

International Ministerial Conference on Nuclear Power in the 21st Century - Panelist

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Safety and Reliability Aspects of Nuclear Energy



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International

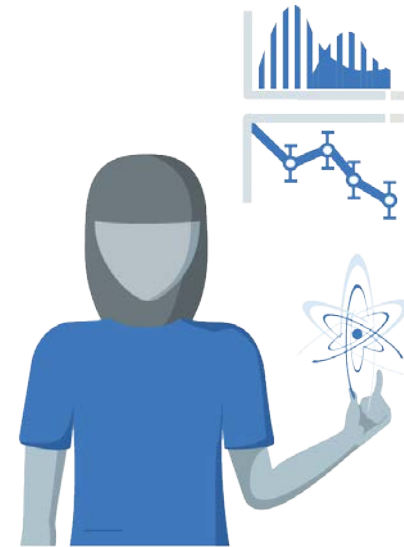
- Safety framework and peer reviews

National Infrastructure

- Credible and independent regulator
- Operators' ultimate responsibility for safety

Regulatory Oversight

- Culture for safety





- The need to enhance regulatory effectiveness and transparency through peer reviews such as legally binding treaties: the Convention of Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management
 - Member States are encouraged to sign on and ratify the conventions. This is an action by the government.
- International Atomic Energy Agency (IAEA) peer reviews services and international cooperation in particular for new entrants
- World Association of Nuclear Operators (WANO) – Peer review
 - Operators have the prime responsibility for ensuring safety



Challenges

- No global nuclear safety watch dog
- Lack of transparency in publically rendering the results of peer reviews to include follow up on the implementation of the recommended and suggested actions



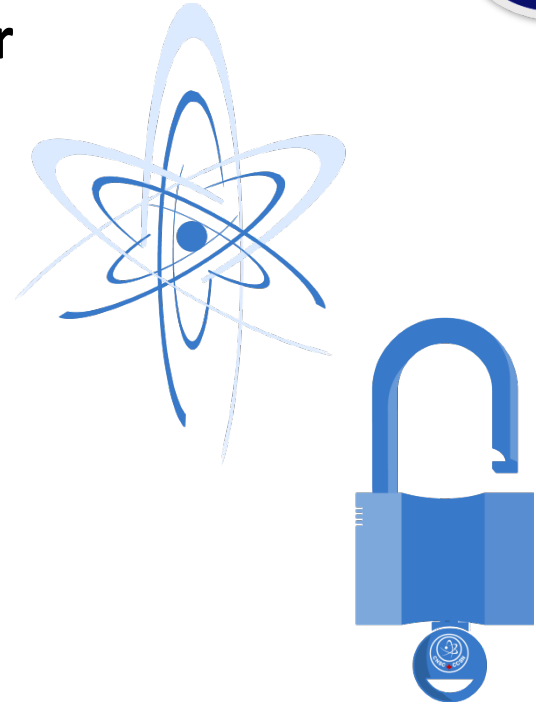


- Brief overview of the 7th review of Convention on Nuclear Safety
- Goal to increase participation and transparency – what has been achieved
 - Highest participation to date
 - Publication of all National Reports on the IAEA's website
 - Webcasting segments of the opening and closing plenary
 - Engagement with non-Contracting Parties (CPs), previously non-compliant CPs, and directly with Governments to enhance conformity with the articles of the Convention
- Peer reviews of the CPs met the Convention's objective of maintaining a high level of nuclear safety worldwide



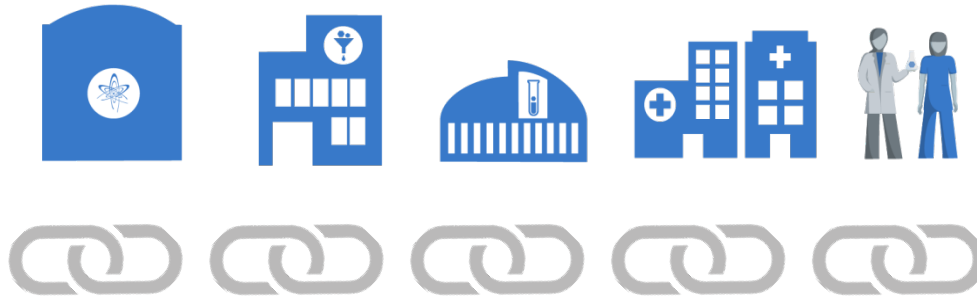
Safety is assured by an effective regulator

