Improving stakeholder engagement during the implementation of Small Nuclear Reactors

Lorraine Brown, Aleksandar Despotovic,
Roozbeh Hosseini, Todd Johnston & Alyssa Kirlin

Career Development for Regulatory Professionals
Certificate Program
School of Public Administration
Carleton University

RGI Regulatory Governance Initiative

Stakeholder Engagement on Small Modular Reactors

1. Executive Summary

- Budget 2023 signalled the intent of the Government of Canada to support increased use of nuclear power, including development of small modular reactors (SMRs).
- Analysis of stakeholders identified a range of concerns, including regulatory preparedness, safe operation, waste management, the integrity of CNSC itself, and limited understanding of nuclear technology by the general public.
- Given the adoption of SMRs in the near term, CNSC requires an engagement strategy that is timely, transparent, and accessible in order to address stakeholder concerns and build trust in the adaptability of CNSC's current regulatory regime.
- We are making three recommendations for consideration including: improving existing communication strategies; building scientific replace in our stakeholders for greater understanding and more fruitful discussions; and co-developing new opportunities with our working groups and new community partners.
- If approved, we will return with a proposal for resource allocation.

2. Background

Budget 2023 introduced several measures that will support the development of nuclear energy projects, signalling the federal government's goal to integrate nuclear power into Canada's clean energy strategy. As Canada's nuclear energy regulator, the Canadian Nuclear Safety Commission (CNSC) must be ready to enable the government's desired growth in the nuclear sector and to ensure this growth is safe and sustainable.

In planning for Canada's clean energy future and diversification of energy sources, small modular reactors (SMRs) have been proposed as a solution to meet several needs. For example, current power grids and employed technologies struggle to provide reliable, clean energy for several applications, including: on-grid power generation (as coal and other fossil fuels are phased out), industrial power generation, and power for remote communities that currently rely on diesel fuel.

Briefly, SMRs are nuclear reactors that are smaller than traditional large-scale nuclear power plants. Several manufacturers have proposed modular designs, in which the reactors can be factory-built, shipped, then commissioned and operated at a separate site, allowing for self-contained, ready-to-use reactors.

There is growing interest in Canada and other countries to implement SMRs as the technology matures, with current estimates suggesting that SMRs will be commercially viable within the decade. It is expected that the investments and tax credits being introduced in Budget 2023 will support and contribute to these developments.

While the CNSC has extensive experience regulating larger nuclear reactors, there are novel approaches being developed for SMRs that collectively introduce uncertainty around their safety and security. These include: increased use of automation; decreased on-site personnel; use of security-by-design features; and smaller containment systems.

Additionally, if SMRs become widely adopted in communities across Canada, there are further concerns surrounding more regular transportation and storage of radioactive waste materials, and the generation of increasing amounts of waste over time with unique characteristics. Nuclear waste must be managed temporarily for the initial years, then buried deeply for thousands of years. This will have inherent long-term ramifications on local communities for generations to come. Notably, these concerns must be considered in the context of the United Nations Declaration on the Rights of Indigenous Peoples when they are located in First Nations Communities.

The CNSC does not intend to introduce SMR-specific regulations to manage the above concerns, as the existing regulations developed for traditional power plants are translatable to this context. This is due to the flexibility offered to the nuclear industry through CNSC's performance-based approach to regulation, whereby SMRs would be treated like other technological innovations that would need to demonstrably meet the existing standards.

However, the growth in SMRs will require adaptation of CNSC's existing stakeholder engagement strategies, as there will be an increasing number of communities, rights holders, and other stakeholders impacted by all stages of an SMR's life cycle. For this reason, stakeholder engagement must be sensitive to the requirement for stewardship of Canada's valuable resources now and for generations. This stewardship necessarily requires principles of transparency, timeliness and accessibility as a suitable framework for stakeholder engagement.

While the CNSC is confident that the regulatory framework is ready and adaptable to protect public safety, the environment, and Canada's natural resources as SMRs are implemented while simultaneously engendering trust in the CNSC as a regulator, this sentiment is not necessarily shared by the various stakeholders, rights holders, and other partners who may be impacted. Key concerns include:

- Ensuring the energy industry understands how the regulatory framework applies to SMRs and the performance standards they must meet.
- Health, safety, and environmental concerns of municipalities, Indigenous communities and environmental NGOs where SMRs will be employed or where waste will be stored, and the desire to co-develop solutions to ensure regulatory compliance.
- A lack of trust amongst the public at large regarding the safety of nuclear technology and environmental preservation as Canada's use of nuclear power becomes more widespread, including concerns around CNSC's role as an independent regulator and perceptions of being too close to the nuclear industry.

