The Dosimetry Laboratory at the NRPA

The Dosimetry Laboratory at the Norwegian Radiation Protection Authority (NRPA) is the National Calibration Laboratory for the units gray (Gy), sievert (Sv) and becquerel (Bq). The Secondary Standard Dosimetry Laboratory (SSDL) was founded in 1939 and calibrates dosemeters for users in Norway.

Calibration of reference chamber for radiotherapy dosimetry. Collection of units under test.

National Calibration Laboratory.

The SSDL is a designated National Calibration Laboratory, which works under the framework of the Meter Convention. National standards for ionising radiation are held and maintained by the SSDL.

Calibration and measurement capabilities

SSDL offers calibration of dosemeters for ionising radiation measurements in addition to issuing calibration certificates for the following:

Field	Dosemeter
Radiotherapy	Farmer chambers and Plane parallel chambers
X-ray diagnostic examination and x-ray intervention	DAP meter, CT and mammography chambers
Radiation protection	Handheld monitors and personal dosemeters

SSDL's radiation beams for calibration

1. Co-60 beam for therapy level calibrations
2. X-ray unit 10-320 kV with two x-ray tubes
3. Source carousel Cs-137, Co-60 and Am-241 for radiation protection

CIPM MRA logo on certificates

Calibrations, performed by the SSDL, meet the requirements of the Mutual Recognition Arrangement (MRA). This is due to the agreement with Justervesenet (Norwegian Metrology Service) in 2004. The SSDL is therefore authorised to use the CIPM MRA logo on its' certificates.

Norwegian Radiation Protection Authority, P.O. Box 55, N-1332 Østerås
Phone: 67 16 25 00 • Fax: 67 14 74 07 • E-mail: nrpa@nrpa.no
www.nrpa.no

Inquiries to; Per Otto Hetland • Phone: 67 16 25 16

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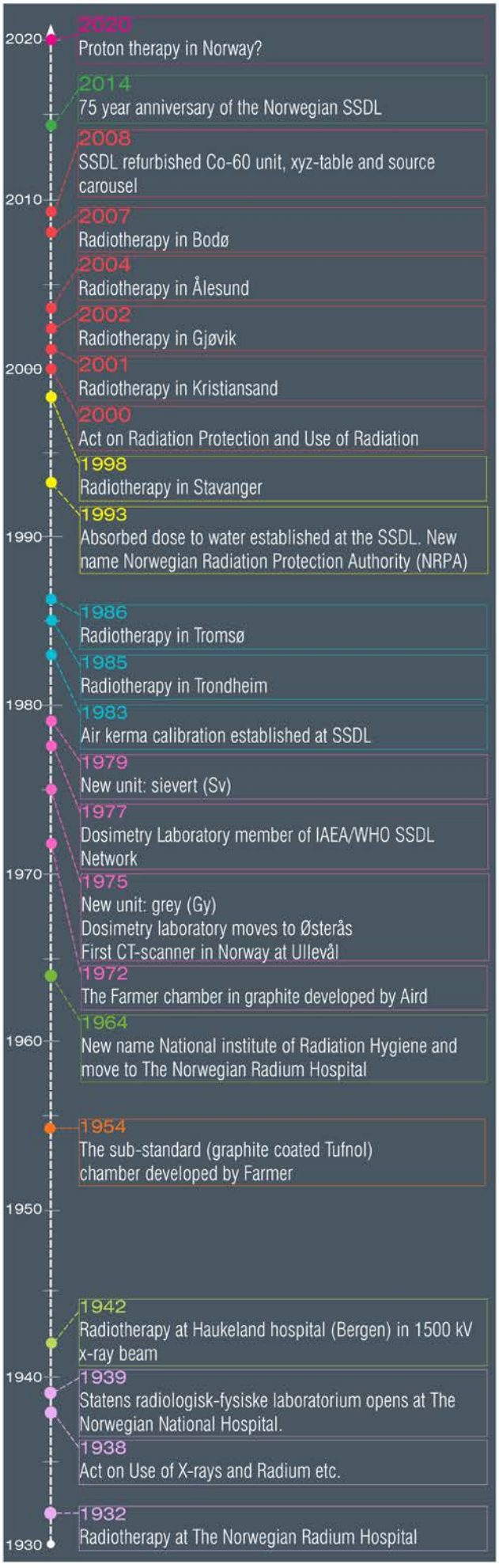

The history of SSDL

The laboratory was founded in 1939. In 1977, it became member of the IAEA/WHO SSDL Network and in 1990 it joined the EURAMET (The European Association of National Metrology Institutes). The Nordic countries have always had close cooperation.
See time line.

Competence at international level

The Dosimetry Laboratory is an active member of the Nordic dosimetry group and the EURAMET Technical Committee for Ionising Radiation. Furthermore, it is an observer in The Consultative Committee for Ionizing Radiation CCRI(I) at the BIPM (The International Bureau of Weights and Measures).

Accessory activities at the SSDL

The SSDL supports the administrative regulation in questions concerning dosimetry, and it is the secretary for the national dosimetry group for quality assurance in radiotherapy (KVIST). The SSDL calibrates electrometers used with ionisation chambers.

Plane parallel chambers for measurement in electron beam are calibrated at hospital using the Bjerke phantom.

Fundamentals of Ionising Radiation

The quantity, absorbed dose, with the unit gray (Gy), is the base unit for ionising radiation. The unit Gy has shown to be robust in terms of physical quantity. In radiotherapy the dosage for treatment of cancer patients is given in the amount of Gys. Risk assessment in diagnostic X-ray is determined using organ dose in Gy.

Dose equivalent

Absorbed dose alone is not sufficient in order to determine the dose related to biological effects. Empirical weighting procedures have been applied in order to counteract the limited prediction power of absorbed dose. The quantity dose equivalent, with the unit sievert (Sv), is used in radiation protection. This dose equivalent accounts for the difference in biological effectiveness for the different ionising radiations, and is limited to determination of low doses associated with stochastic effects.