## GSS-GSM/Coalition - 1

**Reference:**

MPA Report Page 53 lines 23-31

**Preamble to IR (If Any):**

At page 53, MPA writes:

> Explicit endorsement by the PUB of policies around reserves, cash flows, and rate increases will help all market participants understand what to expect. The lack of clarity about whether Manitoba Hydro is "self-supporting" could be at least partly addressed by a statement from the PUB about how it might consider approaching a hypothetical financial distress situation in the future. For example, adoption of a "debt service coverage" ratemaking formula in the style of the Tennessee Valley Authority would signal that rates will be adjusted above all to ensure sufficiency of cash flows **(perhaps over some medium-term timeframe, such as a rolling five-year forward period, to aid in the smoothing of rates).** Alternatively, **use of some fixed or inflation-adjusted level of annual contribution to reserves, built into rates on an ongoing basis**, would provide a means for observers to estimate the cash flows and financial resources of Manitoba Hydro under different circumstances. [Emphasis Added]

**Question:**

a) Please elaborate on the concept of a "debt service coverage" ratemaking formula including the rolling five-year forward period for cash flow? From a regulatory principles perspective, please discuss the strengths and weaknesses of that approach.

b) Please elaborate on the concept of a fixed or inflation-adjusted level of annual contribution to reserves, built into rates? From a regulatory principles perspective, please discuss the strengths and weaknesses of that approach including its consistency with the cost of service model of Manitoba Hydro.

**RESPONSE:**

*Please note that on the broad issues of minimum financial targets and rate-setting mechanisms, it may be useful to read MPA responses to six IRs in tandem. These are PUB/Coalition 29, 30, 31, and 32, and GSS-GSM/1 and 2.*

Please note that this IR invites consideration of possible new and alternative ways of managing certain issues related to Manitoba Hydro rates. While MPA is pleased to offer suggestions and ideas, it should be recognized that these are necessarily tentative and reflective of the limited time and resources available during a general rate-setting process. Adequately reviewing all possible pros and cons of new options and rules is well beyond the limitations of an IR response. It would be very much appreciated if the following response was understood in this light.

a) Debt service coverage ratemaking and rolling-forward targets

Using a rate-setting mechanism based on targeted minimum debt-service coverage on a rolling-forward basis attempts to balance the various regulatory principles to help to arrive at just and reasonable rates. Other methodologies strike a different balance. Nevertheless, for a utility like Manitoba Hydro which faces substantial hydrological risk, this approach might be worth further consideration.

The basic question this methodology seeks to answer is “What is the minimum combination of reserve levels and rate path that is consistent with minimally required financial health in the face of known risks?”

If coverage of debt-service costs were considered a minimum condition of ratemaking, then rates could be set to ensure that adjusted net cash flows from operations are at least break-even over time, under all reasonably foreseeable conditions. This means that the calculation “Cash Revenues less Cash Expenses including debt service (and for Manitoba Hydro also

including payments to Winnipeg and for Mitigation)" cannot result in a negative figure. Since rates are not set every year, rates would have to be set at a level which is expected to achieve this condition on an average basis over a period of years at least equal to the rate period or perhaps longer (possibly 5 years, or 7 years, or some other period chosen).

Making a calculation as described above requires a forecast about what revenues and costs are expected to be for the period of time in question. Some of those items are relatively certain (such as wages and building maintenance costs), some may be relatively predictable because of some fixed and variable components (such as total interest costs of outstanding debt, which are partly fixed because of long term bonds outstanding, but partly variable because of new debt issues priced currently), while others, such as export revenues and fuel costs, are highly uncertain and can swing wildly every year. For the period in question, the total possible range for net cash flows over the whole period could be calculated at various rate paths, in order to calculate which rate path results in at least 0 net cash flows over the whole period. Note that this rate path would achieve the 0 net cash flow under the worst expected conditions for the period of time. If conditions were better than the worst, then a better than 0 net cash flow would result.

Assuming the calculated minimum rate path is selected for the period, the total range of annual net cash flows for every year within the period should then be calculated, because individual years within the period will always be better or worse than the average for the whole period. In an individual year, if net cash flows for the year are less than 0 in the worst possible conditions, then it would be assumed that financial obligations would have to be paid for from reserves. The maximum cumulative payments from reserves at any given instant in time during the period would represent the level of reserves that would be required to be on hand before the beginning of the period in question.

[An example may help to clarify the preceding paragraph. Assume that a rate path was calculated for a five-year period, where the rate path results in net cash flows of 0 over the worst possible five-year average conditions. However, the worst five-year average conditions

might include individual years resulting in cash flows of -10, -10, 0, 10, 10. In that case, the minimum reserves required to be on hand at the beginning of the period would be 20. On the other hand, the five-year cash flows might be 0, -20, -10, 15, 15, in which case the minimum reserves required would actually be 30.]

