

Course on “Principles of Radiation Protection and International Framework. Regulatory Control”		
Units and LO Statements		
Unit 1 – Principles of radiation protection (1 ECTS)	Responsibility / Autonomy	
	Autonomously apply radiation protection principles in practices with radiation sources	
	Skills	Knowledge
<p>Applies the fundamental principle of justification to planned, emergency and existing exposure situations in terms of decision whether the exposure would do more good than harm.</p> <p>Evaluates the level of protection of the exposure situations in order to find the optimised radiological protection solution.</p> <p>Applies the dose limits principle for occupational and public exposure in planned exposure situations in order to comply with the regulatory requirements.</p>	<ul style="list-style-type: none"> • Use the operational quantities that can be measured and from which the equivalent dose and the effective dose can be assessed • Estimate the doses from radiation exposures in order to relate the radiation dose to radiation risk (detriment) taking into account variations in the biological effectiveness of radiations of different quality as well as the varying sensitivity of organs and tissues to ionising radiation • Analyse stochastic effects and tissue reactions within Linear-non-threshold (LNT) model and, respectively, threshold doses for deterministic effects • Use the dose quantities for prospective dose assessment in planned exposure situations for optimisation • Use and implement the concepts of dose constraint and reference level in conjunction with the optimisation of protection in order to restrict individual doses • Use the dose quantities for retrospective dose assessments for proving the compliance with dose limits • Design a planned situation having regard of potential exposures that may result from deviations from normal operating conditions and from the related issues of the safety and security of radiation sources • Perform the justification process, taking into account the risks and benefits • Develop an organisational policy to keep doses to the personnel ALARA • Apply measures to limit staff and public exposure • Put into practice the basic measures of preventing unnecessary exposure (time, distance, shielding) • List relevant dose limits for workers (including organ doses), for pregnant workers and general public • Identify possible deviations from planned operating procedures and accidents, as well as assess the resulting dose and evaluate the detriment associated with that dose • Develop the protection strategies for application in emergency exposure situations, using the reference levels in the process of optimisation • Implement optimised protection strategies, which are established by the authorities, for reducing the individual doses to below the adopted reference levels 	<ul style="list-style-type: none"> • Reminder of dose quantities and their units <ul style="list-style-type: none"> - absorbed dose - fundamental physical quantity - the radiological protection quantities used to specify exposure limits - operational quantities for area and individual monitoring of external exposures • Describe the biological effects of radiation and the differences between deterministic and stochastic effects • Definitions and characterisation of the different exposure situations (planned, emergency and existing exposure situations) • Distinction between the categories of exposures: occupational exposures, public exposures and medical exposures • Describe the basic principles of radiation protection, as outlined by the ICRP • Understand the need for justification for all exposure situations • Explain the ALARA concept as a source-related principle • Describe practical dose reduction strategies for workers and the public, including the use of shielding and dose monitoring • Understand the principle of application of dose limits in planned exposure situations as individual-related principle

Unit 2 – International Framework. Regulatory Control (1 ECTS)	Responsibility / Autonomy	
	Autonomously apply European and national legislation and regulations in radiation protection	
	Skills	Knowledge
<p>Analyzes the European and international radiation protection framework in terms of its impact on the national regulatory process.</p> <p>Applies the regulatory control concepts and tools in order to achieve an appropriate standard of radiological protection.</p> <p>Applies the requirements of European directives and national regulations in order to ensuring the adequate level of radiological safety of the radiation sources.</p>	<ul style="list-style-type: none"> • Find and apply the relevant regulations and guidance for the planned exposure situation within its responsibility • For each exposure situation, apply European and national laws, regulations, recommendations and standards related to radiation safety • Understand the relationship between legislation, regulatory authority and primary responsibility for radiation safety • Apply of the concepts of exclusion, exemption and clearance with respect to own practice • Identify the legal radiation protection obligations in daily practice • Understand the requirements of the legislation regarding the notification, authorisation, registration, licensing within own activity • Apply the legal requirements and practical solutions which can be used to enhance safe storage, handling and disposal of radioactive materials 	<ul style="list-style-type: none"> • List international and European bodies involved in radiation protection regulatory processes • Specify the relevant regulatory framework (Recommendations, Standards, Directives, Regulations, etc.) governing the use of ionising radiation in own country and the EU • Understand the main concepts associated with the scope of radiological protection regulations (exclusion and exemption) • Describe the main elements of the infrastructure required for regulatory control (legal framework, regulatory authority, additional organisations, etc.) • Tools used for regulatory control of practices: notification and authorisation (registration and licensing) • Describe the requirements for regulatory compliance with respect to the management and use of radiation sources, including requirements for storage, shielding, record-keeping and audit, as well as the disposal of radioactive waste and the transportation of radioactive substances
<p>Assessment criteria = to demonstrate mastery and innovation, advanced skills, required to solve complex and unpredictable problems in applying of radiation protection principles</p>		
<p>Recommended assessment methods: Practical and written test, face to face examination, grid test with multiple choices [choosing among different options].</p>		

Course applicable (in part or fully) for the following job profiles:

- Radiation Protection Officer (in various types of practices)
- Radiation Protection Expert
- Medical Physics Expert
- Nuclear specialists
- Specialists from other disciplines demanded in the nuclear workforce