INTERNATIONAL PROJECT ON INNOVATIVE NUCLEAR REACTORS AND FUEL CYCLES (INPRO)

Break-out Sessions on the Topic 1:

Driving forces of collaboration on innovations

Facilitators: Mr Juergen KUPITZ and Mr Vladimir KUZNETSOV

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International Atomic Energy Agency

List of participants :

M. Lorca (Chile), M.M.A. Ibrahim (Egypt), J. Kupitz (Germany), T. Taryo (Indonesia), M.A.S. Syed (Pakistan), A. Rizea (Romania), K. Silva (Thailand), O. Dudkin (Ukraine), S.T. Napier (UK), K. Strangis (USA), V. Kuznetsov (IAEA), G. Dupuy (IAEA), A. Gevorgyan (IAEA), A. Grigoriev (IAEA), F. Gramotkin (IAEA), J. de Grosbois (IAEA).

Overview

- Chile, Pakistan, and Thailand presented the status of nuclear energy development in their countries and the driving forces for collaboration on NES
- Mr. Kuznetsov (INPRO) presented international collaboration in the fuel cycle back end as addressed within the INPRO collaborative projects GAINS, SYNERGIES and ROADMAPS
- Group discussions mainly focused on drivers and impediments to collaboration

Key points, major observations and conclusions

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CHILE:

- No plans in place for nuclear energy, but considering development of nuclear power in the medium to long term to address lack of energy supply
- Government encourages innovation, investment, and development of human capital and technology mainly through a coordinated National Innovation Strategy
- Must develop public and political support for nuclear energy if nuclear power is to become an option in the future

Key points, major observations and conclusions

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PAKISTAN:

- Seeks to enhance collaboration on developing small modular reactors (SMRs)
  - SMRs particularly attractive due to shorter construction timeline and the country's small localized grids and severe electricity shortfall
- Strong indigenous capacity (e.g., for design and commercial operations, training, radiation safety, engineering support and maintenance) but still some dependencies, (mainly cooperating with China)
- Seeks to overcome impediments to broader collaboration
  - Impediments include lack of international support, finance, R&D, infrastructure, licensing, IP regulations, legal issues related to technology transfer, etc.

Key points, major observations and conclusions

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THAILAND:

- Plans for NPP programme postponed following Fukushima -- still interested, but no political decision to move forward since 2011
- Considering innovative technology in order to:
  - facilitate the political decision to deploy first NPP
  - drive the development of human resources needed
  - prepare emergency response capabilities to cope with potential accidents in the region
- Very limited human resources
  - sustained national collaboration is needed to keep limited experts together
  - International collaboration is needed to get guidance and develop expertise
- Political decision is needed to keep experts involved and pursue international collaboration, and seek foreign investment

Key points, major observations and conclusions (cont'd)

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Common drivers of collaboration:

- Developing national capacities for strategic energy planning and harnessing innovations
- Sharing of resources and risks to reduce individual costs
- Synergistic use of core competencies
- Need to improve internal and external stakeholder involvement
- Providing feedback to technology holders from users
- Improve interactions between established technology users and embarking-country users
- Increasing licensing and regulatory assurance and support
- Harmonisation of licensing and safety requirements

Key points, major observations and conclusions (cont'd)

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- Training of human resources to increase research base
- Common use of research facilities, computer programs and simulators
- Reaching feasible financial agreements between technology holders and users
- Increasing trust with financial institutions
- Improvement of local and regional socio-economic development
- Improving societal acceptance of nuclear energy
- Developing market access
- Provision of a vehicle to attract new investments
- Improving awareness of specific innovative technology options to overcome barriers for their adoption

Key points, major observations and conclusions (cont'd)

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Common Impediments to collaboration:

- Lack of international support
- Politicization of nuclear technology
- Lack of adequate IP regulations and framework agreements
- Inconsistences of regulatory and licencing requirements
- Lack of understanding of the added value of collaboration
- Lack of national/governmental support
- Lack of international legal commitments
- Unavailability of long term financing
- Perceived technical and financial risks

Examples of collaboration on innovations:

- Activities of international organisations and fora, e.g. IAEA, ITER, CERN, SNETP, European Framework programmes and Joint Research Centres, Gen-IV International Forum, IFNEC, OECD-NEA, etc.

Key points, major observations and conclusions (cont'd)

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Conclusions:

- All countries shall need a better understanding of regional and global development scenarios to foster collaboration for sustainable NES
- Technical experts must provide policy makers with comprehensive information about the potential of nuclear applications to enable them to make informed decisions
- It is necessary to promote the value added by collaboration to improve governmental and public trust and support in nuclear energy
- Political decision to pursue nuclear energy is key to promoting collaborative processes
- The drivers and impediments to collaboration vary depending on status of nuclear energy in the country
- Effective IP regulation must be in force to protect commercial interests