Purpose: Determine the uncertainty of the Radiological Physics Center's (RPC) remote audit dose measurement of photon and electron beam outputs using Optically Stimulated Luminescence Dosimeters (OSLD).
Methods: In June 2010 the RPC implemented a switch from TLD to an OSLD mailed dosimetry audit using Landauer's InLight nanoDot™ OSL dosimeters and microStar reader System™. The steps and factors for the calculation of dose with OSLD were designed to follow those already in use with TLD including the use of the same acrylic mini-phantoms and irradiation instructions. The OSLD sensitivity was referenced to Co-60, and corrections for linearity, individual dosimeter response, fading, use of mini-phantoms and energy were determined for the OSLD. An analysis of the uncertainty of each of the correction factors was determined to give an overall uncertainty of the OSLD dose measurement under Co-60 reference conditions and megavoltage beam audits.
Results: The expectation was that with the physical processes for OSLD, being so closely resembling those of TLD, the uncertainties of OSLD would be comparable to those of TLD. A combined uncertainty of 0.8% for irradiations with Co-60 under controlled reference conditions and 1.8% for irradiations with high-energy X-rays was determined as compared to 1% and 2% for the previously used TLD, respectively. The OSLD energy block correction factor (KE) is the primary source of the overall OSLD dose measurement uncertainty. To date, the OSLD audit results after a year are essentially identical to the previous 5 years of TLD results both showing a mean TLD/Inst. Ratio of 1.00 ± 0.018.
Conclusion: The uncertainty of the RPC's new OSLD remote dosimetry audit program's dose measurement is equal to if not less than that for the historical TLD program.

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