Undertaking Questions 1 – 25 from the PUB for the Independent Expert Witnesses

(May 17, 2011)

1. The Board Chairman has raised with KM the question of the "wisdom" of Manitoba Hydro's preferred development plan, one predicated on obtaining new long-term export contracts with U.S. counter-parties (the contracts to extend over a period of time much shorter than the expected service life of the assets and the expected 25-30-year related debt obligations). The concept being that export revenues "pay for" the advancement of projects ahead of the need for additional Manitoba supply.

   Would you agree that Manitoba Hydro's preferred development plan:

   a) Anticipates the construction of generation and transmission assets in advance of domestic load requirements?

   b) Reflects an extension of NSP sales contracts?

   c) Is contingent on term sheets (WPS and MP) and associated U.S. transmission upgrades coming into force and service by about 2018, and requiring new generation and transmission assets?

   d) Assumes that beyond 2035 market conditions will likely yield higher prices than would be achieved by an extrapolation of term sheet prices, this based on the assumption that significant CO2 pricing will come into effect?

   e) Reflects U.S. counterparty unwillingness to commit to more than 10-15 years of fixed prices, suggestive of the counterparties betting against a significant CO2 regime and/or a major change in the pricing of natural gas coming into play ahead of a subsequent renewal of the agreements?

   f) Assumes an adequate export revenue stream beyond the termination dates of the sales contemplated in the term sheets?

   g) Does not contemplate the now expected slow-down in industrial growth and overall domestic growth.

2. Manitoba Hydro's preferred development plan before the Board was developed ahead of a number of particularly substantive events – those including the global credit crisis and recession, the ascent of the Canadian dollar, an evident slow-down in Manitoba industrial load growth, the development of low-cost shale gas, changes in the U.S. political environment wherein climate change and carbon pricing have become lesser immediate concerns, major increases in the

construction estimates for the preferred development plan , a "collapse" in opportunity export sales prices, a delay in the completion of the export term sheets, no indication to-date of construction on the U.S. side with respect to a transmission hook-up to the Manitoba border – required for the major new sales, and, recently, a deferral of the expected in-service dates for Bipole 3, Keeyask and Conawapa.

Do these events suggest that a re-think of the preferred development plan should take place?

3. Please confirm or vary Dr. Kurbursi's testimony of May 6th that the rate rider proposed by KM would address inter-generational equity with respect to domestic Manitoba rates.

   Manitoba Hydro has significant pre-build expenditures on its books and projects a decade of rate increases representing perhaps twice the rate of expected inflation for domestic rate classes. In this context, is not the present generation of ratepayers taking on risks that, potentially, future generations of ratepayers would be responsible to "pay for" if the Utility's current financial forecast were not achieved?

4. Would you agree that Manitoba Hydro has and does pursue sales to U.S. counterparties for three reported reasons: a) to produce profits on the sales, b) to earn revenues sufficient to justify the advancement of new generation before it is needed for domestic load, and c) to secure the opportunity to import power from U.S. MISO market in the event of a drought or another generating problem in Manitoba?

5. Of the three provincially (government) owned hydro-electric utilities in Canada, being Manitoba Hydro, BC Hydro and Quebec Hydro, would you agree that the Utility most dependent upon net export sales is Manitoba Hydro, with Manitoba Hydro selling approximately one-third of its generated power to U.S. counterparties?

6. Would you agree that BC Hydro has been a net importer, and Hydro Quebec sells into a much more lucrative north-eastern U.S. market, and, with respect to those sales, they are representative of a much lower percentage of total generation than Manitoba Hydro's?

7. From a risk perspective, is Manitoba Hydro's export-reliant approach more risky, for domestic customers, with respect to domestic rate implications, than the strategy of BC Hydro or Quebec Hydro?