3. Considerations

Regulatory Preparedness

The CNSC has already taken several steps to ensure the regulatory framework is ready for SMRs, including:

- Developing regulatory documents and guidance materials for industry (e.g., RD-367: Design of Small Nuclear Facilities, etc.).
- Providing a pre-licensing review service for potential licensees.
- Establishing and participating in working groups to ensure alignment of standards with other jurisdictions and to address wide-reaching issues, including agreements with industry, academic researchers, and the Inter-departmental Radiological and Nuclear Emergency Preparedness committee.
- Positioning Canada as a global leader for SMR technology through international agreements with the United States, the United Kingdom, and Poland.

The CNSC has also taken a critical first step in enabling SMR technology in Canada, by licensing a first-of-its-kind SMR facility, namely the Darlington New Nuclear Project (DNNP). This site will serve as a demonstration facility for other communities interested in implementing SMRs, and is an important test case for the adaptability of the regulatory framework. Reactor construction is scheduled to be completed by 2028 and be operational in 2029.

Addressing Community Concerns

Both Indigenous rights holders and non-Indigenous communities are potential beneficiaries of SMRs, but will also bear the risk of operation and waste management practices. It's also important to be sensitive to the historical stigma and negative connotations associated with nuclear energy, despite an overall strong safety record.

Additionally, engagement during the development of the Canadian SMR Roadmap specifically highlighted concerns from Northern communities who did not want to be test sites, but rather wanted to see implementation in southern Canada first.

The CNSC has several existing initiatives that could be utilized to help address these concerns, including:

- Providing site tours at DNNP once it is in operation.
- Providing public access to monitoring data to allow for free citizen review.
- Expanding collaborative environmental monitoring programs to give communities a role in ensuring the safety of SMR sites.

The CNSC can also leverage lessons learned from previous engagement efforts, such as the decommissioning of the Whiteshell power plant that demonstrated the benefits of early outreach through many channels, and the consultations around the Chalk River waste disposal facility that demonstrated the insightful feedback and co-development that can come from properly engaged communities.

Scientific Understanding

Weighing the risks and benefits of SMRs can be challenging for the public due to the high level of technical complexity required to fully understand the technology. This was highlighted by feedback received during the DNNP pre-licensing consultation hosted on the "Let's Talk Nuclear" Platform, including concerns from the Mayor of the Municipality of Clarington and other citizens and organizations who responded that they did not have sufficient expertise to provide meaningful input to the consultation.

Thus, stakeholder engagement must be sensitive to this and make efforts to meet stakeholders where they are at in terms of technical complexity, beginning with basic explanations and plain language where needed. Efforts should be made to raise scientific replace related to nuclear technology overall, especially as it is increasingly a part of Canada's energy milieu. The Canadian Association of Nuclear Host Communities could be a key partner in these efforts, however stakeholders have raised concerns about their lack of resources and difficulties in obtaining funding from the Participant Funding Program.

4. Recommendations

The CNSC needs to make improvements to its stakeholder engagement strategy with respect to SMRs. As described above, each of our strategies endeavour to meet goals of (1) Timeliness: early engagement is beneficial, as the technology is being implemented in the coming years), (2) Transparency: stakeholders and rights holders need to be aware of what CNSC and its partners are doing, and (3) Accessibility of information. Accessibility requires plain language communication and employing basic descriptions before diving into the more complex explanations, which is key for meaningful participation in engagement. Additionally, utilization of a variety of active and passive communication channels will enable broad reach). Additionally, it is important to recognize that no strategy will be "one size fits all" as stakeholders have varying needs and levels of technical understanding. [See Annex for more detail to recognize what each stakeholder needs for accessibility.]

Recommendation #1: Highlight and improve upon CNSC's existing engagement strategies

- CNSC has already developed several initiatives for stakeholder and rights holder engagement, including offering site tours, collaborative environmental monitoring programs, the Let's Talk Nuclear Safety platform, the Participant Funding Program, and Natural Resources Canada's Action Plan input template. However, stakeholder feedback indicates these may be failing to meet intended objectives, suggesting there is space for CNSC to improve the content and expand the reach of these initiatives to ensure they are meeting stakeholder needs.
    - PROS:
        - Existing initiatives cover a range of channels and engagement modes.
        - Some provide opportunities for stakeholders and rights holders to participate in monitoring efforts and take agency in the process.
        - Provides opportunities to build relationships with communities, and to co-develop solutions adapted to unique needs of each location.
    - CONS:
        - Site tours, etc. will not be physically accessible to all interested parties, meaning CNSC will have to consider travel costs.
        - Several of the existing platforms are not necessarily accessible for all stakeholders, so gaps in scientific replace may persist.

Recommendation #2: Build scientific understating of SMRs

- Stakeholders have indicated that they have insufficient understanding of SMRs to meaningfully participate in engagement. This can be improved upon by building capacity within CNSC for knowledge translation and science communication, and by ensuring the use of plain, accessible language throughout all communications with stakeholders.
- Principles to guide towards this aim include approaching communication with patience and humility, co-developing public education materials with stakeholders to meet their specific needs, and working with trusted local figures to deliver messaging.

