by actively defending that standard as fully protective, public concerns will be reduced with time.

### *(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.*

**Response:** Economic factors should be incorporated into the rulemaking decision process. In addition to the factors referenced, the costs associated with disposal alternatives should be included (e.g., disposal at a licensed low-level radioactive waste (LLRW) disposal facility, storage on-site by licensee if disposal is unavailable, use of vendor processing, etc.)

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

**Response:** If the standard is fully protective of public health and safety and the environment, then the *"net environmental impacts"* should be positive. If the standard is measurable and practical to implement, then the *"net economic impacts"* should also be positive. If the evaluation is conducted thoughtfully, both the environmental and economic benefits will support the rulemaking.

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

**Response:** The major economic cost is the cost of implementation. Given two possible standards, both protective of public health, the cost of implementation should drive decision-making. Additional costs that do not add to public health protection are a drain on societal resources and must be avoided. Benefits should be considered as well as major economic costs. Release of material for disposal at a local landfill will result in a significant economic cost saving when compared to disposal at a licensed LLRW facility.

*(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?*

**Response:** If the recycle pathway is not available as a release option, then most of the material not destined for direct reuse would probably be disposed at a landfill. The major impact would be the additional cost for mining and processing of replacement material and the associated environmental impacts. Actual cost associated with the disposal of released material at a landfill would be minimal and significantly less than disposal at a licensed LLRW facility.

*(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 smelter or scrap yard based on a radiation survey at that point? What means could minimize such economic risks?*

**Response:** Radiation surveys are conducted at some scrap metal dealers and many smelters to detect orphaned radioactive sources. The loss of control of these highly concentrated radioactive sources has cost the steel industry tens of millions of dollars in clean-up and has resulted in significant potential risk to workers and the public. The recapture of these sources under regulatory control is a high priority here and abroad.

The truck monitor geometry typically used by the steel industry coupled with the shielding provided by tons of scrap steel leads to the use of highly sensitive monitors set at the very limits of detection. These factors tend to cause alarms and potential rejection of loads due to natural radioactivity associated with concrete, soil, fertilizer, pipe scale, and refractory residue associated with shipments.

Clearly this is a problem and places a burden on the steel industry. This problem is the direct result of a failed regulatory process. Perhaps a longer count time or a less shielded geometry would provide improved detection while reducing the impact of false alarms.

Regardless of these source related problems, the clearance of scrap metal at levels equivalent to a few mrem/year should not cause false positives above what is currently experienced due to naturally occurring radioactive materials. While at a recent international symposium on radiological clearance, participants toured a German nuclear power plant in the process of decommissioning. The German federal regulators have established a clearance standard equivalent to 1 mrem/year. We observed metals cleared at this level and were informed that the scrap passes through the detectors used by the smelter without alarm.

*(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?*

**Response:** Analysis needs to be performed to ensure that the potential for significant buildup of radioactivity is minimal. However, as indicated in a previous response, the conservatism in the establishment of a dose level significantly below the dose limit to a member of the public and the fact that the radionuclides

continue to decay with time, should be sufficient in addressing the uncertainties associated with buildup.

*(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? 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?*

**Response:** The establishment of dose levels and resulting surface contamination and volume concentration limits should not be less than the lower limits of detection of commonly used survey instrumentation using normal survey techniques, sample geometry, sample volumes, and counting times. The screening values contained in ANSI N13.12 are nominally equivalent to 1 mrem/year and are easily detected using standard survey equipment. Levels equivalent to 0.1 mrem/year will be difficult or impossible to measure using standard survey equipment. A level of zero is impossible to measure or verify.

Acceptable survey and sampling techniques could be addressed in Regulatory Guides. Licensees should be responsible for performing surveys, not the receiving facilities. Application of limits should be consistent between licensees. Nuclear power reactor licensees currently have programs and procedures in place for surveying the release of material. These programs would be modified as necessary to implement any new requirements and would be subject to inspection.

*(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?*

**Response:** Survey methods should be appropriate for the material and type of radiation expected to be present. For example, for materials in which a consistent geometry for calibration and counting purposes can be obtained, such as soil or resin where gamma-emitting isotopes are suspected to be present, gamma isotopic analysis would be appropriate. For material that has the potential to contain

surface contamination, a direct frisk with appropriate counting instrumentation should be acceptable. Surveys should be performed on material exiting areas with the potential for contamination by radioactive material (e.g., for power reactor licensees the Radiological Control Area) or areas suspected of having contamination.

Process knowledge is currently used to evaluate materials from areas of a nuclear facility that have no reasonable potential for contamination. This approach is reasonable and effective. In addition, it is also acceptable to the EPA in evaluating whether a solid waste is also hazardous. This flexibility is appropriate and should be continued.

