



HEALTH
PHYSICS
SOCIETY

CLEARANCE OF MATERIALS HAVING SURFACE OR INTERNAL RADIOACTIVITY

POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY*

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The Health Physics Society* welcomes the opportunity to participate in the process initiated by the Nuclear Regulatory Commission for development of standards for the clearance of materials having surface or internal radioactivity. The Society believes that the definition of clearance levels is an important part of the standards that provide for the safe handling, use, and disposal of radioactive materials.

The position of the Society relative to radiation protection regulations and standards for the general public have been established in previous Position Statements of the Society. Portions of these positions relative to the clearance of materials having surface or internal radioactivity are:

- (1) we support regulations for radiation protection that are based on the National Council of Radiation Protection and Measurements' (NCRP) recommendations for dose limits for individual members of the public;**
- (2) we recommend that constraints¹ be applied to all regulated, non-medical, non-occupational sources of radiation exposure to the general public, excluding indoor radon, such that no individual member of the public will receive in any one year a total effective dose equivalent (TEDE)² exceeding 100 mrem (1 mSv)³ from all such sources combined; and,**
- (3) we recommend that dose limits be applied only to individual members of the public, not to the collective dose to population groups.**

Expansion and clarification of these recommendations specific to clearance of materials having surface or internal radioactivity further leads the Society to take the position that:

- (4) **we recommend that regulations for radiation protection be based on consensus standards of the American National Standards Institute (ANSI) issued by the Health Physics Society Standards Committee in keeping with the intent of Public Law 104-113 “National Technology and Transfer Act of 1995” and OMB Circular A-119 “Federal Participation in the Development and Use of Voluntary Consensus Standards”;**
- (5) **we recommend that primary radiation protection standards be all pathway TEDE standards with screening levels related to quantities that can be measured such that compliance with these levels will result in the primary dose standards being met for reasonable and likely scenarios;**
- (6) **we recommend that these screening levels be derived with consideration of the principle of as low as reasonably achievable (ALARA); and,**
- (7) **we support the adoption of ANSI Standard N13.12 (1999), “*Surface and Volume Radioactivity Standards for Clearance*”, which is consistent with positions (1) through (6) above.**

ANSI Standard N13.12

Clearance is the removal from further control, of any kind, of items or materials that may contain residual levels of radioactivity. In 1964, the Health Physics Society, under the auspices of ANSI, began the technical evaluation of clearance, resulting in early drafts of ANSI N13.12. These early drafts of the clearance standard were based primarily on detection levels that could be achieved using field instruments, with secondary concerns about the potential individual doses that may result. An early draft version of ANSI N13.12 was consistent with the surface contamination limits that were published by the U.S. Atomic Energy Commission in the 1974 version of Regulatory Guide 1.86, *Termination of Operating Licenses for Nuclear Reactors*, which is still in use today.

In 1993, the Health Physics Society Standards Committee, in agreement with ANSI Committee N13, established a technical writing group to develop the final N13.12 clearance standard. The charter of the writing group was to develop a consensus clearance standard that would be protective of public health based on the recommendations of the International Commission on Radiological Protection (ICRP). Recommendations of the NCRP that have been adopted as the regulatory basis in this country are consistent with those of the ICRP. The standard was also chartered to consider both surface and volume radioactive contamination, consider radiation detection issues, and consider international issues such as the clearance principles outlined by the International Atomic Energy Agency and international trade implications for recycled or reused items or materials.

The final clearance standard was approved in August 1999 as N13.12, *Surface and Volume Radioactivity Standards for Clearance*. This standard provides both the individual dose criterion of 1 mrem per year for clearance and derived screening levels for groups of similar radionuclides. The standard also allows for clearance, when justified on a case-by-case basis, at higher dose levels when it can be assured that exposures to multiple sources (including those not covered by the standard) will be maintained ALARA and will provide an adequate margin of safety below the public dose limit of 100 mrem/y (TEDE). It was recognized that there were several complex issues that would make it difficult to fully implement the clearance standard. As a result, some of these issues were defined to be beyond the scope of the standard, including: naturally occurring

radioactive materials, radioactive materials in or on persons, release of a licensed or regulated site or facility for unrestricted use, radioactive materials on or in foodstuffs, release of land or soil intended for agricultural purposes, materials related to national security, and process gases or liquids.

Footnotes

¹ “Constraints” refer to restrictions placed on sources or practices in order to achieve the dose limits that apply to an individual.

² The total effective dose equivalent (TEDE) is the sum of the absorbed doses that will be delivered to the separate organs or tissues during the lifetime of an individual from one year’s intake of radionuclides plus irradiation by external sources, with each organ or tissue dose weighted for the type of radiation producing the dose and with an estimate of the risk that the organ or tissue will develop a radiation induced cancer or result in a genetic effect.

³ The Sievert (Sv) is the international (SI) unit of dose equivalent or of effective dose equivalent; 100 mrem = 1 millisievert (mSv). The Society endorses the use of SI units; however, because U. S. regulatory agencies continue to use traditional units in regulations, this position statement uses the traditional unit for dose equivalent, i.e., mrem, throughout the document.

* The Health Physics Society is a non profit 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.