



## THE SUSTAINABLE USE OF NUCLEAR AND OTHER RADIOACTIVE MATERIALS FOR PEACEFUL PURPOSES

On 21 March 2019, the VCDNP organised a panel discussion with the support of the Government of the Netherlands on “The Sustainable Use of Nuclear and other Radioactive Material for Peaceful Purposes”. Thirty-eight diplomats and technical experts from 33 Member States of the International Atomic Energy Agency (IAEA) attended the panel discussion. The panel comprised experts from Bangladesh, Brazil and Ghana.

The experts from Bangladesh and Ghana provided information on the efforts made in their countries to securely manage nuclear material and other radioactive sources and their related facilities. They also highlighted the support they receive from the IAEA and other countries. An international expert from Brazil shared his perspective on the interplay between nuclear safety and security and between nuclear security and technical cooperation. He also considered the perceptual and political barriers to reaching agreement in the IAEA on nuclear security and suggested ways in which the Technical Cooperation Programme of the IAEA could be strengthened.

### DISCUSSION

#### THE SUSTAINABLE USE OF RADIOACTIVE SOURCES IN GHANA

**Ms. Ann Mensah**, Nuclear Security Regulatory Officer in the Nuclear Regulatory Authority of Ghana, explained that the use of radioactive sources in Ghana for medical, industrial and research purposes dates back to 1950. The use of radioactive sources and their associated facilities and activities form part of the critical infrastructure in Ghana.

The IAEA was instrumental in the initial setup of radiotherapy centres in Ghana and continues to be supportive with supplemental training of personnel. The first radiotherapy centre in Accra was established in 1997 in collaboration with the IAEA to provide care for Ghanaian cancer patients. Cancer patients from, Benin, Burkina Faso, Côte d’Ivoire, Liberia, Sierra Leone, Togo and, on occasion, Nigeria are also treated at this centre.



Ghana's radiotherapy machines include two cobalt-60 teletherapy machines and two linear accelerators. The country has an estimated 0.1 machine per one million patients, which is far below the expected 1–3 machines per one million patients in Africa and 4–8 per million in developed countries. Ghana is working with the IAEA to improve its cancer control programme.

With the IAEA's support, security at its radiological facilities was upgraded as identified in Ghana's latest [Integrated Nuclear Security Support Plan](#) (INSSP). Typical upgrades include improvement in access control, hardening of storage facilities, intrusion detection systems, closed-circuit television cameras, central alarm station improvements as well as improvement of new voice communication systems. The system designs are based on international security guidelines of the IAEA. In 2015, the [Nuclear Regulatory Authority Act 895](#) was promulgated, establishing an independent regulatory body in Ghana responsible for nuclear safety and security, physical protection, radiation protection, transport and waste safety.

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## THE SUSTAINABLE USE OF NUCLEAR MATERIAL IN BANGLADESH

**Mr. Akhter Shahid**, Brigadier General and Chief Coordinator, Nuclear Security and Physical Protection System Cell, Dhaka Cantonment, gave [an overview of Bangladesh's experience](#) with nuclear power. Bangladesh is the third newcomer country to construct a nuclear power plant (NPP) in three decades after the United Arab Emirates (UAE) and Belarus. A consistent annual economic growth rate of 7 percent has significantly increased electricity demand in the country of 162 million people. Natural gas, oil, coal, hydro,



solar and biogas is the current power source for Bangladesh, however diversification is required to enhance energy security. Accordingly, Bangladesh has opted for nuclear power to increase its power generation capacity. The plan is to increase current generation capacity from 20 GW to 40 GW by 2030, 10 percent of which will be generated by nuclear power.

The first proposal for a nuclear build was made in 1961, followed by a Nuclear Power Action Plan in 2001. In 2011 an agreement was signed with ROSATOM for two plants on a turnkey basis with ROSATOM providing the design, production, construction, installation, as well as the start-up and commissioning. Construction of the NPP started in 2017.

The IAEA provides a comprehensive framework of guidance, known as the [Milestones Approach](#) for countries embarking on nuclear power programmes. Bangladesh has faced similar challenges to other embarking countries, such as the development of a skilled workforce to handle a project of this nature, ensuring regulatory compliance on the use of nuclear energy and making the necessary arrangements for the security and physical protection of the nuclear material and nuclear facilities.

Support to address these challenges is being provided by the IAEA and individual Member States. The IAEA is providing guidance and support to Bangladesh in a number of ways, including the development of necessary nuclear infrastructure, the review of regulatory documents, compliance with international legal instruments, site characterisation and environmental impact assessment. The IAEA integrated Nuclear Infrastructure Review (INIR) Mission took place in Bangladesh in 2011 with a [follow-up mission in 2016](#). Bangladesh also received support from the India, Japan, Russian Federation and the United States, which included personnel training and exchange of expertise and experience.

