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July 20, 2010

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Kirsten Walli
Board Secretary
Ontario Energy Board
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Toronto, Ontario M4P 1E4

Dear Ms. Walli

Re: Determination Under Section 1.2.1 of the Standard Supply Service Code to mandate Time-of-Use Pricing for Regulated Price plan Customers Board File NO. EB-2010-0218

Thank you for your letter of July 14, 2010.

The IESO is committed to working closely with electricity distributors to support mandatory implementation of Time of Use (TOU) pricing as contemplated in the June Proposed Determination.

Prior to responding to your specific points of concern, allow us to put some context around the Province's overall efforts on the Smart Metering Initiative. Ontario is becoming an acknowledged world leader not only for the introduction of a large scale implementation of smart metering, but also for developing a centralized service for processing interval consumption data for more than 75 utilities. As in any cutting-edge endeavour, there are no road maps or blue prints that we can follow and we, and the Local Distribution Companies (LDCS), can reasonably expect to encounter unforeseen challenges along the way. While this shouldn't preclude setting TOU rollout schedules for the province, it should be a consideration when evaluating any difficulties in meeting those schedules. We believe that the vast majority of organizations involved and their personnel have the requisite commitment and skills to ultimately achieve complete success.

Let me now turn to your specific points of concern:

1. The ability of the MDM/R to support high volume TOU billing that will be required with a mandatory implementation; and,

5. The adequacy of resource and service levels at the SME to accommodate TOU rollout

As these two issues are related, we propose to address them together.

Performance

The MDM/R was never intended to be at full processing capacity from inception. Since the MDM/R went into service, the system has stayed ahead of the LDCs' growth curve in terms of capacity and its ability to meet service levels. To ensure that service levels will continue to be met throughout the ramp up to full TOU roll out volumes, performance tuning and enhancements have been an ongoing effort for the MDM/R since we commenced production operations in March 2008. The very first version we tested processed reads from 50,000 meters per hour. We are now operating at 267,000 meters per hour and have demonstrated a throughput rate of 600,000 meters per hour in a testing environment. With the cooperation of the LDCs to distribute the submittal of meter read data across the available processing window and with ongoing system tuning, we are projecting a throughput of around 1,000,000 meters. This rate should be adequate to support the summer 2011 target of 3.6 million customers on TOU rates. Beyond that we will look to improve throughput further to provide operational flexibility and to support organic growth.

The MDM/R has also been able to support all of the accelerated meter enrollment activities to date, with over 600,000 meters added in the past two months, to a total of over one million or 25% of the smart meters installed in the province. During this time, the service levels for processing meter additions and changes to meters have been consistently met and exceeded. The IESO has not requested that any LDCs delay the enrollment of their smart meters due to MDM/R capacity constraints. We have asked LDCs enrolling a significant number of meters over short time periods to work with us to schedule these additions and this is expected to be the normal mode of operation throughout the one-off steep ramp up period between now and next May. We are confident that with the planned actions and the next release of the MDM/R software being deployed this fall, that the MDM/R will continue to support the LDCs' meter enrollment plans both under the mandate and at full provincial volumes.

The IESO continues to conduct performance testing as outlined in our Performance Testing Status Update Report dated June 1, 2010. Performance testing plans and results have been shared with those LDCs in or near production operation since February of this year. If any projected processing shortfalls are identified through the predictive simulations or testing, there will be sufficient time to increase system capacity through some combination of the following techniques:

- Updating and tuning underlying storage infrastructure and database systems;
- Updating system configuration based on actual and projected LDC interactions with the MDM/R;
- Upgrading server processing capacity; and
- Working with high volume LDCs to more smoothly schedule data submissions.

Service Levels

The IESO was asked by the Ministry of Energy to manage the procurement of the MDM/R in mid-2006. At the time it was not known who would have responsibility to operate the system, nor were there any precedents for such a system. For these reasons the IESO recommended that a joint system delivery and system operate contract be procured. Because of the lack of experience within the province (and beyond) of these types of systems the IESO, rather than attempt to define detailed technical requirements, aimed for a fully managed service offering and specified only business service levels which left responsibility for meeting them with the vendor. The IESO stakeholdered with the LDC community the service levels which formed part of the requirements used for the procurement.

These service levels are now embedded in the MDM/R Terms of Service and our contract with IBM in its role as the Operational Service Provider (OSP). The service levels obligate IBM to ensure that they provide adequate capacity and processes for the MDM/R to meet contracted service levels.

The IESO is monitoring and publishing MDM/R performance results to LDCs nearing production, with the intent to post them on our public website in the future. While we acknowledge that there have been instances where the MDM/R did not operate within the tolerances defined in the service levels, for the most part the MDM/R has been meeting or exceeding service levels. Issues that did arise were isolated, dealt with quickly and had minimal impact on LDCs meter to bill processing. The IESO and IBM take every issue seriously and take appropriate actions to reduce the risk of similar incidents in the future.

