

DOCKET NUMBER
PROPOSED RULE PR 40
(67 FR 55 175)

NEI

NUCLEAR ENERGY INSTITUTE

DOCKETED
USNRC

22

November 18, 2002 (11:28AM))

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

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November 15, 2002

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

ATTN: Rulemakings and Adjudications Staff

SUBJECT: Comments on the Proposed Rulemaking on Transfers of Certain Source Materials by Specific Licensees [67 Fed. Reg. p.55175 – August 28, 2002]

Dear Sir or Madame:

The Nuclear Energy Institute (NEI)¹ on behalf of its industry members has reviewed the proposed rule change to 10 CFR 40 regarding the transfer of unimportant quantities of source material from licensees to persons exempt from licensing. Ores containing source material below licensable levels would be considered part of a licensee's licensed Atomic Energy Act (AEA) material inventory and would require disposal in a licensed or permitted facility unless specific Nuclear Regulatory Commission (NRC) approval was granted to do otherwise. This rulemaking was prompted, in part, by a concern that uranium recovery licensees could use the 10 CFR 40.13(a) exemption to dispose of wastes containing low concentrations (or so-called "unimportant quantities") of source material (<0.05% wt. U+Th) and that the transfer and disposal of such material to unlicensed (or "exempt") persons could pose occupational and/or public health and safety risks.

NEI believes the proposed rulemaking is completely unnecessary and should be withdrawn. Perceived radiation exposure risks are based on overly conservative dosimetry modeling using anecdotal data of questionable veracity. Few uranium recovery operations or industries processing ores and minerals for their non-

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 nuclear companies 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.

Template = SECY-067

SECY-02

radionuclide contents, could yield occupational or public exposures exceeding regulatory limits. The failure to establish clear rules applicable to all Part 40 licensees and reliance on a highly subjective, case-by-case approval process constitutes poor agency policy. The additional and significant costs, transportation burdens and liabilities associated with extension of regulatory oversight to natural materials having very low activity levels can not be justified. NEI, therefore, recommends that the proposed rulemaking be terminated and that existing industry practices for management of unimportant quantities of source material, which have very adequately protected the public and the environment in the past, continue.

The balance of this letter details our specific concerns with the substance, timing and scope of the proposed rulemaking.

Licensing Basis Change

Section 62 of the AEA states that there shall be no licenses for material that contains unimportant quantities of source material. Implementing regulations in 10 CFR 40.13(a), 40.13(b) and 40.51(b)(3) currently allow licensees to transfer materials containing such unimportant quantities of source material (e.g., construction debris, soils, demolition materials, natural ores) to exempt persons. Low activity Naturally Occurring Radioactive Material (NORM) and Technologically Enhanced Naturally Occurring Radioactive Material (TENORM), such as mine overburden, would, similarly, be non-licensable and could also be transferred to exempt persons, although the disposal of such materials is generally subject to State and/or EPA regulation. The proposed rulemaking would modify §40.51 to incorporate low activity ores containing source material below the licensable levels as part of the licensee's licensed AEA material inventory. This change would require licensees to dispose of such low-activity source material at a licensed or permitted facility (e.g., direct disposal in a licensed mill tailings impoundment, processing as an alternate feed by a licensed uranium recovery mill, disposal in a RCRA-licensed landfill). The proposed rulemaking would, however, allow a licensee to petition the NRC for approval to transfer "*source material derived from specifically licensed material*" to a non-licensed entity if certain exposure dose limitations were satisfied. The new term "*source material derived from specifically licensed material*" is not clearly defined, but may include, for example, non-11e.(2) byproduct materials such as different mill feedstocks, contaminated soils or concrete excavated from spill sites or leaking underground piping, or debris originating from facility decommissioning, all of which would be separated or classified by their U+Th contents. Whether derivation of "*source material from specifically licensed material*" creates 11e.(2) byproduct material, low level radioactive waste (that may or may not meet the criteria for release for

unrestricted use) or “*source material derived from specifically licensed material*” requires a careful distinction, for their resulting disposition options will differ significantly. Licensees will have the added burden of tracking the process history and provenance of each pile of material containing unimportant quantities of source material.

