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Global approaches to Small Modular Reactor and Advanced Reactor licensing

NRC RIC Panel Session
10 March 2022

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UK ambitions for new nuclear

- Set by UK government
- Nuclear is key player in a low carbon economy
- Commitment set out in various published documents
- Initial funding provided to regulators
- GW scale, SMR and AMR mix – Hinkley Point C, Sizewell C, Rolls Royce SMR, HTGR demonstrator, others in near future
- Nuclear Roadmap to be published in next few months

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Regulation

*"Regulation **can be both an unnecessary barrier to growth** for many businesses **and** a catalyst for investment in new sectors."*

UK Taskforce on Innovation, Growth and Regulatory Reform, May 2021

The good and the bad!

ONRs Approach

Philosophy of enabling regulation

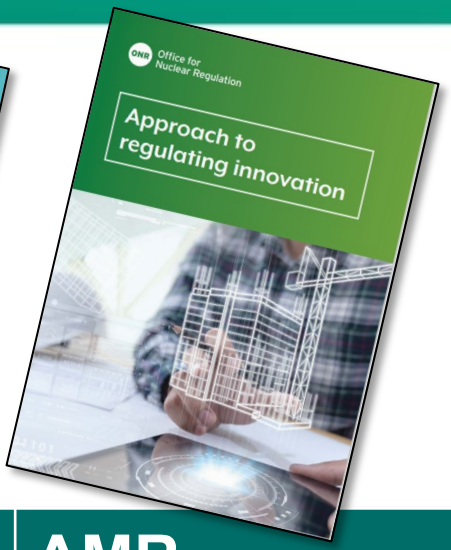
Last 5 years ONR has engaged with a range of SMR/AMR vendors

- Communicate UK approach to licensing, design assessment and regulation of supply chains.
- Gauge the maturity of SMR/AMR market.
- Advise on UK regulatory expectations for specific design concepts.
- Convey that small should not mean reduction in safety and security standards
- Highlight that inherent safety needs a robust justification

Modernised GDA - Increased flexibility and confidence for industry

Grow capability - technology specific training packages for its inspectors

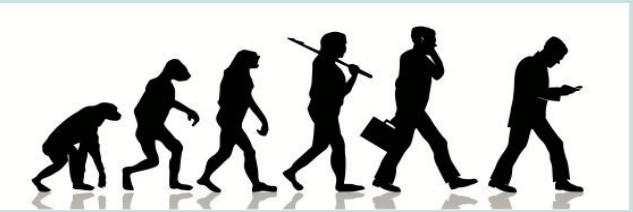
Use pre-existing assessment documentation



SMR		AMR	
PWR	Rolls Royce SMR	LFR	Westinghouse
PWR	Holtec	LFR	NewCleo
PWR	EDF	LFR	LeadCold
PWR	Westinghouse	HTGR	Urenco Ubattery
PWR	Last Energy	HTGR	Ultra Safe Nuclear Corporation
PWR	NuScale Power	HTGR	DBD Ltd.
BWR	GEH BWRX300	MSR	Moltex
		SFR	Advanced Reactor Concepts

Regulatory challenges

- Limited industry or regulatory cooperation
- Industry standards and regulatory requirements vary
- Sovereign regulatory systems pervade
- Must develop openminded, strategic thinking – lessons from aviation, radioactive materials transport, non-proliferation
- Regulatory and legal frameworks must evolve
- Stakeholder and public trust/confidence is essential, all have a part to play in achieving it



Global context

International Cooperation

- International agencies, associations etc
- Multilateral and bilateral cooperation and exchanges e.g. TRISO fuel, HTGR OPEX
- Promotes learning and sharing
- Establish global harmonised standards and good practice

Environment

- Climate change, COP26 targets and beyond
- Low carbon energy range of sources required
- SMRs and AMRs seen as opportunity to tackle climate change
- Multiple vendors of range of technologies

UN CLIMATE CHANGE CONFERENCE UK 2021

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The future

- Industry working effectively together
- International collaboration between national regulatory bodies common place
- Agile, robust international regulatory frameworks
- Harmonised, common approaches to regulatory assessment and standards
- Convergence of/single reactor designs deployed globally
- Safe and secure deployment of new technologies and innovative solutions enabled
- Embarking nations entering the nuclear age – Supported to ensure robust legal and regulatory frameworks

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Getting it right

- Strong regulatory frameworks with degrees of commonality, flexible and avoiding undue burden without reducing safety and security standards
- A global industry delivering evident, high standards of safety and security performance, ensuring the protection of society
- Technologies deployed efficiently, effectively, safely and securely
- An industry that effectively manages the full nuclear cycle, from cradle to grave, at the forefront of innovation

Requires - leadership vision and cooperation

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In conclusion

- ONR will remain agile, working with industry to ensure the safe and secure deployment of SMR and AMR technologies
- We are exploring opportunities to harmonise regulatory standards and approaches to secure the benefits it will provide
- We will optimise our processes to avoid undue burden, use pre-existing assessment work from other regulators, where appropriate
- ONR is open to the adoption of innovative solutions and new technologies recognising the safety benefits they can provide
- Will require safety and security standards to be met