2025 G7 NSSG CHAIR'S REPORT

INTRODUCTION

The Nuclear Safety and Security Group (NSSG), established at the Kananaskis Summit in 2002 and responsible to Leaders, provides technically informed strategic policy advice pertaining to nuclear safety and security in the peaceful use of nuclear energy in close cooperation with multilateral organizations.

The NSSG reaffirms our shared commitment to uphold the highest levels of nuclear safety and security as an issue of global significance and we are united in our resolve to emphasize the importance of the responsible application of nuclear technologies worldwide.

The NSSG met three times under Canada's 2025 G7 Presidency. During our nuclear safety and security policy discussions, we were joined by representatives from the European Commission (EC), the IAEA and the European Bank for Reconstruction and Development (EBRD).

In addition to discussing evolving nuclear safety and security risks including those related to emerging technologies, Canada's NSSG Presidency has focussed on three key themes to advance domestic and international priorities. These themes are: remote siting of nuclear reactors; radioactive waste management; and international development finance. To support these discussions, we received presentations from G7 experts as well as the OECD Nuclear Energy Agency (NEA), the Stimson Centre, the Vienna Centre for Disarmament and Non-Proliferation (VCDNP), the Royal United Services Institute and the World Bank.

This report provides an overview of the activities of the NSSG during Canada's Presidency in 2025.

THE NUCLEAR SAFETY AND SECURITY SITUATION IN UKRAINE

More than three years after Russia's full-scale invasion of Ukraine, nuclear safety and security in Ukraine remain under serious threat with nuclear facilities and their supporting infrastructure in peril. We note with grave concern Russia's ongoing seizure and control of the ZNPP.

The NSSG recognizes the importance of the IAEA's continuous presence at the sites and commends the IAEA's commitment to upholding nuclear safety, security, and safeguards implementation in Ukraine and the dedication of Agency staff deployed to Ukraine under extremely challenging circumstances.

The NSSG appreciates updates from the IAEA on nuclear safety and security in Ukraine including information on the February 2025 strike on the Chornobyl New Safe Confinement (NSC) Structure. The NSSG also takes note of the reports from the EBRD on the ongoing fundamental stabilization and restoration efforts at the New Safe Confinement and recognizes the complex structural, capacity and legal challenges at play there. The NSSG underscores the urgent need for additional resources to support repairs to the NSC and other efforts.

EMERGING TECHNOLOGIES & NUCLEAR SECURITY

To ensure that nuclear energy and related emerging technologies can be safely and responsibly used worldwide, it is imperative that States uphold the highest standards of nuclear safety, security and non-proliferation. In this context, the NSSG welcomes the analysis presented by the Stimson Center, VCDNP, CNSC (Canada) and MASE (Italy) on the topics of AI, quantum tech, additive manufacturing and fusion.

New technologies will continually reshape nuclear safety, security and non-proliferation risks and therefore will remain a key focus of the NSSG agenda. The NSSG emphasizes the need for regulatory readiness and inclusion of non-traditional players as well as the need for coordinated international policy and investment to support future safe and secure deployment.

While recognizing that it is the responsibility of each country to implement its own regulatory framework, the NSSG stresses the importance of establishing and maintaining high regulatory standards to uphold safety and security norms for these new technologies as they evolve, and underscores the benefit of international cooperation to optimize the efficiency of regulatory reviews.

In this regard, the NSSG takes note of the ongoing work on AI such as that being undertaken trilaterally by the regulators in the US,UK and Canada. As well, the NSSG expresses its appreciation for the critical work of the IAEA through its Nuclear Harmonization and Standardization Initiative for advanced nuclear reactors. The NSSG is also appreciative of the IAEA's ongoing review to update four Nuclear Security Series documents (NSS 13, 14, 15 and 20) and confirms the importance of limited revisions to these documents to maintain their focus, effectiveness and efficacy.

