

From: "Keith Dinger" <govtliasion@hps.org>
To: <NRCREP@nrc.gov>
Date: Mon, Feb 6, 2006 2:22 PM
Subject: Comments on RSPS-TF FR 71 page 1771 of 11 January 2006

Please find attached comments from the Health Physics Society (HPS) on the subject Federal Register Notice, which are forwarded on behalf of HPS President Ruth E. McBurney.

Sincerely,

Keith H. Dinger, CHP
Health Physics Society
Federal Agency Liaison
govtliasion@hps.org

01/11/06

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HEALTH PHYSICS SOCIETY

"Specialists in Radiation Safety"

RUTH E. McBURNEY, CHP
President

Executive Offices, Suite 402
1313 Dolley Madison Blvd.
McLean, Virginia 22101
Tel: (703) 790-1745
Fax: (703) 790-2672
E-Mail: hps@burkinc.com

February 6, 2006

Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
Mail Stop T6-D59
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: RSPS-TF Request for Comments (January 11, 2006; 71 FR 1776); HPS Submittal

Dear Sir or Madam:

The Health Physics Society (HPS) believes that security of vulnerable and orphan sources, both domestic and international, is a radiation safety issue of high priority needing additional state and national attention. The HPS first addressed the need for increased security and control of orphan sources in its position statement *State and Federal Action Is Needed for Better Control of Orphan Sources*, which was issued in April 2002. More recently, the HPS commissioned an expert working group to report on the current status of radioactive source security and control. The working group issued its report, *Actions Needed to Better Secure Vulnerable Radioactive Sources: A Contemporary Report*, in September 2005, including recommendations to the HPS for further actions. In January 2006, the HPS issued a new position statement, *Continued Federal and State Actions are Needed to Better Control Radioactive Sources*, which superceded the April 2002 position statement. The purpose of this position statement was to update and expand the scope of the April 2002 position statement to include, among other things, security of all vulnerable and orphan sources and to establish HPS positions and recommendations based on the HPS working group report.

Most of the recommendations in the January 2006 position statement and much of the discussion in the September 2005 working group report are directly pertinent to the mission and task of the Radiation Source Protection and Security Task Force established by the Energy Policy Act of 2005 (the *Act*) and to the request for public comments in the subject Federal Register. Therefore, the HPS is submitting the recommendations and material from these two documents in a format to be responsive to the Federal Register call for comments.

Topic 2: The national system for recovery of lost or stolen radiation sources.

Comment 1: The HPS commends the Nuclear Regulatory Commission (NRC), Department of Energy (DOE), and Conference of Radiation Control Program Directors for their cooperative roles in supporting the establishment of the Off-Site Source Recovery Project (OSRP). However, the HPS believes congressional action is needed to authorize programs and appropriate sufficient funds on an ongoing basis to maintain a robust national capability for the recovery and disposition of vulnerable and orphan sources within the United States and abroad in order to assure the national defense and security and protection of public health and safety.

Discussion: Despite the success of OSRP, the program has been subject to repeated funding cuts (Center for Non-proliferation Studies, July 2004). However, in late 2003, the program's prospects substantially improved. First, Congress restored cuts by adding supplemental funding to the fiscal year (FY) 2004 budget. Second, also in late 2003, DOE's leadership moved the program from the Environmental Management division, which did not consider the program a high priority, to the National Nuclear Security Agency (NNSA), which considers the program an important national security endeavor. Because the program exceeded expectations in recovering disused sources, it ran out of money in early 2004. Wanting to keep the program moving forward, NNSA asked for and received permission to reprogram funds from other parts of DOE to the OSRP.

With the assignment to NNSA, and the importance of the project being recognized as a part of global threat reduction, the funding picture through FY 2006, as it is known now, appears to be adequate to support OSRP operations. Continued funding to support the expanded mission will be critical to continued OSRP success.

Comment 2: The HPS recommends that the Administration establish and implement a national policy aimed at recovering vulnerable and orphan sources of US origin that currently reside outside of US borders instead of the current efforts that involve approval of the recovery of individual sources on a case-by-case basis.

