Response to Draft Guidelines – DGR

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As I reflect on this important project, I'm reminded that Canada has no operational permanent disposal facility for Low-level (LLW), Intermediate-level (ILW) or High-level nuclear waste (HLW). This industry's experience is with interim storage at existing nuclear facilities. There are no operational Deep Geological Repositories (DGR) anywhere in the world, but there have been some failures. The previous failures and the interim storage facilities are the only real cycles of learning this industry can rely on. Other DGR's are in process, but not operational, so It's not possible to say this industry has "best practices" to permanently manage nuclear waste. This is my frame of reference – this industry has no experience permanently managing nuclear waste. Having worked in regulated industries (medical device and nuclear), I'm extremely concerned that this project must be approached with a duty of care that values long-term safety and environmental protections over economic development. Safety must be a priority – IAAC must ensure long-term safety.

Nuclear Waste Management Organization (NWMO) has no previous experience developing or operating a nuclear waste facility, or experience with Impact Assessments. As such, there are many areas of concern related to the Initial Project Description that must be addressed in the Tailored Impact Statement Guidelines (TISG). Areas of Concern with the IPD and the Draft Guidelines:

1) Lack of Nuclear Safety Culture. This project requirement is missing from the IPD and Guidelines and this is noted in the IPD comments from the Township of Ignace. OPG operates their nuclear facilities with a Safety Culture, supported by training, incident reporting systems, emergency management systems, safety committees, etc. OPG nuclear facility employees and their families are community members who have a vested interest in safe operations and that safety protocols are adhered to. The IPD is lacking a requirement for Safety Culture (instead it treats this project as a mining operation). What will NWMO do to integrate workers into the community; transient workforces (2 weeks in and 2 weeks out) are not invested in the community in which they work. Safety Culture and management systems must be a requirement in the Draft Guidelines.
2) Lack of Emergency Management Systems. The Draft Guidelines must require EMS throughout the entire project life cycle – throughout all phases and after closure.

3) Lack of Management Systems required in a regulated industry. There is no evidence in the IDP or guidelines that NWMO complies with management systems to control and manage risks, reporting, measurements, document control, quality management, incident reporting systems, project management, etc.
4) Risk Management. The Draft Guidelines indicate a requirement for Risk Management, however it only applies to the DGR site. This project should demand a full risk assessment of the entire waste management process that NWMO is responsible for, from manufacturing the storage containers (shipping, burial containers), building the DGR (blasting, etc.), loading containers/trucks at the reactor site, managing the waste along the transportation routes, re-packaging at the DGR, placement processes, potential accident modes in the DGR and in surface activities, monitoring, closure of the vaults, etc. Risk management requires identification of all potential failure modes and addressing/preventing/mitigation of the risks. Alternatives need to be evaluated to prevent risk. Engineering standards in many industries (such as automotive and medical device design and manufacturing) use a "Failure Modes Effects Analysis". If risk assessments have been done, the results have not been shared with the public or the "host communities", or people on the transportation routes, or nearby communities. Risk assessments should be transparent, and involve experts from various disciplines such as mining, transportation, metallurgy, chemical engineering, environmental/watershed experts, security, etc. The public and impacted communities have a right to understand the risks. With a view to the entire project that NWMO is responsible for, Transportation must be included in the IA, and must be addressed in Risk Assessment, since failure modes (including accident scenarios) need to be examined. NWMO is responsible for managing the waste while on route to the DGR.
5) The IPD and guidelines are incomplete and lacking details on the design, operations and post closure, for example: shaft design, mining/boring processes, safety procedures, accident procedures, the re-packaging plant design and operations, manufacturing of storage containers to ensure 100% manufacturing quality (copper coating, steel and welds), boundary definitions, transportation modes and routes, security, containment/protection from radioactive releases to workers and the public, stormwater and wastewater contamination risks and measurements during construction, operations and long-term monitoring (for thousands of years).
6) The IPD and guidelines are incomplete regarding details on proof of concept. The IPD in many ways describes a concept and is not a detailed design that includes process design detail or criteria for process validation, design validation, transportation validation, etc. There needs to be transparent scientific evidence and validation that the DGR will safely contain the radioactive materials for the long-term - 100,000+ years.

7) This project is the first of its kind in Canada – a DGR for HL radioactive waste. The licencing timelines are confusing – and it's not clear what documents and criteria must be met before a Licence to Construct can be applied for. This level of detail should be outlined in a detailed project plan that is available to the public and impacted communities. There are many unanswered questions and incomplete project details that should be resolved before construction begins, but what are the criteria identified that would allow construction to begin? It appears that NWMO is trying to fly the plane while building it. For example, site characterisation is not complete, yet they have announced that the DGR will be built at the Revell site.
8) Site characterisation of the geology is ongoing, but the site selection was based on 6 boreholes. This is not statistically relevant sample size. Time is also a factor – how long should the boreholes be monitored to understand the flow of groundwater. Blasting will also have an impact on the fractures in the rock – is that being tested to understand the effects of blasting the rock while radioactive waste is placed in vaults? The IPD indicates that "Geochemical testing to date indicates that the excavated rock is not expected to be acid generating or metal leaching", but this is based on only 6 boreholes.
9) Consultation with Indigenous communities. There is much opposition to this project, yet NWMO is ignoring much of the opposition. For example, many Indigenous communities along the transportation route and near the DGR site are opposed, have not been consulted with, and could bring this project to a halt. NWMO says they are "engaging" with indigenous communities and taking into consideration Traditional Knowledge. In Indigenous tradition, when a resource is taken from the earth, such as an animal taken for food, every part of the animal is used (nothing goes to waste). Nuclear energy is wasteful and potentially dangerous – this waste can never be reconciled with Indigenous knowledge.
10) Per the Seaborn Panel Report, the solution for nuclear waste should be "developed within a sound ethical and social assessment framework". It's difficult to reconcile the concept of asking indigenous and poor northern communities to accept nuclear waste they have not benefitted from. It is especially difficult to trust NWMO when some communities have been paid for support (some would view this as being bribed which is unethical), and agreements have been kept confidential. NWMO has not gained support from impacted indigenous and non-indigenous communities when they are biased, paying for support, not transparent in educating the public and host communities about the risks of the project. NWMO has created an unhealthy and combative social environment in Ignace and neighbouring communities where community members are now pitted against each other.
11) Alternatives to the project. Details have not been provided on alternatives to the DGR project for HL waste, and related detailed cost estimates. For the past 40+ years, the

nuclear industry has implied they would bury the fuel waste in the Canadian Shield. It appears NWMO is working towards this self-fulfilling prophecy, but they haven't done the homework to provide a trustworthy complete plan that provides long-term safety through the entire waste management process (from reactor to DGR and post closure). Perhaps an alternative that should be considered first is a DGR for low-level and/or intermediate level waste. This project is too important to get wrong and there are no cycles of learning or proven best practices from other DGR's for HL waste. Why not start with a LL & IL waste first to get some cycles of learning, develop best practices, develop proof of concept. Long-term safety should be the goal and the approach.

12) Jurisdiction. NWMO has engaged with 2 communities, neither of whom have jurisdiction over the proposed site. They cannot be the decision makers.

Thank you for the opportunity to comment.

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