



HEALTH  
PHYSICS  
SOCIETY

## CONTINUED FEDERAL AND STATE ACTION IS NEEDED FOR BETTER CONTROL OF RADIOACTIVE SOURCES

### POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY\*

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The Health Physics Society (HPS) believes that security of vulnerable<sup>1</sup> and orphan<sup>2</sup> sources, both domestic and international, is a radiation safety issue of high priority needing additional state and national attention. Many disused<sup>3</sup> sources are also vulnerable and to that extent are included in this statement.

The HPS Position Statement *State and Federal Action Is Needed for Better Control of Orphan Sources* (HPS 2002) conveyed the Society's view that the orphan-source problem was a radiation safety issue of high priority. Although publication of the position statement followed the events of September 11, 2001, the document was primarily drafted prior to that date so it did not focus on the potential for malevolent use of radioactive sources. With concerns about the increased malevolent use<sup>4</sup> of radioactive sources emerging as a possible threat, the enhancement of orphan-source controls as advocated in the April 2002 position statement has become a subset of the security controls needed for all vulnerable sources.

The purpose of this position statement is 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 an HPS working group report, *Actions Needed to Better Secure Vulnerable Radioactive Sources: A Contemporary Report* (HPS 2005a). This position statement supersedes the April 2002 position statement regarding orphan-source control.

Since September 11, 2001, states, federal agencies, international organizations, and the US Congress have taken, and continue to take, significant actions, and they have implemented major improvements regarding the security of radioactive sources.<sup>5</sup> Therefore, these recommendations must be taken in the context of any actions that are taken following its issuance.

The specific HPS positions and recommendations for actions to better control vulnerable and orphan sources are given below.

Concerning recent actions to improve source security:

1. The HPS believes the Department of State should be commended for its leadership in successfully encouraging 77 International Atomic Energy Agency (IAEA) member states (as of September 2005) to commit to adopting the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources (Code of Conduct)*.
2. The HPS is concerned that very few countries (11 to date, including the United States and Canada) have so far committed to implementing the import/export provisions of the *Code of Conduct* by the end of 2005. 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.
3. 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). In addition the HPS commends the NRC for revising rules for the import/export of radioactive materials and promulgating a proposed rule for a National Source Tracking System for certain sealed sources of concern.
4. The HPS supports the study of alternative technologies, as provided for by the *Energy Policy Act of 2005*, to reduce the use of radioactive materials when hazards and disposition are an issue and to provide a basis for statement 6 below.

Concerning a source prioritization system that underlies security measures both for national defense and security and for public health and safety:

5. The HPS supports the IAEA categorization system, but recognizes there is a need for other categorization levels for different purposes to support missions of the various federal agencies. The HPS believes that federal agencies must continue working together as they develop a consistent national regulatory framework that serves as the basis for a prioritization system that all agencies can use in achieving their respective goals and responsibilities.

Concerning future licensing of radioactive sources:

6. 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<sup>6</sup> 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.
7. 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 sources on the license 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*.

Concerning source recovery:

8. 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.

Concerning the NRC rule for import/export controls:

9. 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.

Concerning the implementation of the provisions for reclassification of naturally occurring radioactive materials (NORM) contained in the Energy Policy Act of 2005:

10. The HPS believes the NRC, in addressing the definition of discrete sources of NORM, should make a definition that addresses to the maximum extent allowed by the Energy Policy Act the need to establish uniform radiation protection standards to protect both public health and safety and national security, in accordance with the joint position of the HPS and the Organization of Agreement States, as described in their statement *Congressional Action Is Needed to Ensure Uniform Safety and Security for Certain Radioactive Materials* (HPS/OAS 2005).

Concerning the NRC proposed rule for a National Source Tracking System:

11. 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 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.

Concerning transportation of vulnerable sources:

12. 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.
13. 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 applicants for certification. HPS further recommends that NRC expedite the review and approval process for updated replacement containers.

Concerning waste-disposal options for sources:

14. The HPS recommends that Congress take action to ensure accessible and safe options are available for disposing of all radioactive sources, but especially the higher-category (1-3) sources and orphan sources. If implemented, the recommendations in the HPS Position Statement *Low-Level Radioactive Waste Management Needs a Complete and Coordinated Overhaul* (HPS 2005b) will improve the effectiveness and efficiency of recovering and disposing of such sources.
15. The HPS recommends that federal and state agencies, in conjunction with radiation safety organizations like the HPS and other professional and trade organizations, develop and implement programs to better inform all entities that possess radioactive sources about available options for source disposition. In particular, this educational effort should be directed toward licensees who have had little contact with federal and state regulators and have minimal radiation safety programs.