Discussion: Although the OSRP is recovering sources there is no statement by the Administration that it is the policy of the United States to recover vulnerable and orphan sources of US origin. Such a policy statement would institutionalize the program and form the basis for its existence into future Administrations.

Topic 4: The national source tracking system for radiation sources.

Comment 3: The HPS recommends that, because of the potential for unacceptable personal injury, economic, or social consequences from a mismanaged or poorly secured individual Category 3 source, the NRC should be consistent with the approach of the International Atomic Energy Agency (IAEA) and consider that Category 3 sources warrant inclusion in the tracking system, unless an analysis can demonstrate that the large number of such sources and the economic cost for tracking them would be overly burdensome. If the analysis demonstrates that the inclusion of all Category 3 sources is not justified on an economic basis, an evaluation should be performed as to how aggregate quantities of Category 3 sources that roll up to Category 1 or 2 thresholds can be identified and included

in the tracking system or to identify if there are alternatives other than an “all or nothing” approach. For example, the analysis might identify some types of Category 3 sources that could be excluded while others should appropriately be included in the tracking system or may identify alternatives to the National Source Tracking System that accomplish the same results for these sources. The analysis and inclusion/exclusion of Category 3 sources should not interfere with the timely implementation of the tracking system for Category 1 and 2 sources.

Discussion: The current mindset of the NRC towards Category 3 sources is that they do not need to be included at this time, but they may be included in the future based on a security risk. However, the HPS considers that public health and safety concerns, as well as security concerns, support a mind set that Category 3 sources should be included at this time, unless an appropriate study and analysis demonstrates it would be overly burdensome.

The HPS agrees with the NRC statement in its Federal Notice requesting public comments on the proposed rule for a national source tracking system that an aggregation of Category 3 sources could be a security concern. However, by definition, individual Category 3 sources are also “dangerous.” IAEA Safety Guide RS-G-1.9, “Categorization of Radioactive Sources,” Appendix II Table 3 describes a Category 3 source as follows:

“Dangerous to the person: This source, if not safely managed or securely protected, could cause permanent injury to a person who handled it or who was otherwise in contact with it for some hours.”

In addition to the ability to cause permanent injury, individual Category 3 sources can have a serious social and economic impact if not managed or securely protected. As reported in the previously cited *“Actions Needed for Better Control of Vulnerable Radioactive Sources: A Contemporary Report,”* in an attack involving a radiological dispersal device (RDD) it is expected radiation injuries and deaths will be relatively small compared to psychosocial and economic damage. Significant psychosocial effects were observed in the aftermath of the Goiania, Brazil radioactive contamination accident. With respect to economic damage, the cost for a contaminated steel mill to shut down and clean up after accidentally melting a radioactive source has been as high as \$23 million and has averaged \$12 million per event, even though the contamination is confined to specific pathways within mill property. Further, only one of the 22 accidents of this type in the United States involved a source exceeding IAEA Category 2 thresholds. The economic consequences of radioactive contamination caused by similar radioactive sources dispersed by an RDD into a public area would be far greater.

This same report also details that in developing the *Code of Conduct* provision for a source tracking system, the IAEA concluded that Category 3 sources carried a potential risk of harm *that warrants inclusion in a tracking system*. However, participating Member States did not want to make inclusion of Category 3 sources in the national registry a requirement because the large number of such sources and the economic cost for tracking them could be overly burdensome.

The HPS comment recommends that the analysis be done to justify *exclusion* of Category 3 sources due to cost or burden rather than an analysis to justify *inclusion* due to security risk.

Topic 5: A national system to provide for the proper disposal of radiation sources.

Comment 4: The HPS recommends that a requirement be incorporated into the licensing process that an acquirer of Category 1, 2, or 3 sources must provide financial surety for disposal of the sources. This financial surety could be, for example, via an escrow account under NRC control with sufficient funds to cover government or third-party costs to dispose of the licensed sources with return of remaining funds to the purchaser upon disposition of all sources and termination of the license. The establishment of financial surety is consistent with the IAEA *Code of Conduct*.

