# Requirements of the International and the European Basic Safety Standards regarding Medical Physics Education


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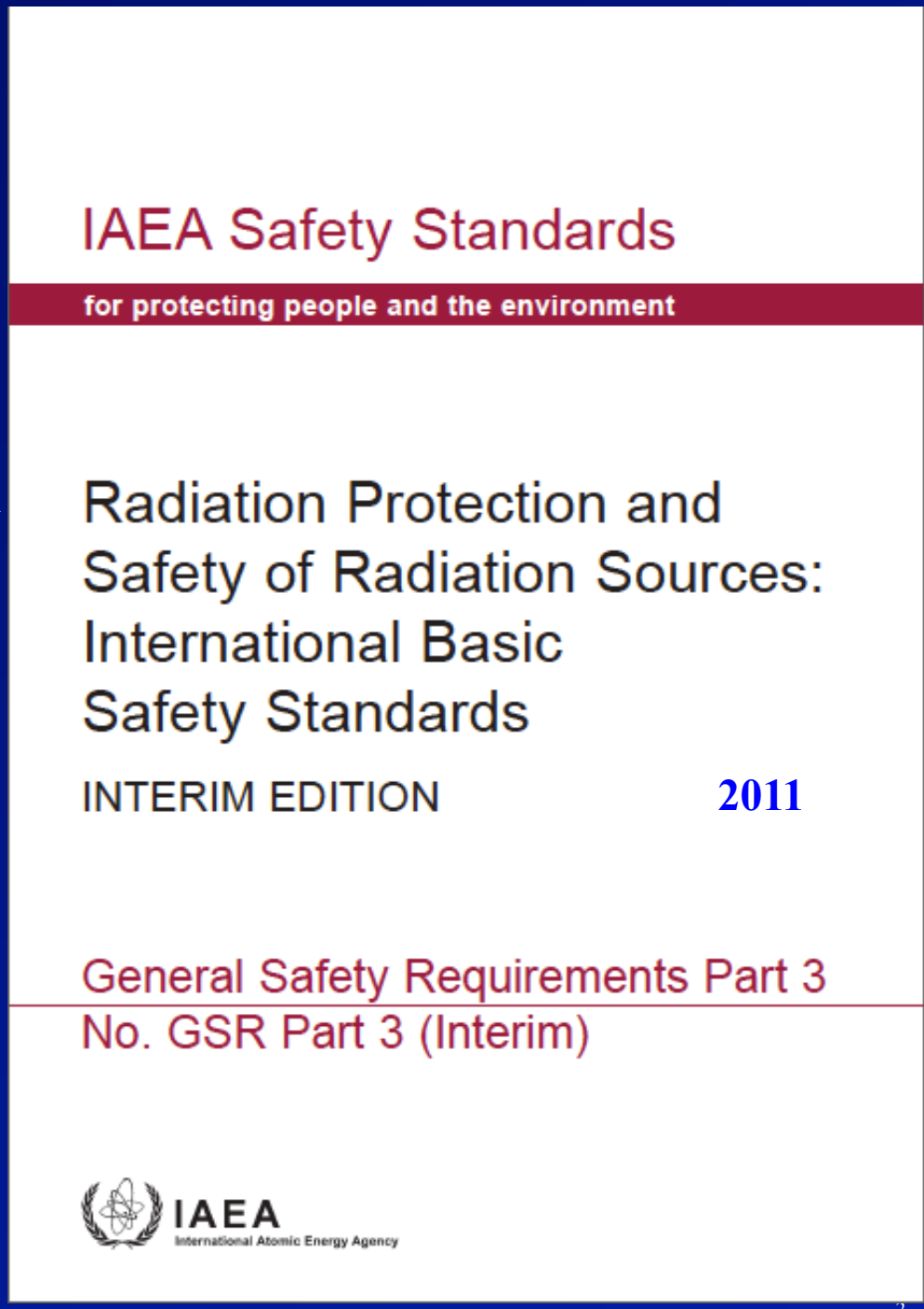
# International BSS

