September 10, 2012

Mr. Albert Sweetnam
Executive Vice President
Deep Geologic Repository Project
Ontario Power Generation
700 University Avenue
Toronto, Ontario M5G 1X6

Subject: Modelling Technical Information Session

Dear Mr. Sweetnam:

Enclosed is a Public Notice announcing that the Joint Review Panel has rescheduled the modelling technical information session for Thursday, October 11, 2012.

Thank you for providing the Panel with Ontario Power Generation’s presentation materials for the modelling session (Registry document #706). The written submission and slides are helpful and informative and the majority of the information is presented in appropriate detail.

Some re-organization and augmentation of the written submission and/or the presentation is required, however, as detailed below. This should increase the efficiency of the modeling session and reduce the need for undertakings at the session.

1. Return to the directions from the Panel in its July 31 letter (Registry document #659) which outlines the intended focus of the TIS as: fundamental aspects of the models; calibration of the models; verification of the models; and, uncertainty analysis.

   The written submission and slides should adopt these topics as subheadings and be re-arranged as appropriate. Following the reorganization, it will be apparent where additional information is required for certain models. Most specifically, the major assumptions are not clearly stated for all models (e.g. slide 9, slide 14). In other cases, a description of assumptions embedded in the text will be better highlighted under the subheading of ‘fundamental aspects of the model’. 
2. Ensure that calibration, verification and uncertainty analysis are addressed separately with respect to confidence. See slides 59-60 and slides 86-93 as examples of where bullets should be rearranged under these three parameters.

3. Where multiple lines of evidence contribute to confidence, provide a matrix or table to describe the relative contribution of each line of evidence to the modelling result (e.g. slide 73). Each line of evidence can be described quantitatively in terms of its relative contribution to confidence in the modeling results. For example, OPG may decide to use a simple ranking scheme that presents the relative contribution of each line of evidence to overall confidence. An example is given below. The Panel understands that relative contribution will be reported based on professional judgment.

<table>
<thead>
<tr>
<th>Line of Evidence</th>
<th>Relative Contribution to Confidence</th>
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<tbody>
<tr>
<td>Widely used and reviewed code</td>
<td>++</td>
</tr>
<tr>
<td>Calibration using input data from the DGR site when available</td>
<td>+++</td>
</tr>
<tr>
<td>Calibration using regional data</td>
<td>+</td>
</tr>
<tr>
<td>Verification via confirmation that model results are consistent with the conceptual model of the behavior of the system</td>
<td>+++</td>
</tr>
<tr>
<td>Verification via comparison of model results with other codes</td>
<td>++</td>
</tr>
<tr>
<td>Conservative bounding conditions</td>
<td>+++</td>
</tr>
<tr>
<td>Sensitivity analysis used to identify critical parameters that largely determine model outcome</td>
<td>+++</td>
</tr>
<tr>
<td><strong>Overall Confidence</strong></td>
<td>+++</td>
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</tbody>
</table>

4. For each model, describe how the selection of bounding conditions helps ensure conservatism such that modeled outcomes of concern (e.g. groundwater migration to surface, exposure of the public to air emissions) are not underestimated. Specify how the choice of bounding conditions adheres to CNSC G-320 guidance regarding the use of bounding conditions in the treatment of uncertainty.

5. Where two or more computational models were run to investigate model uncertainty, provide additional details with respect to degree of agreement between the models (e.g. slide 27).
6. Uncertainty in the model input can produce non-uniqueness where more than one set of input parameters will produce essentially the same results. Comment on the uniqueness of each model. Non-uniqueness is not a fault of the model itself, but rather of the quality and quantity of the actual data.

7. Provide results of sensitivity analyses rather than simply listing how many were performed. In particular, summarize the key findings of the sensitivity analyses with respect to critical parameters that are the primary determinants of model outcome. Describe the natural variability of these critical parameters. Explain how the use of conservative bounding conditions for critical parameters helps ensure that underestimation does not occur.

8. In the oral and written presentation, be clear and consistent regarding spatial scale. On slide 17, for example, a basin-scale cross-section is provided without reference to the applicability of the model to that scale.

9. To facilitate the understanding of all participants in the review, provide plain-language interpretations of technical terms and processes in the oral presentation (e.g. sensitivity analysis, discretization, boundary conditions, finite element, variably saturated porous media).

10. Clearly distinguish between calibration and verification of models.

11. Conceptual diagrams or illustrations need to be added to the presentation to explain technical processes (e.g. a diagram that explains the processes simulated by the FRAC3DVS-OPG model as listed on slide 12; e.g. a diagram that explains over-pressure/under-pressure; e.g. a graphic that presents the capabilities of the MIN3P model as listed on slide 39). Slide 136 is a very good depiction of a model and its processes that are applicable to the site. Some specific requirements follow.

12. When referring to the Ordovician sediments, rock, etc. highlight that this is where the proposed DGR is to be located.

13. Slide 6 - Modify the diagram to highlight the contour lines and increase the size of the contour labeling values. Remove or lighten the blue overlay if possible/necessary to increase clarity.