8. KM has suggested that new generation and transmission assets would best be amortized over a shorter period than the expected service life of the new assets. Please explain, hypothetically:

   a) How Bipole 3, with an assumed service life of 30 years, representing the average of transmission lines, converters, etc., should be recovered through annual rates if entirely

charged to domestic customers – should it occur over a shorter period of time than the service life?

b) How Keeyask with an assumed service life of 50 years, the average of the concrete, gates, turbines/generators etc., should be allocated against annual exports in the first 10 years of the new station's operations? Assume that Keeyask was built ten years ahead of domestic load needs, this to support a 10 year contract, firm, with opportunity sales in excess of dependable energy?

c) What is the best amortization approach with respect to exports for the remaining service life of Keeyask?

9. From KM's review of the term sheet prices for WPS or MP, where it considered that the prices appeared adequate to support the investments planned for generation and transmission:

   a) Does KM's view refer to the fixed price component for 5 x 16 peak energy sales?

   b) Does KM's view also take into account the variable price component for 2 x 16 weekend peak energy?

   In short, from KM's perspective, does the "price adequacy" KM has indicated to be present (given KM's indication that it was not then aware of increases in expected construction costs) apply to the average annual price for all energy to be potentially sold, and did that average annual price, as perceived then by KM, fully support the advancement of investment in new generation and transmission?

10. KM has suggested high import prices are not necessarily coincident with a drought:

    a) Would KM agree that high import prices are unlikely when Hydro experiences high water flow conditions?

    b) Would KM agree that high import prices are not common when Hydro is exporting off peak energy?

    c) Did KM observe any evidence that MH did not incur high fuel and power purchase prices during drought events, such as those experienced in 2003/04?

    d) Did KM review Hydro's 2006/07 surplus energy prices, and, if so, note in particular off-peak prices in the 6-8 cent per kWhr during November and December 2006 and February and March 2007, the latter being a time when Hydro received a 2.25% domestic rate increase related to the prior drought?

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11. Reference has been made to so-called Black Swan events. As well, it has been reported that Manitoba Hydro is focused on building sufficient financial strength to withstand a five-year drought. Yet, in its recorded history, Manitoba has "suffered through" a drought that extended over a period of twelve years, a seven year drought, followed by two years of no drought, followed by a five year drought (1928-1942 saw 12 of 14 years of drought conditions).

    Given MH is now in the export business with and planning further firm export commitments, and knowing of a 12-year drought experience, is Manitoba Hydro's preparing for surviving a five year drought reasonable?

12. Before Limestone, sales to U.S. counter-parties was not part of the business plan, now it is: does this not increase the financial risks associated with the occurrence of Black Swan event and suggest that building a retained earnings to meet a five year drought in an era where commitments (curtailable at the potential cost of Manitoba Hydro's dependability reputation), increase the financial risk to Manitoba Hydro in the event of a drought extending beyond five years?

13. While Manitoba Hydro has assured parties that its proposed new export sales to U.S. counterparties provide for no penalty if water flows are particularly low and Manitoba Hydro cannot supply the power committed to the Americans, the Utility has also indicated that it has and could in the future meet its obligations for business reasons – to protect its reputation as a reliable supplier.

    Please comment on this issue.

14. Manitoba Hydro enters into commitments and sells power to U.S. counterparties as part of its overall business plan. Some may hold that these sales are, thus, not by-product sales and that full costing should be applied to the sales to determine whether or not they are profitable.

    Do you agree?

15. While Bipole 3 is being advanced by Manitoba Hydro for reliability reasons, not for export, the government has suggested that Bipole 3 will be paid for by revenues from export sales. (Manitoba Hydro has also advised that without Bipole 3 Keeyask and Conawapa cannot proceed.)

    Manitoba Hydro's load forecasts, particularly now taking into account the deferral of industrial load growth, may suggest that the present deferral of in-service dates for the new generation and transmission could be extended further, excepting for the pending commitments to supply power to U.S. counterparties.

