

# Radiation Dosimetry Metrology Projects

## Reference radiation facilities

Developed and maintained by the BIPM for the **validation of NMI primary standards** and to **provide traceability to the SI** through the calibration of NMI secondary standards, serving the radiotherapy, diagnostic radiology and radiation protection communities

### X-ray facilities

#### Beams at the BIPM

- Low-energy x-rays
- Mammography
- Medium-energy x-rays

#### Primary standards

- Free-air chambers



#### NEW: Upgrade of the medium-energy x-ray facility

- New high-voltage generator, x-ray tube and bench
- Design and construction of a new primary standard

#### Application

**Diagnostic and Therapy for cancer**



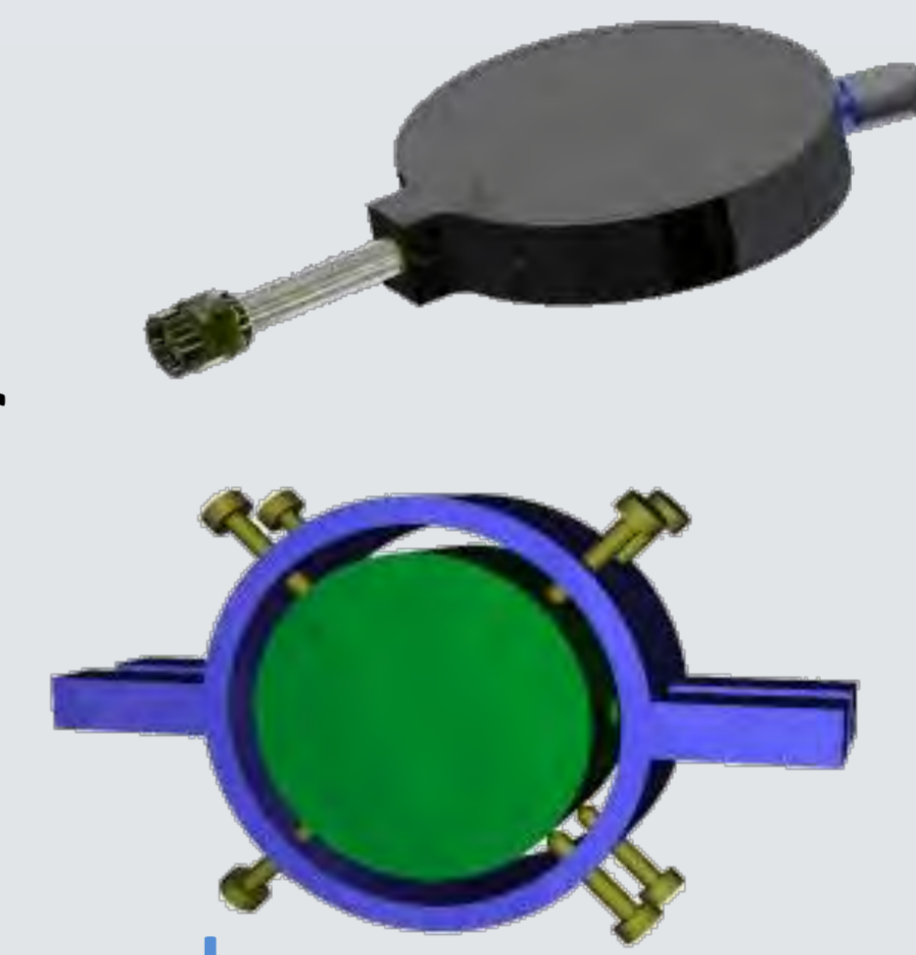