The proposed rulemaking is not intended to apply to source material at concentrations that are “...*essentially at the natural background levels of the surrounding area...*”² This exclusion appears to be included to address regulatory oversight of NORM. No guidance is offered as to how the natural background levels are to be established and whether NRC approval would be required to transfer source material to an exempt person if the U+Th concentrations might be less than the background value. Granting a license permission to transfer “*source material derived from specifically licensed material*” with a high U+Th concentration may be of little relevance if the recipient landfill is in an area of lower background value or if state regulations prohibit the transfer or acceptance of the source material at the released concentrations.

The proposed rule appears to be inconsistent in protecting public health and safety. The NRC would be unlikely to authorize the transfer of “*source material derived from specifically licensed material*” to a member of the public to use as aggregate or in construction, even though that same individual could excavate identical material (or material having even higher concentrations of source material) just outside the licensee’s permit boundary and use it for the same purpose(s). Throughout many western states outcrops of ores containing source material below licensable levels, but at concentrations greater than those at which the NRC would need to authorize transfer from a licensed facility can readily be located. Unless the proposed rulemaking is broadened to prevent exempt persons from using non-licensable source material, we really don’t see how the changes to 10 CFR 40.51 can consistently be protective of the public health and safety. Many industries processing ores and minerals for their non-radionuclide contents inadvertently concentrate trace quantities of naturally occurring uranium and thorium during beneficiation. Ores of phosphate, zirconium, titanium, yttrium, bauxite and coal, for example, typically contain from 1-10 Bq/g uranium (in equilibrium with decay progeny) and the concentrated source material in certain process circuit streams may result in occupational radiation doses that can potentially far exceed those emitted by unimportant quantities of source material. Although such mineral processors are not generally licensed by the NRC (unless the source material is recovered in a

² 67 *Federal Register* p. 55176 – August 28, 2002.

side stream operation), facility operators are subject to adherence to the Occupational Safety and Health Administration's (OSHA) radiation exposure guidelines. We cite this example of an exempt person processing ores for their non-radiological content to show that non-NRC licensed operations routinely and effectively protect against occupational radiation doses that far exceed those attributable to unimportant quantities of source material. We believe there should be some greater consistency between the NRC and OSHA's occupational radiation standard of 5 rem/yr³ and that equivalent flexibility should be afforded to mineral processors and Part 40 licensees in handling materials with comparatively low activity concentrations.

To take the proposed rule changes to the extreme, a licensee would be prohibited from allowing geology and engineering student visitors to collect and remove from the licensed facility low-grade ore samples without first seeking NRC approval, conducting a radiation dose study, instructing the (potentially exposed) student of the potential for radiation exposure and obtaining his written consent and acknowledgement of potential exposures, reviewing the individuals' exposure history and seeking assurance that the state and local regulations for possession of exempt material in the individual's domicile are met. The necessity for such exposure dose modeling and other studies to transfer and possess low activity ores containing source material below licensable levels is totally unnecessary, a bureaucratic quagmire and lacking of any sound scientific basis.

We cite one final example of the inconsistency in the proposed changes to the §40.13(a) exemption and the new requirement that ores containing source material below licensable concentrations be disposed of in licensed or permitted facilities. An exempt person without a specific radioactive materials license could handle source material below the unimportant quantity concentration and, unlike a Part 40 licensee who would be mandated to dispose of such ores as in a licensed or permitted facility could use, transfer or dispose of the material as he saw fit⁴. This inequity between exempt persons and Part 40 licensees in the management of source material is inappropriate and inequitable and should be rectified. The proposed rulemaking further exacerbates this inequality.

