HEALTH PHYSICS SOCIETY

EXCLUSIVE USE OF SI UNITS TO EXPRESS RADIOLOGICAL QUANTITIES

POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY*

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It is the position of the Health Physics Society (HPS) that the International System of Units (SI) should be used *exclusively* when expressing radiological quantities. The continued use of traditional, yet outdated, units to express radiological quantities in the United States can have significant repercussions with regard to effective response to radiation emergencies. It will also have negative impacts on educating and conditioning future generations in the United States who are not well versed in the current scientific and internationally adopted radiological units.

The SI-derived units with special names for radiological quantities are gray (Gy), becquerel (Bq), and sievert (Sv). These units were defined by the International Commission on Radiation Units and Measurements in 1975, and they replace the traditional units of rad, curie, and rem. The SI units for radiological quantities are used exclusively by organizations such as the International Commission on Radiological Protection, the National Council on Radiation Protection and Measurements (NCRP), and the International Atomic Energy Agency. These units have also been fully adopted by nearly every country in the world and every major scientific publication, including *Health Physics.*

The issue of the use of SI units for radiological quantities in the United States is quite separate from the long-standing issue of converting to SI units for everyday quantities such as length, mass, area, volume, or speed. The everyday units to express these quantities are engrained in the public mind and culture, and a full conversion and exclusive use of SI units for these quantities is difficult, if not impractical. However, the radiological quantities and the units of rad, curie, and rem are not used by the public and are not engrained in everyday culture.

In fact, most print and television media reporting on the 2011 disaster in Fukushima, Japan, used the current and correct international system of units to report radiation dose and environmental quantities during the Fukushima incident. This is an example of how such information is generated locally, shared globally, interpreted by the international radiation safety community, and reported by international news agencies.

The NCRP called for a gradual adoption of SI units in the United States over a five-year transition period in 1985 (NCRP 1985). The National Institute of Standards and Technology continues to strongly discourage the use of the curie, roentgen, rad, and rem (NIST 1998, 2008a, 2008b). However, the U.S. regulatory agencies and, by habit and necessity, radiation safety professionals, perpetuate the use of these outdated units in their practice in the United States.

The continued use of these traditional units:

- Hinders the exchange and interpretation of information even among radiation safety professionals, especially during a radiation emergency,
- Provides an unnecessary barrier to public communication, and
- Educates and conditions yet another generation of radiation protection practitioners who are not well versed in the current scientific and internationally adopted radiological units.

Nearly all countries in the world, many with well-established nuclear industries, have effected this transition successfully, without compromising health and safety, and have demonstrated that complete conversion to current international units is certainly practical and doable.

The HPS believes the *exclusive* use of SI units to express radiological quantities is the responsible practice to promote—a practice that is long overdue in the United States.

References

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National Institute of Standards and Technology. The International System of Units (SI). Gaithersburg, MD: National Institute of Standards and Technology; Special Publication 330; 2008a.

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*The Health Physics Society is a nonprofit scientific professional organization whose mission is excellence in the science and practice of radiation safety. Since its formation in 1956, the Society has represented the largest radiation safety society in the world, with a membership that includes scientists, safety professionals, physicists, engineers, attorneys, and other professionals from academia, industry, medical institutions, state and federal government, the national laboratories, the military, 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.