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NEW DESIGNS: REGULATORY CHALLENGES

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1 - NEW DESIGNS: WHAT ARE WE TALKING ABOUT?

New designs are not necessary new technologies

New reactor designs are based on technologies that have existed for many years

- not for commercial use, but for research reactors (molten salts, HTRs, etc.) or in the naval sector (PWRs, lead reactors)

However, considered as innovative reactors because of:

- **technological** innovations
- **intellectual** innovations

Growing interest in new designs to ensure a decarbonised energy mix by 2050, but in the same time, a demand for additional safety and security

CHALLENGE

Ensure a balance between the needs of stakeholders and the expected safety level



2 - IS THE REGULATOR AN OBSTACLE TO INNOVATION (1/3)?

Most regulations are goal oriented

- no means specified
- licensees can choose the most appropriate provisions

In France, the same regulations apply from La Hague to ITER and haven't prevented significant innovations implementation

- technological innovations
- intellectual innovations



2 - IS THE REGULATOR AN OBSTACLE TO INNOVATION (2/3)?

The regulator's objective is to ensure:

- Innovation aims to reducing risks (priority to safety)
- Innovation will produce the expected effects
- Innovation relies on proven technology



➔ An innovation must be not only attractive but has to be a proven technology

CHALLENGE

Accommodate innovation introduction
with proven technology

2 - IS THE REGULATOR AN OBSTACLE TO INNOVATION (3/3)?

An innovation has to be a proven technology

- this takes time: time for R&D, experiments, studies, qualification

Regulators should be involved in this timeframe

- understanding of the issues (learning curve)
- expressing specific expectations at a very early stage
- open-minded



CHALLENGE

Engage early dialogue on innovations between regulators and innovation's support (licencee, start-up)

3- WHAT HARMONISATION NEEDS TO BE DONE FOR SMRS (1/2)?

Industry calls for harmonization

There is a need to distinguish harmonisation of

- A. Safety requirements
- B. Authorisation or licensing process

A. Safety requirements

- Established in different frameworks (IAEA, WENRA) and built on the experience of what is already implemented (mainly derived from water reactors)



No need really for requirements harmonisation now

- it is rather how to demonstrate compliance with the requirements that needs to be worked on



3 - WHAT HARMONISATION NEEDS TO BE DONE FOR SMRS (2/2)?

The issues specific to SMRs have been identified, both on the licensee and regulator sides

Cooperation between regulators on the pre-assessment of SMRs is an opportunity

- to share regulators' approach
- it brings robustness to the assessment: it may lead (or not) to common positions. The common positions or dissensus (and why) are made clear to the licensees and provides predictability

It requires a mature design, a similar time frame and therefore a cooperation of licensees as well

CHALLENGE

Promote cooperation of involved regulators to carry out a joint pre-assessment on a mature design



4 - WHAT HARMONISATION NEEDS TO BE DONE FOR SMRS (1/2)?

B. Authorisation or licensing process

- Cooperation carried out in some frameworks : should contribute to a certain convergence in the pre-licensing or licensing processes
- At this stage, it cannot lead to international certification or reciprocal recognition of the authorisations issued by the safety authorities

different processes, no experience feedback, public acceptance....



Authorisation remains the sovereign responsibility of states

4 - WHAT HARMONISATION NEEDS TO BE DONE FOR SMRS (2/2)?

SMRs have intrinsic safety features expected to improve safety

especially with regard to core melt frequency and the associated radiological consequences, which shouldn't require protective action (no necessity of iodine prophylaxis, sheltering nor evacuation)

➡ **SMRs are therefore an opportunity to make a step in safety**

WENRA considers [GEN III] objectives to be the minimum requirement for SMRs. Higher safety requirements should be expected, particularly when considering the potential for such modern technologies to provide significant improvements in safety performance



CHALLENGE

Achieve higher safety objectives for SMRs than those of Generation III

3- CONCLUSION

A need to clarify expectations on harmonization

Actions to address the challenges

- 1** Ensure a balance between the needs of stakeholders and the expected safety level
- 2** Accommodate innovation introduction with proven technology
- 3** Engage early dialogue on innovations between regulators and innovation's support
- 4** Promote cooperation of involved regulators to carry out a joint pre-assessment on a mature design
- 5** Achieve higher safety objectives for SMRs than those of Generation III