PRE-ASKS FROM MANITOBA HYDRO FOR PROFESSORS KUBURSI AND MAGEE

MH/KM PRE-ASK 1

Reference: Determination of Cost for Five-Year and Seven-Year Drought

In the KM direct evidence (Page 13) the financial impact of drought is quantified as follows: *The consequence of a one year drought on net income is $788 million, while that of a five year drought is $3,342.7 million and a seven year drought $4,548.3 million.*

(a) Please describe the methodology used to convert water flow into energy volumes for export sales and the requirement for thermal and import energy. Is this methodology based on a single annual average for all quantities for each year or does it operate on a monthly time step?

(b) Please confirm that the financial consequences of the five year and seven year droughts were estimated utilizing the same probability density functions and methodology as used in determining the one year estimate. If not confirmed, please explain how the estimates were determined.

(c) Please indicate whether these estimates of drought cost correspond to a drought beginning in 2012/13? If some other year, please specify the year. Do these drought cost estimates include financing costs?

(d) Please provide information describing the severity of the one, five and seven year droughts that are utilized in developing the estimates. This information should include the specific water flow for each of the drought years within each of the drought scenarios as well as a comparison to average.

(e) How does the severity of the one, five and seven year droughts utilized by KM compare to the 1940/41, 1987-92, 1936-42 utilized by Manitoba Hydro? Please provide the probability associated with each of the droughts that are utilized by KM in order to quantify the financial consequence of drought events.

(f) In the response to PUB/MH I-206(a) Manitoba Hydro provided an annual breakdown of the volumes and revenues and costs that are associated with its estimate of drought cost. For each of the drought scenarios please provide a similar breakdown for each drought year which includes a summary of the change in firm and non-firm export revenues, change in thermal and import costs and change in water rental cost due to drought compared to the average. In addition, please provide all the annual volumes of energy associated with each of these quantities.

(g) In addition to the information requested in (f), please provide the prices assumed for exports, thermal and import energy for each of the years of a drought period that are associated with the changes in energy volumes.

(h) Is the KM estimate of drought cost based on a methodology that reduces average export prices during periods of high export volumes? Similarly, do import prices increase during periods of low flow when large quantities of import energy are

required? Are export and import prices linked? If they are linked, how is this accomplished?

(i) Does the KM methodology produce an estimate of drought cost that is different from the Manitoba Hydro estimate? If it is different, please explain why?

MH/KM PRE-ASK 2

Reference: Estimate of Annual Drought Losses in 2015 and 2020

In the KM direct evidence (Page 13) it is stated that KM started with the benchmark conditions in 2015 and 2020 and introduced the volumetric declines without altering any of the other assumptions, and thereafter reached the conclusion that "*For 2015, a drought would result in an average annual loss in net income of $499 million and $712 million in 2020."*

(a) What is the definition of "average annual loss" as it is used by KM? Are these net income reductions relative to the positive net income indicated in IFF09 of $122 million in 2015 and $287 million?

(b) What severity of drought is associated with these losses?

(c) How are these losses different from the $788 million referenced in Table 6.2 of the KM report and in MH/KM PRE-ASK 1?