AbstractID: 7550 Title: Routine Per Article Manufacturing Testing of the Xoft Axxent® Source

Purpose: To accept sources during routine manufacturing which exhibit reliable stability and match the reference dosimetry parameters (using the TG-43 formalism) to within pre-determined criteria for patient treatment.
Materials and Methods: Two formally validated pieces of equipment consisting of hardware and software are used to measure a) the spatial characteristics of azimuthal symmetry, polar anisotropy and depth-dose; and b) the x-ray output reproducibility and stability during repeated on-off cycling and an extended on period. Automated software runs the tests, analyzes and evaluates the results, and produces printed reports that form part of the permanent history for each source.
Results: All sources are required to have azimuthal asymmetry ≤ 7%, normalized polar anisotropy in two orthogonal planes ≤ 0.10 of the TG-43 reference, and depth-dose behavior within 0.05 of the TG-43 reference. In addition, when cycled on and off, all sources must reproduce their previous output within 2%, with an average standard deviation of ≤ 2% during the on portion of the short cycles. During the 20 minute “on” period the drift (maximum deviation from start) measured over four 5 minute intervals is required to be ≤ 3%, and the noise (standard deviation of 0.5 second readings) at 10 second intervals is ≤ 0.25%.
Conclusions: Manufacturing testing of every source ensures that those accepted for human use will be stable, and have spatial output characteristics consistent with the values used for treatment planning within error limits established to ensure accurate dose delivery.

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