

Appendix C
MANITOBA HYDRO'S ASSET MANAGEMENT
INADEQUATE LEVEL OF DETAIL

A. Overview

- At the close of the first round information responses, the level of detail provided by MH regarding the development of its asset management plan and associated capital expenditure budget was not sufficient to enable our experts to develop a robust understanding of critical aspects of the Hydro asset management process, its application or the merits of its spending decisions.
- At a stage when they would normally be undertaking the critical draft of their evidence, the disclosure available to Coalition experts was below what they would expect from a robust, initial application. They were without meaningful responses to first round discovery requests or an opportunity to explore modelling during a workshop.
- An imperfect but more robust series of second round information responses¹ left Coalition witnesses somewhat better informed but at a much later stage in the procedural schedule. For example, the response to Coalition II-53 d), the Manitoba Hydro 2012 Asset Condition Assessment by Kinectrics, Inc., would be one that Coalition experts would expect to be filed as part of the originating application given its relevance to transmission projects under the sustaining capital expenditures.
- Inadequacies present at the end of the first round information responses are identified under four different categories. Additional information relating to the second round of information requests is found at the end of this document.

1. DETERMINATION OF OVERALL BUDGET

- The initial application addressed the capital process in roughly 1 ½ pages (Tab 4, pages 2-3) and, in doing so, primarily addressed the process for approval of individual capital projects.
- The process description noted that the need for each project is set out in the project's capital project justification (CPJ) which assesses the project based on system reliability, safety, efficiency, customer service, environmental impacts and corporate profitability. The description also noted that consideration was given to the priority of proposed projects such that overall funding levels remain within the MHEB approved CEF limits.
- However, there was no information provided in the Application as to how the "approved capital spending limits" were determined in the first place and how MH balanced the borrowing and rate implications of its proposed spending with the system needs, as established through the individual project CPJs, when determining what capital projects will be undertaken.

¹See Coalition II-53 d) and II 52 a – f.

- More details were requested during the IR process,² but little additional “real” detail on how the budgeting process was actually provided.
- For contrast, we have provided a link to a small excerpt from the OEB filing of Power Stream with regard to its consolidated system plan (section 5.3.3). While by no means the gold standard, the section highlights the quality of discussion which might be expected in a modern regulatory filing:

[http://www.powerstream.ca/ContentMgr/attachments/G-2-1_ConsolidatedDistributionSystemPlan\(Chapter5FilingRequirements\).pdf](http://www.powerstream.ca/ContentMgr/attachments/G-2-1_ConsolidatedDistributionSystemPlan(Chapter5FilingRequirements).pdf)

2. BASIS FOR PRIORITIZATION BETWEEN LINES OF BUSINESS

- The description of the capital planning process speaks to the approval process for specific projects based on the dollar size of the project and notes that projects below \$50 M are approved at the Business Unit Level while those above go the Executive Committee.
- However, there is no description in the Application of the process or methodology used for determining how the total capital budget for the corporation is apportioned/prioritized across Business Units.
- More details were requested during the IR process,³ but little additional “real” detail on how the assignment between Business Units is done was actually provided.

3. ASSET CONDITION ASSESSMENT – DETERMINATION OF HEALTH INDEXES

- According to Appendix 4.2,⁴ the Asset Condition Assessment methodology develops an Asset Health Index for each class/type of equipment based on various inputs including age, lab tests, maintenance and operating experience, engineering assessments, etc.
- The next 59 pages⁵ simply provide for each asset type the page profile and the relative population for each asset categorized by Very Good/Good/Fair/Poor/Very Poor condition.
- While the Appendices set the factors/considerations that went into assessing the “health” of each asset type, there is no explanation in the Application as to how this data was combined to create a health index value for each member of the asset group or how it was determined what “score” values would result would lead to one of the five ratings.
- In response to IRs, links were provided to documentation for how the health indexes and ratings were determined for certain generation assets⁶ but similar documentation was not provided for the vast majority of the asset types evaluated.