At the end of the period in question, circumstances will have resulted in some level of net cash flow, either 0 in the worst case, or some higher number in all other cases. Since in most cases (99% of them, by definition, since the worst case is the bottom 1%), net cash flow will be higher than zero, so some of that net cash flow may be used to retire outstanding debt, and the remainder can be kept as a reserve for use during the next period of time.

Starting from this basic theory, many adjustments can be made:

- By targeting 0 net cash flows at the worst case (P1) scenario, it means that required reserve levels are minimized, but it also means that rates will need to be relatively high (because rates have to be high enough to compensate for the worst case full period scenario, and the worst case average for five years will be relatively close to the worst case performance for one year, for example). Instead, if 0 net cash flows are targeted for the “almost” worst case (e.g., P5 or P10 instead of P1), then the variation between the period average and the worst possible year will be bigger, but average rates will be lower. [Bonneville Power Administration targets the P5 case in their analysis, as an example.] Note however, that this tradeoff must take into account the cost of holding the reserves, because those reserves came from ratepayers themselves (in a previous period). In order to address this problem, the cost of building the reserve account must be included in the analysis at a cost of capital associated with ratepayers. That will allow the calculation of a true least cost “Reserve Account plus Rate Path” (for example, if the cost of capital for ratepayers is 5%, then an annual “Cost of the Reserve” should be added to notional rates for every year at 5% * Starting Reserve; if

the Reserve is larger there will be a higher annual cost of reserve, but at the same time there will be lower rates, so an optimal combination of the two can be found).

- The period can be made longer or shorter: the shorter the period in question, the smaller the reserves that will be required (because annual worst years will be closer to period average if the period is short), but the more likely it will be that rates will change by larger amounts each time they are set.

- At the end of the period, in the worst case, it could be that reserves may be very low, which means there will be very little reserves available for the next period. As a result, it may be necessary to make reserves larger to begin with, or adjust rates to ensure that reserves will be replenished over time.

- It can be assumed that “inter-period” adjustments will be made for certain variables, but not others: for example, every two years there could be an adjustment for changes in long-term interest costs or new wage agreements, effectively removing these variables from management by reserve. This would have the effect of reducing the size of reserve requirements. Setting a longer period for reserves analysis (e.g., 7 years instead of 5 years), but allowing for adjustments to certain variables every two years would result in some changes to rates over time, while at the same time focusing the size of necessary reserves on a more limited set of variables.

- Analysis of the P50 case for any combined Reserve + Rate Path scenario will show how the resulting net cash flow would compare to the amount of depreciation which would be charged over the period (since the traditional revenue requirement formula includes depreciation, but depreciation is not captured in cash flow measures), or alternatively how the net cash flow compares to desired capital expenditures and debt repayment (if cash needs are the primary focus). Depending on this analysis, the Reserve + Rate Path scenario could be adjusted.

If rates are set every two years, but the objective is to manage Reserve + Rate Path over a longer period, such as 5 years or longer, then changes in rates will be more modest than if all variables were reset only at the beginning and end of every period. This results in “rolling forward” calculations, and reduces fluctuations between rate periods.

From the perspective of regulatory principles, this kind of ratemaking analysis has some attractive attributes:

- *Capital Markets Access*: there will be no doubt that the utility will be managed to ensure that it meets the test of being “self-supporting”. This is the fundamental condition of the model. Moreover, use of such a model will transparently communicate to the capital markets that meeting financial tests is a priority in rate-setting.

- *Efficiency*: the level of Reserves and the Rate Path are kept to the minimum level necessary to meet the required conditions, so ratepayers can be confident that their capital is being used as efficiently as possible.

- *Cost Causality*: the model is not perfect, in that from period to period, or from rate-setting to rate-setting, rates will change depending on prevailing conditions. As a result, different cohorts of ratepayers over time will face different inflation or discount-rate adjusted costs for power. For example, high water levels or export prices will mean that excess cash flow will be available to pay down debt, thus reducing interest costs for the future, giving an advantage to future ratepayers. However, in this construct the contributions of all ratepayers, both in terms of rates as well as reserves, are taken into account at a cost of capital associated with them.

- *Stability and Predictability*: by adjusting rates every two years, but based on a longer rolling-forward period, changes at any given point in time should be muted, despite prevailing or recent conditions. Even though, for example, water levels may have been extremely challenging for one or two years, rate changes would be based on

expectations for a forward-average period of time, and would not just react to recent conditions. Again, this method of rate-setting would not be perfectly stable or predictable. This is a trade-off that must be considered.

- *Prudence*: the process of forward planning and estimating a range of possible outcomes demonstrates detailed planning and risk management.