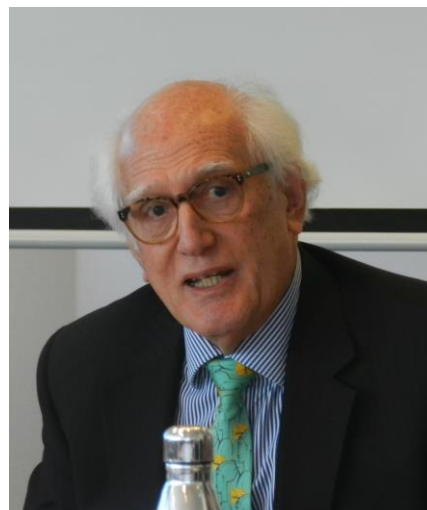
Another significant challenge for Bangladesh was gaining public acceptance for the nuclear build, due to the facility's location in a densely populated area. As a result, the government has engaged in extensive public awareness campaigns with the aim to create an enabling environment for nuclear power.

Bangladesh also uses radioactive sources for agriculture, research and medical purposes. New varieties of rice produced with nuclear techniques have helped Bangladesh increase its rice production three-fold in the last few decades. Thirteen new rice varieties have been developed by the Bangladesh Institute of Nuclear Agriculture using plant mutation breeding since the 1970s, in part through the [IAEA Technical Cooperation \(TC\) Programme](#).

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## THE INTERPLAY BETWEEN NUCLEAR SAFETY AND SECURITY AND TECHNICAL COOPERATION

**Mr. Laercio Vinhas** provided an overview of the benefits of nuclear energy and nuclear applications for development. Mr. Vinhas is currently the chair of the IAEA Advisory Committee on Nuclear Security (AdSec). As Brazil's Sherpa for the Nuclear Security Summits, the former Brazilian Permanent Representative to the IAEA and Chair of the Board of Governors, he has a unique understanding of the dynamics between the Member States of the IAEA and the interplay



between nuclear safety and security on one hand and nuclear security and the IAEA's TC Programme on the other.

Regarding nuclear safety and security, he said that States were able to reach agreement on standards for nuclear safety, which sets out the requirements that must be met to ensure the protection of people, the environment and property. Whilst the IAEA provides international consensus *guidance* on all aspects of nuclear security through its [Nuclear Security Series](#), it is difficult for States to go beyond the [Convention on the Physical Protection of Nuclear Material \(CCPNM\) and its Amendment](#), in terms of agreeing on nuclear security. There is limited sharing between countries on nuclear security as it is seen as an integral part of national security. This is especially the case in countries with nuclear weapons. This perception of nuclear security not only affects international cooperation on nuclear security but also the interface between nuclear safety and security due to concerns by some States that such an interface can be used to interfere in national security regimes.

Regarding the interplay between the TC Programme and nuclear security, Mr. Vinhas explained that developing countries are concerned with the potential of nuclear security arrangements to hamper the transfer of nuclear technology by the Agency. Overstating the importance of nuclear security could result in overregulation, which could hamper the transfer and use of nuclear technology and associated materials. Conversely, understating the importance of nuclear security could result in the use of the technology and materials for malicious purposes. Accordingly he advised that care should be taken to ensure the adequate application of nuclear security measures.

Mr. Vinhas suggested ways in which the TC Programme could be improved. One hundred and forty-four Member States define their development priorities through their Country Programme Framework, which determines the delivery of technical assistance through the TC Programme to individual countries. Identifying areas where the Agency can support the development needs of countries is a challenge as countries often lack capacity in this regard. Capacity to successfully manage the project is also a challenge for many countries. As a solution Mr. Vinhas suggested the creation of technical cooperation support plans for countries and project development units in countries to support the development and management of TC projects. He also recommended that INSSPs, which have proven to be a useful tool in assisting countries to identify their nuclear security needs, be integrated into these technical cooperation support plans to further strengthen the delivery of technical assistance.

## CONCLUSION

Nuclear and other radioactive materials contribute significantly to sustainable development. The use of these materials and their related facilities, however, require that appropriate nuclear safety and security measures are put in place and maintained. The IAEA and individual States provide essential support to countries in the safe and secure management of these resources. Nuclear safety and security, however, are the responsibility of individual countries and they have to make every effort to ensure that international standards and requirements are met and that international guidance is followed.

There are political and perceptual barriers to reaching agreement within the IAEA on nuclear security, due in part to nuclear security's close association with national security. Another contributing factor is the concern that disproportionate security measures could impede access to nuclear technologies and nuclear and other radioactive materials. On the other hand, understating the importance of nuclear security could result in the malicious use of these materials and technologies. Strengthening international cooperation through the IAEA on nuclear security is essential to overcoming these barriers. Furthermore, promoting awareness of actual security risks associated with the use and transportation of nuclear and other radioactive materials and related technologies and applying adequate nuclear security measures is critical to ensuring the sustainable use of these materials and technologies.

Strengthening the IAEA's Technical Cooperation Programme, the vehicle for the delivery of nuclear technologies to its developing Member States, would also contribute to the sustainable use of nuclear and other radioactive materials. In this regard, consideration could be given to developing a technical cooperation support plan that would include the INSSP.