Given this, is there any justification for not allocating a part, if not all, at least until domestic load requires Keeyask and then Conawapa, of the cost of Bipole 3 against export revenue to arrive at net export revenue?

16. Please provide your view as to the rationale for U.S. counterparties "paying for" Bipole 3, when their options for power include both coal and gas plants much closer to their customers than Manitoba Hydro's northern generating stations?

17. Would it be fair to say that the biggest risk the Utility faces is neither drought, which is expected to occur from time to time, nor adding generation and transmission assets to meet forecasts of future domestic load growth, with construction of the assets advanced on the premise export net sales will cover the costs, but equipment or market failure once the new assets are in place?

18. Reference: KM Report Summary of Findings Page xxxvii

    a) Please provide KM's estimates of the potential hydraulic generation shortfalls under current energy resources (from an average output of 29,000 GWh) for the following drought periods;

        - Fiscal 2002/02 to 2004
        - Fiscal 1987/88 to 1991/92 (Basis for 5-year drought)
        - Fiscal 1936/37 to 1942/43 (Basis for 7-year drought)

    b) On an order of magnitude basis would KM agree that the other significant historical droughts could have seen potential hydraulic generation shortfalls as follows:

        - 1980/81 to 1984/85 – Similar but less than 1987/88 To 1991/92
        - 1976/77 to 1977/78 – Somewhat greater than 2002/03 to 2004/05
        - 1960/61 to 1962/63 – Similar to 1980/81 to 1984/85
        - 1929/30 to 1933/34 – Similar to 1987/88 to 1991/92

c) Would KM agree that the financial impact of the hydraulic generation shortfall in 2002/03 to 2004/05 fiscal years would have been exceeded by at least six other drought periods?

d) Would KM agree that MH's worst drought on record would currently have an aggregate hydraulic generation shortfall almost 4x greater than the 2002/03 to 2004/05 drought period?

e) Would KM agree that MH's designated 5-year drought (reflective of 1987/88 to 1991/92) would currently have an aggregate hydraulic generation shortfall about 2x greater than 2002/03 to 2004/05?

19. Reference: KM Report Summary of Findings (p. xxxvii), Table 6.2 p. 229, PUB/MH I-206 (a)

"low water flows have the largest impacts on net revenue of MH. A total of $788 million can be lost on account of the worst drought on record".

a) Please confirm that a $788 million revenue loss in one year (excluding finance expenses) is substantially greater than the net income loss of $424 million recorded in 2003/04.

b) Please confirm that MH's 5 year drought analysis included a one year net revenue shortfall of $742 million under current demand conditions and l988/89 (flows) indicating a hydraulic generation shortfall of 10,700kwh.

c) Please confirm that the hydraulic generation shortfall with 1941/42 flow conditions and current generation facilities should have much greater net revenue losses than 1988/89. Explain.

20. Reference: MH Annual Report – 2010 (p. 100/101)

a) Please confirm that in 2003/04 MH suffered a net income loss (including finance expenses) of $436 million resulting from a net revenue reduction of about $500 to $600 million.

b) Please confirm that MH's 2003/04 hydraulic generation shortfall was about 10,000 GWH which with IFF09-1 export price forecasts beyond 2011/12 would potentially result in much higher revenue reductions.

21. Reference: PUB/MH I-206(a)

a) Can KM confirm that that MH in PUB/MH I-206(a) as attached indicated that a 5 year drought would see a total hydraulic generation shortfall of 33,246 GWH (compared to IFF09-1 output assumptions)?

b) Did KM arrive at a similar total hydraulic generation in their 5-year drought analysis?

c) What total hydraulic generation did KM arrive at in their 7-year drought analysis?