REMOTE SITING

As small modular reactors (SMRs) come into use and demand increases for novel deployment options for nuclear power for emerging and expanding countries, the need to maintain robust and risk-informed nuclear safety and security measures for remotely located reactors will be an issue of growing importance. The NSSG notes nuclear safety and security challenges such as those related to: regulatory readiness and licensing aspects; emergency response and external hazards; community engagement; and deployment to disaster-affected areas. The NSSG recognizes that there may be unique

considerations for siting and operation in remote areas based on a variety of issues ranging from the infrastructure available in the selected location, the size of the reactor, its intended use, the proximity of medical and emergency personnel, etc. The NSSG welcomes the presentation from the IAEA on the safety considerations for remote siting including seismic and emergency response planning.

Overall, the NSSG recognizes the following as important factors to take into account for the siting and regulatory oversight of facilities in remote areas:

- licensing strategy and approach to safety and security assessment as well as resulting measures
- external hazards unique to remote locations
- emergency responses and capabilities
- construction, operations and maintenance
- nuclear fuel transportation, loading and safeguards
- engagement with local and Indigenous communities
- radioactive waste management and decommissioning strategy
- the safety and security of the site's employees.

More generally, for all new projects including those in remote areas, the NSSG recognizes the importance of taking proactive steps to optimize readiness. The NSSG highlights the following elements to support a sound approach to readiness:

- maintaining a robust and risk-informed regulatory framework
- recognition of priority for, and taking steps to support, a dedicated organizational focus on advanced nuclear technologies
- early engagement with all parties of interest (e.g. regulatory bodies, policy makers, proponents, local communities) to ensure security, safeguards and safety-by-design factors are incorporated
- focused research initiatives and international collaboration.

RADIOACTIVE WASTE MANAGEMENT

Radioactive waste management is crucial for protecting human health and the environment by minimizing the risks associated with radioactive materials, both now and into the future. Effective management, which involves the safe handling, storage and disposal of radioactive waste, is essential to prevent potential harm from radiation exposure, to prevent contamination of ecosystems and to ensure long-term safety. The NSSG welcomes the conclusions drawn from Canada's updated Policy for Radioactive Waste Management and Decommissioning and the US presentation on their radioactive waste management priorities.

The NSSG noted the positive outcomes of the Eighth Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive

Waste Management and commends its Vice-President, from France, in presiding over it successfully.

The NSSG stresses the importance of the following in considering spent fuel and radioactive waste management:

- waste minimization
- intergenerational fairness
- early consideration of waste from new nuclear developments such as SMRs, advanced reactors and advanced fuels
- continuous improvement in safety and security
- effective engagement with communities and stakeholders
- international cooperation.

DEVELOPMENT FINANCING

The NSSG recognizes the importance of having access to financing to ensure that nuclear safety and security factors are given due consideration in nuclear projects. The NSSG notes the update to the World Bank's posture on nuclear and the partnership agreement between the World Bank Group and the IAEA, both concluded in June 2025.

The NSSG found instructive the presentations from the EBRD and OECD NEA in discussing the role of multilateral development banks (MDBs) in supporting nuclear projects, with most still excluding nuclear energy from financing. The NSSG discussed different perspectives on the prospective role of international development finance to widen the access to funding including to:

- support peaceful, safe and secure applications of nuclear technology in furthering sustainable development goals and economies
- maintain and enhance safety and security measures at nuclear facilities
- support compliance with nuclear safety and security requirements
- foster technological advancement to enhance nuclear security
- mitigate nuclear security risks, and
- advance global security.

OTHER MATTERS

As regards the Advanced Liquid Processing System (ALPS) at the Fukushima Daiichi Nuclear Power Station, the NSSG notes its appreciation of the work undertaken by Japan at Fukushima and reaffirms its full confidence in Japan and its continued cooperation with the IAEA to ensure the safe discharge of the ALPS treated water into the sea.

For the work ahead, the NSSG notes key conferences in the coming months that intersect with this group's mandate and underlines these meetings as important

opportunities for the G7 to coordinate. This includes the 2026 international conferences on Computer Security in the Nuclear World and that on the Safe and Secure Transport of Nuclear and Radioactive Materials and the Tenth Review Meeting of the Convention on Nuclear Safety and, in 2027, the second Review Conference for the Convention on the Physical Protection of Nuclear Materials as Amended (A/CPPNM).