Exhibit # _____

NEEDS FOR AND ALTERNATIVES TO (NFAT)

Elenchus Undertaking # 91

"Elenchus to review Manitoba Hydro's March 10th evidence and update its analysis, including the heuristic analysis as necessary, and file that revised analysis with the Board."

Response:

Elenchus understands that the focus of this undertaking is on slide 4 of the March 10, 2014 Manitoba Hydro (MH) evidence (Exhibit MH 95) which shows the changes in the expected In-Service Date (ISD) for Keeyask according to various scenarios, *viz*.:

- 2012 Planning Assumptions;
- 2013 Planning Assumptions;
- Level 1 DSM(Demand Side Management);
- Level 2 DSM;
- Level 3 DSM;
- Level 2 DSM with increased pipeline load; and
- Level 3 DSM with increased pipeline load.

Two criteria are shown as triggers for the ISD; when forecast dependable energy meets forecast load (including existing import and export commitments); and when dependable capacity is equal to forecast winter peak.

The heuristic analysis in the Elenchus DSM report (Exhibit ERA-2) was designed to **illustrate** how the uncertainty associated with DSM could result in a wide divergence of outcomes as measured against the criterion of Capacity Reserve (shown as target and historical average). Capacity Reserve is defined as: the ratio of the excess of capacity over peak to peak, expressed as a percentage. The analysis included only domestic MH load and supply. Given the asymmetry of consequences of DSM forecast overachievement and underachievement (the former may result in underutilized capacity which may be offset by increased exports, the latter may result in chronic outages or expensive imports), the report suggested that it would not be prudent to challenge MH's proposed ISDs in its Business Plan on the basis of DSM programs.

In the current analysis only the Target Capacity Reserve ("CR") is shown. In applying this method to slide 4 of MH's March 10 evidence, the analysis goes beyond what was intended in the Elenchus DSM Report. The report was intended to show how explicit modelling of DSM uncertainty could be done without attempting to present itself as an

analysis that could be used to set appropriate ISDs for planned facilities. In contrast, this analysis does suggest conclusions about the ISD for Keeyask. The analysis period remains 2013/14 to 2028/29 since MH provides no estimates of the contributions of DSM programs beyond that date. (The DSM savings from existing programs are projected to be reduced annually at rates consistent with MH's experience.)

Other than the 2012 Planning Assumptions, the source of all data in this analysis is Exhibit MH 104-3. The 2012 Planning Assumptions are taken from Appendix 4.2 of the NFAT Business Case (Exhibit MH-14). Conceptually the CR and the MH Winter Peak are different expressions of the same concept but Dependable Energy criterion is related to the two capacity criteria by the application of capacity factors to the different capacity supply estimates.[1] For years beyond 2024/25, MH does not project exports.

The figures show the results of including uncertainty in the ISD estimates for domestic load and supply only as in the original report. As before, there are two components to the DSM uncertainty heuristic analysis: an adjustment to the DSM load factor to be the same as the system load factor that results in less capacity than in the MH DSM projections; and, a series of arbitrary reductions in the efficacy of DSM programming. The latter assume that all DSM levels are 95% less effective in delivering capacity reductions than the MH projection with additional annual rates of reduction of efficacy of 1% for Level 1 DSM, 2% for Level 2 DSM and 2.5% for Level 3 DSM.

Figure 1 shows the 2012 planning assumptions. Planned DSM shifts the ISD from 2021/22 to 2023/24 and modelled DSM uncertainty shifts this back to 2022/23.

[1] As described in Exhibit MH-14, Appendix 4.2, MH makes adjustments to both capacity and dependable energy that reflect known contractual or other constraints, such as the exclusion of Brandon's capacity and adverse water (energy). Capacity factor is a measure of actual output as a percentage of maximum output.