22. Reference: PUB/MH BOD 9, p. 42 SEP Sales prices, PUB/MH BOD 34, Q.2 & Q.3 of 2004/05 Q.1 of 2006/07

a) Was KM aware that MH offers a "Surplus Energy Program " (SEP) to industrial customers at market prices for peak, shoulder and off-peak energy as determined from MISO real time and day-ahead sales

b) Was KM aware that MH in June to October of 2009/10 was offering surplus energy to SEP industrial customers and also was making off-peak summer (night time) sales into the MISO market at <1.0 ¢/kwh; in effect covering only water rental and transmission charges?

c) Would KM agree in Pub/MH BOD 34 (p.72), it can be shown that MH was also offering off-peak surplus energy to MH's SEP industrial customers (and by inference to MISO market) at less than 1 cent/kwh for:

- 16 weeks in 2005

- 12 weeks in 2006

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23. Reference: PUB/MH Appendix 56 Market Planning Conditions J. Flynn May 31/2010

a) In Appendix 56, MH has provided (p. 7 & 8 of the J. Flynn presentation on "MH market considerations for planning"), typical variable production costs from existing generation which suggest these variable costs could range from:

- Coal generation 1.7 to 2.2 ¢/kwh
- CCCT generation 3.0 to 6.0¢ /kwh (Natural Gas cost $3-7/GJ)
- GT (peaker generation) 4.0 to 7.5 ¢/kwh (Natural Gas cost $3-7/GJ)

Can KM explain what MISO market circumstances would require MH to offer off-peak energy at less than the variable production costs (fuel and operating) in order to sell its off-peak hydraulic energy?

b) Did KM determine what percentage of the off- peak (7x8 overnight) MISO market trading was being supplied by MH?

c) What in KM's view would be the impact on MH"s off-peak sales if MH offered energy in the MISO market at a minimum price of 1.5 ¢/kwh or at a minimum price of 2.0 ¢/kwh?

d) In KM's view is MH the lowest price provider of off-peak (7x8 overnight) energy in the MISO market?

24. Reference: PUB/MH BOD 35 P. 78, BOD 3 P. 10, BOD 35 P. 76,

a) When KM speaks of Risk Misalignment –Could this have been the case in 2003/04 when the Board understands that MH sold 6917 GWh as exports including about 1000 GWh in excess of dependable contract commitments?

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b) Was KM aware that after incurring a $436 million net loss, MH sought rate increases from PUB which led to rate increases of:

- 5.0% as of Apr. 1, 2004 $33M/yr
- 2.25% as of Oct. 1, 2004 $22M/yr
- 2.25% as of Apr. 15, 2005 $23M/yr

$80M/yr

c) Was KM aware that MH achieved ongoing future revenue gains of $80M/yr totaling over $500M since F 2004?

d) Was KM aware that in 2003/04 MH undertook to buy-back about 2500 GWh and import about 7000 GWh of energy in order to satisfy firm commitments?

e) Would KM agree that if MH had started 2003/04 with an additional 5000 GWh (9200 GWh instead of 4200 GWh) of energy in storage as of April 1st the drought costs might have been reduced by about 50% and that lower rate increases could have resulted?

f) Was KM aware that the 2003/04 shortfall came about in part because in 2002/03 MH sold:

- 3,900 GWh (dependable)
- 3,300 GWh (opportunity time)
- 3,000 GWh (day ahead and real-time opportunity)
- 10,200 GWh TOTAL

g) Was KM aware that about half of this energy was sold in the last 8 months of 2002/03 when MH reduced energy storage by 10,200 GWh from 14,400 GWh down to 4,200 GWh?

h) Please confirm that if MH had a policy of minimum April 1st energy in storage of 9,200 GWh the 2002/03 sales would have been down by 5,000 GWh or by about $100-$200M (with a 2-4 ¢/ KWh value). Confirm on this basis there would have been an additional 5,000 GWh in 2003/04 which would have been worth about $250-300M (based on a 5-6 ¢/KWh value)

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25. Do Drs. KM believe that Manitoba's commitment to the Western Climate Initiative will expose MH to potential carbon costs arising from imports during drought periods, thereby increasing import price impacts?