

MANITOBA HYDRO  
2010-2011 GENERAL RATE APPLICATION

**CONSUMER ASSOCIATION OF CANADA  
(Manitoba Branch) and  
MANITOBA SOCIETY OF SENIORS**

# **BOOK OF DOCUMENTS**

**April 6, 2011**

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## TABLE OF CONTENTS

Page	
1	PUB Order 116/08, pp 345-346
3	PUB Order 116/08, pp 101-102
5	PUB Order 160/08, pp 26 and 69
7	CAC/MSOS/MH I-17 c)
11	Manitoba Hydro Exhibit #72, p 1
12	PUB/MH I-56 a)

19.0 Board Directives

- e) An updated IFF and CEF (covering the years 2008 to 2028) reflecting the expected impact of the new standards and assumptions of related operational changes as may be planned or contemplated by MH;
6. MH to undertake and file with the Board, by June 30, 2009, an independent benchmarking study of key performance metrics, using the most currently-available data and including:
- a) Primary key drivers of OM&A in each operational division [Board preference is for a divisional break-down to allow for a comparison with other utilities, even if the comparison needs to be limited to specific divisions/activities],
  - b) Comparable other Canadian Utility data for each of the drivers;
  - c) Key comparison indicators, including staffing levels;
  - d) A comparison with and discussion of industry best practices; and
  - e) Potential improvement areas.

The Board expects to be apprised of the scope of the benchmarking study in advance of it being undertaken, and will anticipate being provided a study outline on or before January 15, 2009, to allow the Board the opportunity to provide direction and/or comment.

7. MH to undertake and file with the Board an Asset Condition Assessment Report by June 30, 2009, that defines:
- a) major assets and categories of assets;
  - b) the estimated remaining economic life of each major asset and category of asset;
  - c) an indication of the implications for OM&A costs related to required and scheduled maintenance;

19.0 Board Directives

- d) a listing of scheduled, planned or anticipated major upgrading/decommissioning of major assets and/or categories of assets;
- e) forecast expenditures for planned renovations and/or replacements with respect to now available energy supply and transmission; and
- f) Dam Safety Condition Assessment and Maintenance requirements.

In advance of the commencement of the Asset Condition Assessment Study, MH to file with the Board detailed Terms of Reference containing the scope for undertaking such a study and a definition of the resources to be employed, on or before January 15, 2009.

8. MH to file a report with the Board by June 30, 2009 detailing the final all-inclusive capital cost of the corporate head office project (including such things as construction cost, furniture and equipment, telecommunications, equipment leases, etc.), and the contemplated or planned operating actions to recover incremental costs related to the new head office. (The Board reaffirms that no additional incremental costs are to accrue or be allocated to Centra as a result of the new MH head office.)
9. MH to file a report with the Board by January 15, 2009 indicating:
  - a) whether the current depreciation rates for the Generation, Transmission, Distribution and other assets purchased from Winnipeg Hydro [including Slave Falls] and the Brandon Coal Plant remain appropriate; and
  - b) the related proposed capital replacement, expansion and decommissioning costs;

#### 5.0 Operating, Maintenance, and Administrative Expenses

- a) Primary key drivers of OM&A in each operational division [Board preference is to allow for a comparison with a greater number of other utilities].
- b) Comparable other Canadian Utility data for each of the drivers.
- c) Key comparison indicators including staffing levels.
- d) A comparison with and discussion of industry best practices.
- e) Potential improvement areas.

The Board expects to be apprised of the scope of the study in advance of it being undertaken, and will anticipate being provided the opportunity to provide direction.

The Board is convinced that both the Province and ratepayers will benefit from the developments of appropriate metrics to assess the reasonableness of the level of current and future OM&A expenses, in advance and particularly because of, the proposed major capital expansion program.

MH's justification for the level and growth of OM&A expenditures includes an indicated need for increased maintenance and/or replacement of aging capital assets to maintain the safety and integrity of its electrical system. Recently this assertion is difficult for the Board to evaluate, as the Board lacks jurisdiction over MH's capital expenditures, yet capital expenditures are the major driver of rates.

One item that is lacking is sufficient support for the level of maintenance and upgrades to the existing capital assets of the Corporation. The Board notes Mr. Harper's suggestion that as a best practice, MH should undertake an Asset Condition Assessment, and his view that such a study will provide information on the degree of degradation of existing assets and the need for rehabilitation and/or replacement of capital assets.

