

Ionizing radiation dosimetry at the BIPM

some years ago.....

....and today

1960 – 1970

...the development of primary standards to measure ionizing radiation started,

1980 – 2000

... changes and improvements were introduced through the years, mainly when Monte Carlo techniques were worldwide implemented, ...

2010 – 2020

...new challenges using off-site facilities and new services were launched , ...

2025

... facilities are renewed to maintain the international facility for dosimetry

The BIPM maintains 9 facilities for the validation of NMI primary standards and to provide traceability to the SI units through calibration of NMI secondary standards

Diagnostic radiology

x-rays

1960

low-energy x-rays

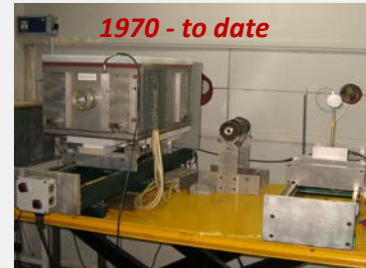


1963 - to date

Key comparisons
BIPM.RI(I)-K2
Location BIPM

1970

medium-energy x-rays



1970 - to date

Key comparisons
BIPM.RI(I)-K3
BIPM.RI(I)-K9
Location BIPM

2000

mammography x-rays



2009 - to date

Key comparison
BIPM.RI(I)-K7
Location BIPM

2020

new facility
medium-energy x-rays



2023 - to date

new facility

New facility for BIPM.RI(I)-K3 and -K9; overlap with the existing one to assure the long-term stability of the Key Comparison Reference Value KCRV

Radiation therapy

Co-60 γ -rays

1970

Ionometric cavity standards for Co-60

Location BIPM

Key comparisons BIPM.RI(I)-K1 and BIPM.RI(I)-K4

Three reference Co-60 beams through the years for the continuity of the services with overlapping to assure the long-term stability of the Key Comparison Reference Value KCRV



1972 - 2007

Co-60 Picker replaced by



2000 - 2014

Co-60 CIS Bio replaced by



2012 - to date

Co-60 Theratron

Radiation protection

Cs-137 γ -rays

1980

Ionometric primary standard for Cs-137
radiation protection beam

Key comparison BIPM.RI(I)-K5

Location

1980 to 2017 : BIPM

2022 - to date: IAEA



Cs-137 at the BIPM



2022

Brachytherapy
Ir-192 γ -rays

2010

Ionometric transfer
standard for Ir-192

Key comparison

BIPM.RI(I)-k8

Location

at the NMIs



Ir-192 at the NMIs

Radiation therapy

MV x-rays

2000

Calorimetric and
ionometric standards for
high-energy MV x-ray
beams



2010

Key comparison

BIPM.RI(I)-K6

Location

2010-2016:
at the NMIs

2017 to-date:
DOSEO-France



2017

2025

... the work continues to serve more than 30 NMIs for the radiotherapy, diagnostic radiology and radiation protection communities