Discussion: The absence of a requirement that users of radioactive sources prepay or otherwise provide financial surety for disposal costs can result in licensees being uninformed of the disposal costs and being unprepared to pay them when their sources reach the end of their service lives. Options such as return to the manufacturer are not necessarily cost-free and may not be available if the manufacturer discontinues business, as has already happened with some major manufacturers. Establishing such financial surety requirements would serve to more completely move toward implementation of the *Code of Conduct*.

The HPS position provides one example of an acceptable financial surety vehicle, i.e., an escrow account. An escrow account is one financial surety method acceptable for meeting the requirements of 10CFR30.35(f). The HPS cautions that the decommissioning fund established in 10CFR30.35(a) is generally applicable to large companies or institutions by virtue of the thresholds established in the rule. The recommendation to include all Category 1, 2, or 3 sealed sources would expand the need for financial surety to small companies that may not have the financial resources inherent in those that would possess sources of the size currently covered by 10CFR30.35. Therefore, the financial surety vehicle needs to be one that ensures funds adequate to cover source disposal are set aside in a manner that they cannot be withdrawn by the licensee before all sources in their possession are properly disposed, except for the purpose of covering the cost of source disposal.

The recommendation that Category 1, 2, and 3 sources be required to have financial surety is based on the fact that all three categories are classified as “dangerous” under the IAEA Categorization system. Therefore, proper disposal of each of these categories of sources is needed to protect public health and safety. The threshold for financial surety of sealed sources in 10CFR30.35 is millions of times greater than some of the commonly licensed sealed sources that are classified as “dangerous” by IAEA standards.

The Federal Register notice cites in the discussion of *Topic 2* that the NRC’s lost source enforcement policy (December 18, 2000; 65 FR 70139) serves as a discouragement from improperly disposing of a source. However, this is only effective for licensees that are still in business and citable for the penalty. The addition of a requirement for financial surety as

a preventative measure would assure that users of radioactive sources provide the financial support for their proper disposal rather than federal and state governmental agencies.

Comment 5: In September 2005, the HPS has issued a position statement, *Low-Level Radioactive Waste Management Needs a Complete and Coordinated Overhaul*, which contains a number of recommendations that we consider will improve the effectiveness and efficiency of recovering and disposing of sources. The recommendations include actions for both Congress and federal and state agencies that will result in a national low-level radioactive waste management system that can be integrated with other hazardous waste disposal.

Discussion: One of the most significant root-causes currently affecting the ability to safely disposition sources that could be vulnerable to loss or theft is the lack of availability of disposal sites and the high cost of waste disposal. Consequently, sources under the control of the OSRP and commercial industry have no other choice but to elect "safe storage" of the sealed sources in their possession.

This national problem is exacerbated by existing legislation that impedes disposal of certain types of radioactive materials. The recently issued HPS position statement, *Low-Level Radioactive Waste Management Needs a Complete and Coordinated Overhaul*, is based on HPS congressional testimony to the Senate Energy and Natural Resources Committee and informational materials to the Government Accountability Office (GAO) on issues related to low-level radioactive waste (LLRW) disposal. In the position statement the HPS recommends a new regulatory framework for management and disposal of LLRW. This position calls for fundamental changes to allow general access for disposal of LLRW. The changes include a complete rework of the regulatory framework such that the classification of waste is based on the risk posed to human health and safety, not its origin or legislative stature. The HPS position also calls for amending or replacing the Low-Level Radioactive Waste Policy Act of 1985, as amended (LLWPAA) to:

- (1) Allow non-DOE waste generators access to all existing licensed and permitted disposal facilities;
- (2) Allow non-DOE waste generators access to existing DOE disposal facilities;
and,
- (3) Provide a new waste disposal capacity for all classes of LLRW at new facilities located on DOE sites, other government property, or privately owned land.

