



## A FINNISH NATIONAL CODE OF PRACTICE FOR REFERENCE DOSIMETRY OF RADIATION THERAPY

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A national Code of Practice (CoP) for reference dosimetry of radiation therapy in Finland will be established during 2002 and will be implemented from the beginning of 2003. The CoP will cover dosimetry of the conventional radiotherapy modalities used in Finland i.e. external radiotherapy with megavoltage photon and electron beams, external radiotherapy with low energy kilovoltage X-ray beams and brachytherapy. The formalisms for external radiation beam dosimetry are those of TRS 389 [1]. For brachytherapy the formalism will follow the general guidelines of TECDOC-1274 [2]. The CoP will be prepared by the SSDL of STUK in close co-operation with the Finnish radiotherapy physicists.

For external beam radiotherapy, the main objective of the national Code of Practice for radiation therapy dosimetry is to maintain the achieved good level of consistency of the dosimetry procedures in external beam radiotherapy as the 'absorbed dose to water' based approach of TRS 389 is implemented in Finland. In the CoP the dosimetry the procedures are described for the whole dosimetry chain starting from the calibration of the ionisation chambers at the SSDL of STUK and ending to the calibration of the beam monitor ionisation chamber of a linear accelerator. For brachytherapy dosimetry the aim is to fix the national practice for reference air kerma rate calibrations both for radioactive sources and for well-type ionisation chambers.

Although the dosimetry procedures are described independently of the SSDL service, CoP makes use of the special features of the calibration service offered by the SSDL of STUK. For ionisation chambers used for photon dosimetry the calibration factors for the user measurement chain are given not only for the actual reference beam quality ( $^{60}\text{Co}$ ) but also for a set of user beam qualities. Furthermore, SSDL of STUK offers calibration services for plane parallel ionisation chambers in an electron beam of a user linac [1,3]. For brachytherapy SSDL of STUK has traceable calibrations for the reference well ionisation chamber for  $^{137}\text{Cs}$ ,  $^{192}\text{Ir}$ ,  $^{125}\text{I}$  and  $^{103}\text{Pd}$  radioactive sources. In the CoP a special attention will be paid to the practical aspects of the dosimetry at the radiotherapy clinics.

The implementation of the Finnish CoP is organized through training of the users of the CoP during the regular site visits by the staff of the SSDL of STUK to the hospitals and through lectures at the annual meeting with the radiotherapy physicists.

### REFERENCES

- [1] Absorbed Dose Determination in External Beam Radiotherapy, An International Code of Practice for Dosimetry Based on Standards of Absorbed Dose to Water, Sponsored by the IAEA, WHO, PAHO and ESTRO, Technical Report Series 398, IAEA, 2000.
- [2] INTERNATIONAL ATOMIC ENERGY AGENCY, Calibration of brachytherapy sources. Guidelines on standardized procedures for the calibration of brachytherapy sources at the Secondary Standard Dosimetry Laboratories (SSDLs) and hospitals, IAEA-TECDOC-1274, Vienna (2002).
- [3] The Use of Plane Parallel Ionization Chambers in High Energy Electron and Photon Beams, An International Code of Practice for Dosimetry, Technical Report Series 381, IAEA, 1997.