*(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?*

**Response:** Release criteria should be risk- or dose-based. Regulatory Guides should be drafted to provide the methodology for reasonable implementation. The methodology presented in ANSI N13.12, "Surface and Volume Radioactivity Standards for Clearance" should be considered for endorsement. The methodology should address the differences in licensee source terms and application of release criteria. The methodology should also address the release of material with the potential to contain discrete radioactive particles.

***(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 EPA to set import screening guidelines be considered?*

**Response:** Guidelines set by international standard setting bodies should be reviewed and addressed in the drafting of the proposed rule. Due to the global implications associated with international trade of cleared materials, particularly steel, harmonization of clearance standards is important. Differences in the proposed rule and those set by international bodies should be identified and justifications for differences provided.

*b) How should guidelines of other U.S. agencies, e.g., DOE and EPA, be considered? 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)? 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*

**Response:** As stated earlier, other Federal agencies should be involved in the rulemaking process and efforts to coordinate establishment of criteria for clearance should continue through the Interagency Steering Committee on Radiation Standards.

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

**Response:** Differences in the proposed rule and recommendations from NCRP should be identified and justified.

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

**Response:** ANSI N13.12, "Surface and Volume Radioactivity Standards for Clearance," should be endorsed in a Regulatory Guide if found acceptable. This voluntary consensus standard is endorsed by the Health Physics Society, is consistent with the philosophy and approach of the IAEA, and should be considered by the NRC as was intended by Public Law 104-113 *"National Technology and Transfer Act of 1995"* and by the OMB Circular A-119, *"Federal Participation in the Development and Use of Voluntary Consensus Standards."*

*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?*

**Response:** The NRC should rely heavily on the recommendations and standards under development by these recognized national and international experts. Harmonization with IAEA is particularly important for materials, like steel, which are common in international commerce.

*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?*

**Response:** Discussions at a recent international symposium on radiological clearance indicated that trade impacts associated with inconsistent clearance standards could approach the equivalent of six billion U.S. dollars per year. The true cost of disagreements between U.S. regulators is loss of public confidence in government.

*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 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.*

**Response:** Agreement State radiation control programs should be consistent with any final rule. Health-based radiation standards should be a matter of strict compatibility. Failure of states to incorporate the requirements in any final rule could result in conflicts with interstate transportation and commerce. Inconsistent standards undermine public trust and confidence.

*(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? 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.*

**Response:** No. Proposed rulemaking dose criteria should be consistent with the current standards for release of materials in liquid and gaseous effluents in 10CFR20 and 10CFR50, Appendix I.

***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?***

*Items for Discussion*

**Note: In preparing the following comments (1) through (8), NEI considered the issues paper concept of "restrictions on future use" to be the creation of a new system of post-release material control. NEI responses to the questions should not be taken to oppose taking credit for restrictions imposed by existing institutional controls associated with specific alternative disposal options. Examples of such existing restrictions might include those associated with disposal at permitted landfills or surface sludge application allowed by state permits.**

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

**Response:** Not at this time. A prerequisite to a restricted release standard is an established unrestricted release standard that allows for the evaluation of the proposed restriction.

*(2) If so, what types of restricted uses should be considered?*

**Response:** No comment.

*(3) What types of controls could restrict use to assure that the material would not be released for unrestricted use? Would these controls be reasonable? 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 a NRC license?*

**Response:** Controls of the type discussed would be overly burdensome to implement by either licensees releasing the material or processing companies receiving the material. Ensuring compliance by the NRC or Agreements States would also be difficult. The cost/benefit of implementing restrictions should be considered.

Once an unrestricted release standard is developed, and if market forces provide the incentive, a fixed base facility could be envisioned that would accept a material above the unrestricted release standard and process it into a product, such as oil and gas pipe, such that after the initial restricted use, the material would meet the unrestricted release criteria. The fixed base facility could operate under a NRC license to allow for additional control.

*(4) How long would the use 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?*

**Response:** All of those factors need to be addressed, but of key importance are the unrestricted criteria the material would need to meet at the end of the restriction. Set that level first. Let market forces determine if a restricted scenario is viable.

*(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? 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.*

**Response:** All of those factors need to be addressed, but of key importance are the unrestricted criteria the material would need to meet at the end of the restriction. Set that level first. Let market forces determine if a restricted scenario is viable.

*(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 [[Page 35099]] 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?*

**Response:** The public has opportunity for involvement with the current rulemaking process. The opportunity for involvement began with the issuance of the Issues Paper and conduct of the enhanced public participatory process. Additional public involvement may be appropriate under the scenario outlined above for a fixed base facility. In such a case, NRC licensing of the facility would provide additional opportunities for public involvement.

