Update on NIST X-Ray Air-Kerma Standards and Calibrations

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The report of an indirect comparison between the NIST and the BIPM for x-ray energies between 100 and 250 kV was published in 2006[1]. As a result of this comparison the recombination corrections were measured for the specified beams, and the uncertainty analysis was refined from the previous NIST-BIPM 1991 comparison.

The five additional reference-beam techniques recently determined at the NIST to represent the low-energy BIPM qualities have been used to calibrate NIST chambers to allow an indirect comparison with the PTB. The indirect comparison with the PTB began in January of 2006 with a visit to the PTB in March. Two transfer standards were calibrated at the NIST to mammography qualities. During the visit it was decided to include the low-energy BIPM (CCRI) techniques in the comparison. The NIST calibrations to these techniques are currently in progress, with a report planned for this summer.

The design and drawings for the replacement chamber to the Wyckoff-Attix free-air ionization chamber was completed in September of 2006. Various components and materials have been ordered and construction should start this summer.

Calibrations were provided in June of 2005 to the IAEA to provide traceability for mammography.

[1] D. Burn and M. O'Brien, Comparison of the NIST and BIPM Standards for Air Kerma in Medium-Energy X-Rays, J. Res. Natl. Inst. Stand. Technol. **111**, 385-391 (2006).