- Government's commitment for independent regulator with adequate financial and human resources to ensure capacity for action
- Public acceptance and trust
- Safety is national responsibility; National regulatory competency can not be outsourced
 - Long term sustainability is a must



Operators are ultimately responsible for the safe operations of their facility

- Safety is an integral component in dealing with infrastructure issues to include the supply chain



Safety requires a strong political commitment by supporting the independence of the regulator

- To ensure safety is maintained throughout the whole life cycle of nuclear facilities and activities





Google Glass

Nuclear industry experimenting with google glass that displays real time radiation levels



3D Printing

Westinghouse chose binder jetting additive manufacturing to produce its passive hydrogen igniter prototypes for testing. The parts could not be produced with the same performance benefits using traditional manufacturing.



Wireless sensors

Comanche Peak Nuclear Power Plant is the site of a pilot program using a wireless, automated, remote diagnostic system



Drones

OPG first used unmanned aerial vehicles to inspect Darlington's vacuum building



Autonomous vehicles

Rio Tinto has at least 54 autonomous trucks currently operating handling various transportation-related tasks.



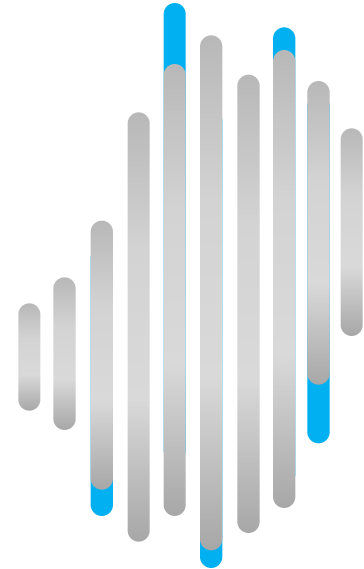
New energy systems

“Next-generation nuclear has the potential to disrupt the global energy mix”

“Fusion power has massive disruptive potential”



- Effective regulator requires technical competence and a modern, flexible regulatory framework
- Significant interest in potential deployment of small modular reactors (SMRs) in Canada
- Novel technology and approaches to deployment challenge the existing regulatory framework
- CNSC reviewing its processes, benchmarking with other countries, and identify challenges early to ensure readiness





The CNSC has a long-standing culture for safety

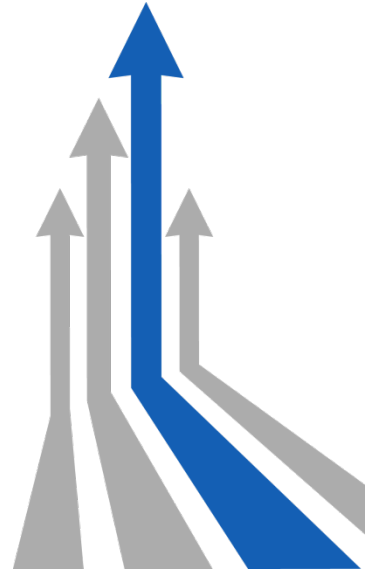
- Recognized value embedded in legislation
- Accountability and leadership is clear
- Safety is learning-driven and integrated into all activities
- Imposed effective accident mitigation measures to practically eliminate consequences of accidents
- Safety of aging facilities is real risk that must be addressed for Long Term Operations





Outcomes from the CNS 7th Review Meeting:

- CPs reported progress in developing approaches to oversight of **operators'** culture for safety; however,
- CPs noted that embedding processes to promote and sustain the culture for safety of the **regulatory body** itself are not widely adopted
- The IAEA is encouraged to continue developing guidance on culture for safety with input from States



Reliability of Safety for Nuclear Energy



- Safety is an assurance for reliability, safety is dependent on an independent and competent regulator, qualified operator, and they are dependent on the culture for safety of their people
- Need clear roles and responsibilities for the IAEA, governments in support of regulators, and industry





- There is no global nuclear safety champion
- International safety framework fills this void through international cooperation but requires a commitment from States, through actions from their Government to non-performing regulator
- Need for continuous improvement, demonstration of accountability and transparency, and a strong culture for safety

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