International Conference on Human Resource Development for Introducing and Expanding Nuclear Power Programmes
14-18 March 2010, Abu Dhabi, United Arab Emirates

Establishment of the University Centre for Nuclear Competence and Knowledge Management

- towards human resource development in nuclear field in Montenegro -

Slobodan Jovanovic
University of Montenegro


©GraphicMaps.com
Slovenia
Hungary
Zagreb
Venice
Gulf of Venice
Croatia
WorldAtlas.Com
Rijeka
Italy
BALKAN PENINSULA
Bosnia & Herzegovina
Serbia
San Marino
Ancona
Split
Sarajevo
70 mi
70 km
ADRIATIC SEA
Montenegro
Dubrovnik
Vatican
Rome
Gargano Peninsula
Gulf of Manfredonia
Podgorica
Tirane
Bari
Tyrrhenian Sea
Italy
Brindisi
Albania
Taranto
Gulf of Taranto
Salento Peninsula
Strait of Otranto
Mediterranean Sea
Ionian Sea
Greece
ADRIATIC SEA


BOSNIA AND HERZEGOVINA
SERBIA
Nis
MONTENEGRO
Kolasin
KOSOVO
Pristina
North Albanian Alps
MACEDONIA
Skopje
Podgorica
Cetinje
CROATIA
North
Adriatic Sea
Bar
Shkoder
ALBANIA
40 mi.
40 km
TIME Map by Joe Lertola

- Montenegro is small developing country, emerging from ex-Yugoslavia, independent and IAEA member state since 2006

- 13.800 km2 area, 625.000 population
  GDP 4.44 billion USD in 2009, i.e. 7.100 USD/capita

- By the first article of its constitution, Montenegro is declared as “ecological state”, which means that all major decisions and steps to be undertaken in the country should be regarded from environmental sustainability standpoint firstly. Apart from a few declining metal industries, tourism and agriculture represent the country’s major revenue.

- The use of radiation sources is modest and limited to ordinary medical and industrial applications. Regulatory authority is established only a year ago and is placed within Environmental Protection Agency (EPA), belonging to the Ministry of Spatial Planning and Environment.

- "Law on radiation protection and safety" (Official Gazette of Montenegro, No. 56/09 of 14 August 2009) does not address nuclear security, although refers to it in the "definitions" and a few articles.

- Given the size and economic/HR parameters of the country, introduction of nuclear energy for electricity production is not likely in the foreseeable future.

- However, with several neighboring countries having officially opted for including nuclear electricity production in future energy mix, it is realistic to assume Montenegro might express its interest in a possible future (sub)regional initiative for a joint nuclear power programme.

- One should also keep on mind the fact that no new electricity generation installations have been built in Montenegro since 1975, yielding to a 35-40% chronic electricity deficit. This fact weighs heavily on all aspects of economy, politics and life.

Despite limited scope of activities, a relatively significant nuclear knowledge (NK) is (or will be) needed in Montenegro. It goes about the following areas:

- medical applications (diagnostics, radiotherapy, palliation, sterilization of equipment/consumables/blood products, …)
- environmental protection (radioecology, low and medium activity radioactive waste management, analytical and monitoring services, ...)
- industrial, geological, hydrological, agricultural and biochemical applications (non-destructive testing, various gauges, radioisotope labeling, …)
- scientific and educational applications
- radiation protection, emphasizing safety and security of radiation sources
- legislative and regulatory aspects, including complying to international safety/security norms and joining international conventions in the field

….

…. cont'd

- preparedness and response to radiological and nuclear emergency situations
- combating illicit trafficking of nuclear and radioactive materials
- forensic applications
- security systems based on X-ray and other nuclear methods
- introduction of future topics (e.g. nuclear power for electricity generation and sea water desalination)
- public information and communication with media

At present, there is a clear shortage in NK in the country, resulting i.a. from

- disconnection with former nuclear centres in ex-Yugoslavia
- long lasting poor interest of young students for the subject and
- loss of “KN critical mass” due to
  - brain drain
  - attrition
  - career development and
  - long lasting political/social instability in the region

adequate NK

minimal NK

critical NK

By mid-2008 the idea of establishing a university Centre for Nuclear Competence and Knowledge Management (UCNC) was raised by a tiny remaining nuclear group, with intention of:

- **being national center of competence and expertise in nuclear related issues**
- **acting towards assessing, creating, preserving and transferring NK, according to Montenegro needs**
- **offering consultancies and technical support services to regulatory authorities and stakeholders**
- **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,**

cont'd…

- promoting nuclear applications for peaceful purposes, in particular medicine and environmental protection
- being national radiation protection centre
- developing curricula for nuclear related studies at all levels (from elementary education to university degrees)
- supporting young students and scientists in nuclear related field and facilitate their exchange with reputed institutions abroad and
- giving proper and timely information and comments to the public and media on relevant nuclear related subjects.