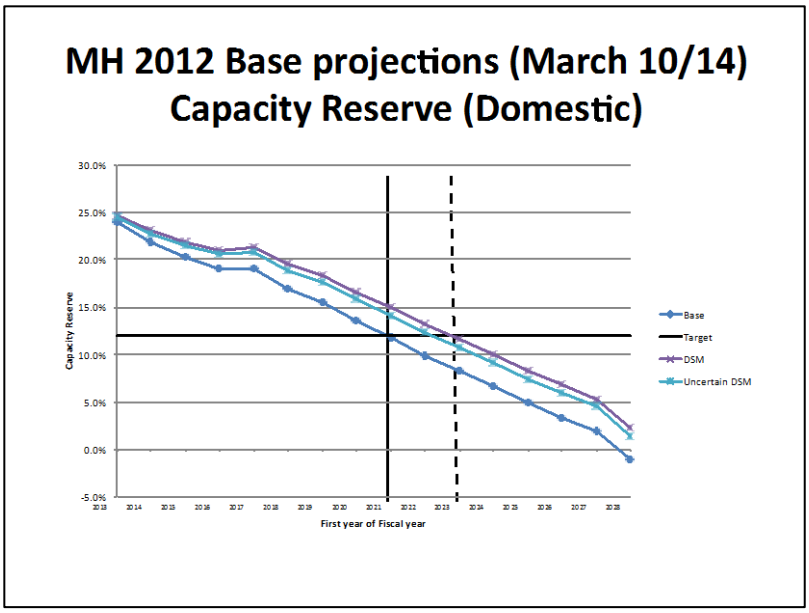

Figure 1

Figure 2 shows the 2013 planning assumptions. Planned DSM shifts the ISD from 2021/22 to 2023/24 and modelled DSM uncertainty shifts this back to 2022/23.

