



## G8 NSSG

# Nuclear Education and Training - Institutional Capacity-Building

### Background

1. Every application of nuclear technology is based on nuclear knowledge. Assuring the smooth and seamless transfer of knowledge from one generation of nuclear experts to the next is a key component of nuclear safety and security infrastructure, with regard to both nuclear power and non-power nuclear applications.
2. International safety standards and security guidance require Governments to ensure that an adequate legal framework is established which requires, inter alia, appropriate training for all personnel engaged in nuclear activities at the regulatory and licensee levels.
3. Human resources are one of the key elements for planning and implementing the various types of nuclear application, setting up adequate and sustainable safety and security national infrastructure and ensuring the required high level of safety and security within a framework of control and supervision.
4. A significant number of countries worldwide have already expressed their interest in embarking for the first time on nuclear programmes. Not all of these countries can be expected to have adequate experience and expertise in the development of infrastructure and for the education and training of a sufficient number of experts to initiate and sustain a safe and secure civil nuclear power programme.
5. As a result, international and national Education and Training (E&T) activities in the nuclear field are urgently needed in order to ensure the development and maintenance of safe and secure nuclear energy in the countries concerned. Major efforts must be directed towards attracting sufficient numbers of bright and highly motivated students to the field. In



addition, E&T is essential to maintain and build capacity at the institutional level, including an adequate and sustainable regulatory framework.

## **E&T and institutional capacity-building for emerging nuclear energy countries**

6. The NSSG Italian presidency is paying special attention to the issue of education and training (E&T), as an essential tool to build capacity at the institutional level, including the establishment of an adequate and sustainable regulatory framework. The focus will be on countries embarking on nuclear power programmes for the first time (*emerging nuclear energy countries*) and the need to ensure that they are in a position to implement their programmes in compliance with existing international instruments and internationally recognized safety standards and security guidelines.
7. Countries planning to initiate nuclear programmes need to develop the supporting national infrastructure in order to meet safety, security and safeguards requirements as a long-term commitment. Institutional and human infrastructures underpinning this process must be developed as a first step. At an institutional level, infrastructure includes the definition of roles, functions and responsibilities and the establishment of a legal and regulatory framework, ensuring control and supervision, and the implementation of appropriate authorization and licensing processes. Details of national infrastructure, including E&T, are well covered in the IAEA document “Milestones in the Development of a National Infrastructure for Nuclear Power” as well as in the IAEA Safety Standards and Security Guidance.
8. The development of institutional capacity is a government responsibility. E&T is an essential building block in the build-up of capacity at the institutional level, and in the establishment of an adequate and sustainable legal and regulatory framework. Sustainability is a key principle for ensuring that governments take full responsibility, particularly in meeting international safeguards obligations.
9. With respect to institutional capacity-building, E&T needs to focus on the legislative and regulatory framework, nuclear safety, safeguards, security and physical protection, radiation safety, emergency preparedness and response, and radioactive waste planning. An important aspect of E&T is

the comprehensive understanding of roles and responsibilities of all involved parties, e.g. applicants, licensees and regulators. This approach requires vocational training in management, regulatory and decision-making processes, provision for technical support, etc. The promotion of a safety and security culture should be an integral part of a programme aimed at creating institutional capacity-building.

10. Major efforts are required by the countries embarking on nuclear power to develop these infrastructures and capabilities and a number of initiatives are already in place or planned at multilateral and bilateral levels. These initiatives include the efforts underway to increase the number of trained nuclear experts through a variety of education and training initiatives. The sharing of knowledge and experience is essential in order to enable emerging nuclear power countries to make informed policy decisions, and to develop the required institutional capacity-building in relation to safety, safeguards and security.
11. The IAEA plays an essential role in implementing a global nuclear safety and security framework by supporting the establishment or strengthening of national infrastructure, setting up international safety standards and security guidance, and providing peer reviews and services such as the Integrated Regulatory Review Service (IRRS), training and educational programmes, and information networks for sharing knowledge, experience and best practices. Therefore the IAEA can play a strategic role in supporting E&T programmes and assessing measures to meet these needs in emerging nuclear power countries. The Global Nuclear Safety and Security Network (GNSSN) is also expected to contribute to enhancing capacity-building and safety and security infrastructure through the sharing of knowledge, experience and feedback in nuclear safety and security activities.
12. Vendors have always played an important role in E&T in the development and operation of nuclear power programmes. While this role continues to be valid, what is also evident is the benefit of an increased commitment on their part to supporting the creation of an adequate safety and security infrastructure in the recipient countries. Moreover, the Regulatory Bodies of the country of origin and the recipient country should also be in a position to evaluate the differences in regulatory frameworks and licensing processes



and to cooperate with a view to strengthening the recipient country capacity-building, including education and training capabilities.

### **Proposal of the Italian presidency for E&T and institutional capacity-building for emerging nuclear energy countries**

13. The NSSG Italian presidency is proposing that the G8 pay special attention to the issue of education and training, which is also part of the International Initiative on “3S-based Nuclear Energy Infrastructure”, as an essential tool to promote capacity-building at the institutional level in countries embarking on nuclear power, thus contributing to the safe and secure implementation of their nuclear programmes and maintaining high levels of safety and security worldwide.

14. The G8 could contribute to the development of capacity-building at an institutional level and adequate regulatory frameworks by:

- supporting IAEA efforts and training already underway towards a global nuclear safety and security framework through its programmes and initiatives that will enable countries embarking on nuclear power to make informed policy decisions and develop adequate and sustainable safety and security infrastructure, including education and training of a sufficient number of experts who will be fundamental for their institutional capacity in relation to safety, safeguards and security;
- promoting effective cooperation among governments, industries, other multilateral groups, and academic communities of emerging and industrialized countries through coordination of ongoing international training in order to strengthen the cooperation on E&T and the sharing of best practices for a safe and secure development of nuclear programmes;
- promoting educational partnerships and networks that will not only strengthen the global safety and security framework, but also streamline structures and resources;
- supporting, on a voluntary basis, initiatives aimed at enhancing nuclear safety and security and ensuring the availability of human resources, e.g. development of nuclear knowledge, and fostering of science, technology and engineering.



15. The NSSG Italian presidency, under the auspices of the Italian government and in close cooperation with the IAEA and the European Commission, is planning an international workshop on E&T and institutional capacity-building focused on safety and security in countries embarking on or expanding nuclear programmes. This seminar will look at current international training programs for developing countries, assess needs and gaps in resources and attempt to coordinate information and activities and practices already underway.