## Cosponsors

- European Commission / Euratom
- Food And Agriculture Organization of the UN
- International Atomic Energy Agency
- International Labour Organisation
- OECD / Nuclear Energy Agency
- Pan American Health Organization
- UN Environment Program
- World Health Organization



# European BSS

**Directive Published in the Official Journal of the European Union 17 January 2014**

## COUNCIL DIRECTIVE 2013/59/EURATOM

**of 5 December 2013**

**laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom**

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Articles 31 and 32 thereof,

Having regard to the proposal from the European Commission, drawn up after having obtained the opinion of a group of persons appointed by the Scientific and Technical Committee from among scientific experts in the Member States, and after having consulted the European Economic and Social Committee,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the European Economic and Social Committee,

Whereas:

(1) Point (b) of Article 2 of the Euratom Treaty provides for the establishment of uniform safety standards to protect the health of workers and of the general public. Article 30 of the Euratom Treaty defines "basic standards" for the protection of the health of workers and the general public against the dangers arising from ionising radiations.

(2) In order to perform its task, the Community laid down basic standards for the first time in 1959 by means of Directives of 2 February 1959 laying down the basic standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation [1]. The Directives have been revised several times, most recently by Council Directive 96/29/Euratom [2] which repealed the earlier Directives.

(3) Directive 96/29/Euratom establishes the basic safety standards. The provisions of that Directive apply to normal and emergency situations and have been supplemented by more specific legislation.

(4) Council Directive 97/43/Euratom [3], Council Directive 89/618/Euratom [4], Council Directive 90/641/Euratom [5] and Council Directive 2003/122/Euratom [6] cover different specific aspects complementary to Directive 96/29/Euratom.

(5) As recognised by the Court of Justice of the European Union in its case-law, the tasks imposed on the Community by point (b) of Article 2 of the Euratom Treaty to lay down uniform safety standards to protect the health of workers and the general public does not preclude, unless explicitly stated in the standards, a Member State from providing for more stringent measures of protection. As this Directive provides for minimum rules, Member States should be free to adopt or maintain more stringent measures in the subject-matter covered by this Directive, without prejudice to the free movement of goods and services in the internal market as defined by the case-law of the Court of Justice.

(6) The Group of Experts appointed by the Scientific and Technical Committee has advised that the basic safety