In the event of a significant operational issue with the MDM/R, the IESO and our service providers will focus on having the issue assessed and service restored as quickly as possible to minimize the impact to MDM/R service recipients. Consequently, issues impacting critical services receive the highest priority and attention, irrespective of the timescales for each step of handling them.

As well as maintaining critical component redundancy at its primary processing site, in the event of a disaster that renders the primary MDM/R system inoperable, IBM maintains a backup disaster recovery facility to provide MDM/R restoration in accordance with specified timelines.

Resources to Support LDC TOU Implementation Plans

To support the Board's Proposed Determination and the anticipated increased levels of LDC support requirements, the IESO has the following resources available:

- Registration and enrollment staff to guide LDCs from the start of registration through unit testing, enrollment testing and cutover to production operations. Each LDC is assigned an enrollment manager who will be their primary contact and advocate through their registration and enrollment process;
- Training, workshop and awareness sessions are conducted regularly and additional sessions can be arranged based on LDC needs;

- Introductory materials including guides and templates;
- Standards and technical reference material; and
- SME website and newsletter (www.smi-ieso.ca).

The nature of requests from the LDC community covers a range of issues from Advanced Metering Infrastructure (AMI) through to Customer Information Systems (CIS) as well as the MDM/R and we have been helping the LDCs resolve their concerns. The IESO is in the process of adding resources to support accelerated LDC enrollment under the proposed mandate, current and projected volumes of LDC support requests and tickets raised through our help desk.

2. Possible performance problems indicated by recent changes to MDM/R protocols for load profile data transfers

We believe that "...recent changes to MDM/R protocols for load profile data transfers" refers to discussions held in the MDM/R Operations Workshop that began in June of this year. There are two parts to these discussions:

- Spreading the submittal of daily meter read data between midnight and 5 a.m.; and,
- Submitting daily meter read data in midnight to midnight blocks.

Each topic is separately covered below.

First, the requirement that submittals of the 4.5 million daily meter reads must be reasonably spread out over the period from midnight to 5 a.m. is not a new requirement. It has been known and shared since the beginning of the project and the need for some reasonable arrival distribution acknowledged in the contract with the vendor – clearly it is unreasonable to contract with a vendor to process 4.5 million meter reads in a five-hour window and then deliver them all at 5am. Throughout the life of the initiative there have been numerous references to the need to spread the submission of meter read data. We include the earliest below:

- September 2006 – MDM/R Service and Performance Levels in the MDM/R Procurement Specification documents included the following:
    - **"AMI Inputs into the MDM/R:** the process of receiving Meter Reads during day N and Meter Reads in files/batches over the course of the Daily Read Period and into the first five hours of the following day (day N+1)"
    - "...it is possible to extend those processes into day N that may be performed concurrently as Meter Reads arrive at the MDM/R over the course of the Daily Read Period. This in turn yields a maximum processing timeline for a meter reading following the Automatic Meter Read Processing Timeline."
    - "The earliest start time for Automatic Meter Read Processing lies between 01:00 EST and 01:30 EST during the day 'N' Daily Read Period, at which point the first real-time Meter Reads (i.e. those Meter Reads that are not held in batches until

the end of the daily read period) could begin arriving at the MDM/R. While the start of these processes is not quite "concurrent" for a single Meter Read this short period of time represents the theoretical frontier for their earliest possible start for most of the value added process that touch on a Meter Read within the MDM/R."

The above statements convey the expectation that meter read data would be submitted both during the day for which the reads apply and in the first five hours of the following day (i.e. a distribution across approximately 16 hours). However, apparently this approach causes a number of logistical difficulties, so it is not now expected to materialize, but it does place greater emphasis on the need to achieve a reasonable flow in the midnight to 5 a.m. window. Although, we have only recently begun to work with the 15 largest LDCs to achieve some management of the smoothing across the window, the nature of these conversations should not have come as a surprise.

The second requirement, that LDCs need to submit the preponderance of their daily meter read data in midnight to midnight blocks, is more recent. It is based on recent operational experience where blocks of data that were not framed from midnight to midnight caused substantial extra processing burdens on the MDM/R software. This was a surprise to us as well as the LDCs but, upon consultations with the MDM/R software supplier they have confirmed that the system architecture does rely heavily upon the midnight to midnight construct for processing efficiency. This is an example of what we referred to at the beginning of this letter, a result of being in uncharted waters – for both the IESO with the MDM/R and for the LDCs with respect to AMI systems.

This situation is unfortunate and does place an additional burden on some LDCs. The degree of the problem depends on both the specifics of each AMI technology and how each LDC has chosen to implement their data collection and MDM/R integration systems. We have asked one LDC to implement the necessary midnight to midnight accommodation for the MDM/R before they embark on sending meter read data for more meters than originally planned in 2010. We are working with them to keep to their planned meter enrollment schedule for the balance of this year.

