IAEA
International Atomic Energy Agency

Workshop on Uncertainty Estimations for Radiation Measurements

IAEA Headquarters, Vienna, Austria
3–7 April 2017

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Prospectus

Title:	Workshop on Uncertainty Estimations for Radiation Measurements
Venue:	IAEA Headquarters, Vienna, Austria
Dates:	3–7 April 2017
Deadline for Nominations:	**28 February 2017**
Organizer(s):	The International Atomic Energy Agency (IAEA).
Course Director:	Paula Toroi Medical Radiation Physicist — SSDL Officer International Atomic Energy Agency Vienna International Centre PO Box 100 1400 Vienna Austria Email: P.Toroi@iaea.org | T: (+43 -1) 2600-21660 |
Language of Instruction:	English

Purpose:

The workshop will provide the participants with practical information on how to prepare uncertainty estimations for the calibrations preformed in secondary standard dosimetry laboratories (SSDLs). This workshop will also provide the participants with an understanding of the methods used for the assessment of various uncertainty components and will provide guidance on how to report measurement uncertainties related to their calibration services in a way that is consistent with *Guide to the expression of uncertainty in measurement* (GUM). Using tutorials adapted to practical situations, the candidates will learn how to prepare an uncertainty budget. The main emphasis is on SSDL calibrations but the whole traceability chain of dosimetry from the primary laboratory to the end user will be covered.

Nature of the Workshop:

The workshop will consist of lectures, discussions and practical sessions offering theoretical and practical training on method validation and uncertainty measurement for calibration of dosimetry equipment

Background Information:

The need for international traceability for radiation dose measurements has been understood since the early 1960s. The benefits of high dosimetric accuracy were recognized particularly in radiotherapy, where the outcome of treatments is dependent on the radiation dose delivered to patients. When considering radiation protection and diagnostic radiology dosimetry, the uncertainty may be greater than for radiation therapy, but proper traceability of measurements is no less important.

To ensure harmonization and consistency in radiation measurements, the IAEA and the World Health Organization created a network of SSDLs in 1976. The role of the SSDLs is crucial in providing traceable calibrations; they disseminate calibrations at specific radiation qualities appropriate for the use of radiation measuring instruments. Although the first SSDLs were established mainly to provide radiotherapy level calibrations, the scope of their work has expanded over the years. Today, many SSDLs provide traceability for diagnostic radiology and radiation protection measurements.

The demonstration of the competence of calibration laboratories is achieved through comparisons and the establishment of a quality management system following the International Organization for Standardization (ISO) Guide 17025. One of the requirements of the quality management system of a calibration laboratory is the assessment of the measurement uncertainty for all its calibration and testing services, by elaborating the uncertainty budget detailing all components affecting the overall uncertainty of the calibration activity. General guidance on the estimation of measurement uncertainties was published by the ISO in 1995. However, that document addresses all calibration and testing laboratories and not only dosimetry calibration laboratories. IAEA Technical Document IAEA-TECDOC-1585, published by the IAEA in 2008, filled this gap by providing scientists working in calibration laboratories and physicists involved in radiation dosimetry measurements with a practical guide on the estimation of measurement uncertainties.

Participation: The workshop is open to 80 participants from Member States of the IAEA.

Participants' Qualifications and Experience: The candidates should be engaged in dosimetry and calibration activities as radiation metrologists, physicists or technicians at an SSDL or as medical physicists at a hospital.

As the workshop will be conducted in English, participants should have sufficient proficiency to follow lectures and express themselves in this language without difficulty.

Nomination Procedure: Nominations should be submitted on the standard IAEA participation form for training courses. **Completed forms should be endorsed by, and returned through the official channels established**. They must be received by the International Atomic Energy Agency not later than 28 February 2017. Nominations received after that date or applications which have not been routed through one of the aforementioned channels cannot be considered.

Nomination forms can be submitted by e-mail (Dosimetry@iaea.org).

Administrative and Financial Arrangements: The workshop is free of charge. Please note that the IAEA will not provide cost free participants with any financial support.

Nominating Governments will be informed in due course of the names of the selected candidates and will at that time be given full details on the procedures to be followed with regard to administrative matters.

Participants from countries eligible to receive technical assistance should contact their National Liaison Officer to inquire after possible forms of financial support.

The organizers of the workshop do not accept liability for the payment of any cost or compensation that may arise from damage to or loss of personal property, or from illness, injury, disability or death of a participant while he/she is travelling to and from or attending the course, and it is clearly understood that each Government, in nominating participants, undertakes responsibility for such coverage.

Governments would be well advised to take out insurance against these risks.