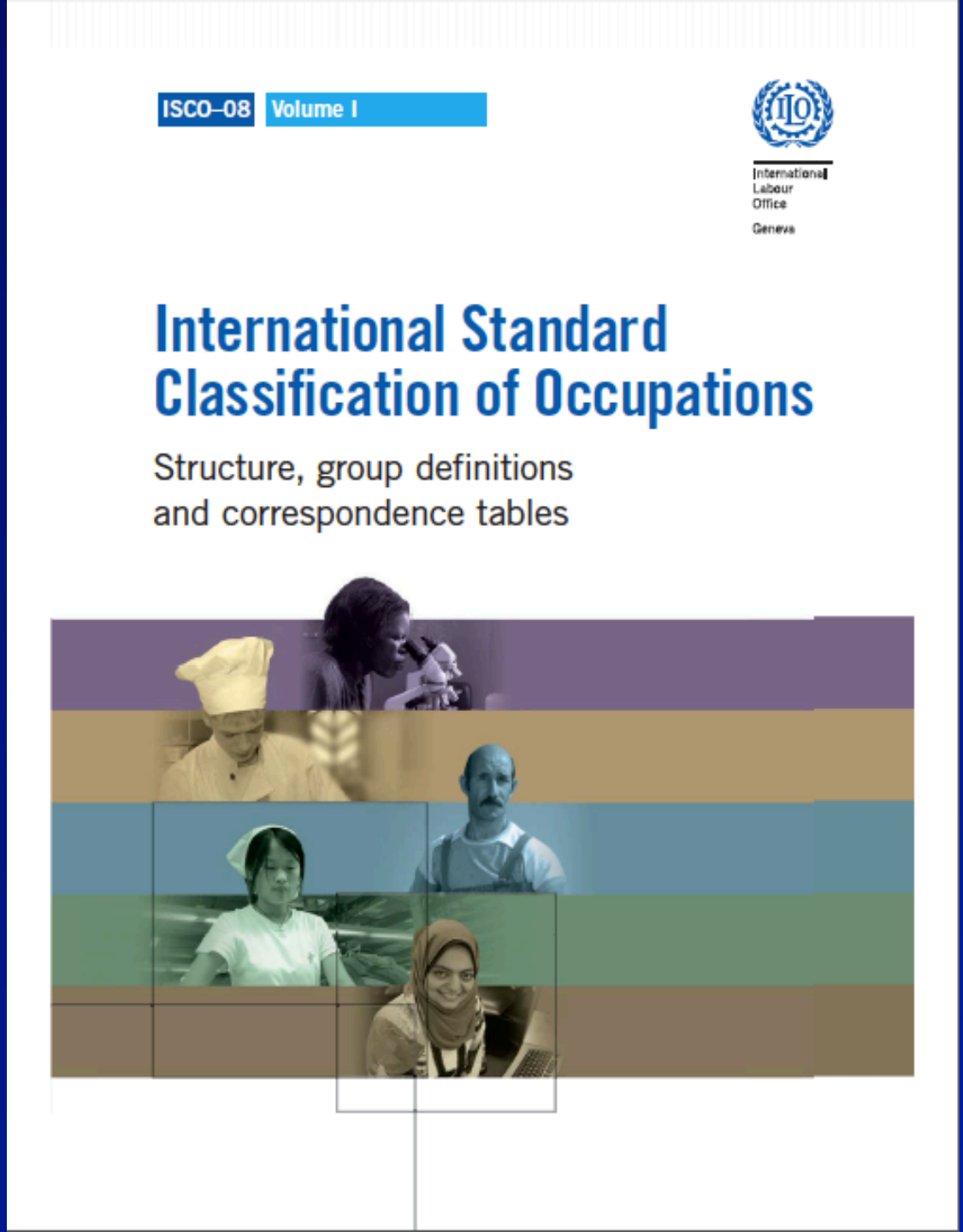
[1] OJ L 11, 20.2.1959, p. 221.
[2] Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (OJ L 159, 29.6.1996, p. 1).
[3] Council Directive 97/43/Euratom of 30 June 1997 on health protection of individuals against the dangers of ionising radiation in relation to medical exposure, and repealing Directive 84/466/Euratom (OJ L 180, 9.7.1997, p. 22).
[4] Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency (OJ L 357, 7.12.1989, p. 31).
[5] Council Directive 90/641/Euratom of 4 December 1990 on the operational protection of outside workers exposed to the risk of ionizing radiation during their activities in controlled areas (OJ L 349, 13.12.1990, p. 21).
[6] Council Directive 2003/122/Euratom of 22 December 2003 on the control of high-activity sealed radioactive sources and orphan sources (OJ L 346, 31.12.2003, p. 57).

**Medical Physicist**

**International BSS**

**Medical Physics Expert**

**European BSS**



Unit Group 2111

## Physicists and Astronomers

Physicists and astronomers conduct research and improve or develop concepts, theories and operational methods concerning matter, space, time, energy, forces and fields and the interrelationship between these physical phenomena. They apply scientific knowledge relating to physics and astronomy in industrial, medical, military or other fields.

Tasks include –

(a) conducting research and improving or developing concepts, theories, instrumentation, software and operational methods related to physics and astronomy;

(b) conducting experiments, tests and analyses on the structure and properties of matter in fields such as mechanics, thermodynamics, electronics, communications, power generation and distribution, aerodynamics, optics and lasers, remote sensing, medicine, sonics, magnetism and nuclear physics;

*Examples of the occupations classified here:*

- Astronomer
- Medical physicist
- Nuclear physicist
- Physicist

*Some related occupations classified elsewhere:*

- Radiation oncologist – 2212
- Radiologist – 2212
- Specialist physician (nuclear medicine) – 2212
- Radiographer – 3211

**Note**

It should be noted that, while they are appropriately classified in this unit group with other physicists, medical physicists are considered to be an integral part of the health workforce alongside those occupations classified in Sub-major Group 22: Health Professionals and others classified in a number of other unit groups in Major Group 2: Professionals.