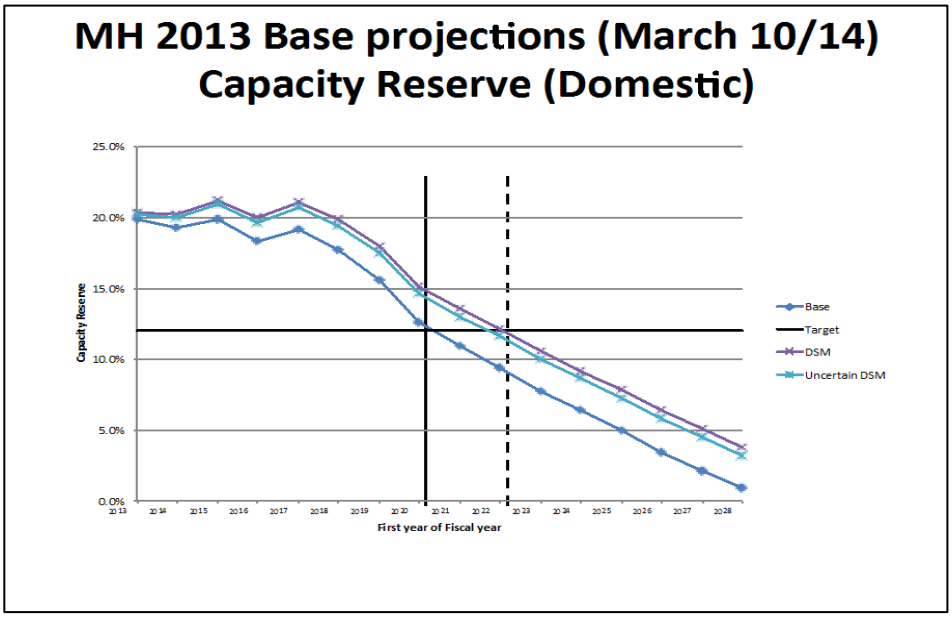

Figure 2

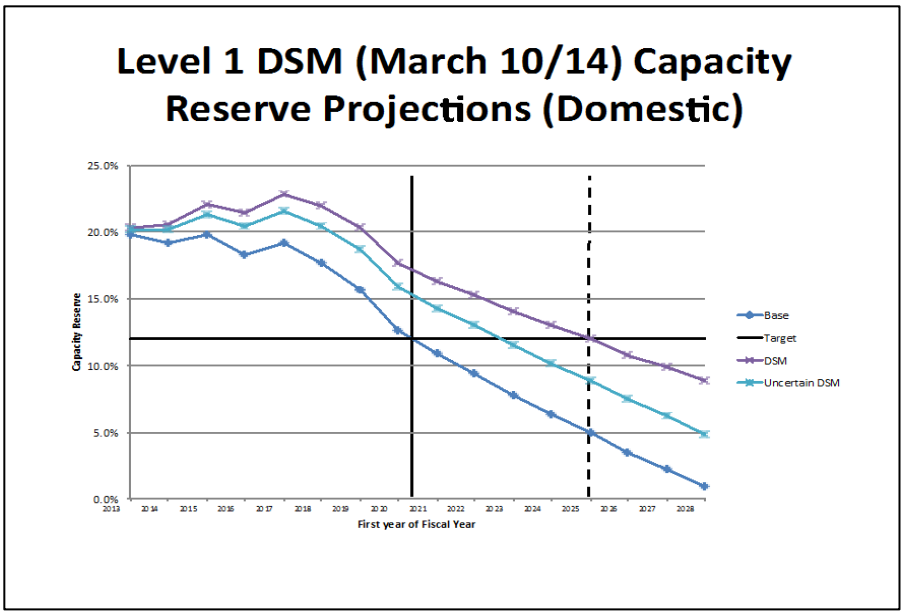

Figure 3

Figure 3 shows the results for Level 1 DSM.

The ISD is shifted to 2025/26 with uncertainty shifting the ISD back to 2023/24. Figures 4 and 5 show the results for DSM Levels 2 and 3.