As noted at the outset, the rate-setting mechanism discussed results in a compromise solution among regulatory principles. The objective is a fair balance, but one that specifically takes into account important minimum conditions. Other potential solutions certainly exist, but any solution should similarly satisfy a balance of the principles.

Finally, it should be understood that employing some mechanism for rate-setting that focus on a specific rolling-forward period of time (such as 5 years or 7 years) does not in any way preclude a constant focus on longer term outcomes. For example, resource adequacy and resource allocation decisions require a much longer period of focus (at least 20 years or more), and so any decisions made about rate-setting should always be understood within that broader context.

b) Equal Contributions to Reserves

An alternative possible mechanism to manage reserves and cash flows over time is to require a fixed annual contribution to reserves. The reserve account would then go up and down, as circumstances require, but the contribution level would not change. This mechanism would be more consistent with the traditional revenue requirement model (resulting in Requirement = expected Opex + Depreciation + Interest Costs + Taxes + Contribution to Reserves).

The challenge with this approach is to calculate what the contribution to Reserves should be over an extended period of time, such that regardless of outcomes, those contributions will not need to change. As with debt-service coverage rate-making, it will be necessary to

understand the full range of risks that would be managed through reserves over time. For example, fluctuations in taxes and wages would be included directly in the revenue requirement, and should therefore only affect reserves in interim rate years. However, water flows might be explicitly managed through reserves. If, for example, contributions to reserves were to be set for a 10-year period, then the total range of possible outcomes from 10 years of water flow, and the impact on reserves of that range, would need to be calculated. An inflation-adjusted contribution to reserves would be calculated which ensures that reserves would never be depleted, and despite annual performance of the utility, the reserve contribution would not be changed during periodic rate reviews.

This mechanism would be easiest to calculate and manage on the basis of a single variable (e.g., water flows, or export prices). However, while even-annual contributions (perhaps adjusted for inflation) to reserves would provide some stability and predictability to rates, there could potentially be a significant adjustment at the start of every new period.

As with the analysis presented above for rolling-forward debt service coverage rates, an analysis would be required into the trade-off between the length of the period between resets of the reserve contribution, and the size and cost of the reserves that would be carried as a result. The analysis of the cost of the reserve could be completed on the basis of the expected size of the reserve that results from the P50 scenario of the variable or variables being managed. This would assist in the choice of an optimum period for the fixed reserve contributions.

From the perspective of regulatory principles, this rate strategy represents compromises between principles, in a similar way to a rolling-forward mechanism:

- *Access to Capital*: Assuming the calculation of reserve contributions was carefully aligned with the risks it is intended to mitigate, and explicitly to ensure that financial resources will be adequate to meet obligations over the whole period, then the

mechanism will provide reassurance to the capital markets about the self-supporting nature of the utility.

- *Predictability and Stability*: During the period of fixed reserve contributions, rates will not be affected by variations in the targeted variables (though rates would continue to respond to non-targeted variables, like wages or interest costs), providing some stability. However, at the end of a period, there could be a more or less significant reset to the size of contribution to the reserves.

- *Efficiency*: The minimum size of reserves and reserve contributions are targeted carefully to financial needs, therefore supporting efficient use of capital resources. However, given that the period between resets of the reserve contribution will be longer, more contributions that strictly required in the short term might be built up in the event that the targeted variables tend to the upside rather than downside.

- *Cost Causality*: Ratepayers within any given period between reserve contribution resets will be treated equally with respect to management of the targeted variables. However, from one period to the next, there could be significant adjustments. As with all models, perfect allocation of burden across ratepayers is not possible, but variations can be minimized.

Each of the two mechanisms described in this IR represents a slightly different balancing of regulatory principles to try and achieve fair rates over time. In both cases, the emphasis is on sufficiency of financial resources to manage obligations, minimization of reserves to levels that are absolutely necessary to manage identified risks, and careful choices about planning periods, the cost of capital faced by ratepayers, and efficient use of resources.

**GSS-GSM/Coalition - 2**

**Reference:**

MPA report Page 50, Lines 4-17

**Preamble to IR (If Any):**

At Page 50, MPA writes:

There are a variety of practical problems associated with calculating a “contribution to reserve” that would be relatively stable and appropriate for all ratepayers over time. However, a primary issue concerns what types of events should be included in the list of occurrences that should be covered by the notional reserve. Certainly, droughts would qualify, as would significant operational challenges like major storm damage. **However, two of the chief risks identified by Manitoba Hydro are interest rates and export prices. Arguably, these are not risks that should be subject to notional insurance or reserves**. In normal ratemaking, regulators do not typically attempt to smooth the cost of interest over time. Instead, ratepayers are required to pay the interest cost at whatever level is extant at the time of ratemaking. Manitoba Hydro is consistent with this practice, since only the actual costs of debt are passed on to ratepayers, and Manitoba Hydro does not attempt to hedge or smooth its interest costs against some notional long-term estimate of what interest rates "should be”. [Emphasis Added].

