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Sent: Friday, December 20, 2013 3:39 PM
To: Commission Secretary BCUC:EX
Cc: bhydroregulatorygroup@bhydro.com
Subject: Meter Choices Program Round 2 Wong Information Requests
Attachments: Wong IRs Round 2.docx

Attached please find my set of Information Requests for BC Hydro's Meter Choices Program.

regards,

David Wong

1. [Resubmission of Wong IR 1.2.2] In Table 3-3 of the filing, under capital costs, there does not appear to be any capital cost adjustment related to the avoided cost to BC Hydro for the purchase of smart meters for those applicable customers who elect a legacy meter.
 - 1.1 Based on the cost to BC Hydro of an individual residential smart meter, and assuming an 8% discount rate (as was used in the business case – see page 31), please calculate the annual avoided capital cost that should accrue to the benefit of an applicable customer if they elected to retain a legacy meter.
2. BCPSO IR 1.15.1 asked “In the detailed spreadsheet supporting the costs it is assumed that 84% of the range extenders will require a transformer. Please explain why.” BC Hydro’s response was “Range extenders operate at secondary voltage levels. The installation of a transformer is required in instances wherein secondary voltage is not available at the site, and primary voltage must be converted to secondary voltage. Schedule A-7a indicates that in 81 per cent of range extender installations, a transformer will be required. This figure is based on the actual incidence of transformer installations for range extenders installed at the time of the analysis.”

In the response to CSTS IR 1.59, BC Hydro states that “The majority of the range extenders are mounted on BC Hydro poles 18 to 24 feet above ground (i.e., 550 to 730 cm above ground). The table provided by BC Hydro in the response to CSTS IR 1.63 indicates that 97% of the range extenders were installed on existing poles (since new poles were only required in 3% of the cases).

In the response to BCUC IR 1.2.1 BC Hydro provides a breakdown by billing area of total residential customers and residential customers refusing a smart meter. Customers in the Lower Mainland (billing areas 1-15 and 19-22) comprise 53.2 per cent of the total residential customers and 36.0 per cent of the customers refusing a smart meter. Customers on Vancouver Island and the Gulf Islands (billing areas 91-99) comprise 20.6 per cent of the total residential customers and 35.8 per cent of the customers refusing a smart meter. Together, they represent almost 75 per cent of the total customers and customers refusing a smart meter.

- 2.1 Please confirm that the majority of the range extenders were installed on BC Hydro poles, but nonetheless 81 per cent of them required transformers.
- 2.2 Please confirm that the “secondary voltage” that range extenders require is the same voltage that is supplied to residential customers.
- 2.3 Please confirm that range extenders typically draw less than 10 W, and therefore a transformer would not be required solely due to the additional load of the range extender itself.
- 2.4 Please confirm that residential customers typically require a drop-down transformer to secondary voltage to be within about 100 m of their service location. If not confirmed, please provide a better number.
- 2.5 Please confirm that range extenders are typically installed within 100 m of at least one residential service location. If not confirmed, please provide a better number.

- 2.6 Given the above, why were transformers required in 81 per cent of the cases?
 - 2.7 What fraction of the already installed range extenders were installed in billing areas 1-15, 19-22, and 91-99?
 - 2.8 What fraction of the range extenders installed in billing areas 1-15, 19-22, and 91-99 also required the installation of a transformer?
3. Wong IR 1.1.3 asked “In general, the later in a capital project that changes are introduced, the higher the cost of those changes. Please confirm that if the “Meter Choices Program” had been included in the original capital project, the incremental costs associated with this program would be lower.” BC Hydro’s response was that “It is not possible to determine what the costs might have been under this hypothetical scenario”.

A paper by Sharif, Khan, and Bhatti published in May 2012 in the International Journal of Computer Science Issues entitled “Measuring the Impact of Changing Requirements on Software Project cost: An Empirical Investigation” (www.ijcsi.org/papers/IJCSI-9-3-1-170-174.pdf) provides in Figure 4 a graph of their results that shows the Mean Man Days Cost as a function of the Phase of the software project. Phases are broken down into Analysis, Design, Implementation, Testing, and Support, with costs increasing significantly when changes are introduced in later phases of the project.