Concerning international cooperation in recovery and security of vulnerable sources:

16. 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.

**Footnotes:**

<sup>1</sup> Vulnerable source: A vulnerable radioactive source is one which is currently under regulatory control, but for which the control is insufficient to provide assurance of long-term safety and security. A vulnerable source is one that could relatively easily become orphaned or be involved in a malevolent incident. This includes disused sources for which the licensee has few or no options for, or is incapable of providing for, the safe disposition of the material. This definition is based on the definition of a vulnerable source in IAEA TECDOC 1388 (February 2004). Similar terms used by other agencies include “sources of concern” or “potentially high-risk sources.”

<sup>2</sup> Orphan source: An orphan source is a radioactive source which is not under regulatory control, either because it has never been under regulatory control or because it has been abandoned, lost, misplaced, stolen, or transferred without proper authorization.

<sup>3</sup> Disused source: A disused source is a radioactive source which is no longer used, and is not intended to be used, for the practice for which an authorization has been granted.

<sup>4</sup> Some examples of past malevolent uses of radioactive materials are the intentional irradiation of a boy by his father with a well-logging source in Texas in February 1974, the intentional contamination of a water cooler and an internal contamination of a researcher at the National Institutes of Health in June 1995, a suspected, but unproven, intentional internal contamination of a researcher at the Massachusetts Institute of Technology in August 1995, and the placement of a radioactive source in Izmailovsky Park, Moscow, in November 1995 by Chechen rebels. It is noted the first three examples were not perpetrated as a terrorist action.

<sup>5</sup> Major developments in radioactive source security include the following:

- Issuance of a major revision to the International Atomic Energy Agency's (IAEA) *Code of Conduct on the Safety and Security of Radioactive Sources (Code of Conduct)* and supporting guidance relating to the safety and security of sealed sources.
- Establishment of a Nuclear Regulatory Commission (NRC) - Department of Energy (DOE) RDD working group and development of their report.
- Issuance of an NRC rule that implements the IAEA *Code of Conduct* provisions and guidance on the export and import of radioactive materials.
- Issuance of orders by the NRC requiring safety and security enhancements for panoramic irradiators, transport of radioactive materials, and the manufacturing and distribution of sources.
- Actions by the NRC and the Agreement States to develop an inventory of certain radioactive sources currently possessed by licensees.
- Publication of an NRC proposed rule to create a national tracking system for certain radioactive sources.
- Establishment of an NRC and Agreement State working group to develop increased controls for all licensees possessing Category 1 and 2 sources.
- Restructuring of the Off-Site Source Recovery Project by the DOE with support from the Congress.
- Drafting by the Department of Homeland Security (DHS) of a nuclear sector-specific plan covering protection of nuclear reactors, radioactive materials, and radioactive waste (as input to the National Infrastructure Protection Plan).
- Establishment within DHS of the Domestic Nuclear Detection Office.
- Enactment of the Energy Policy Act of 2005, containing specific provisions for radioactive source protection.

<sup>6</sup> The IAEA *Code of Conduct* includes a system for categorizing radioactive sources based on their potential to cause harm to people. The system categorizes sources into five categories, 1 through 5, with 1 being the greatest risk and 5 being the lowest risk. Categories 1, 2, and 3 are all classified as "dangerous" sources.

**References:**

Health Physics Society. Position Statement “State and Federal Action Is Needed for Better Control of Orphan Sources,” issued April 2002.

Health Physics Society and Organization of Agreement States. Position Statement “Congressional Action Is Needed to Ensure Uniform Safety and Security for Certain Radioactive Materials,” issued January 2005. Available at: <http://hps.org/documents/MaterialControl.pdf>.

Health Physics Society. Report of a Working Group “Actions Needed to Better Secure Vulnerable Radioactive Sources: A Contemporary Report,” issued 1 September 2005. Available at: <http://hps.org/documents/SafeguardActionNeededVulnerableSources.Public.pdf>.

Health Physics Society. Position Statement “Low-Level Radioactive Waste Management Needs a Complete and Coordinated Overhaul,” issued September 2005. Available at: <http://hps.org/documents/llrw.2005.pdf>.

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\* The Health Physics Society is a nonprofit scientific professional organization whose mission is to promote the practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers, and other professionals representing academia, industry, government, national laboratories, the Department of Defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: [HPS@BurkInc.com](mailto:HPS@BurkInc.com).