### High-energy radiation facilities

#### Beams

- Co-60 at the BIPM
- High-energy photon beams at the DOSEO off-site facility

#### Primary standards

- Air cavity ionization chamber
- Graphite calorimeter



Also used to determine  $k_Q$  factors for input to international protocols

#### Application

**Therapy for cancer**



**NEW**

**Calibration service** for national standards in high-energy x-ray beams at DOSEO

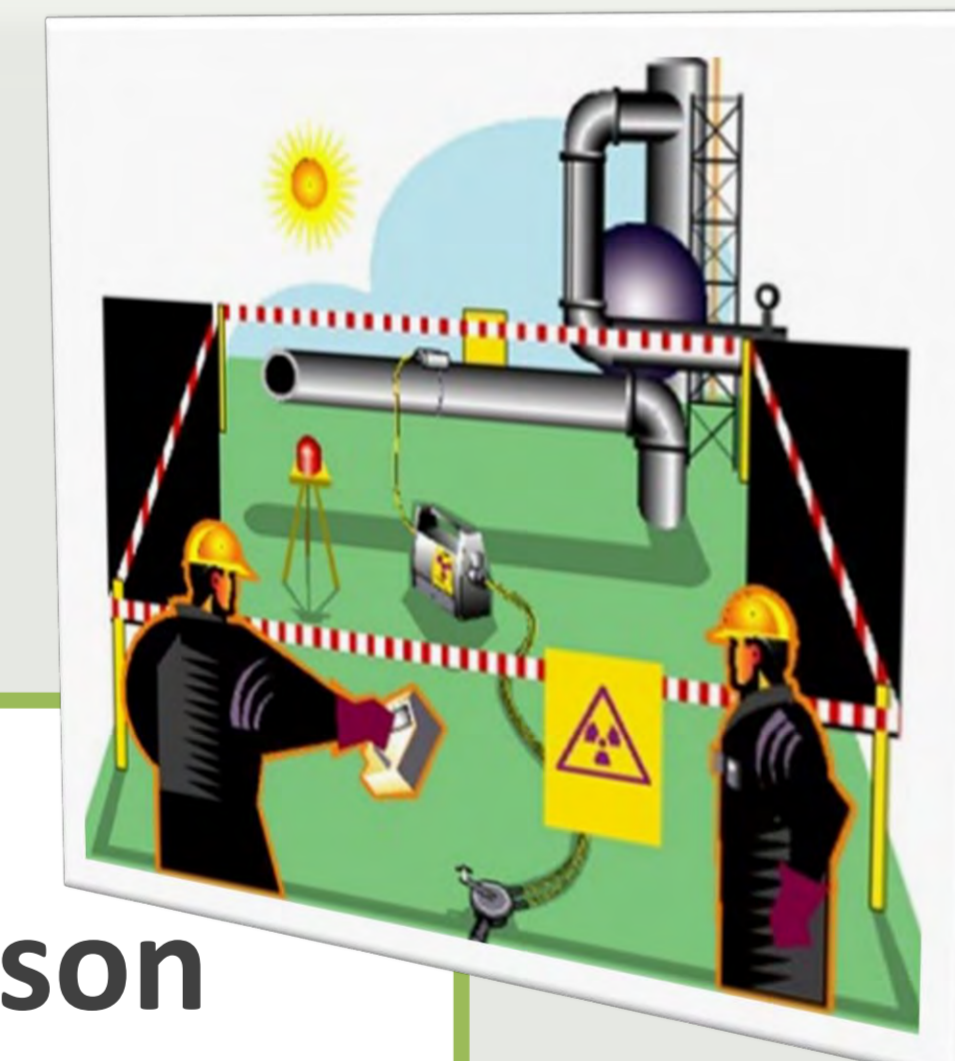
### Cs-137 facility

#### Beam

- Cs-137 source at the IAEA

#### Primary standard

- Air cavity ionization chamber



**NEW**

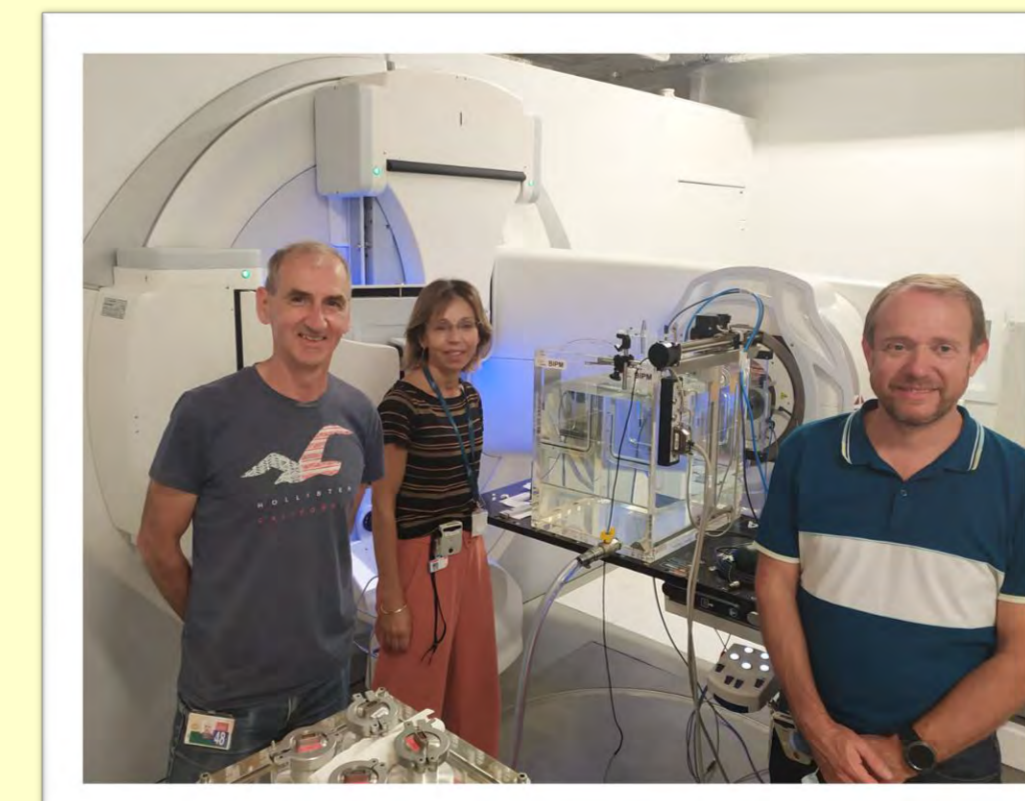
Development of a measuring system to **re-establish the key comparison and calibration** of the NMI standards for radiation protection