## 5.0 Operating, Maintenance, and Administrative Expenses

Despite prior cautions from the Board, MH intends to spend, on average, \$385 million a year on capital construction through to and including 2017/18, capital expenditures that are not related to major generation and transmission projects, which are accounted for separately. In an effort to better justify and demonstrate the necessity of such normal capital expenditures, the Board agrees with interveners on the need for a periodic Asset Condition Assessment Study.

The Board agrees that a study of this nature, done at reasonable intervals, will assist in evaluating MH's progress in maintaining the electrical system, and should also provide additional support for the level of OM&A being incurred and forecast. The Board believes it's appropriate that MH undertake such a study, and will so direct MH to undertake and file with the Board an Asset Condition Assessment by June 30, 2009, that defines:

- a) major assets and categories of assets;
- b) the estimated remaining economic life of each major asset and category of asset;
- c) an indication of the implications for OM&A costs related to maintaining required and scheduled maintenance;
- d) a listing of scheduled, planned or anticipated major upgrading/decommissioning of major assets and/or categories of assets;
- e) forecast expenditures for planned renovations and/or replacements with respect to now-available energy supply and transmission; and
- f) Dam Safety Condition Assessment and Maintenance requirements.

In advance of the commencement of the Asset Condition Assessment Study, MH is to file with the Board detailed Terms of Reference containing the scope for

The benefit of delaying the asset condition assessment would be to allow MH to make use of the functionality of the new system in undertaking the asset condition assessment. This new system may have the potential of reducing the internal cost of undertaking the study.

The Board requires additional information as to the dates, timelines, and functionality of the planned Enterprise Asset Management System.

The Board will vary the existing Directive, by requiring MH to file proposed Terms of Reference for a future Asset Condition Assessment Report by June 30, 2009. The Terms of Reference filing will provide MH with the opportunity to flesh out its timelines and functionality of the proposed Enterprise Asset Management System in completing a detailed Asset Condition Assessment Report.

The Board will also vary the due date of any Asset Condition Assessment Report, to be set by the Board following its review of Terms of Reference.

- a) Primary key drivers of OM&A in each operational division [Board preference is for a divisional break-down to allow for a comparison with other utilities, even if the comparison needs to be limited to specific divisions/activities];
- b) Comparable other Canadian Utility data for each of the drivers;
- c) Key comparison indicators, including staffing levels;
- d) A comparison with and discussion of industry best practices; and
- e) Potential improvement areas.

The Board expects to be apprised of the scope of the benchmarking study in advance of it being undertaken, and will anticipate being provided a study outline on or before ~~January 15~~ June 30, 2009, to allow the Board the opportunity to provide direction and/or comment;

- 7. MH to undertake and file with the Board an Asset Condition Assessment Report by ~~June 30, 2009~~ a date to be fixed by the Board after its review of the Terms of Reference to be filed by MH by June 30, 2009, that defines:



CAC/MSOS/MH I-17

**Subject: OM&A Expense**

**Reference: Appendix 4.4, pages 3-10**

- c) **With respect to page 6, how does Manitoba Hydro determine the asset maintenance and replacement requirements for a given year? In particular, how is asset age used and what other information is used?**

ANSWER:

The assessment of Manitoba Hydro's asset maintenance and replacement requirements is an ongoing, dynamic process. Functional areas routinely consider numerous factors in the assessment process, including customer requirements and growth patterns, asset condition, performance, age, failure rates, employee and public safety, corporate policy, manufacturer's recommendation, clearance requirements, environmental legislation and appropriate costs and revenues. Assets are installed, repaired, overhauled, replaced, or retired based on these complex assessments and are prioritized with consideration to availability of financial and human resources.

Hydraulic Generating Stations, HVDC Converter Stations, and Major Water Control Stations

The assessments are driven by service time, manufacturer's recommendation, performance, regulatory requirements, environmental legislation or corporate policy. Condition assessments are performed by various experts in Power Supply which may lead to recommendations for repair, overhaul or replacement.

( The Corporate Dam Safety Program's principal activities include surveillance inspections, instrumentation monitoring, engineering analyses and condition assessments of dams and dikes within a consequence category framework, and the systematic utilization of failure models-based condition assessment techniques. All concrete and earth-filled structures are scored on a Health Index basis and this system is used to prioritize repairs and upgrades to dams.