**Question:**

a) Please explain why interest rates and export prices are not risks that should be subject to notional insurance or reserves?

b) To the extent that these significant risks are not subject to notional insurance or reserves what other tools might be employed to protect ratepayers?

**RESPONSE:**

*Please note that on the broad issues of minimum financial targets and rate-setting mechanisms, it may be useful to read MPA responses to six IRs in tandem. These are PUB/Coalition 29, 30, 31, and 32, and GSS-GSM/1 and 2.*

a) Using reserves or some other form of an insurance scheme is a good way to manage risks associated with variables which have an expected mean level, but which can deviate from that mean level in unpredictable ways. To put it differently, if a business is subject to sharp shocks of relatively short duration, then in "normal" times reserves can be built up, while during the "shocks" reserves can be called upon to help satisfy financial obligations. The definition of "short duration", "sharp shocks" and "normal times" are specific to every business. However, it is important that the definitions are not so elastic as to include changes or trends in general business conditions that persist for long periods of time.

From the perspective of a regulated utility like Manitoba Hydro, interest costs do not appear to have the characteristics that make them appropriate for management through the use of reserves. Interest costs change relatively slowly over time, and persist for long periods of time. Manitoba Hydro has a sophisticated treasury department which effectively manages its debt portfolio to minimize risks. Only a relatively small portion of its debt portfolio comes due in any year, and therefore only a relatively small portion of its debt portfolio is priced at currently prevailing rates. Changes in interest rates therefore only have a gradual effect on the weighted average cost of interest on its outstanding debt. If interest rates move up or down over a sustained period of time, then the company's total cost of interest will follow that trend.

Interest rates are not a short-term volatility problem for which reserves are appropriate, but rather a more long-term pressure on financial conditions: if interest rates rise or fall for a sustained period of time, then the overall landscape for the utility will change, and its revenue requirement should change with it.

Interest rates are also closely related to general inflation. Historically, periods of high interest rates have often coincided with high inflation, and the reverse is also true. The past ten years of generally low interest rates has coincided with low levels of inflation. Inflation, like interest rates, affects not only regulated utility rates, but the economy as a whole. All businesses, and general price levels, are subject to the effects of interest rates and inflation. Why should a reserve scheme be created to resist the effects of changes in interest rates and inflation that affect the economy generally, especially when those effects are not sudden or particularly sharp?

Export prices share some of the characteristics of interest rates and inflation, but not others. Manitoba Hydro sells its excess power into the very large MISO market, that is subject to price pressures well outside Manitoba Hydro's control. In effect, Manitoba Hydro is a "price taker" when it sells into the export market.

MISO prices are volatile in the short-term, based on the usual list of factors: weather, fuel availability, outages at major facilities, etc. However, MISO prices can also be affected over the longer term by changes in structural factors such as technology change (e.g., the fundamental change in natural gas prices caused by the development of hydraulic fracturing and horizontal drilling technology; or the very significant decline in the price of solar photovoltaic panels), environmental policy (e.g., pollution controls and carbon prices), or shifts in demand (e.g., the widespread use of LED lighting which is measurably reducing consumption levels; the wholesale demand destruction that occurred in the "rust belt" when many industries left the mid-western United States). While it may make sense to have some level of reserves to manage the

short-term fluctuations in export prices, resisting the effects of long-term changes in export price levels is likely beyond the scope of any reasonable level of reserves.[1]

b) Manitoba Hydro already operates a sophisticated treasury function which seeks to minimize the risk of significant fluctuation of interest costs over time, and to manage those costs as efficiently as possible. It is not clear that any additional steps are required with respect to interest costs.

For export prices, which are subject to some short-term variability, but which are also subject to long-term trends, it may be appropriate to have some level of reserves to offset the short-term changes. However, as part of general rate cases, it is likely advisable to simply consider the longer-term trends affecting export prices, and "reset the baseline" for those prices periodically. Unfortunately, it is unlikely that much can be done by Manitoba Hydro to offset long-term trends in export prices, given its status as a "price taker".

[1] It may be understandable that there is some confusion over this issue of risks which are appropriate for smoothing through reserves given the inclusion of a variety of risks in the NFAT analysis. The NFAT process was focused on making choices among competing alternatives for infrastructure development. In order to make a choice between those alternatives, it was appropriate to consider the impact of variables such as interest rates, inflation, long-term export prices and so on. In fact, understanding the conditions under which one plan would have better outcomes than another plan was a key part of the NFAT analysis. However, analysis which was appropriate for that type of choice is different from the question of whether it is appropriate to try and smooth the impact of these kinds of variables in the context of general rates.