AbstractID: 11196 Title: Measurement of the average seed strength in a Mick cartridge

Purpose: Develop an efficient method for the measurement of the average strength of brachytherapy seeds according to the 2008 recommendations of the AAPM Low Energy Brachytherapy Source Calibration Working Group. **Method and Materials:** The reentrant well ionization chamber is calibrated, at ADCL, for a single radioactive seed in a single-seed holder. When the seeds, loaded in Mick cartridges, are received from the manufacturer, it is necessary, only one time, to open only one cartridge. The strength of each seed in this cartridge is measured in the reentrant well chamber using the single-source holder and the ADCL calibration factor. As the seeds are removed from the Mick cartridge, one by one, the well chamber measurement is taken of the Mick cartridge, with the remaining seeds, in the Mick cartridge holder. Since the strength of each seed has been measured, the total strength of these remaining seeds in the Mick cartridge can be calculated. **Results**: Calibration coefficients have been determined for a Mick cartridge containing any number from 1 to 15 ^{125}I or ^{103}Pd seeds. Using these coefficients the average strength of the seeds in the cartridge, with any number of seeds, can be determined with one single measurement in the reentrant well chamber. After the initial process, used to calculate the calibration coefficients, there is no more need to remove any seed from any cartridge. Typically, one-minute measurements of the electric charge generated in the reentrant well chamber are used for each Mick cartridge. **Conclusion:** A time-saving method for measurement of the average activity of ^{125}I and ^{103}Pd seeds has been developed. Only a one-minute measurement of the electric charge generated in a reentrant well chamber is needed to calculate the average strength of the radioactive seeds in the Mick cartridge loaded with any number from 1 to 15 seeds.