Technical Basis of the Rulemaking

The NRC commissioned a study in 2001 to assess the potential radiological impacts on the public associated with the present exemptions for source and

³ The OSHA maximum permissible occupational standard is 5,000 mrem/yr [29 CFR 1096].

⁴ Daughter products such as radium may cause the unimportant quantity of source material to be classified as NORM (or TENORM) and subject its transfer or disposal to State regulations.

byproduct materials. The study, which was published as NUREG-1717 "*Systematic Radiological Assessment of Exemptions for Source and Byproduct Materials*," compiled published and anecdotal information on doses for various commercial products and industrial processes in which uranium and thorium could be, or become, concentrated. Unfortunately, the study methodology was deficient and the dose information for many processes (especially for ores) is of questionable veracity and value. The study authors made no attempt to assess the reliability of various data, failed to apply the same dose calculation methodology so as to enable some basis for comparison of the exposures of different industrial processes, and frequently and significantly overstated exposures in mineral processes through use of older ICRP dosimetry models. For the zircon industry, as an example, staff members of the NRC's Part 40 Jurisdictional Working Group concluded that "...uncertainties regarding particle size, conservatism in calculations, which are not realistic, errors in original references, etc...." caused the NUREG-1717 authors to overstate occupational doses by several orders of magnitude⁵. NUREG-1717 reported that doses from exempt source material in zircon flour processing could reach 4,000 mrem/yr, a value close to OSHA's maximum permissible occupational standard of 5,000 mrem/yr, but which when computed correctly or actually measured⁶ can be up to several orders of magnitude smaller. Overestimation of exposure doses from source material for industries processing other ores and minerals for their non-radionuclide contents data can be cited.

Even allowing both for errors in the reported data and for the conservative dosimetry models that were used, NUREG-1717 identifies very few mineral or industrial processes in which the source material could ever result in an occupational radiation dose of concern. The two bases used by the NRC staff to address the need to regulate transfers of unimportant quantities of source material, NUREG-717 and SECY-990-259, provide little support for the assertion that such material can pose serious risks to occupational or public health and safety. In the absence of sound, defensible exposure data, this perceived risk to human health and safety can not be established or validated.

Transportation Issues

The concern for public exposure to radiation doses from unimportant quantities of source material presumably extends to the off-site transportation of such materials from the licensed facility. Department of

⁵ Meeting Summary of the Part 40 Jurisdictional Working Group, March 6-7, 2002.

⁶ Consult, for example, Hartley, B.M. (2001): *The Measurement of Radionuclide Levels in Australian Zircon Milling Plants: Health Physics*, Vol. 80, No. 1, pp. 16-23.

Transportation (DOT) and NRC transportation regulations do not apply to natural materials and ores containing naturally occurring radionuclides, provided that the activity concentrations of the material do not exceed ten times the values specified in Table A-2 of 10 CFR Part 71. Exemption values are based on the ^{238}U nuclide where progeny are present. The exempt activity concentration for natural uranium is 1,900 pCi/g, a value much greater than those stated for natural uranium (339 pCi/g) or natural thorium (116 pCi/g)⁷ in the rulemaking documents. Clearly, if this rulemaking were to proceed, the new regulations would be internally inconsistent with the NRC's transportation regulations and public concern over the safety and adequacy of the DOT's regulations would be fostered.

Industry Practice

The NRC is concerned that uranium recovery licensees may use the 40.13(b) unimportant quantity exemption to dispose of low activity waste off-site. But fears of "sham disposal" by those few remaining uranium recovery licensees have seldom materialized. During the heyday of the uranium exploration boom thirty years ago, many exploratory adits and pits were developed by unlicensed, independent entrepreneurs without any thought of environmental restoration or protection of human health and safety. Many of these legacy sites now await proper restoration. However, licensees are now bound not only by NRC, but by state regulations, particularly as to the management of low-level radioactive waste, NORM and TENORM materials. Part 40 licensees have been very responsible in abiding by state regulations, as well as by county and municipal regulations that govern the acceptability of materials for disposal in municipal landfills. The limited alternatives for off-site disposal have now prompted licensees to consider on-site burial of NORM, TENORM and low-grade natural ores, backfilling into open pits, processing as alternate feed or, when possible, free release. NEI commends the responsible actions of licensees in managing their ores containing source material below licensable levels and contends that further regulation is superfluous and unneeded.