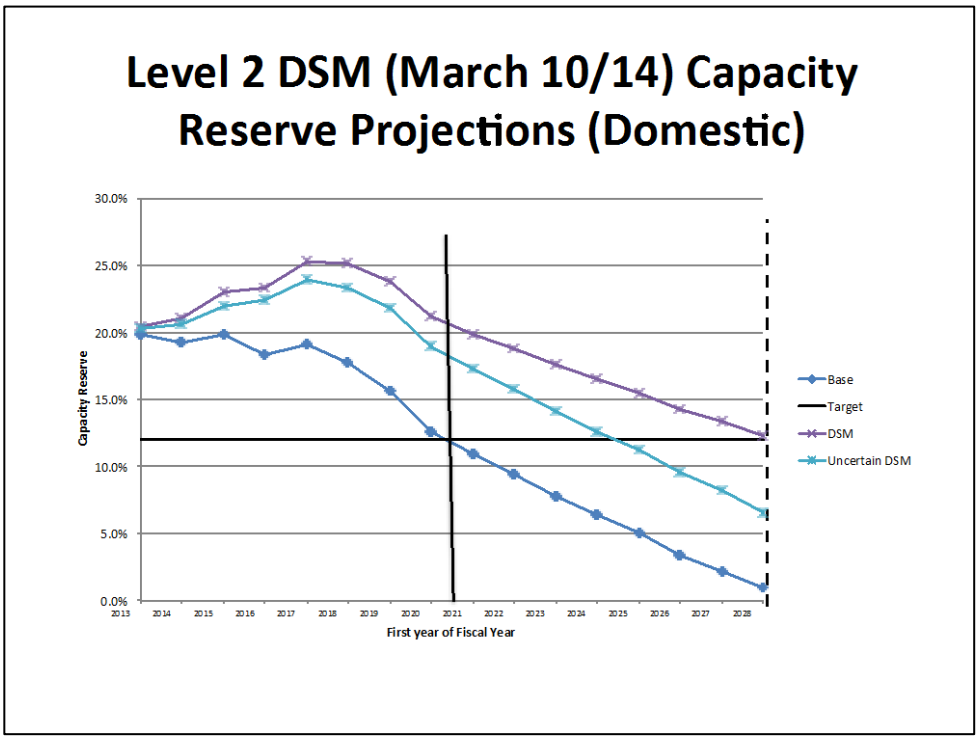

Figure 4

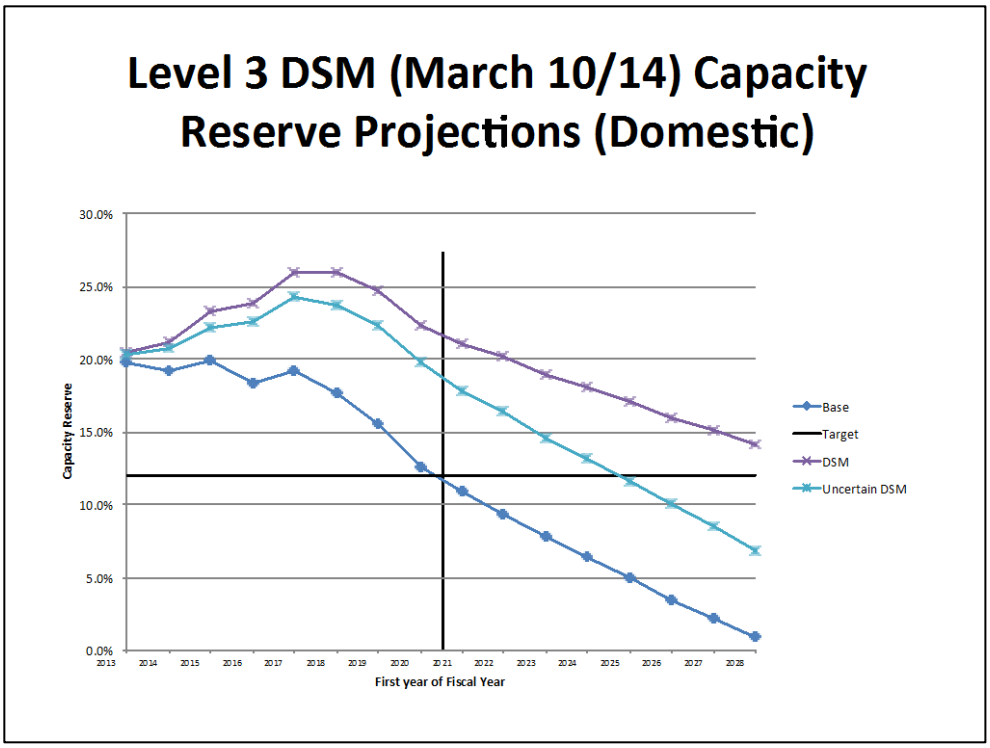

Figure 5

Level 2 DSM shifts the Keeyask ISD to 2028/29 and uncertainty shifts it back to 2025/26. Level 3 DSM shifts the point at which CR equals the 12% target beyond 2028/29; in MH Exhibit 95 the Keeyask ISD is shifted to 2033/34.Figures 6 and 7 show the impacts of higher pipeline load for DSM levels 2 and 3.

