



**To / À** Kelly McGee, Panel Co-Manager  
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**From / De** Patsy Thompson  
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**Subject / Objet** Canadian Regulatory Context and CNSC Staff Review Practices for Numerical Modelling – DGR Project

**ISSUE/QUESTION**

The Joint Review Panel (JRP) for the Deep Geologic Repository (DGR) has requested that Ontario Power Generation (OPG) provide additional information regarding numerical modelling used in the preparation of its Environmental Impact Statement (EIS) and licence application documents; and subsequently present this information in a one-day technical information session. While the Canadian Nuclear Safety Commission (CNSC) staff will be present at the session, they have not been asked to formally present any information.

**PURPOSE/OBJECTIF**

The purpose of this memo is to provide the JRP with the Canadian regulatory context and the existing CNSC staff review practices with respect to numerical modelling.

**DISCUSSION**

For the DGR project, CNSC staff consult many documents for guidance in their review of numerical models. For this project, the following document (G-320) is the main guidance document.

*G-320: Assessing the Long Term Safety of Radioactive Waste* [1] is a guide to assist applicants for new licences and for licence renewals in assessing the long term safety of radioactive waste management and can be found at: [http://www.nuclearsafety.gc.ca/pubs\\_catalogue/uploads/G-320\\_Final\\_e.pdf](http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/G-320_Final_e.pdf). When reviewing and assessing numerical models that have been used and referenced in the EIS and licence application, CNSC staff assess whether or not the modeling is in line with the requirements of G-320.

Of particular interest to the JRP is Section 7.6 of G-320 entitled ‘Developing and Using Assessment Models’. This section indicates the level of accuracy needed in long term assessment modelling and the degree of conservatism desired in the results, which are dependent

on the purpose of the assessment and the importance of the model results on expected performance and safety.

The accuracy of predictions made in long term assessments cannot be checked, making it necessary to rigorously test and evaluate the assessment models to the extent determined by the purpose of the assessment.

In order to provide confidence to the modelling results since accuracy cannot always be evaluated, CNSC staff verifies that the proponent has performed a number of activities, including (but not limited to):

1. Performing independent predictions using entirely different assessment strategies and computing tools
2. Demonstrating consistency between the results of the long term assessment model and complementary scoping and bounding assessments
3. Applying the assessment model to an analog of the waste management system
4. Performing model comparison studies of benchmark problems
5. Scientific peer review by publication in open literature
6. Widespread use by the scientific and technical community

CNSC staff also independently perform some of the above activities (in particular 1, 2 and 3) which includes verifying that all input parameters to a model are within natural variability or within ranges found in the scientific literature.

## **RECOMMENDATION**

If the JRP requires any further information, CNSC staff are available to respond.

## **REFERENCE**

- [1] Canadian Nuclear Safety Commission, 2006. Regulatory Guide G-320 - Assessing the Long Term Safety of Radioactive Waste Management, December 2006

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