(d) applying principles, techniques and processes to develop or improve industrial, medical, military and other practical applications of the principles and techniques of physics or astronomy;

(e) ensuring the safe and effective delivery of radiation (ionizing and non-ionizing) to patients to achieve a diagnostic or therapeutic result as prescribed by a medical practitioner;

(f) ensuring the accurate measurement and characterization of physical quantities used in medical applications;

(g) testing, commissioning and evaluating equipment used in applications such as imaging, medical treatment and dosimetry;

(h) advising and consulting with medical practitioners and other health care professionals in optimizing the balance between the beneficial and deleterious effects of radiation;

(i) observing, analysing and interpreting celestial phenomena and developing methods, numerical models and techniques to extend knowledge of fields such as navigation, satellite communication, space exploration, celestial bodies and cosmic radiation;

(j) developing, implementing and maintaining standards and protocols for the measurement of physical phenomena and for the use of nuclear technology in industrial and medical applications;

(k) preparing scientific papers and reports.

**ISCO-08**

# Medical Physicist (International BSS)

A *health professional*, with specialist education and training in the concepts and techniques of applying physics in medicine, and competent to practise independently in one or more of the subfields (specialties*) of medical physics.

*(e.g. diagnostic radiology, radiation therapy, nuclear medicine)

**Competence** of persons is normally assessed by the State by having a formal mechanism for registration, accreditation or certification of medical physicists in the various specialties (e.g. diagnostic radiology, radiation therapy, nuclear medicine). States that have yet to develop such a mechanism would need to assess the **education, training and competence** of any individual proposed by the licensee to act as a medical physicist and to decide, on the basis either of international accreditation standards or standards of a State where such an accreditation system exists, whether such an individual could undertake the functions of a medical physicist, **within the required specialty** .

**(International BSS)**

# Definition of MPE (EU BSS)

**"medical physics expert" means an individual or, if provided for in national legislation, a group of individuals, having the knowledge, training and experience to act or give advice on matters relating to radiation physics applied to medical exposure, whose competence in this respect is recognised by the competent authority;**

By 'group of individuals' is meant a group of Medical Physics Professionals with at least one who has reached the status of MPE in each specialised area of radiation physics applied to medical exposure e.g., Diagnostic and Interventional Radiology or Radiation Oncology or Nuclear Medicine or a sub-speciality of these e.g., Brachytherapy, Nuclear Medicine therapy, Interventional Imaging in Cardiology as owing to the rapid expansion in medical technology it is becoming increasingly difficult for any single individual to be able to act or give advice in all areas of radiation physics applied to medical exposure.

EU BSS

CHAPTER IV

# REQUIREMENTS FOR RADIATION PROTECTION EDUCATION, TRAINING AND INFORMATION

*Article 14*

## General responsibilities for the education, training and provision of information

1. Member States shall establish an adequate legislative and administrative framework ensuring the provision of appropriate radiation protection education, training and information to all individuals whose tasks require specific competences in radiation protection. The provision of training and information shall be repeated at appropriate intervals and documented.

2. Member States shall ensure that arrangements are made for the establishment of education, training and retraining to allow the recognition of radiation protection experts and medical physics experts, as well as occupational health services and dosimetry services, in relation to the type of practice.

*Article 18*

## Education, information and training in the field of medical exposure

1. Member States shall ensure that practitioners and the individuals involved in the practical aspects of medical radiological procedures have adequate education, information and theoretical and practical training for the purpose of medical radiological practices, as well as relevant competence in radiation protection.

For this purpose Member States shall ensure that appropriate curricula are established and shall recognise the corresponding diplomas, certificates or formal qualifications.

