ICRU REPORT 33 - Radiation Quantities and Units

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This new ICRU report "Radiation Quantities and Units" supersedes Report 19 with the same title. The main part of the document is a series of definitions of the fundamental quantities of radiometry, interaction coefficients, dosimetry and radioactivity. The second part of the report discusses quantities and units for use in radiation protection, in particular dose equivalent and the unrestricted and restricted dose indices.

The Report stresses the use of SI units and the special named radiation units in the SI system, the becquerel, gray and sievert. The special units, curie, roentgen, rad and rem are recognised in the Report but the ICRU states the intention to drop the usage of these old units by 1985.

Perhaps the most significant change since the previous report is the emphasis that the ICRU now appears to place on the use of air kerma as the quantity for specifying a field of uncharged ionising particles. The exposure rate constant of a radioactive nuclide emitting photons has been replaced by the air kerma-rate constant which appears to imply that the ICRU intends that in future gamma ray emitting sources should be specified in terms of their air kerma-rate rather than exposure rate. For the photon radiations from radioactive materials the numerical value of the air kerma-rate is practically the same as that for the absorbed dose-rate to air under conditions of electronic equilibrium. The only difference is a small correction for energy loss due to bremsstrahlung radiation from fast charged particles produced in the interactions.

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