Information on activities related to SMR and new reactors.

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Outline:

1. Interim conclusions on EPR for new reactors design
2. Situation regarding deployment of new reactors
3. IAEA Activities related to EPR aspects of SMR and Floating Reactors
4. Conclusions
Interim conclusions on EPR for new reactors design

Conclusions (TM on Next Generation Reactors and EPR, Feb. 2017)

❖ International Safety Standards provide for guidance that allow for establishing adequate EPR arrangements based on a graded approach for all facilities and activities, including new reactors

❖ Detailed definition of EPR arrangements for power reactors, based on Safety Standards, to date only has been done for conventional designs (like large LWR)

❖ More detailed guidance is needed to address the case of novel reactors designs, which encompass new safety features that should be properly taken into account in the hazard assessment

❖ More work to be done in this field in the upcoming years
Situation regarding deployment of new reactors (1)

- Among new reactors design, SMR are the ones being in the most advanced status of development
- About 50 SMR designs are in development
- The number of Member States interested in SMRs has increased over the past few years
- Some SMR already under construction and expected to be operational in the upcoming years
A new type of SMR with specific features (Floating reactors) based on the SMR concept being developed

To be deployed in the near term (Russian Federation). Also in China a floating reactor is under development and expected to be deployed in the upcoming years.

Floating reactors involve an additional challenge to EPR because in addition to hazard stemming from operation in fixed site, hazard stemming from transport from one location to another should be considered.
Resolution 8/65 of GC 61 request the IAEA to address this issue, in particular regarding SMR and floating reactors.

IAEA is requested to continue to organize meetings and activities on transportable nuclear power plants and SMR “with a view to using their findings to consider, under the common existing requirements and legal instruments, the various safety aspects of such power plants, including their transport”

A Task Group created in NS, involving all Divisions
Second Technical Meeting on Next Generation Reactors and EPR is planned for 2019. Specific sessions will be devoted SMR and floating reactors.

Coordinated Research Project (CRP) for Developing Approach, Methodologies and Criteria for SMR Emergency Planning Zones (EPZ) has been recently launched.
- Started January 2018, to be completed by the end of 2020
- 18 entities from 11 MS and EC participating
- Will dig in hazard assessment of SMR and other relevant considerations for deriving EPZ for this kind of reactors
- Specific research devoted to EPR of floating reactors (Chinese design, aimed at being installed in oil rigs)
- Technical guidance (EPR Series) document will be developed based on the CRP. Expected to be published by 2021
IAEA activities related to SMR/Floating reactors - EPR (2)

KEY ASPECTS TO BE TAKEN INTO ACCOUNT FOR SMR EPZ SIZING (ALSO FOR FLOATING REACTORS) AND ASPECTS EXPECTED TO BE ADDRESSED UNDER CRP

- Hazard assessment (including very low probability events and beyond design basis accidents)
- Estimation of source term and timing
- Dose projections to the public
- Establishing criteria for implementing response actions (i.e. generic criteria)
- Evaluate effectiveness of response actions
- Consider available resources
- Integrate into overall protection strategy (size of EPZ/D will be derived)
- Adapt to local / national circumstances
- Optimize

Activities that are expected to be covered under CRP
Conclusions

- Current safety standards and regulations in EPR are applicable to SMR and floating reactors, but only provide general guidance.
- Need to develop new detailed guidance based on overarching criteria set forth in SS in EPR.
- The issue of the transport feature of floating reactors has relevant implications both from the transport safety perspective and EPR.
- More work is needed in the upcoming years on this topic.
- Relevant challenge for the EPR community.
Thank you!