

The Operational Quantities and New Approach by ICRU

A. Endo

ICRP Committee 2

Japan Atomic Energy Agency, Tokai-mura, Ibaraki, Japan

On behalf of the ICRU Report Committee 26 on Operational Radiation Protection Quantities for External Radiation

The protection quantities, equivalent dose in an organ or tissue and effective dose, were developed by ICRP to allow quantification of the extent of exposure of the human body to ionising radiation; they are to be used for the implementation of the limitation and optimisation principles. The body-related protection quantities are not measurable in practice. Therefore, International Commission on Radiation Units and Measurements (ICRU) developed a set of operational dose quantities for use in radiation measurements for external radiations that can assess the protection quantities. The current ICRU operational quantities were defined more than 30 years ago. The ICRU Report Committee 26 has examined the rationale for operational quantities taking into account the changes in the definitions of the protection quantities in the ICRP 2007 Recommendations. The considerations have included the range of types and energies of particles contributing to doses of workers and members of the public. The Committee has investigated a set of alternative definitions for operational quantities different to the existing quantities. The major change to the currently favoured set of quantities is the redefinition of the operational quantities for area monitoring, from being based on doses at a point in the ICRU sphere to being based on particle fluence and the relationship to the protection quantities, effective dose, and equivalent dose to the lens of the eye and local skin.