

A State University in TSO Role: Fundamental Contribution to Nuclear Safety and Security Regime at National Level through Provision of Commensurate Education, Training and Scientific/Technical Expertize – Experience of Montenegro

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There are, in principle, two major aspects of addressing nuclear safety and security issues in small countries: institutional/legal framework and knowledge/competence/expertize provision. As to Montenegro, the former is relatively well established (and will not be addressed in this paper), while the latter trails somewhat behind [1] and will be dealt with.

Montenegro is, thus, such small, developing and “non-nuclear” country –the use of radiation sources being modest and limited to a few ordinary applications (primarily in health care). Even though, there is (or will be in the foreseeable future) a significant need in nuclear knowledge, competence and expertize –directly or indirectly related to nuclear safety and security issues. It goes about the following, the list being not exhaustive: (i) medical applications (diagnostics, radiotherapy, palliation, sterilization of equipment, consumables, blood products, etc.), (ii) radiation protection, including various dosimetry services and QC/QA of radiation sources; (iii) environmental protection (radioecology, analytical and monitoring services, etc.), (iv) low and medium activity radioactive waste management (including a newly licensed storage), (v) industrial, geological, hydrological, agricultural, biochemical and archaeological applications (non-destructive testing, various gauges, radioisotope labeling, harmful insects sterilization, etc.), (vi) scientific and educational uses, (vii) cultural heritage preservation and investigation, (viii) legislative and regulatory aspects, including complying to international safety/security norms and joining international conventions in the field, (ix) preparedness and response to radiological and nuclear emergency situations, (x) combating illicit trafficking of nuclear and other radioactive materials, (xi) nuclear forensics, (xii) security systems based on X-ray and other nuclear methods, (xiii) introduction of some future topics (e.g. nuclear power for electricity generation and sea water desalination), (xiv) public information and communication with media, etc. [2].

University of Montenegro (UoM) is the only state university in the country and the only one providing higher education, scientific research and expertise in natural and technical sciences, including nuclear/radiation-related ones –it is the statutory duty of UoM to do so, and to do it in a manner commensurate with country needs. By far the most relevant expertise in the country is either concentrated at UoM or is deriving out of it; it therefore goes without saying that UoM has fundamental role in meeting nuclear-related (safety and security included) goals in Montenegro [3].

Small issues in big countries are often big issues in small countries. IAEA offers the unique and equal opportunity for all Member States to come up with their issues and seek for cooperation/assistance in order to cope with the problems; there are numerous modalities in pursuing this aim.

Networking is becoming increasingly important for building/sustaining the national body of knowledge, competence and expertize. This is particularly valid for those countries whose domestic resources are limited and/or where no critical mass of the above three constituents exists, which could sustain the system on its own. IAEA-based international networks for nuclear security education (INSEN) and training&support (NSSC), even relatively recent, proved pivotal/fundamental in this respect [4,5]. At UoM (Department of Physics) we have launched several targeted educational courses at post-graduate level, following INSEN guidelines; the pioneering educational materials developed within the network represent the basic literature for both students' and lecturers' use [6]. We also participate in nuclear knowledge management (NKM) activities and use their information system (INIS) when sourcing relevant data. UoM is also national contact point for INES (International Nuclear and Radiological Event Scale) and has trained staff for properly reporting in case of incident/accident [7]. UoM participates in IAEA-supported Nuclear Instrumentation Laboratory Network (NILNET). We will also be among the first ones to participate in Internet Reactor Laboratory (IRL) –a novel/advanced learning tool in nuclear physics and engineering.

UoM offers a number of laboratory services, primarily for educational/training purposes, but also for routine measurements, monitoring of radioactivity and radiation parameters in the living, working or outdoor environment. Laboratory for nuclear spectrometry has classic NaI and HPGe detector systems, very high sensitivity anti-coincident spectrometer, etc., while environmental laboratory offers atomic absorption spectrometer, medical QC/QA control devices, radon equipment, etc. Most of these are at students' permanent disposal [8].

In concluding [1], UoM is, or should act towards: (i) becoming national center of competence and expertise in nuclear related issues, (ii) assessing, creating, preserving and transferring nuclear knowledge (NK), according to Montenegro needs, (iii) offering consultancies and technical support services to regulatory authorities and relevant stakeholders, (iv) being advisory body to the government for nuclear related issues and (v) focal point for dissemination and exchange of NK, in particular with the IAEA, (vi) promoting nuclear applications for peaceful purposes, in particular medicine and environmental protection, (vii) being national radiation protection centre, (viii) developing curricula for nuclear related studies at all levels, (ix) supporting young students and scientists in nuclear related field and facilitate their exchange with reputed institutions abroad and (x) giving proper and timely information and comments to the public and media on relevant nuclear related subjects.

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Country or International Organisation

Montenegro

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