



**INPRO**  
International Project on  
Innovative Nuclear Reactors  
and Fuel Cycles

## Terms of Reference for INPRO Dialogue Forum on Global Nuclear Energy Sustainability: Licensing and Safety Issues for Small and Medium-sized Nuclear Power Reactors (SMRs)

IAEA Headquarters, Vienna, Austria, 29 July - 2 August 2013  
Boardroom A, Building M, Vienna International Centre (VIC)

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### Background

The Agency seeks to bring together technology holders and technology users to discuss and share information on desirable innovations, both technical and institutional, to ensure that nuclear energy is available to meet long-term global energy needs in a sustainable manner. The INPRO Dialogue Forum is one mechanism for technology holders and users to discuss such innovations.

The 56th IAEA general Conference resolution (GC(56)/RES/12) stressed the importance, when planning and deploying nuclear energy, including nuclear power and related fuel cycle activities, of ensuring the highest standards of safety and emergency preparedness and response, including incorporating the lessons learned from the Fukushima Daiichi accident.

In October 2011 an INPRO Dialogue Forum was held on Common User Considerations (CUC) for Small and Medium-sized Nuclear Power Reactors (SMRs) to discuss user considerations for SMRs in light of the conclusions reached in the CUC study and recent developments in SMR technologies.

The IAEA technical meeting, held in December 2011, on “Technology Assessment of SMRs for Near Term Deployment” concluded with respect to their safety and licensing aspects as follows: 1) Since many innovative SMRs contain a certain degree of ‘first-of-kind’ engineering systems and components, licensing and regulatory issues must be addressed; 2) Many newcomers are still in favour of ‘proven’ technology and want SMR technologies to be first deployed in the country of origin to minimize licensing and performance risks; 3) In the light of the Fukushima Daiichi Accident, the technology users paid particular attention to the implications of multi-module plants relating to extreme natural events that could potentially lead to severe accidents; and 4) The technology holders should incorporate lessons learned from the Fukushima Daiichi Accident into the design.

In December 2012, the INPRO Group in cooperation with NENP-NPTDS and NS-NSNI organized a Consultancy Meeting to prepare this Dialogue Forum and to discuss the possibility of setting up a “SMR Regulators Forum” in the IAEA Member States. At this Consultancy Meeting, participants discussed and identified specific topics and issues for this Dialogue Forum.

### Participation

The meeting is open to 80 or more participants from Member States including Albania, Algeria, Argentina, Armenia, Bangladesh, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Croatia, Czech Republic, Egypt, Finland, France, Germany, Hungary, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Republic of Korea, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Pakistan, Poland, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sudan, Switzerland, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States of America, Uruguay, Vietnam, and the European Commission.

Participants may include representatives from: WENRA, OECD/NEA groups such as CNRA, CSNI and MDEP, technology developers (vendors/reactor designers, GIF, fuel cycle facility designers), utilities and utilities groups such as WANO, TSOs, key “code and standard” developers (e.g., ASME), and NEPIO representatives from embarking countries.

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The meeting targets senior officers or technical experts from potential licensees and national regulators, in both developing and developed countries, engaged or interested in the development, deployment and licensing of sustainable nuclear energy systems, especially on innovative SMRs. The participants will be expected to actively participate in the breakout session, including presenting any evidence to support a point of view. Participants are strongly encouraged to review the background material prior to the meeting.

## **Programmatic Context**

The meeting is being held under Subprogramme 1.1.4, “International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)”, of *The Agency’s Programme and Budget 2012–2013* (IAEA document GC(55)/5 issued in August 2011).

## **Objectives and Outputs of the Meeting**

The traditional objective of the INPRO Dialogue Forum is to bring together nuclear technology users and technology holders from all IAEA interested Member States to discuss issues related to sustainable nuclear energy development and deployment. This dialogue facilitates mutual understanding of the needs and potential roles of technology users and the possibilities and limitations of technology holders. To date, five INPRO Dialogue Forums have been held since 2010. For details, see [www.iaea.org/INPRO](http://www.iaea.org/INPRO).

This Dialogue Forum aims to discuss the following major issues regarding licensing and safety issues of Small and Medium sized Nuclear Power Reactors (SMRs): 1) considerations for SMR designs; 2) siting considerations of SMRs; 3) application of graded approach in regulatory and licensing process; 4) legal and regulatory framework of SMRs; and 5) public participation in SMR licensing process (see Annex: Scope and nature of the Meeting).

The primary audience for this forum will be nuclear regulators and operating organisations in the IAEA Member States that are potentially licensing or preparing to license SMRs. Other stakeholders such as technical support organizations, vendors, and codes and standards organizations are also encouraged to participate. All participants will discuss the common issues for deployment of SMRs. For those countries considering SMRs in their nuclear power development programme, it will provide licensing and regulatory knowledge and experience through its participants with an opportunity to discuss common safety issues with technology holders.

Participating Member States considering the use of SMR technology are expected to develop and prioritise a list of licensing and safety issues, develop an understanding of related work in other forums and a recommended path forward to resolve, and address the issues identified through participation in a working group.

## **Location**

This Dialogue Forum will be held at IAEA Headquarters, Boardroom A, Building M, Vienna International Centre (VIC), Austria.

## Meeting Officers

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## Annex: Scope and Nature of the Meeting

The workshop will consist of lectures and presentations by IAEA professional staffs, invited experts and representatives from Member States and International Organizations as follows:

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- IAEA presentations may include INPRO methodology to assess innovative nuclear energy systems; status and prospects for SMRs; IAEA Safety Standards on the licensing process and related safety assessment requirements for nuclear power plants; and common user considerations on safety for SMRs.
- Member States' presentations may include: experiences and preparations for SMR licensing and deployment (technology holders) and licensing safety issues for SMRs (technology users).
- Presentations by International Organizations and invited speakers may include; licensing and safety approaches, development of design criteria, codes and standards for new nuclear energy systems including SMRs and Generation IV reactors.

Prior to the workshop selected participants will be provided with an opportunity to supply information on:

- Their national vision and status of development, deployment and licensing of SMRs from the perspectives of technology holders.
- Licensing and safety issues for the deployment of SMR technologies from the perspectives of technology users.
- Policy and technical issues and user requirements with respect to the unique design features and deployment plans for SMRs.

These presentations will be followed by breakout sessions to facilitate in-depth discussion on the following topics and issues:

- (Group 1) Considerations for SMR designs: implementation of defence in depth; approaches to international standardization; I&C and plant staffing; safety analysis challenges; and Fukushima lessons learned.
- (Group 2) Siting considerations for SMRs: determining source terms for non-water cooled SMRs or novel fuels; siting considerations for fuelled transportable reactors; and sites in regions lacking in fundamental infrastructure (including extreme remote sites).
- (Group 3) Application of graded approach in regulatory and licensing process: flexibility in emergency planning requirements and accident response; licensing codes and methodologies; R&D programmes; and demonstration of innovative features.
- (Group 4) Legal and regulatory framework of SMRs: plant staffing; licensing process for multiple modules; standardization of portion of design and safety classification; identification of required changes to safety standards; and transportation of fuelled-NPPs (modules).
- (Group 5) Public participation in SMR licensing process: new nuclear fuel issues (e.g. uranium nitride); environmental impact; safety culture; transportation of fuelled-NPPs (modules); and spent fuel management.

This breakout session will be followed by a panel discussion toward innovative licensing approaches for SMRs and presentations of proposals toward future actions for licensing and safety issues for SMRs.

The final session will consist of presentations summarizing the conclusions and recommendations from representatives from technology developers and potential users with a summation and concluding remarks by the Chairperson.