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Growth of Nuclear Energy: Issues in Safety, Safeguards and Security

By Olli Heinonen

Synopsis

Nuclear energy is seeing a revival post-Fukushima, with interest shifting away from Europe to Asia. As nuclear power use grows, so must the international community bear in mind the 3S - safety, safeguards and security.

Commentary

LATEST PROJECTIONS show that global nuclear electricity generation is expected to almost double by 2040. While renewable energy sources are projected to be the world's fastest growing energy source for electricity production between 2012 and 2040, nuclear energy is projected to become the third fastest growing sector after natural gas.

Its share of total primary energy over this period will increase from four percent to six percent. According to the United States Department of Energy's Energy Information Administration, concerns over energy security and greenhouse gas emissions support the development of new nuclear generating capacity.

Big Shift from Europe to Asia

There is now a significant shift from Europe to Asia in nuclear energy generation. Asia is now the main region where nuclear generating capacity is growing significantly, driven by China's nuclear power projects. Specifically in Southeast Asia, Vietnam is set to commission its first nuclear reactor by 2025 while Indonesia and Malaysia have long been preparing for possible nuclear power generation.

In the context of Asia and Southeast Asian nations, observing transparency and

strict monitoring of states' compliance to global nuclear 3S (safety, safeguards and security) regulations are becoming more important as more Asian states are planning to go nuclear. The region still has significant regional concerns over nuclear safety and security. For instance, there is still a tremendous need to educate more young professionals in the nuclear field, particularly nuclear safety and security.

Nuclear energy users – from electricity generators to companies desalinating water to establishments using radioisotopes - must demonstrate that nuclear energy is safe, secure and do not contribute to nuclear proliferation. An important basic step is for states to adhere to the latest legal instruments on nuclear safety, security, and safeguards, as well as publicly demonstrate their full compliance with its requirements.

At the same time, nuclear vigilance and maintaining nuclear order goes far beyond signing on to international conventions. The nuclear disaster at Fukushima in March 2011 demonstrated the limitations of international safety monitoring mechanisms. One resulting lesson is the International Atomic Energy Agency's (IAEA) on-going efforts to enhance Safety and Security Standards.

Nuclear Safety Post-Fukushima

The Action Plan on Nuclear Safety that the IAEA crafted in 2011 after the Fukushima disaster was another important mark. But much work remains to be done at nuclear installations and to ensure well functioning nuclear regulatory bodies. In the area of nuclear security, a more transparent international monitoring mechanism needs to be developed, even as the entering into force the amendment of the Convention of on the Physical Protection of Nuclear Material (CPPNM) is a welcome step forward. In the field of nuclear terrorism, the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) and the CPPNM are yet to be universally adopted and implemented.

Beyond international conventions and efforts made to secure them as basic compliant standards, the ultimate responsibility for nuclear safety and security continues to rest with individual states. Nuclear safety and security issues continue to paint a mixed picture. While progress and attention has been made to better address vulnerabilities and threats, the 2016 Nuclear Threat Initiative Security Index concludes, inter alia, that the current global nuclear security system still lacks a common set of international standards and best practices. Furthermore, there remains no mechanism for holding states with lax security accountable.

Nuclear use also means adhering to safeguards that ensures a purely peaceful application of nuclear energy. The IAEA, which holds the sole international responsibility to apply safeguards, has upgraded its safeguards approach as well as verification methods over the years. The Agency also publishes an annual Safeguards Implementation Report (SIR) that evaluates the performance of its member states and makes recommendations for improvement. The latest SIR has called for the enhancement of national nuclear regulatory bodies that are often found to lack adequate resources or authorities in carrying out its safeguards obligations.

Different But Mutually Reinforcing Roles

While safety, security and safeguards have different roles, they also co-exist and are mutually reinforcing in many ways. Nuclear safety, security and safeguards are close 'triplets' that have synergetic effects on one another, and contribute to the efficiency and effectiveness of the overall nuclear order.

For instance, near real-time nuclear material accountancy, together with monitoring systems, provide valuable information about the location and status of nuclear material. This in turn is useful for nuclear security measures. Similarly, such information serves to benefit nuclear safety by contributing as input to criticality controls and locations of nuclear materials.

Currently, information on states' undertakings on nuclear safety, safeguards and security are scattered within various IAEA and other UN documents, including records of review meetings and the UN Security Council resolution 1540 committee. Such information is not only unthreaded, thereby making it more difficult to present a holistic picture, but data provided is also often lacking in public assessments on the effectiveness and efficiency of those measures.

Need for Implementation Report on 3S

States can also further opt to make public their nuclear safety, safeguards and security regulations as well as other relevant information to build further confidence that the basic legal and regulatory framework for nuclear safety, safeguards and security is in place. This is particularly useful for states and region that are freshly embarking on nuclear power.

The IAEA already supports its member states by conducting voluntary peer reviews on various aspects of safety, safeguards, and security. Such reviews are helpful tools to both improve states' performance and also build confidence in a state's commitment to continuously meet its obligations under the various conventions and treaties. Stepping up this platform by publishing the results of such international reviews on a regular basis will help move up the transparency needle.

Strengthening the nuclear 3S should be pursued as a work in progress that is seen to benefit the industry, nuclear users as well as its non-users. Nuclear incidents can range from accidents with localised radiological impact to large-scale nuclear terrorist attacks with transnational spillovers that jolt national and regional economy, security and psychology in ways that extend far beyond the mere physical fallout.

To provide the international community with a full picture on the global status of nuclear safety, safeguards and security, the IAEA should be tasked to provide a biannual implementation report. Such a report would assess the effectiveness of states undertakings on the ground to ensure nuclear energy is used in a safe, secure and peaceful manner. The report should indicate where enhancements are required and suggest improvements taken by individual states or by the international community.

Olli Heinonen PhD was an RSIS Distinguished Visiting Fellow and a speaker at the RSIS Roundtable during the Singapore International Energy Week in October 2015. He is currently Senior Fellow at the Belfer Centre for Science and International Affairs, Harvard University. He contributed this specially to RSIS Commentary.

Nanyang Technological University
Block S4, Level B4, 50 Nanyang Avenue, Singapore 639798
Tel: +65 6790 6982 | Fax: +65 6794 0617 | www.rsis.edu.sg