14. Slide 24 and written submission - Revise to provide clarity on how the site specific analogue results presented in the slide provide confidence.

15. Slide 44 - Modify the diagram to clearly define the curve labels.

17. Slide 60 – Should be titled as “Verification”.


19. Slide 70 – Should be redone to resemble slide 108

20. Slide 73 – Provide a summary matrix or table of the lines of evidence as per the example provided in item 3, above.

21. Slide 73- Use slide 110 as an example to illustrate the results of the 16 calculated cases.

22. Slide 75 – Provide an illustration that explains the model and its parameters.

23. Slide 80 - Explain the exclusion of the Cambrian rock formation.

24. Slide 89 - The results of each model are not all consistent (i.e. the green line is very different from the others in the top graph and the dotted blue line is different in the bottom graph). Explain what each line represents and clarify the curve labels.

25. Slide 94 – Use slide 110 as an example of how to illustrate the results of the 20 calculated cases. Also see item 7, above.

26. Slide 96 – Provide an illustration that explains the model and its parameters.

27. Slide 99 – Provide a diagram that illustrates AMBER in a Canadian context.

28. Slide 104 – Identify the main assumptions in the model (in a separate slide)

29. Slide 108 - Provide some illustrative results of the probabilistic sensitivity analysis with emphasis on the distribution of the predicted doses using different scenarios (show the curve of the results over time span) (i.e. increased gas generation and reduced shaft seal perforation)


31. AERMOD - Provide a summary of the treatment of uncertainties similar to that provided for AMBER (slide 110)
32. Slide 177 – Provide an illustration (e.g. isopleths overlain on a map) of the predicted noise levels during construction in the regional study area and highlight the nearest residences.

33. Slide 180 – Include the modeling of wildlife receptors locations.

Any questions that you may have may be directed to the Panel Co-Managers, Kelly McGee at (613) 947-3710 or Debra Myles at (613) 957-0626.

Sincerely,

Stella Swanson
Chair
Deep Geologic Repository Joint Review Panel

<original signed by>

Stella Swanson
Chair
Deep Geologic Repository Joint Review Panel

c.c.: James F. Archibald, Joint Review Panel Member
      Gunter Muecke, Joint Review Panel Member

Enclosure

September 10, 2012 - The Joint Review Panel for the Deep Geologic Repository Project for Low and Intermediate Level Radioactive Waste (DGR) invites the public to attend a technical information session on October 11, 2012 in Ottawa, regarding the numeric modelling used by Ontario Power Generation Inc. (OPG) in the preparation of its Environmental Impact Statement (EIS) and licence application documents. This session originally planned for September has been rescheduled.

The objective of the full day session is for the Panel to obtain additional information on how numeric models used in the environmental impact assessment and the preliminary safety assessment contribute confidence in and an understanding of the expected performance of the DGR. Focus will be on the fundamental aspects, calibration, verification and uncertainty related to the hydrogeology, repository evolution, air quality, noise and radiation dose models.

This information is needed to satisfy the requirements of the Environmental Impact Statement (EIS) Guidelines issued by government for the DGR. The session is not the venue for the testing of information already on the record.

The modelling technical information session will be held:

<table>
<thead>
<tr>
<th>Date</th>
<th>Thursday, October 11, 2012</th>
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<tbody>
<tr>
<td>Location</td>
<td>Canadian Nuclear Safety Commission Public Hearing Room</td>
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<tr>
<td></td>
<td>14th Floor, 280 Slater Street, Ottawa, Ontario</td>
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<tr>
<td>Time</td>
<td>9:00 a.m to 5:00 p.m.</td>
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The session will be webcast live via the Canadian Nuclear Safety Commission Web site at www.nuclearsafety.gc.ca and the archived webcast will be available on that site. Transcripts of the proceedings will be posted on the Canadian Environmental Assessment Registry at www.ceaa.gc.ca, reference number 06-05-17520.

The public is encouraged to attend the modelling technical information session in person or to access the webcast. Although the public and media will not have an opportunity to ask questions during the session, follow-up questions may be sent to the Panel for its consideration.

The modelling technical information session is being held during the review and comment period on the DGR EIS and Application for a Licence to Prepare Site and Construct. Note that the end date of this review and comment period, which was originally scheduled for August 3, 2012, continues to be extended to accommodate time required for Ontario Power Generation to respond to information requests from the Panel. The new comment period deadline will be announced at a later date.

To be kept informed of the panel review process and ongoing activities, send an email to DGR.Review@ceaa-acee.gc.ca and ask to be added to the interested parties distribution list.

About the Project
The DGR is a proposal by Ontario Power Generation to prepare a site, and construct and operate a facility for the long-term management of low and intermediate level radioactive waste at the Bruce Nuclear site, within the Municipality of Kincardine, Ontario. Low level radioactive waste consists of industrial items that have become contaminated during routine clean up and maintenance activities at nuclear generating stations. Intermediate level radioactive waste consists primarily of used nuclear reactor components, ion-exchange resins, and filters used to purify reactor systems. Used nuclear fuel will not be stored or managed in the DGR.