In the response to Middleton IR 1.2.1, BC Hydro states that the “Cost estimates for IT Integration have been estimated on an incremental basis. These costs arise as a result of the Meter Choices Program, and there is no resulting duplication of costs. In the response to Middleton IR 1.2.2, BC Hydro states that “The IT system which is now in place needs to be modified to accommodate the ongoing presence of legacy meters and radio-off meters on the system. These changes and modifications to the system are discussed in section 3.4.1.2 of the Application.”

- 3.1 Please confirm that the “Information Technology Capital Costs” provided in table 3-4 of the Application are entirely software project related costs. If not confirmed, please explain what other costs are included.
- 3.2 Please confirm that the fact that the “IT system ... is now in place” means that per Sharif, Khan, and Bhatti’s definition it would now be in the Support phase.
- 3.3 Please confirm that according to Sharif, Khan, and Bhatti’s paper Figure 4, the costs of the software changes that arise as a result of the Meter Choices Program are approximately 35 times greater than they would have been had the requirements been introduced in the original design (i.e. in the Analysis phase).
- 3.4 Does BC Hydro agree that the “Information Technology Capital Costs” of 1238K would have been approximately 35 times less, or about 35K, if the requirements had been included in the original program design? If not, please explain.

4. In the Application on page 3-16, BC Hydro states “Due to the relatively low number of remaining legacy meters, combined with the relatively large number of potential sample groups, sample testing is not viable for most of the sample groups.”

In the response to Wong IR 1.4.2, BC Hydro states that “no additional legacy meters will be purchased”.

In the response to Wong IR 1.4.3, BC Hydro states that it believes that the Commission does not have the authority to order BC Hydro to purchase additional analog meters.

Wong IR 1.4.1 asked “What is the smallest size of residential meter group, as the term is used on page 3-16, line 11 of the Application, that BC Hydro has had in installed service over the last 15 years?” BC Hydro responded “The smallest sample size was in the order of 100 meters.”

- 4.1 Is BC Hydro’s decision not to purchase additional legacy-type meters a direction from the government? If so, please provide a reference. If not, on what grounds does BC Hydro believe that the Commission does not have the authority to order the purchase of additional legacy meters?
 - 4.2 Does BC Hydro believe that the Commission has the authority to order BC Hydro to retain and continue to sample test the existing pool of legacy meters? If not, why not?
 - 4.3 If some of the groups are as small as 100 meters and yet sample testing was still deemed to be appropriate, why is sample testing on the groups of meters in the approximately 10,000 legacy meters “not viable”?
5. BCPSO IR 1.4.1 asked “What is considered “an obstruction” (per page 2-8)?” BC Hydro replied that ““An obstruction” refers to anything that blocks reasonable, safe, physical access to the meter base including by debris, unsafe walkways or other means of access, or the presence of animals, and the customer does not remedy the problem upon being requested by BC Hydro.”

There are a number of web sites on the internet that are promoting the purchase or construction of Faraday cages to block the transmission of electro-magnetic waves from smart meters. Typical contraptions involve the use of a wire mesh so that the meter may still be read.

- 5.1 Does BC Hydro consider a wire mesh Faraday cage to be “an obstruction”?
 - 5.2 If the customer’s Faraday cage includes a port to allow the optical probe to be used to read the meter, would this implementation be considered “an obstruction”?
 - 5.3 If a customer installs a Faraday cage, and it works as advertised to restrict the transmission of wireless signals, will BC Hydro charge this customer the wireless option fee, or a portion of it? Please explain why or why not.
6. BC Hydro’s response to Hurd IR 1.2.0 is that there are “Approximately \$70 million of financial benefits resulting from the implementation of the SMI Program, including reduced operating costs and increased revenues from theft detection, are being shared across all customers in the

form of reduced rates from F2012-F2014, including for those customers who choose a legacy or radio-off meter.”

- 6.1 Please provide a breakdown of the \$70 million of financial benefits into those related to reduced operating costs and those related to increased revenues from theft detection, by fiscal year. In the case of theft detection, please provide the associated energy amounts.