/ The Insulation Testing Department performs condition assessments on all critical electrical insulated equipment such as transformers and generator rotors and stators. Frequently, these

electrical tests predict the end of life or when significant rehabilitation of a transformer or hydraulic generating unit is required.

/ Apparatus Inspection Program conducts condition assessments of electrical and mechanical equipment used in the generation & transmission of electric power.

System outages are reviewed to determine the cause of the outage and to determine the steps required to correct the problem. A system called HVDC Data Storage & Retrieval (HDS&R) is used to capture performance data and trending information relating to outages.

This infrastructure is managed using the following processes and tools. A computerized maintenance management system called Applied Maintenance Planning System (AMPS) is the main tool used by station staff to plan and schedule day to day maintenance tasks and inspections and document asset condition. The application Power Supply Performance (PowerUp) is used to record and provide reports on unit operating availability, reliability and performance. Reliability Centered Maintenance (RCM) is used to determine maintenance tasks and inspections, time frames and work criticality.

/ Power Supply is now using a new tool called hydroAmp to provide an Equipment Health Index for main drive train (items whose failure could cause extended outages) components at Hydraulic Generating Stations. Technical teams comprised of experts from the four organizations involved in hydroAMP, the Bureau of Reclamation (BOR), Hydro-Québec (HQ), the Army Corps of Engineers (COE), and the Bonneville Power Administration (BPA), joined together in 2001 to develop condition assessment guides for hydroelectric power plants. The result of this collaborative work is a common framework and process to streamline, simplify and improve the assessment and documentation of the condition of hydroelectric equipment and facilities in order to support condition-based prioritization of hydropower asset management.

Centralized capital planners coordinate rehabilitation requests from generating station staff, Manitoba Hydro equipment experts from design and maintenance engineering departments and finally Equipment Health Index information from hydroAmps is used to build long term capital plan. The plan is entered into a program tool called CAMELOT (Capital and Maintenance Long Term) where the portfolio of proposed projects is prioritized and scheduled. Scheduling has to take into account project priority levelizing cash flow, staffing resources and minimizing unit outage time. Finally the Capital Project Justification (CPJ) process is used to present the Business Case for asset replacement for Manitoba Hydro executive approval.

A new tool called Asset Investment Planning (AIP) has just been approved for Power Supply. The tool replaces CAMELOT and will connect to all data sources used for capital planning including Enterprise Asset Management, hydroAMPS, SAP and PowerUp. The Asset capital planner can then review assets at all stations and run custom reports looking for assets that may be candidates for a capital rehabilitation program. Examples of attributes that could be part of the search are assets with an age well beyond expected life, assets that have a poor health index and or have a poor performance history.

This program will be used to build a twenty year plan but release of individual items in the plan will still require a thorough business case and CPJ approval. This program should be fully functioning in approximately 2 years.

#### Transmission Systems and Communication System Stations

The various components of this infrastructure are maintained in a variety of ways. The transmission line clearance program verifies clearances using laser technology. Lines will be refurbished to maintain mandated clearances. The circuit breaker replacement program reviews the breaker age and low short circuit interrupting capability. Transmission lines are inspected yearly on a periodic basis and defective components are scheduled for replacement. This process uses the T-Line database (developed internally) to keep track of inspections and required maintenance work for transmission lines.

The performance of Manitoba Hydro's communications infrastructure is continuously monitored, and performance reports are generated monthly and annually to identify troublesome equipment and systems. An investigation is performed on all systems that have exceeded performance targets and, where deemed necessary, remedial work or replacement is recommended.

Electric equipment and stations asset groups are assessed periodically through inspections, and condition monitoring activities. The data is compiled in the Regional Maintenance System (RMS), when assessed in light of operating history and performance by specialized equipment experts, the need for repair, replacement or modified maintenance activities is established. These efforts are to ensure continued reliability.

Overall, the Capital Project Justification (CPJ) process is used to justify and prioritize significant expenditures for asset replacement. There are some new tools are being reviewed

including a Transmission Geographical Information System (GIS) which will be used to integrate the prioritization and scheduling functionality.

### Distribution Systems

The Distribution system is assessed based on equipment failure history. Routine failures are assessed based on similar models to address future failures. The Distribution system is also assessed when designs for new facilities are required in areas where there are existing facilities; the existing plant is investigated and addressed. A Civil Infrastructure Condition Assessment program has been established to review and document the state of civil infrastructure in the Manitoba Hydro distribution system.

