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Mme. J. Primeau
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Re : Your fax of March 8, 2007 "Project d'implantation du terminal méthanier Rabaska et des infrastructures connexes"

Madam,

C100

I regret that our laboratory does not have the necessary information or experience to be able to reply to question C100. I understand from subsequent emails that M. Michaud of our department will arrange for an expert in seismic events to reply on behalf of Natural Resources Canada.

C102

The answer to question C102 is not entirely straightforward. The question is whether the "initial" pool resulting from a LNG spill should be used to determine the potential hazards from a pool fire, or whether the smaller "equilibrium" pool size is more appropriate, as is argued by the promoter. The "equilibrium" pool is smaller, as the heat generated by the pool fire serves to increase the rate of evaporation of the pool, so that, under fire conditions, it does not spread out as far as the "initial" pool that would be formed before ignition took place. The answer depends on the level of thermal flux, because the time it takes for a given thermal flux to have a serious effect on a person decreases as the flux increases. This is important, as (according to the promoter) it will take approximately 20 s for the initial pool to shrink back to the equilibrium pool after ignition.

In our opinion, the approach taken by the promoter is acceptable. The use of the "equilibrium" pool size is

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appropriate for establishing the distances to the 5 kW/m^2 thermal flux limit as, at this thermal flux, the time taken to cause injury is significantly greater than the time taken for the "initial" pool to shrink to the "equilibrium" pool. This is also the approach taken in the reports produced by the Sandia and ABS organizations that are much referenced. For a thermal flux of 5 kW/m^2 the distance calculated by DNV (for a breach of diameter 1500 mm) is 820 m; people within this distance would need to be protected rapidly in the case of a serious breach and fire.

For a thermal flux of 12.5 kW/m^2 , the "equilibrium" pool distance calculated by DNV (again for a breach of 1500 mm) is 550 m, which is less than the distance between the ship and the nearest habitation, so residents would not be exposed to this level of thermal flux for the duration of the fire (tens of minutes). However, for a thermal flux of 12.5 kW/m^2 , the "initial" pool distance calculated by DNV is 1050 m, which means that a number of residences would potentially be exposed to this high level of thermal flux for the 20 s or so that the initial pool would take to burn back to the equilibrium pool. As the time required for injury to people is less than 20 s at this thermal flux level, it is appropriate to consider the "initial" pool for these short-term effects. It is our understanding that the risk contours calculated by the promoter take into account both the equilibrium and initial pool sizes, depending on whether there is immediate or delayed ignition of the LNG spill. As a result, the risk calculation should be adequate.

We remain at your disposal to answer other questions regarding the Rabaska project where we do have the necessary expertise.

Yours, sincerely,

A handwritten signature in black ink, appearing to be 'L. Michaud'.

c.c. Livain Michaud, Michel Boulianne (TC), Bert von Rosen