NCRP Releases Report No. 158,
Uncertainties in the Measurement and Dosimetry of External Radiation

NCRP Report No. 158, *Uncertainties in the Measurement and Dosimetry of External Radiation,* discusses the major sources of uncertainty in various types of external radiation measurements as well as the uncertainty in relating a particular measured quantity to an absorbed dose in a body organ. The Report also discusses the basic statistical principles needed to describe the distributions of uncertainty and how to combine these distributions to arrive at an estimate of the distribution in the uncertainty in organ absorbed dose ($D_T$). A number of practical examples (case studies of occupational and environmental exposures) are included to illustrate some of the principles described.

The major sources of uncertainty in relating a reported measurement to $D_T$ arise from incomplete information regarding the incident radiation. Variations in body size and orientation contribute to the uncertainty. The uncertainty is greater if the measurement was reported as an operational quantity (e.g., dose equivalent) rather than as a physical quantity (e.g., air kerma or fluence).

This Report provides the information required to understand the various sources of uncertainty, the magnitude and range of the likely uncertainties, and methods for combining these estimated uncertainties to obtain an estimate of the uncertainty in $D_T$. The discussions in this Report should be useful to investigators charged with making and reporting measurements of environmental and occupational sources of external radiation as well as those involved in estimating $D_T$ based on these measurements or reconstructing doses based on previously reported measurements. The Report also provides important information on dose uncertainty estimation from external radiation sources in prospective epidemiological studies related to medical procedures and other public and occupational exposures.

The Report is available from the NCRP website, [http://NCRPpublications.org](http://NCRPpublications.org), in both soft- and hard-copy formats. For additional information contact David A. Schauer, ScD, CHP at [schauer@NCRPonline.org](mailto:schauer@NCRPonline.org), 301.657.2652 (x20) or 301.907.8768 (fax).

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