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Presentation from

Pete Roche

In the Matter of

Ontario Power Generation Inc.

OPG's Deep Geological Repository (DGR)
Project for Low and Intermediate Level
Radioactive Waste

Joint Review Panel

September 2014

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Pete Roche

In the Matter of

Ontario Power Generation Inc.

Installation de stockage de déchets radioactifs à
faible et moyenne activité dans des couches
géologiques profondes

Commission d'examen conjoint

septembre 2014

Expansion Plans for the DGR Project and Implications for the Waste Inventory

Pete Roche

Edinburgh Energy and Environment Consultancy

Presentation to the Joint Review Panel – September 2014

Prepared for Northwatch and ZeroWaste4ZeroBurning

Review of Ontario Power Generation's Proposed Deep Geologic Repository
for Low and Intermediate Level Nuclear Wastes

From EIS12-512 we learn:

- ✦ Of a possible increase in the planned waste volume capacity of 200,000 m³ to a capacity of 400,000 m³
- ✦ This may arise from (a) new reactors (b) new refurbishments (c) decommissioning
- ✦ Don't know volumes
- ✦ Don't know characteristics



Yet according to OPG:

- *“...waste types ... are fundamentally the same as those arising from operations and refurbishment activities.”*



But significant differences:

	Decommissioning Waste	Operational Waste
Radionuclide content	Higher	Lower
Total amounts of Ni-59, Ni-63, Fe-55, Co-60, (activation products in metal) Cl-36 and Ca-41 (activation in concrete)	Higher	Lower
Amounts of concrete & metal	Larger	Smaller
Total amounts of H3 and C14 (most important radionuclides for operational safety for inhalation exposure)	Expected to be less	
Co-60 inventory (With Cs-137 most important radionuclides for operational safety for external irradiation)	Expected to be higher.	Lower
Most important radionuclides in terms of the higher dose scenarios for long-term safety are C-14 and Nb-94	Similar, so adding waste arising from decommissioning to the DGR would result in a calculated post-closure peak dose that is approximately double the dose calculated for waste arising from operational and refurbishment only	Similar
Other radionuclides, notably Ni-59 and Ni-63	Larger inventory, but the increase has limited effect since these are sufficiently small dose contributors for operations and refurbishment L&ILW that their dose contribution remains relatively small.	
Gas Generation Potential	Expected to be larger due to higher metal content.	

For operational and refurbishment waste

- The EIS gives: Number of packages
- Volumes of different types of waste
- Estimated radionuclide inventory
- Little of this detailed info is available for decommissioning waste, but expected to accept back-of-the-envelope calculation that adding decommissioning waste will:

“...double the dose calculated for waste arising from operational and refurbishment only...”

Gas Generation

- A larger proportion of metals means more gas generated by anaerobic corrosion of metals,
- Uncertainties about radionuclide properties means estimated contamination levels and risk estimates could be subject to very large errors.
- Throws development of safety case into disarray.



Conclusions

- Uncertainties regarding radionuclides could mean estimated contamination levels calculated for a deep geological disposal facility are in error by a factor of 10,000 to 1,000,000
- Additional wastes from decommissioning or even new reactors have not been properly characterised
- Additional wastes from decommissioning or even new reactors have not been properly subjected to a full Environmental Impact Statement process

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