# Regulatory Body

# (International BSS - Para. 2.32)

**The regulatory body shall ensure the application of the requirements for education, training, qualification and competence in protection and safety of all persons engaged in activities relevant to protection and safety.**

# Regulatory Body (Intl BSS)

**The regulatory body shall ensure that the authorization for medical exposures to be performed at a particular medical radiation facility allows personnel (radiological medical practitioners, medical physicists, medical radiation technologists and any other health professionals with specific duties in relation to the radiation protection of patients) to take on the responsibilities specified in these Standards only if they:**

# Regulatory Body (Intl BSS)

a) are specialized in the appropriate area;

b) meet the respective requirements for education, training and competence in radiation protection, in accordance with para. 2.32

c) are named in a list maintained up to date by the registrant or licensee.

# IOMP Policy Statement No. 1


## Medical Physics Specialties

- Radiation Oncology Physics
- Medical Imaging Physics
- Nuclear Medicine Physics
- Medical Health Physics (Radiation Protection in Medicine)
- Non-ionizing Medical Radiation Physics
- Physiological Measurements

# IOMP Policy Statement No. 2

## Basic Requirements for Education and Training of Medical Physicists

- The minimum educational qualification for a medical physicists is a university degree or equivalent (level corresponding to a master's degree) majoring in medical physics or an appropriate science subject.
- Medical physicists who have clinical responsibilities should have received(additionally to their education) a clinical competency training, preferably in the form of a formal residency or an equivalent clinical training program, for a duration appropriate to their roles and responsibilities. (2 year minimum).

# International Conference on Medical Physics 2011

## Medical Physics Board Certification: Looking Ahead

**May 23rd, 2010**

**International Medical Physics Certification Board was established**

**www.IMPCB.org**

**Raymond K. Wu**

Porto Alegre, April 17-20, 2011

# Certification Process

Certification should be by examination, conducted by a country-specific, geographically regional or other designated Medical Physics Certification Board

# International Medical Physics Board Certification: Objectives

- To establish minimum standards and improve the practice of MP
- To develop standards and procedures for the certification of MP
- To establish and evaluate qualifications of candidates requesting examination for certification
- To arrange, and conduct examinations to test the competence of candidates for certification in the field of medical physics
- To grant and issue certificates in the field of medical physics to applicants who have been found qualified by the Board
- To maintain a registry of holders of such certificates and serve the public by preparing and furnishing lists of medical physicists who have been certified by the Board

Raymond K. Wu, April 2011

# Examination Guidelines IMPCB

- Part I is designed to test the competence of the candidate in fundamental aspects of medical physics (General Medical Physics).
- Part II is designed to determine the competence of the candidate in a specialty area of medical physics
- Part III is designed to determine the candidate's knowledge and fitness to practice clinical medical physics in a designated specialty

Raymond K. Wu, April 2011

# Specialties currently under consideration by the IMPCB

- Medical Physics in Diagnostic and Interventional Radiology
- Medical Physics in Nuclear Medicine
- Medical Physics in Radiation Oncology

# Eligibility IMPCB Minimum Requirements

a. Part I Written Examination - General Medical Physics
    i. Education – graduation from an accredited college or university with an advanced degree (Masters or Doctorate) in physics, medical physics or an equivalent degree in an appropriate physical or engineering science discipline.
    ii. Professional Training – none required

# Eligibility IMPCB (cont)

b. Part II Written Examination - Medical Physics Specialty

i. Education – requirements as specified above for Part I

ii. Professional Training – 2 (two) years full-time equivalent training preceding the date of application for examination. The training should be carried out under the supervision of a Certified Medical Physicist (CMP) specializing in the same sub-field or under the supervision of a qualified individual with a level of professional experience and expertise equivalent to that of a CMP.

c. Part III Oral Examination - Medical Physics Specialty

Prerequisites – successfully passed Parts I and II


impcb
INTERNATIONAL MEDICAL PHYSICS
CERTIFICATION BOARD