

ROUTINE CALIBRATION OF RADIATION PROTECTION MONITORING INSTRUMENTS: A FIVE YEARS PROGRESS REPORT

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Since 1980 the Calibration Laboratory of IPEN calibrates about 1000 instruments per year, at radiation protection level, belonging to industries, hospitals, clinics and other users located in São Paulo State and others in south of Brazil. The gamma radiation set-up of the laboratory consists of ^{60}Co and ^{137}Cs sealed sources with different activities. The measurement system consists of an ionization chamber, model 2581, and an electrometer, model 2502/3, both from Nuclear Enterprises Ltd. The applied technique is the use of radiation fields whose properties are well known. The tested instruments were: Geiger-Müller and ionization chamber portable instruments (59%), dose integrator detectors (36%) and alarm dosimeters (5%). The radiation detectors calibrated by the laboratory in the last five years were studied. In this period 6504 instruments were tested, but 20% did not show good enough performances to receive calibration certificates, because of a lack of scale linearity, in most cases. The tested instruments can be divided in three kinds of owners: Hospitals (20%), IPEN (14%) and Industries (66%). In order to analyze the equipments' behavior a group of instruments was selected taking into consideration the regularity of its calibration. The energy dependence (^{137}Cs - ^{60}Co range) presented variations between 0.7 and 8% for ionization chamber detectors and between 6 and 34% for Geiger-Müller detectors. Calibration factors between 0.878 and 1.18 R/(h.scale unit) were obtained. The highest difference in the calibration factors for the same instrument was 21 %.

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