The Distribution Maintenance Planning System (DMPS) is used for tracking and scheduling maintenance work. The Integrated Pole Maintenance (IPM) process tests the condition of the poles and applies reconditioning treatments to extend life. The Underground Assessment Program is designed to assess the condition of the underground plant and to make repairs to deficiencies found during the assessment. The street light standard testing program includes annual inspection and severely deteriorated standards are replaced. Service interruption reports are used to analyze causes of outages and assess possible deterioration of hardware, insulators and other equipment.

Overall, the Capital Project Justification (CPJ) process is used to justify and prioritize significant expenditures for asset replacement. There are some new tools being introduced to improve the management of infrastructure: Mobile Workforce Management will assist with scheduling and dispatching and a Pole Maintenance database will track individual pole information (type of pole, problems, maintenance history).

## 1.0 OVERVIEW

The 20 Year Financial Outlook is an extension to the Integrated Financial Forecast IFF10 which was approved by the Manitoba Hydro-Electric Board on November 18, 2010. The 20 Year Financial Outlook depicts the long-term financial direction of Manitoba Hydro based on current assumptions of future events.

The first decade of the 20 Year Financial Outlook (the decade of investment) shows the financial impacts of major investments in new generation and transmission. Financial ratios are projected to weaken somewhat in the first decade but rebound in the second decade (the decade of returns). Domestic rate increases are projected to range from 2.9% to 3.5% per year in the first decade, and then decline to 2.0% per year in the second decade. Equity (retained earnings) is projected to remain strong throughout the period, rising from \$2.4 billion at March 31, 2011 to \$10.5 billion at the end of 20 years.

Drought remains one of the major risks with a 5 year drought projected to cost \$2.1 billion (assuming drought commencing in 2012/13). The occurrence of a 5 year drought commencing in 2012/13 would reduce retained earnings from the projected level of \$2.5 billion at March 31, 2012 to approximately \$1.4 billion at the end of the 5 year period (assuming no other action is taken to mitigate the financial consequences).

## 2.0 KEY ASSUMPTIONS

The key assumptions included in the 20 Year Financial Outlook reflect similar assumptions as the 10 year IFF and include the following:

### 1) Domestic Load Growth

Domestic electricity load will grow at an average of 1.5% per year for net firm energy over the 20 Year Financial Outlook to 2029/30. Net total peak demand grows at an average of 1.4% per year over the 20 Year Financial Outlook to 2029/30.

Natural gas volumes are projected to decline approximately 0.4% per year over the 20 Year Financial Outlook to 2029/30.

### 2) Domestic Rate Increases

The interim approved average electricity rate increase of 2.8% is included in 2010/11 and an additional 2.9% average rate increase is projected in 2011/12 followed by 3.5% per year to 2020/21. Average electricity rate increases then

**PUB/MH I-56**

**Subject: Tab 6: Capital Expenditures**

**Reference: CEF 09-1, CEF 08-1, Order No. 116/08 (CEF 04-1 to CEF 07-1)**

- a) Please confirm the accuracy of the progression of project costs, in the table that follows:

Progression of Project Costs in \$ M							
	CEF-03	CEF-04	CEF-05	CEF-06	CEF-07	CEF-08	CEF-09
Wuskwatim G.S.		846	935	1,094	1,275	1,275	1,275
Wuskwatim Transmission		199	200	257	320	316	316
Wuskwatim Total Project	988	1,045	1,135	1,351	1,595	1,591	1,591
Herblet Lake Transmission	57	55	54	54	95	93	93
Bipole III	360(E)	388(E)	1,880	1,880	2,248	2,248	2,248
Riel C.S.	96	101	103	103	105	268	268
Kelsey G.S.	121	121	166	166	184	190	190
Kettle G.S.		61	61	61	61	76	76
Pointe du Bois	421	288	692	834	818	818	318
Pointe du Bois Trans.					83	86	86
Slave Falls G.S.				179	192	198	198
Conawapa G.S.		4,050	4,516	4,978	4,978	4,978	6,325
Keeyask G.S.						3,700	4,592
500 KV Dorsey U.S. Border						205	205

**ANSWER:**

Confirmed with minor rounding differences.