

## Manitoba Hydro Sustaining Capital Expenditure - Supporting Written Arguments

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### I. Asset Management and Sustaining Capital Expenditures

Asset management is the process where a utility considers performance, risk and budget in order to produce three interrelated plans: a capital plan, an operations plan and a maintenance plan. Sustaining Capital Expenditures are just one part of the capital expenditures that the Manitoba Hydro (“MH” or “Company”) will make in the overall context of its total planned capital spending, and should be considered alongside the related operations plan and maintenance plan in order to determine whether the Company is pursuing least costs solutions to the provision of safe, reliable and reasonably price utility services. A concrete and detailed description of this multi-part process in the initial GRA filing will provide a solid regulatory foundation to review the resulting costs the Company wishes to place into rates.

An optimal asset management plan should balance risk, performance and budget in developing the three plans that will result this activity. MH generally provided information in discovery related to each of the three asset management inputs individually, but limited information on how the balance of these three areas occurs.

- a. Risk: MH apparently utilizes a set of risk criteria to prioritize its capital investments.<sup>1</sup> According to the Company, these factors consist financial, employee and public safety, system reliability, capacity or transfer capability and environment and are weighted considering operational and business requirements.<sup>2</sup> The Company, however, did not describe how these operational and business requirements are applied to each asset class in the Sustaining Capital Expenditure so their reasonableness could be assessed. Furthermore, the concept of systemic risk – how the proposed changes of an asset plan affects the system risk as a whole – was not analyzed in any detail by the Company so it was not possible to evaluate how individual types of Sustaining Capital Expenditures would impact system wide risk.
- b. Budget: The Company’s executive committee members and controllers division assess different levels of sustaining capital expenditures both in terms of their magnitude and financial risk.<sup>3</sup> To a certain extent, budget “constraints” on a regulated utility are somewhat subjective, since the budget target may change based on what a utility may be able to convince a commission to approve.
- c. Performance: MH does not include common system performance metrics, such as SAIFI and SAIDI, as targets for its performance criteria part of the asset management project selection process.<sup>4</sup> While simply replacing assets under Sustaining Capital Expenditure plan may very well have some improvement to system performance in their slipstream, such indirect improvements are very likely to be an inefficient method of meeting

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1 COALITION /MH-I-11a, p. 2.

2 COALITION /MH- II-49a-d, p. 2 of 5.

3 Undertaking no. 26 page 1373 on May 29<sup>th</sup>.

4 COALITION/MH-I-87c (“Manitoba Hydro does not directly factor SAIDI and SAIFI reliability performance into its capital project selection process. . .”)

system performance targets.

All three inputs to the asset management process are addressed individually but there is no indication on how they are co-optimized in MH's asset management process. There is no department that collects the three inputs and aims to optimize their output.

## **II. Trade-off Between Three Outputs of the Asset Management Process**

The result of an asset process includes three outputs: capital plan, operational plan and maintenance plan, as noted above. These three plans are not static

- a. Capital plan: The Company has approved capital targets, which do not appear to be the product of the output of the asset management process, allocated to the major asset categories, including Sustaining Capital Expenditures.<sup>5</sup>
- a. Maintenance plan: MH did not provide any detailed analysis in the GRA connecting the proposed Sustaining Capital Expenditure with maintenance plan or any type of work other than replacement. Maintenance activities, like vegetation management, for example, can have a significant impact on how the system operates in addition to the capital solution of replacing failed or failing equipment.
- b. Operational Plan: The asset management's operational plan output is extremely important in how a company manages its assets so that it can realize the optimal amount of benefits from their operation. If for example, a generator is over utilized due a specific system configuration, the output of the asset management plan will provide a operations plan for the company which will reconfigure the system to mitigate this overutilization and extend the generator's effective life. MH did not provide any indication on whether any operational plan is resulted by the asset management plan. In addition, Kinectrics identified other actions for reaching the asset management plan optimal cost-benefit balance such as refurbishment and modified parts strategy.<sup>6</sup> MH did not provide any indication that the company is reviewing or implementing these alternatives.

## **III. Asset Health Index**

A properly constructed Asset Health Index ("AHI") can be an input into the asset management process by providing performance data, or if criticality factors are added, then the AHI can help in the project prioritization process. MH did included probability of failure to the AHI when a statistical failure model was available.<sup>7</sup> However, a subset of MH's asset classes used only age as a primary factor in the calculation of the AHI. As an example, for the overhead conductors' asset class, MH utilized age as the primary condition input in contrast to what its outside expert had used.<sup>8</sup> MH provided the weightings for most all the asset classes included in the Sustaining Capital Expenditures, but it did not provide any quantitative analysis to support how these weightings were established and

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5 COALITION/MH-I-11a.

6 COALITION /MH II-53c-g, p. 17 of 172 Attachment 1.

7Transcript, p. 1253.

8Transcript, p. 1254.

how they evolve through time. For example, what happens when a new technology enhancement comes in for a specific asset class that results in reducing the effect of one of the factors to its AHI? MH did not provide any information on whether these AHI weightings components are reviewed on a specific timeframe to account for these types of changes or other factors that may change and outlook on a weighting. Lastly, the criticality of a specific component of an asset class can change through time. As an example the criticality of a transformer feeding a specific load pocket is reduced when an additional transformer is added to feed the same area. The lower criticality (or consequence of failure) may reduce the need for the original transformer's replacement. MH did not provide any information on how the criticality of assets within an asset class are affected by changes in the neighboring system.