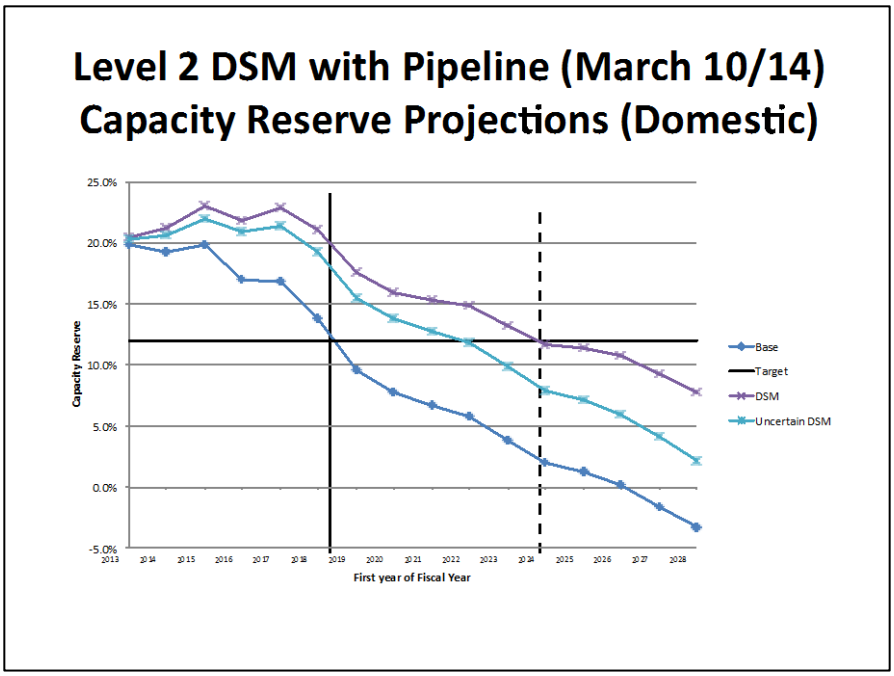

Figure 6

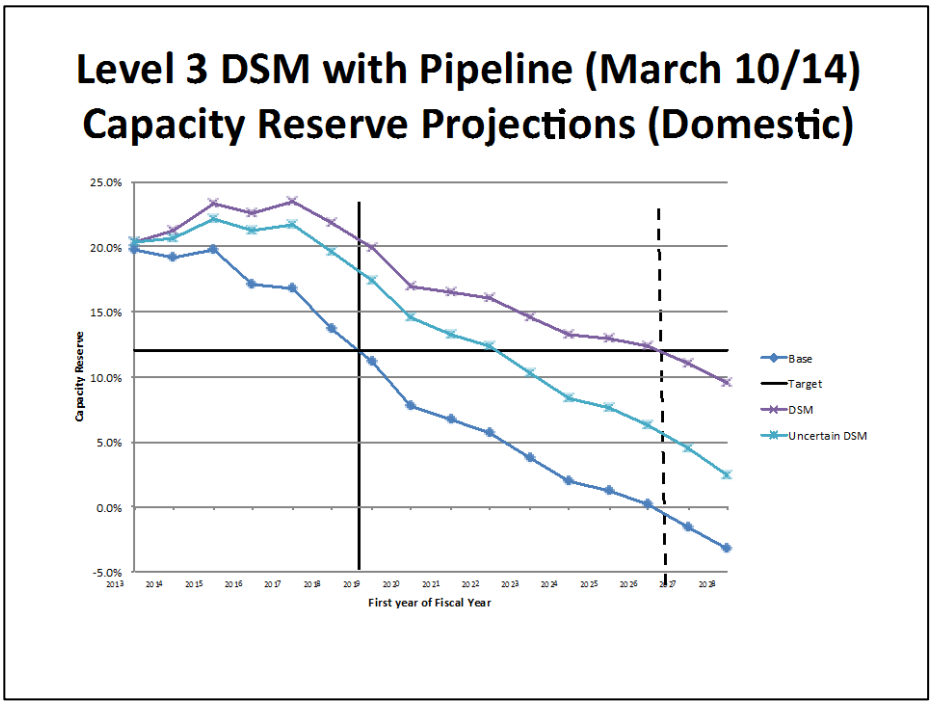

Figure 7

With extra pipeline load, the shifts in Keeyask ISD associated with Levels 2 and 3 DSM are from 2019/20 to 2024/25 and 2028/29, respectively, with the modelled uncertainty shifting the dates back to 2022/23 and 2023/24, respectively.

The table below summarizes the impacts (in integral years) on the Keeyask ISD of differing levels of ISD and of the modelled uncertainties.

Years	2012	2013	Level 1	Level 2	Level 3	Pipeline DSM 2	Pipeline DSM 3
Increased ISD due to DSM	2	2	4	8	10	5	9
Decreased ISD after uncertainty	0	1	2	3	6	2	5

Leaving aside the economic analysis of the deferral of Keeyask, what this analysis suggests is that **as assumed levels of planned DSM increase, the number of years that are potentially at risk of insufficient capacity increases**. In other words, for example, MH may plan for level 2 DSM and on this basis defer Keeyask to 2029 (assuming no further firm exports or imports) but if planned levels of DSM are less than expected, given the particular assumptions of this analysis, as early as 2024 the system would have insufficient reserve capacity. Or, to put it another way, assumed impacts on load of Level 3 DSM might suggest a ten year deferral of Keeyask or more but uncertainty may mean that the expected level of load could occur six years earlier (or four years later than the ISD with no DSM). If work on Keeyask has been suspended the system could be facing reliability problems. These results are not surprising. Like all modelling, this simple heuristic analysis is inevitably subject to the criticism of "garbage in, garbage out", i.e. the results reproduce the underlying assumptions.

To go beyond "what if" analysis to develop estimates that are useful to system planners, Elenchus reiterates its suggestions from its DSM report with an emphasis on improving empirical understanding of how much DSM savings are of equivalent dependability to generation. Retrospective long term statistical comparisons of the loads of consumers who participated in DSM programs with those who did not would provide a more concrete basis for estimating the dependable DSM at different points in the future.[2] In the DSM report the focus is on how the Conawapa ISD could be affected by such studies. In the light of new evidence tabled by MH, it appears that MH is contemplating the deferral of Keeyask. This may provide enough time to supplement MH's current

[2] These would be for residential and commercial consumers; there are two few large industrial consumers for a meaningful statistical analysis.

approach before committing to significant investments in Conawapa with the type of studies recommended by Elenchus.