

# 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

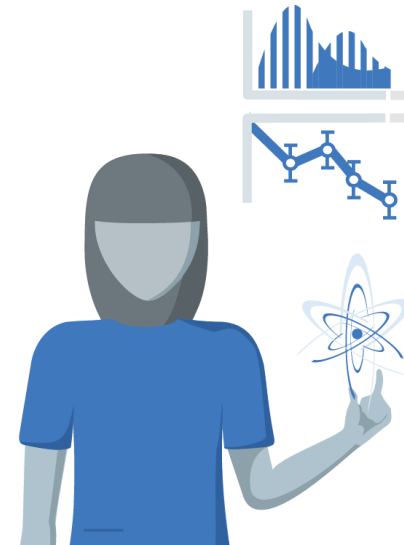
- Safety framework and peer reviews

## 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



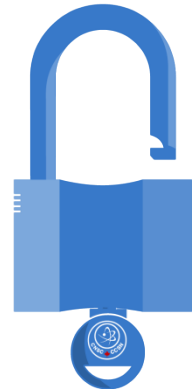
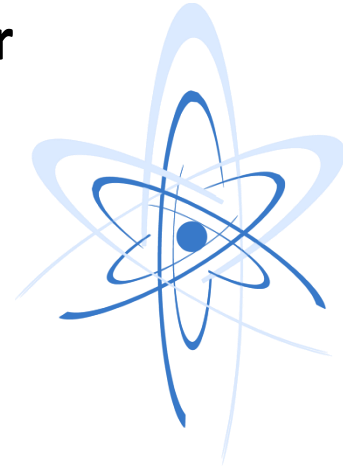


- Brief overview of the 7<sup>th</sup> review of Convention on Nuclear Safety
- Goal to increase participation and transparency – what has been achieved
  - Highest participation to date
  - Publication of all National Reports on the IAEA's website
  - Webcasting segments of the opening and closing plenary
  - 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



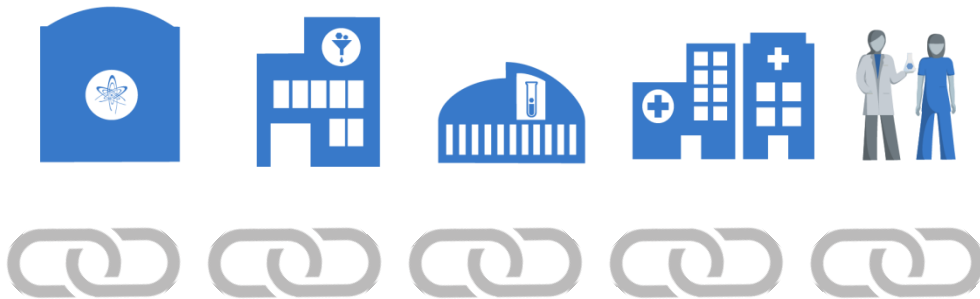
## Safety is assured by an effective regulator

- 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 CNCS has a long-standing culture for safety

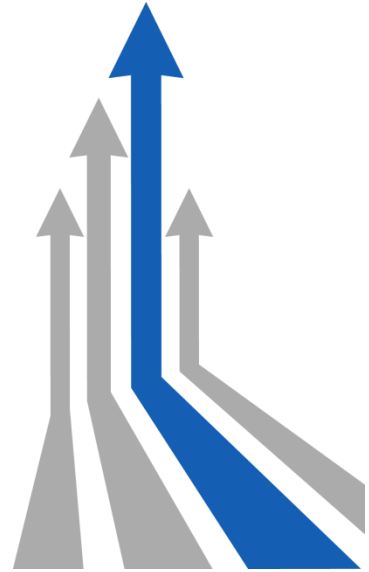
- Recognized value embedded in legislation
- Accountability and leadership is clear
- Safety is learning-driven and integrated into all activities
- Imposed effective accident mitigation measures to practically eliminate consequences of accidents
- Safety of aging facilities is real risk that must be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





## Outcomes from the CNS 7<sup>th</sup> 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



# Conclusion



- 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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CANADA 150