#### *A. Distribution AHI Using Single Variable Index*

In the distribution asset area of the Sustaining Capital Expenditures, the Company used "age" as the single variable for determining the AHI score, an approach which has significant shortcomings since age alone will not determine asset health. Steel structures and overhead conductors have AHI based on age only in contrary to what Kinectrics proposed.<sup>9</sup> Another Canadian Utility takes a different approach than MH to using factors other than age for the AHI on wooden distribution poles.<sup>10</sup>

For MH wood poles and spar arms were assumed to have the same criticality and an AHI based on age alone<sup>11</sup>, while Power Stream's asset management document shows that the pole replacement process includes criticality factoring the presence of transformers, number of primary conductors, criticality of pole, and presence of switches. Age was not the sole factor considered, but MH used age as a sole AHI factor for wooden poles, and a significant number of its distribution class assets. MH attempted justification that the single variable of age rolls up a host of other performance factors<sup>12</sup> is simply another way of saying age alone is an appropriate predominate factor and sole for an AHI, a position that is essentially unsupported on the record. The Board should reject MH use of those AHI and defer consideration of approving increases in Sustaining Capital Expenditures for assets with age as a single AHI factor.

#### **IV. Implementation Review**

The Company retained an external engineering firm, Kinectrics, to assist the Company review certain of its Sustaining Capital Expenditures with a report produce in 2012<sup>13</sup>, but apparently did not have the firm reassess the Company's implementation of its recommendations. As to Kinectrics providing an updated version of the assessment, MH stated that it retained the consultant in March to provide an audit similar to what occurred in Toronto Hydro's case for capital expenditures. Even though there is no set time for when to conduct such an audit, it is advisable to engage the consultant shortly after the initial assessment for at least two reasons: i) to provide additional guidance on the implementation of the Kinectrics recommendations, and ii) to provide a cost-benefit analysis on the existing implementation as adopted by MH and offer alternative solutions, if justified. The original Kinectrics report was dated 2012, so the assessment of the Company's response to the report is timely. The Board should direct that reassessment be performed within 6 months and filed in this matter.

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9 Transcript, p. 1254.

10 Page 6 of 38 5.3.3 of Power stream excerpt.

11 COALITION/MH-II-53b, p. 2 of 2

12 COALITION/MH-II-52a-f.

13 COALITION/MH II-53c-g.

## **V. Capital Scenario Analysis**

It is not clear from the record whether MH is assessing different levels of capital spending scenarios based on established criteria that include operational risk and rate impacts.<sup>14</sup> The Company mentioned that it executes different scenarios in preparation of the IFF<sup>15</sup>, against a set of criteria/objectives such as reliability, safety and consumer impacts but it did not provide any workpaper documentation to confirm this alternative capital spending scenario analysis. The Company has not provided any additional information in response to Undertaking No. 26, so the Board should draw an adverse inference that this part of the asset management process is not being performed by the Company or it is not being done in a way that creates a reviewable paper trail. Given the size of the increase in Sustaining Capital Expenditures in this GRA, the Company should be in a position to fully support its decisions, including providing the alternative capital spends considered and the trade-offs between operational, rate and other impacts each entailed.

## **VI. Recommended Filing Requirements**

In order to facilitate the review of future capital spending, the Board should impose a standard set of filing requirements on the Company for future GRAs in order to ensure that the Company's asset management process is transparent and readily understandable. These requirements should include, but not be limited to, the following:

- a. Asset Management Inputs: Company should specifically list, quantify and fully explain how each risk, performance and budget target used in its asset management process was developed and employed. While the current GRA to a certain extent, and some discovery responses, provide glimpses and high-level discussion of some of these inputs, what is lacking is a cohesive narrative in the GRA with sufficient detail to specify how the trade-offs between each input variable was worked out by the Company and why. The Company filing should also include the alternative spending scenarios considered in the process and all supporting workpapers.
- b. Asset Management Flow Chart and Timeline: The Company should provide a flow chart which depicts each department and working group within MH that contributes to the asset management process, and a timeline depicting when information from those departments and groups are considered in the resulting operations, capital and maintenance plans.
- c. Asset Health Index: The Company should file the complete AHI for each asset class, the variables used in each index, the weights assigned to each index variable and a discussion with supporting analysis explaining any change in variables or weightings used in the last GRA.
- d. Asset Management Outputs: The Company should file copies of the actual capital, operations and maintenance plans that resulted from the asset management process on a standardize basis from year to year. For the proposed spending in each asset class, including Sustaining Capital Expenditures, the Company should identify and

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14 Transcript, p. 1365.

15 Transcript, p. 1367.

discuss related operational considerations and the maintenance plan (including maintenance costs), associated with the asset class with sufficient detail to justify the expenditure as contributing to a least cost and reliable solution for customers.

- e. Models: Each model used by the Company in the asset management process should be identified by name and its use in the process described in detail, including how the model considers the AHI. To the extent that the models represent proprietary information of third parties, the access to the models and information about parameters used in the modeling should be provided on a confidential basis, including through workshops or vendor presentations.
- f. Engineering Reports: The Company should file any internal or third party engineering reports, capital asset failure root cause analyses and asset management assessments performed since the last GRA.

These filing requirements should greatly increase the efficiency of future GRA proceedings by enabling the Board and interveners a better line of sight into the heart of the asset management process, and consequently may reduce the amount of discovery and resulting regulatory burden on the Company. For the most part, the filing requirements simply document the asset management process the Company should have already undertaken, or seeks reports or other information the Company already has on the shelf.