    - PROS:
        - Will complement and strengthen all other engagement efforts.
        - Will ensure capacity within CNSC to effectively communicate with all types of stakeholders and rights holders, regardless of their technical expertise.
        - Meets stakeholders where they are at in terms of technical complexity and provides opportunities for them to strengthen their understanding.

    - CONS:
        - Progress may be slow and difficult to measure.
        - Developing internal expertise may be costly, and could require funding for training or the creation of a new team for knowledge translation.

Recommendation #3: Innovate with new communication platforms, strategies and ideas, informed by work CNSC is already doing, and working with new partners to broaden reach.

- CNSC works with many partners and subject matter experts (as outlined above) to develop regulations and safety standards. These represent an untapped resource that could be leveraged for public communication efforts, including increasing transparency to the public about nuclear-related activities.
- CNSC should also take advantage of popular social media platforms, emerging technologies, and science influencers to broaden the reach of communications across all demographics across Canada and even abroad.

- Additionally, the DNNP provides new opportunities to demonstrate SMR technology and its regulation in real time.

    - PROS:
        - Some groups are already active on communication platforms.
        - Increasing transparency may help build trust with stakeholders and rights holders.
        - There is a wealth of expertise in these groups to contribute to regulatory development and create feedback loops for any necessary amendments.

    - CONS:
        - It may be difficult for both CNSC and partners to strike an appropriate balance and tone to enable conversations without becoming.
        - Advocates for the nuclear industry.
        - It may be difficult to ensure all communications are accessible.
        - Some topics (such as national security) may not be appropriate to share publicly.
        - Increased public messaging may incite unwanted actions from individuals and groups holding more extreme views related to nuclear energy. This potential will require monitoring to determine whether new information products need to be developed.

5. Next Steps

This note is seeking concurrence with the following actions:

- We will return to you in the coming months for a separate decision on a plan for resource allocation within CNSC in order to execute this strategy and build internal capacity for more adaptable scientific communication
- Within 12 months, we will complete an internal audit of all existing communication channels to identify shortcomings and propose solutions to improve them
- Within 18 months, we will co-develop proposals for novel communication strategies with our working group partners and DNNP

ANNEX: Summary of Engagement Activities and Stakeholder Groups

Group	Entity	Interests	Engagement Activities	Technical Expertise
Industry / Technology Provider	Technology Developer New Licensee Nuclear Waste Management Organization Licensed Site	Regulations applicable to technology, operations, licensed sites and decommissioning SMR specific topics: remote operations, advanced control systems, emergency response	Pre-licence vendor review Collaboration with international partners and academia Licensing Process Discussion Documents such as “Small Modular Reactors: Regulatory Strategy, Approaches and Challenges” Staff present at large Nuclear Sites	**Level:** High **Approach:** Leverage technical working groups

Group	Entity	Interests	Engagement Activities	Technical Expertise
Indigenous Rights Holder	First Nations community Inuit communities	Governance and approval processes Transportation of nuclear material Safety and monitoring standards Emergency Response Waste Storage Socio-economic	Face to Face discussion Facility Tour Collaborative environmental monitoring programs Participant Funding Program	**Level:** Typically Low **Approach:** Consent-based co-development Build Scientific understanding Plain Language
Community/Public	Local and regional community Public at large Association (e.g. Canadian Association of Nuclear Host Communities)	Access to accurate and timely information Transportation of nuclear material Safety and monitoring standards Emergency Response Waste Storage Socio-economic	Public engagement sessions Let's Talk Nuclear Platform Facility Tours Community workshops and focus groups Education and awareness campaign Participant Funding Program	**Level:** Low **Approach:** Build Scientific understanding Plain Language

Group	Entity	Interests	Engagement Activities	Technical Expertise
International Partner	US Nuclear Regulatory Commision National Atomic Energy Agency of Poland Office for Nuclear Regulation for the United Kingdom	Technical information related to SMRs Regulatory harmonization and best practices Research and development collaboration	Bilateral and multilateral meetings Technical workshops and exchanges	**Level:** High **Approach:** Leverage technical working groups
NGO	Canadian Environmental Law Association Canadian Environmental Network Greenpeace Ontario Clean Air Alliance	Alternative energy sources Regulatory processes to ensure safety of SMR Access to accurate and timely information	Public engagement sessions Advisory Groups Targeted engagement during key policy or regulatory decision-making processes	**Level:** Moderate **Approach:** Leverage technical working group material
Government or Regulatory Body	Provinces and Territories Transport Canada Environment and Climate Change Canada Public Safety / RCMP Atomic Energy of Canada Limited (AECL)	Departmental mandates	Interdepartmental committees Meetings	**Level:** Moderate **Approach:** Leverage technical working group material