- University of Montenegro is the only state university in the country, effectuating practically complete high education in natural and technical sciences. UCNC was subsequently established in 2009 and a number of envisaged activities meanwhile completed.

- Human resource development (HRD) in nuclear-related topics is thus one of the primary goals of the UCNC. It is important to note that HRD will follow Montenegro needs and priorities. Three areas emerge as the most important ones:
  - medical applications – medical physics
  - regulatory control and
  - safety and security

Podgorica – Millenium Bridge


University of Montenegro

UCNC – Organization … UCNC will gather experts in a broad range of nuclear related fields, including:

- High Energy Physics
- Plasma Physics
- Solid State Physics
- Radiation protection
- Gamma-Spectrometry and Gamma-software
- Quantum Physics
- Nuclear Analytical Techniques
  (AAS, GC, LC, MS, XRF, NAA, …)
- Radioecology
- Positron Physics
- International Nuclear Law
- …

However, UCNC intends to act toward utilizing the existing NK and creating new one according to current/future needs of the country

UCNC will gather:

- University staff
  - Professors
  - Assistants
  - Ph.D. students
  - …
- Members of nuclear related professional organizations
  - Radiation Protection Society
  - Nuclear Society
  - Analytical Society
  - Anti-cancer Society
  - …

- There will be a core team of experts (4-5 people) who would deal with the most important issues – education and training, medical applications, scientific issues, radiation protection, communication with government (ministries and regulatory bodies), media and public, etc.

- Another circle will be groups of "topical experts" from the country (mostly from the University itself) – nuclear physicists, radiation protection experts, radiologists, oncologists, radio-ecologists, analysts, legal experts, etc.

- Third circle would comprise experts abroad of Montenegrin origin, willing to keep contact and contribute to UCNC in whatever way. These are numerous and could become a perfect bridge to knowledge/expertise in more advanced centers of nuclear competence abroad.

- Finally, repute foreign experts will be invited to be in touch as well. Hereby regional experts, particularly those from ex-Yugoslav countries (no language barrier), would be most welcome.

- It is expected that each expert will bring into UCNC not only his/her knowledge and competence, but also to contribute with his/her professional contacts, "outer expert circle", who would subsequently also be involved in UCNC activities.

- In particular a kind of "nuclear youth section" will be organized with the idea of promoting nuclear issues among young generation, but also to supporting them in nuclear related studies when possible/appropriate.

- UCNC will seek contacts and cooperation with institutions and professional organizations from its scope of activities: various nuclear societies, radiation protection associations, academies, etc.

- Special attention will be paid – and much is expected from – cooperation with **international organizations** like IAEA, OECD-NEA, EURATOM, IRPA, etc.

- **Bilateral cooperation** with countries from the region (e.g. those from the present IAEA NKM Mission)

- Two IAEA expert missions which recently visited UCNC (Security Mission in July 2009 and dedicated NKM Mission in September 2009), as well as TC Country Officer (visit in February 2010) – all independently suggested the same idea: positioning of the UCNC as a (sub)regional nuclear-knowledge-and-competence-related education/training centre.

- University management is favorable of this idea, staff and logistics available, while several neighboring universities (Ljubljana, Zagreb, Belgrade, Novi Sad, Budapest) expressed their support and willingness to cooperate, too

- advantage of no-language-barrier between 4-5 ex-Yugoslav countries).

- Educational Programme in Nuclear Security, being so well elaborated in much detail, and with expected IAEA support, seems a logical subject to start with.


IAEA NKM Mission
at the UCNC
September 2009

IAEA NKM Mission
at the University Campus
September 2009

Thank you!


Montenegro
- a great heart of the Mediterranean -