AbstractID: 11219 Title: The impact of photon beam spectra on OneDose MOSFET dosimeter response

Purpose: Relate the spectral differences of several dissimilar linear accelerator photon beams to the response of OneDose™ MOSFET dosimeters. **Method and Materials:** A Virtual Water™ phantom was constructed that mimics recommended usage of the OneDose dosimeter, with simultaneous irradiation of a calibrated ion chamber. The phantom was used for irradiations on Elekta, Siemens and Varian linacs, at photon energies of 4, 6, 10, 15 and 18MV. Field parameters were identical, except that dosimeters and effective point of measurement of the ion chamber were adjusted to d_{max}. Measurements were taken to accurately calculate dose following the TG-51 protocol. At minimum, 20 dosimeters were irradiated per beam to increase statistical validity of results. Dosimeters were read per manufacturer instructions. Readings were adjusted to 100 cGy dose and normalized to the average of 6MV readings for comparison. Readings from exposure to ^{60}Co were compared to linac results. Response dependence to field size and SSD was also studied at 6MV. **Results:** Dosimeter responses at like nominal energies are consistent at the 95% confidence level across all linear accelerators in the study. Response decreases linearly by ~4% from ^{60}Co to 10MV, then becomes nearly independent of energy to 18MV. Response shows no appreciable dependence on SSD from 80-100cm SSD at 6MV, but increases ~5% with field size from 5cm^2 to 20cm^2. **Conclusion:** Similarity of response across different linear accelerators suggests that nominal beam energy is an adequate qualifier for determining OneDose dosimeter energy correction factors. Differences in contamination particles produced in linac head components are not significantly altering response. This conclusion is strengthened by the insensitivity of response to SSD. The increasing response with field size can be attributed to a lower average energy from increased scatter radiation. **Conflict of Interest:** The authors are employees of Sicel Technologies, Inc.