Changes to the manner in which LLRW is dispositioned is urgently needed, given that approximately two million devices containing licensed radioactive materials were estimated to be present in the United States as of 1998. While the majority of the two million sealed sources present in the United States could be disposed of at a waste disposal site licensed under 10 CFR Part 61, other higher activity sources (Greater Than Class C (GTCC)) may not be well suited for shallow land burial. It is estimated that of the two million sources in the United States, 20,000 to 250,000 might be considered GTCC waste once they reach the end of their useful life. The NRC has estimated this number to be

around 27,000 GTCC sources. However, without a working national source database, it is unknown exactly how many sources will end up in the GTCC category. Of these, it is uncertain how many would be considered Category 1 or 2 under the *Code of Conduct*.

For commercially generated waste (i.e., non-DOE generated LLRW), as defined under the LLWPAA, waste generators that do not belong to a host Regional Compact can be prohibited from access to a disposal site. Currently, only three waste disposal sites accept commercially generated LLRW: (1) US Ecology, Richland WA, (2) Chem Nuclear Systems (CNS), Barnwell, SC, and (3) Envirocare of Utah, Clive, UT. Of these three sites, only CNS accepts sealed sources from generators located in non-compact member states. However, since South Carolina recently passed legislation to prohibit access to the CNS facility by non-compact member states on July 1, 2008, licensees in 36 States¹ will have no other choice but “safe-storage” of all sealed sources that otherwise could be dispositioned. Action is required to ensure accessible and safe options are available for dispositioning sealed sources and Class B/C LLRW.

As stated above, the HPS believes that the current system for classifying wastes should be commensurate with the risk posed to public health and safety, not its origin and legislative stature. Non-DOE generated LLRW must be classified into one of four classes in accordance with regulatory requirements as specified in 10 CFR Part 61: Class A, B, C and GTCC. In 1981 this classification scheme was developed to support the Part 61 rulemaking for disposal of LLRW in near surface disposal facilities. Criteria are specified in §61.55 for short and long-lived radionuclides.² For DOE generated wastes, the Performance Objectives³ specified in DOE Order 435.1 titled *Radioactive Waste Management* serve as the regulatory basis for determining whether or not a waste stream is suitable for burial at any one of the existing disposal facilities owned by DOE (e.g., Oak Ridge Reservation or Nevada Test Site (NTS)). While the Performance Objectives set forth in DOE Order 435.1 are similarly protective of public health, the waste classification criteria are separate and uniquely applicable to commercial waste generators. In fact, any commercial facilities that possess or generate GTCC wastes are prohibited from disposing of such sources at a Part 61 licensed facility. However, ⁹⁰Sr sources in excess of 60,000 curies used in radioisotope thermal-electric generators and some non-defense related, transuranic (TRU) wastes generated by DOE (that would be classified as GTCC⁴ waste

¹ Only waste generators in the 14 states located in the Rocky Mountain, Northwest and Atlantic Regional Compacts will have access to dispose of Class B/C LLRW after July 1, 2008.

² These criteria were selected, in part, to ensure compliance with the §61.41 annual doses limits to the general public to 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any organ.

³ DOE Performance Objectives specified in Order 435.1 limit annual doses to members of the public to 25 mrems from all exposure pathways (excluding radon), includes a separate limit of 10 mrems/y via airborne releases, radon limits of 20 pCi/m²/s at the surface of the disposal facility and site boundary of 0.5 pCi/L.

⁴ As discussed in DOE Order 435.1, the reason for this distinction is that waste generated by DOE nuclear activities are much more variable than commercially generated waste. The distribution of radionuclides and their concentrations in DOE-generated wastes is almost continuous, with no natural breakdowns into specific waste classes or concentrations. However, commercially generated wastes have been demonstrated to segregate relatively easily into the waste classes set forth in §61.55.

under §61.55) have been disposed of at sites under DOE control in accordance with Order 435.1.