#### Application

**Radiation protection in medicine and industry**

### Comparisons and calibrations

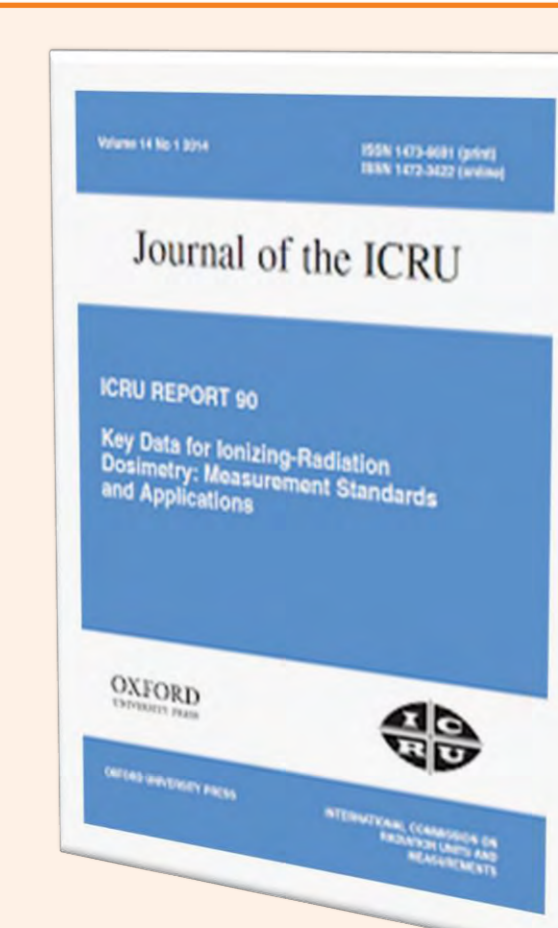
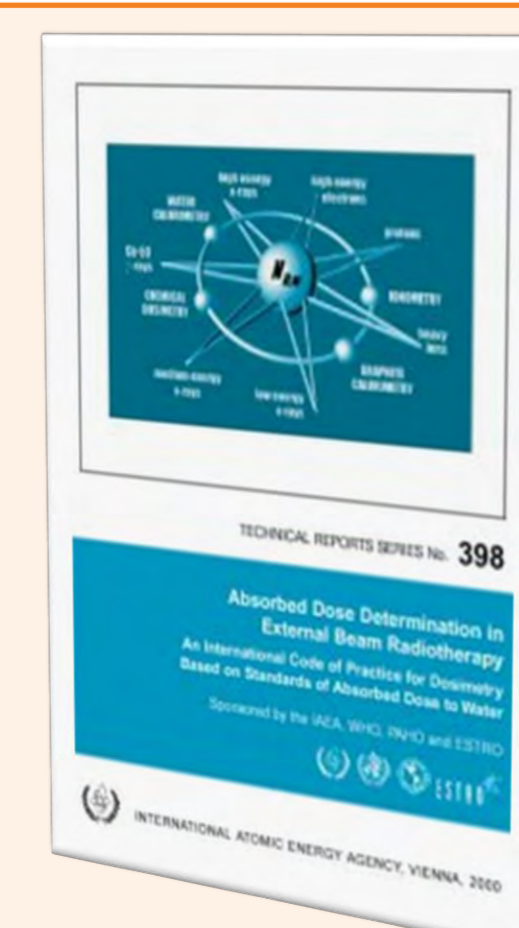
- **39 comparisons** (+12 compared to 2016-2019) representing **80 % of all dosimetry comparisons**
- Calibrations (~60) and comparisons for **25 NMIs/DIs/IOs**



**Services to NMIs/DIs/IOs**

### External coordination

- Contribution to **international protocols** and key data
- Participation in **IAEA Consultancy Meetings** and ICRU
- External **audits** to dosimetry laboratories



#### Application

**Determine radiation dose to patient**