2 COALITION I-11 a) & c).

3 COALITION I-11 a) & c).

4 Page 8.

5 Pages 10-69.

6 COALITION 98 a).

4. PRIORITIZATION PROCESS WITHIN BUSINESS UNITS

- According to the description of the capital planning process, projects are prioritized based on a number of considerations.
- However, there was no description in the Application of how the various “considerations” were taken into account in order to establish the relative priority of various projects.
- More details were requested during the IR process,⁷ but little additional “real” detail on how the prioritization process worked was actually provided.
- Manitoba Hydro was unable to provide historical versus forecast spending by asset type and therefore was unable to demonstrate which asset types were seeing increased spending over historical levels. Such information would have been particularly useful when compared with the health indexes by asset type as it would demonstrate the degree to which increased spending was being made in response to the asset condition assessment report.⁸
- COALITION 81 c) specifically sought to obtain the prioritization “model” – however the response referred to⁹ only provides a very general description of the “principles” underpinning the process but not how it works. The IR also asked for an “example” of how a priority would change and none was provided.
- COALITION 81 d) asked for list of all the criteria used in the prioritization and the response referred was COALITION 11 a) which does not give a comprehensive/definitive list of the criteria.
- Similarly COALITION 92 (copied below) provides only a very high level outline of how the risk factors fit in to the prioritization process and no real insight into how the process works:
While Manitoba Hydro’s risk management process guides the overall Corporate Risk Management Program, business units are ultimately responsible to manage risk within their areas of accountability. As such, each area manages its risks tailored to their specific methods of evaluation. The risk profiles, relative weights and criteria are also distinct in each area with consideration to the business objectives of each business unit.

Pertinent considerations related to Manitoba Hydro’s risk assessment of failed assets include cost of lost generation, consequential damage of running asset to failure, incremental replacement costs, ability to promptly restore/replace an asset, complexity of restoration effort, impact to public and employee safety, environmental and criticality to customers.
- COALITION 93 b) asked for a copy of risk assessment models and all the response did were refer to the generic description¹⁰ of the process. Similar requests for the risk assessment models were made in COALITION / MH-I-93e, 95b. The models were not provided.

7 COALITION I-11 a) & c).

8 COALITION 85 e).

9 COALITION 11 a).

10 COALITION 11 a).

- COALITION 94 posed specific situations and asked how MH would prioritize. Again, MH indicated the factors or considerations that would be taken into account but did not explain how they would be weighted or valued on a common basis.¹¹
- COALITION 95 a) and 96 b) asked for “company manuals” that describe the prioritization process and the response again just referenced the generic description provided in COALITION 11 a). Surely company employees being asked to perform the prioritization process are given more details on how the process works and what is needed to be input than this simple description.
- MH generally identified some of the types of asset management models it uses.¹² It was unclear if these are in-house models or something purchased from a third party.
- MH declined to identify its work order management system.¹³ Although these systems can provide data useful for other asset management functions. MH did, however, identify the "Copperleaf" system for asset management in connection with its generation units, but it was unclear based on this answer whether it used Copperleaf for its transmission and distribution asset management. Copperleaf has suites for these functions as well according to the software developer.
- The Company also identified Kinetrics Inc., as an engineering firm providing 3rd party transmission asset modelling / evaluations.¹⁴
- While it was very clearly asked, MH failed to provide more detailed information regarding the Asset Health Index ("AHI") that the Company itself creates. The AHI is a very important part of the capital planning and project selection process.¹⁵
- The Company:
 1. did not provide “manuals or guidelines” about how the AHI scoring system was developed,¹⁶ nor did it say such documents did not exist;
 2. did not provide “manuals or guidelines that describe how the technical experts should evaluate the condition assessment and other inputs to calculate the AHI”,¹⁷ nor did it say such documents did not exist. Instead, MH directed us to Copperleaf and a HydroAMP web page. But those are 3rd party systems related to generation and not the AHI which MH itself developed;

11 e.g. how does MH establish the project with greatest value or greatest risk reduction when both value and risk have multi-dimensions?