Since DOE is required under the LLWPAA to take the responsibility for disposal of GTCC waste generated by non-DOE entities, it would seem only prudent to take a hard look at addressing these self-imposed barriers that are preventing disposal of certain sealed sources that have outlived their desired purpose⁵. Language in the LLWPAA requires that GTCC sources recovered from the commercial sector that is not DOE owned material be disposed of in an NRC licensed facility. Since there are no currently licensed NRC disposal facilities accepting GTCC wastes, this legislation places DOE in the position of holding, in storage, thousands of sources with no disposal pathway. In the next few years, the OSRP will confront this hurdle. It will need to find a permanent repository for the disused sources now in interim storage. However, funds for developing a permanent disposal plan for these materials have yet to be provided. Moreover, additional funding will likely be required to pay for a needed expansion of the OSRP beyond the GTCC mandate. In particular, many other unwanted sources that do not fit the narrow GTCC definition could pose a high risk for use in an RDD. The OSRP has been recovering some of those sources on a case-by-case basis, but a more systematic approach is needed to more effectively disposition these radioactive materials. This approach must facilitate transferring legal ownership of the sources/devices to DOE in a way that satisfies the requirements for commercial disposal of non-DOE materials recovered from the commercial sector.

Under the *Act*, disposal of discrete sources of naturally occurring and accelerator produced radioactive materials (NARM) will be allowed for facilities licensed by the NRC, at facilities regulated by EPA under Subtitle C of the Resource Conservation and Recovery Act, and at facilities that ensures the protection of public health. While the legislation did not specifically include language of equivalency between the definition of 11e.(2) and 11e.(3)/11e.(4) by-product material it would allow disposal of discrete sources of NARM at uranium mill tailing impoundments. The aforementioned statement of equivalencies contained in the draft legislation on NARM that was proposed by HPS was intended to not only allow such disposal, but also to require DOE to take title of these sites in perpetuity as required under the Uranium Mill Tailing Radiation Control Act (UMTRCA). Considering that the *Act* requires use of State Consensus Standards, which support such disposal practices, federal governmental agencies could enter into a Memorandum of Understanding on the types of radioactive materials that could be permissible for disposal in a uranium mill tailing site and to which DOE would agree to take title of a site under UMTRCA, thus allowing for disposal of by-product material in mill tailing sites without further Congressional action.

Topic 6: Import and export controls on radiation sources to ensure that recipients of radiation sources are able and willing to adequately control radiation sources.

⁵ On May 11, 2005, DOE issued an advanced notice of intent to prepare an Environmental Impact Statement for disposal of GTCC wastes (See Federal Register, Vol. 70, No. 90). The NRC has also set forth a plan to weigh the options for such disposals (see SECY-05-0104), dated June 13, 2005. Lastly, the *ACT* addresses the DOE's responsibilities related to disposal of GTCC (See Section 631 of the *Act*).

Comment 6: The HPS believes that the rule for import/export controls is generally consistent with the IAEA *Code of Conduct* and the supporting guidance and that the rule will have a very significant and positive impact on the control of international transfers of radioactive sources.

Comment 7: The HPS is concerned that very few countries (11 countries by the end of 2005, including the United States and Canada) have so far committed to implementing the import/export provisions of the *Code of Conduct*. The HPS believes the Department of State must continue to use all means possible to work with IAEA to get its member states to adopt and implement the import/export controls and to prevent source transactions with countries that do not have proper source controls.

Topic 8: Procedures for improving the security of transportation of radiation sources.

Comment 8: The HPS recommends that special form testing records be maintained in perpetuity and made available online by manufacturers registering their special form testing records with the Department of Transportation (DOT) in a manner that will not identify potential vulnerabilities of the packaging.

Discussion: One barrier to vulnerable source recovery is a transportation issue related to the characterization and documentation of sealed sources as special form⁶ radioactive material. The requirements for characterization are delineated in 49 CFR Part 173.469. The issue has been that manufacturers of sealed sources typically tested their sources and maintained records of that testing which was documented via a source certificate. Unless the manufacturer applied to the Department of Transportation (DOT) for a Certificate of Competent Authority (COCA), there was no record held by the regulator of the special form testing. If the manufacturer then went out of business the records of special form testing were subsequently lost. The failure to maintain a national record of sealed source special form testing frequently means that the material is reclassified as normal form radioactive material for transportation purposes resulting in the fact that the maximum quantity that can be shipped in a Type A package is reduced by a factor of 1,000. This typically means that sources originally shipped during distribution in a Type A package must now be recovered by shipment in a Type B package. Shipments in Type B packages usually require an NRC approved Quality Assurance (QA) program, which is not very common among NRC licensees. To maintain the ability of the licensee to ship the material in a Type A package, all special form testing records would need to be registered with the DOT regardless of whether or not the manufacturer has applied for a COCA.