3. The stability of planned MDM/R software upgrades

The IESO recognizes that the MDM/R is a key element of the meter to bill process for those LDCs in production. Therefore, we must assure that the introduction of new software upgrades is stable and enhances the usability of the system. To this end we have implemented testing and acceptance procedures to help ensure that all MDM/R software upgrades are stable prior to promotion to production. For example, the IESO's latest release of the MDM/R was deployed in September 2009; however, those LDCs in production last September will recall that the IESO halted the promotion of the originally planned software upgrade precisely because our comprehensive testing program determined there were stability issues. What was promoted instead was a less extensive set of upgrades that our testing indicated was stable. This release of the MDM/R is operating reliably with 10 LDCs and over one million meters.

The IESO's scope and level of testing is determined by the nature of the change and will be commensurate with the level of risk and complexity associated with the change. The IESO's testing of the MDM/R incorporates unit, system integration and acceptance testing across key MDM/R functions and processes. Testing procedures include regression testing of existing functionality, new functionality and corrections of defects.

The IESO tests the MDM/R from an LDC perspective and a typical regression test involves the execution of over 8,000 test cases, with particular focus on areas that could impact the MDM/R service recipients and their data.

Following the IESO's internal testing and prior to the implementation of a release, the IESO publishes known defects along with the expected target release(s) for their resolution. We continue to work with our vendors to assess, prioritize and address defects. We recognize that the impact of a defect may vary across LDCs, and we solicit input from LDCs to help in the assessment.

Once the MDM/R change has reached stability, meaning there are no critical defects for which an adequate work around does not exist and that no further major code fixes are pre-requisite to promoting the code into the production environment, the IESO will make high impact changes available to LDCs for regression testing. During this process LDCs have the opportunity to test their business processes and systems with a new release of the MDM/R and provide feedback to the IESO. For lower risk and impact changes, the IESO may promote changes to production without regression testing by LDCs.

The IESO conducts a one to two week "parallel run" as the final stage of testing before a decision is made whether to promote the new software to production. During this stage the same data that is processed in production each day (under the existing software) is also fed into a test environment containing the candidate software for promotion to production. Any differences in the processing results between the production and test environments are checked to assure no unexpected behaviors are occurring.

In summary, the IESO will implement a change to the MDM/R following IESO acceptance of test results, assessment of the impact of any defects identified during testing, satisfactory completion of the parallel run and any feedback from LDCs from their regression testing.

4. The testing of the system's final readiness has not been completed

We recognize that testing of the system readiness to perform at the projected end-state volumes with all of the LDCs business processes has not been undertaken. As the MDM/R is integrated with LDC business processes and systems, we obtain reasonable assurance through collaboration and testing with LDCs to ensure that the system can support and work with each LDC's unique business processes and systems, prior to transition of the LDC to production. The IESO requires that LDCs successfully complete unit, integration and qualification testing activities with the MDM/R prior to transition to production. In addition, the IESO provides LDCs the opportunity to test significant changes to the MDM/R prior to their implementation.

We have the operational experience and feedback of 10 LDCs with over one million meters currently operating with the MDM/R. We continue to enhance and adapt practices based on the feedback of LDCs, including the development of operating manuals.

The IESO has implemented procedures and controls to ensure that the current system and future upgrades continue to operate reliably and meet service levels at increasing and end-state volumes, including:

- Regression, system integration and acceptance testing;
- Monitoring and enforcement of contracted service levels to help ensure that the MDM/R continues to support full provincial volumes;
- IESO performance monitoring, testing, and tuning to reflect LDCs' interactions with the MDM/R and increasing volumes;
- Adding resources to address LDC support and operational issues raised through our help desk in a timely manner;
- Receiving clean quarterly SAS 70 independent external audits of the OSP's infrastructure operations since the MDM/R went into production operation; and
- Conducting annual S.5970 independent external audits of the MDM/R key functions, controls and procedures, including the IESO's testing procedures. The first audit is currently underway, with first audit report expected to be published in November 2010.

In addition we have, in our OSP, a world-class credible and competent vendor who has proven its commitment to the success of the initiative and we are confident will continue to do so.

The issues outlined by LDCs represent a current snapshot. However, it's important to note that six months ago LDCs and the IESO faced a different set of challenges and concerns. Yet together we have collaborated to solve every challenge we've encountered. As long as our teams can continue to work together we believe we will successfully face every challenge raised in your letter along with those we haven't yet contemplated or encountered. We will experience other learning situations along the way and cannot emphasize enough the need for a collaborative working relationship with everyone involved to keep moving forward towards a successful complete implementation in support of the Province's Smart Metering Initiative.

Yours truly,

Paul Murphy
President and CEO
Independent Electricity System Operator