*(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?*

**Response:** Restricted release can not easily be accomplished in a generic way. It also can not be imposed. Market forces must provide the incentive. If that exists, a specific application will develop for your approval. It will provide all the information required to make your determination.

*(8) What dose should be permitted for material released for restricted use? 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? 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.*

**Response:** The same approach used in Subpart E would be appropriate. The same dose criteria should be used, as unrestricted; assuming the restriction is effective, and a higher value that should not be exceeded even if the restriction failed.

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

**Response:** NEI supports the consideration of a standard for the release of materials for disposal in the various types of landfills. State and local laws limit the activities associated with modern landfill operations and such institutional controls should be credited when establishing release criteria. To avoid impacting landfill regulatory oversight, the NRC should not impose additional restrictions beyond those already imposed by existing solid waste laws and regulations.

If landfill disposal is the only disposal option authorized for a given material, it could be considered a form of restricted release. However, materials should not be restricted to landfill disposal unless there is a health and safety basis for excluding all other release options.

Some states prohibit the disposal of radioactive material at a landfill. These prohibitions overlook the radioactivity associated with building materials, damaged consumer products, and waste products associated with patient diagnosis and treatment. The NRC should be mindful of this legislative language in defining cleared materials. In Germany, cleared material is defined as non-radioactive by federal law. In any case, the NRC and licensees can work with their states to eliminate such restrictions once the NRC has established safe levels for the release of materials destined for disposal at permitted landfills.

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

***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?*

**Response:** Yes, all materials routinely released from nuclear facilities must be covered in some way. If overwhelming difficulties arise with a specific release option, the option should be set aside with the possibility of conducting further rulemaking at a later time. Consideration should be given to deferring steel recycling until the international standard is developed. Steel is most likely to be traded internationally and should be treated as such. Release options associated with reuse or direct disposal should be the first priority.

Yes, all materials routinely released from nuclear facilities must be covered in some way. If difficulties with steel recycling impede progress, it should be set aside until the international standard is developed. Steel is most likely to be traded internationally and should be treated as such. Materials released for reuse or direct disposal should be the first priority.

> ***(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? Would experience gained with the rule on steel, aluminum, copper, concrete, and soil be useful in evaluating requirements for release of other materials later?*

**Response:** The rule should attempt to address as many materials as possible to more efficiently utilize resources and expertise. The similarity of some materials (e.g., soil, sludge, spent resins, etc.) should support the use of a generic analysis, particularly for the disposal scenario. The NRC and a number of agreement states have authorized the release of material under 10CFR20.2002. These authorizations should be reviewed for additional background to support a rulemaking.

In terms of soil, specifically from uranium mining operations, NEI believes there is a problem with overlapping EPA regulations as they pertain to uranium recovery (UR) facilities. Most soils from UR facilities are now classified and regulated under

10 CFR 40 [specifically, Appendix A Criterion 6(6)] as "11e.(2) by-product material" that cannot be disposed of at a low level radioactive waste facilities. NEI believes any proposed NRC Rulemaking must address this whole issue of how to handle 11e.(2) by-product materials.

> ***(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? Other similar materials, such as sludge, 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?*

**Response:** See previous response.

> ***(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?*

**Response:** See response to 1(i). In addition, draft NUREG 1640 drives the activity values for metals release based on recycle. Direct disposal or reuse scenarios, with their unique activity limits should be also developed.

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

**Response:** The rulemaking should include all materials routinely released from nuclear facilities such as trash, recycled paper, computers, welders, cell phones, video cameras, video screens, radios, fire extinguishers, compressed gas cylinders, hand tools, consumable chemical containers, spray paint cans, etc. The scenarios found in draft NUREG 1640 (equipment reuse, or concrete disposal) or in other national and international technical documents may already bound these materials.

***(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? 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?*

**Response:** The NRC needs to develop consistent standards for all materials released from nuclear facilities. These facilities have been in operation for decades. The work has begun and should not stop until it is completed. If the rulemaking is to progress in steps, then current practices should remain in place for materials and release options not yet covered by the rulemaking. If the standards developed are dose-based, safe and practical to implement, then they should also be used in the future as a basis for conducting case-by-case evaluations.

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

**Response:** The survey methods and types of monitoring instrumentation required should not vary significantly from material to material if the standard selected is reasonable and practical to implement.

*(5) Should the NRC rulemaking be extended to cover materials that may be released from nuclear facilities operated by the DOE?*

**Response:** That is a jurisdictional question best answered by the NRC's Office of General Counsel (OGC). In the ideal world, only one set of standards would apply to related activities.