Comment 9: The HPS recommends that DOT extend the authorization for continued domestic use of the specification containers 20WC and 6M as necessary to provide sufficient time for design, testing, and approval of replacement containers with adequate internal volume, gross weights, and cost based on requests for an extension from potential

⁶ A special form of radioactive materials is defined (see 10 CFR 71.4), in part, as either a single solid piece or is contained in a sealed capsule that can be opened only by destroying the capsule.

applicants for certification. HPS further recommends that NRC expedite the review and approval process for updated replacement containers.

Discussion: The DOT and NRC recently initiated rulemakings to harmonize the transportation of radioactive materials in the United States with international standards endorsed by IAEA. In doing this, the transportation regulations issued by DOT and NRC did not provide provisions to maintain the availability of 6M and 20WC specification packaging for domestic use. The 6M and 20WC packagings are the most cost effective and simplest Type B packaging currently available. Many devices and sources are designed to be safely shipped in these packaging. With the implementation of HM-230⁷ the DOT discontinued their regulation of 6M and 20WC packaging and acceded to NRC's desire to phase these out of use by October 2008. NRC's singular statement on the topic was that the packaging no longer met the regulatory requirements for materials QA, testing, or a single complete Safety Assessment. The fact that the Transportation Branch of NRC was stranding devices was not deemed to be an important issue. Without the ability to freely and cost effectively ship sealed sources, a barrier against any affordable movement or disposition of the sources has been raised. The two specification packagings may be resubmitted for a new Certificate of Compliance, but only if private enterprise deems the investment of \$500,000 - \$1,000,000 to be worthwhile.

Generally, the HPS cautions that any reduction in risk obtained through modification of transportation regulations must be balanced with the risk inherent in allowing excess, unwanted, or orphaned sources to remain prolonged in the environment as a result of impediments to recovery and management propagated by regulatory change. While it is necessary to have harmonization with international standards on radioactive material transportation requirements for international trade, it is not clear why allowance for other acceptable transportation methods cannot continue to be used for domestic use.

Topic 10: Alternative technologies.

Comment 10: The HPS recommends that the federal and state regulatory agencies adopt as licensing policy a requirement that license applicants for a new use of a Category 1, 2, or 3 radioactive source examine alternative technologies including, but not limited to, different source forms that are technically and economically feasible and whose alternative use would result in an equal or greater net benefit than from the use of the source.

Discussion: the *Act* directs the National Academy of Sciences (NAS) to conduct an assessment of whether some *current* industrial uses of radiation could be replaced with non-radioactive or less dangerous radioactive materials. The assessment of alternative technologies was called for by the HPS in its 2002 position statement *State and Federal Action Is Needed for Better Control of Orphan Sources* and continues to be called for in its 2006 position statement *Continued Federal and State Actions are Needed to Better Control Radioactive Sources*. While the NAS is tasked with a "current usage" assessment, the HPS

⁷ Rulemaking that required changes to 49 CFR Parts 171,172,173, 174, 175, 176, 177 and 178, (Docket No. RSPA-99-6283 (HM-230). The purpose of this rulemaking initiative is to harmonize requirements of the HMR with the IAEA publication, entitled "IAEA Safety Standards Series: Regulations for the Safe Transport of Radioactive Material, 1996 Edition, Requirements, No. ST-1."

position calls for the evaluation of alternative technologies to be incorporated into the licensing of new sources in the future.

The HPS appreciates the opportunity to provide these comments and discussion to the Radiation Source Protection and Security Task Force and hopes the Task Force finds them helpful.

Sincerely,

A handwritten signature in black ink that reads "Ruth E. McBurney". The signature is written in a cursive, flowing style.

Ruth E. McBurney, CHP