

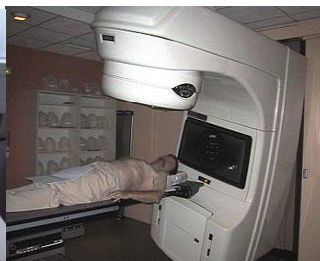
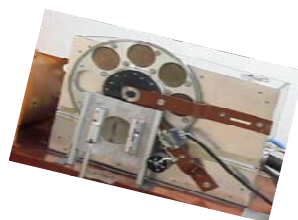
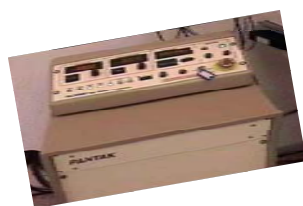


“Automation of the calibration of reference dosimeters for radiotherapy, in terms of Kerma in Air and Absorbed Dose to Water at Cuban SSDL.”

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Traceability, accuracy and consistency of radiation measurements are essential in radiation dosimetry, particularly in radiotherapy, where the outcome of treatments is highly dependent on the radiation dose delivered to patients. The role of Secondary Standard Dosimetry Laboratories (SSDLs) is crucial on providing traceable calibrations to hospitals, since these laboratories disseminate calibrations at specific radiation qualities appropriate to the use of radiation measuring instruments. A common objective for SSDLs is continuous maintenance and improving of calibration competences. SSDLs follow OIEA/WHO guidelines for calibration procedures, often being current and charge measurements described in those guidelines a tedious task. However, these measurements are usually done using modern electrometers which are equipped with a RS-232 interface that allows instrument control from a PC.



This work presents the design and employment of an automated system aimed to measurements of the radiotherapy dosimeters calibration process. A software was developed in order to achieve the acquisition of measured values, calculation of the calibration coefficient and issue of a calibration certificate. A primary data report file is filled and stored in the PC's hard disk. The used electrometer was a PTW UNIDOS E, although UNIDOS 10001, UNIDOS 10002, and UNIDOS WEBLINE models are also supported. The used calibration method was calibration by substitution, described in Technical Report Series No. 374. The automated system is currently in use and has improved the measurements of the calibration for radiotherapy at Cuban Secondary Standard Dosimetry Laboratory at CPHR. A 24% reduction in the calibration process time is appreciated. By using the software, the process tediousness and human level error probability are also reduced.