Over the years the protocol for Cs-137 source calibration has undergone qualitative as well as quantitative changes. The 3M corporation issued product alerts and a revision of the calibration protocol in the early 1980's.

There are 34 Cs-137 tubes in clinical use in our facility. Following the 3M product alert, the recent recommendations of RPC, ACR standards, TG-40 and TG-56, the Cs-137 tubes were re-calibrated and the Quality Assurance program was revised for routine verification of source strength.

For the sources calibration, we used a Standard Imaging HDR 1000 Plus well-type ionization chamber and Keithley 35040 electrometer. Two independent calibration methods have been employed. The first method was based on a well ion chamber calibration factor for the Cs-137 Nuclear Associates Model 67-804 tube as supplied by ADCL. In the second method we used one of our sources (3M model 6D6C) which was calibrated by ADCL. The source strength as determined by both methods was in agreement within 0.2%. This confirms that, despite the fact that the well ion chamber was calibrated using a modern Cs-137 tube, it can be used to calibrate the old 3M sources with a small correction. Either of these methods may be adapted for routine QA purposes. The results of our calibration were compared to the activities calculated from the original data. As expected, the largest discrepancy we found was for sources calibrated in the 1970's (–13% maximum). For sources with calibration certificates dated in 1988 the differences ranged from –2.3% to –1.4% .