Risk-Informed Regulation

Expenditure of agency resources on a rulemaking that has very limited application (the NRC anticipates 3-4 applications annually) and that attempts to address a health and safety issue, the justification of which appears tenuous, is misdirected. Modification of 10 CFR 40 should not be a regulatory priority. The NRC has not demonstrated existence of a significant risk to the public or to workers by uranium recovery and other Part 40

⁷ 67 *Federal Register* p. 55176 – August 28, 2002.

licensees. In the absence of a demonstrable risk, this rulemaking can not be justified as truly risk-informed and should be terminated in favor of re-allocation of agency resources to other problems affecting Part 40 and other classes of licensee.

Timing of the Rulemaking

In addition to our material concerns with the proposed rulemaking, we believe the timing of this proposed rulemaking is inopportune. Before further impeding a licensee's options to manage unimportant quantities of source material, the NRC should, for example, clarify options for the direct disposal of licensee materials in mill tailings impoundments. The current non-11e.(2) direct disposal guidance⁸ specifically allows the direct disposal into mill tailings impoundments of wastes containing source material, but bans the disposal of similar NORM materials. The rulemaking should also await issuance in the spring of 2003 proposed revisions to EPA regulations regarding the disposal of low-level radioactive and other such materials in RCRA-permitted disposal facilities. The regulations should also be modified to permit the wastes (or tailings) from licensed side stream operations (e.g., recovery of uranium in a copper or phosphate fertilizer mill) to be disposed directly in mill tailings impoundments even though such wastes are, by definition, non-11.e(2) byproduct material.

Intentional Dilution

Intentional dilution of wastes and other materials so as to change their regulatory characterization and management is not clearly specified in §40.41(c), although licensees are fully aware of this prohibition in the handling of hazardous materials subject to EPA jurisdiction. Dilution is not the (legal) solution to pollution. We believe this principle is well understood and we do not object to inclusion in 10 CFR 40 of rule language specifically prohibiting any intentional dilution of source material as a waste management practice for Part 40 licensees.

NEI has outlined our principal concerns with the proposed rulemaking. In the absence of accurate and reliable data that could demonstrate the potential for significant occupational and public radiation risks from unimportant quantities of source material, the rulemaking lacks a defensible basis and should be withdrawn. Revision of the source material exemption should not be a regulatory priority, particularly when action on other issues affecting decommissioning and waste material disposal and clearance are of such greater importance. The proposed requirement of revised §40.51 to conduct detailed dose assessments and to seek

⁸ U.S. Nuclear Regulatory Commission: Final Revised Guidance on Disposal of Non-Atomic Energy Act of 1954, Section 11e.(2) Byproduct Material in Tailings Impoundments (August 15, 1995).

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consents from source material recipients is unnecessarily burdensome and unneeded. This requirement constitutes unnecessary paperwork and is open to wide and subjective interpretations by the staff (selection of dosimetry model, modeling assumptions, etc.). NEI recommends that no changes be made to the regulatory regime for regulation of unimportant quantities of source material. Existing OSHA and State regulations supplemented by industry Best Management Practices (including ALARA programs) afford adequate protection against radiation doses from unimportant quantities of uranium and thorium, whether in Part 40 licensed uranium recovery operations or in mineral processing operations for the recovery of non-radionuclide products.

NEI appreciates the opportunity to comment on the proposed rulemaking and should be pleased to answer any questions that you may have with this submission. Please feel free to contact me or Dr. Clifton W. Farrell (202-739-8098) to further discuss our concerns.

Sincerely,



Felix M. Killar, Jr.