12 See COALITION/MH-I-93c "Models and systems used to manage generation assets consist of a computerized asset maintenance system and an asset investment system (AIP)" and "The Distribution Maintenance Planning System (DMPS) is used as an asset registry for many of the asset classes".

13 See COALITION/MH-I-93 d).

14 See COALITION/MH-I-99 a).

15 According to the Company: An Asset Health Index (AHI) quantifies equipment condition based on numerous condition parameters that are related to the long-term degradation factors that cumulatively lead to an asset’s end of life. An AHI should provide a measure of long-term degradation, which is an indicator of the asset’s overall health, and should reflect the likelihood that an asset will fail and necessitate a forced replacement or refurbishment. For some asset types, forced replacements can result in substantial costs and extended outages due to delays associated with procuring a replacement asset and with the engineering required to install the replacement (e.g. replacing older breaker or protection relay technologies with newer technologies).

16 COALITION / MH-I-96 a).

17 COALITION / MH-I-98 a).

3. did not “list all scoring criteria that are used in this process and describe how each factor is weighed” for the AHI. Instead, it referred back to the response to COALITION / MH-I-98a, which includes a link to HydroAMP and mentions Copperleaf, but does not describe the weightings for the AHI factors for generation or any other asset classes. The weighing of the AHI factors are critical since they indicate how such factors as age or condition influence the overall “health” of the asset and MH itself assigns these values. If age, for example, is the predominate factor then MH is simply saying that if an asset is old then that weighs more heavily on the decision to replace, as opposed to weighing evidence of failure more than age. Each asset class is different, of course, but the relative weights are very important.

The Response to Second Round Information requests

Contrary to the intent of *Board Order 33/15*, Manitoba Hydro declined to file the data given to external consultant Kinectrics.¹⁸ However, the Coalition did obtain some fruitful disclosure from MH in the second round IR responses including the response to COALITION/MH-II 53.¹⁹

The information provided in response to COALITION/MH-II-52 a-f also was helpful but could have assisted in the development of evidence if it had been provided in response to a number of first round information requests.²⁰

18 COALITION/MH-II-53a(ii).

19 Our experts asked several questions concerning the modelling work performed by Kinectrics in Round I, most of which the Company said it would not answer because of the proprietary nature of the Kinectrics work (see e.g., COALITION/MH-I-100a). As with the Company’s own internal models, our experts had neither access to the Kinectrics models (COALITION/MH-I-100a) nor a confidential technical session to discuss how the Kinectrics models were used. Perhaps not surprisingly, in Round One responses MH also declined to provide information that MH itself provided to Kinectrics for the asset failure models (COALITION/MH-I-100ci-iii). It is difficult to see how MH’s own input into the models would be proprietary to a 3rd party like Kinectrics. In addition, the Kinectrics report on transmission (see COALITION/MH-II-53d (attachment)) is fairly important and is the type of evidence that should have been filed with the case-in-chief, rather than being dug up in discovery.

20 Manitoba Hydro rejected numerous opportunities to provide AHI related information to the Coalition.

- The information could have been derived from the models specifically requested in COALITION/MH-I-93b and COALITION/MH-I-93e;
- MH could have provided the weightings in response to COALITION/MH-I-93c as part of explanation of its asset management models (although weightings were not directly requested);
- The weightings in the AHI would have been described in the "Company manuals or guidelines" used to develop the AHI that were expressly requested in COALITION/MH-I-96a (note: MH did not say such documents did not exist, but instead gave a general narrative response rather than the documents requested) .
- Weightings could have been quantified in the response to COALITION/MH-I-101ci-v, but instead MH glossed over the weighting factors.