

Measurement Canada Consultation on Recommendations for the Establishment of Electricity Legal Units of Measure Outside an Approved Meter

Summary of Issues and Comments by Industry & Consumer Stakeholders and Measurement Canada/Industry Joint Workgroup Response - March 2008

1. Introduction

1.1 Scope of the Summary and Document Format

This document provides a summary of the comments received by electricity and gas industry and consumer stakeholders in response to the Legal Units of Measure (LUM) Workgroup (WG) Recommendations document issued for industry and public consultation by Measurement Canada (MC) on the Agency's website in December 2007.

Several formal comments have been received from external parties. This response addresses only the more substantive comments.

For ease of reference, the format of this document has been developed to follow the format used in the LUM WG Recommendations document. As a result of the comments received, the LUM Recommendations document will be revised and re-issued as the LUM WG's final submission for MC consideration and approval.

1.2 Level of Participation

In general, the very large majority of comments came from several large electricity utilities, a provincial electricity market regulator, and the Canadian Electricity Association (CEA) which represents a very large number of Canadian electricity industry stakeholders. Submissions were also received from several electricity meter and metering software manufacturers.

Response levels from consumer groups representing residential and commercial/industrial interests were generally very low with only one formal submission received from the Association Québécoise des Consommateurs industriels d'électricité representing a large commercial/industrial consumer group.

2.0 General

2.1 MC Authority to Regulate LUM used in Utility Rate Applications

A general concern submitted by several stakeholders raised questions on the extent of MC's authority with respect to the regulation of LUM used in utility rate applications (in particular, the LUM adjusted by way of multipliers and other correction factors). The WG reviewed the MC legislation in regards to this question.

Section 3 of the *Electricity and Gas Inspection Act* (EGIA) prescribes that the units of measurement for the sale of electricity are the watt hour, var hour, volt-ampere hour, and the joule. Reference to the sale of electricity must be noted here. Section 28 of the EGIA gives authority to the Governor-in-council to make regulations:

- (i) establishing or providing for the establishment of specifications for meter type approval, verification, sealing, and installation and use;
- (ii) prescribing additional or alternate units of measurement to what is prescribed in section 3; and
- (iii) prescribing the conditions and manner of determination of units of measurement referred to in the EGIA.

Further to item (ii) above, subsection 5(1) of the *Electricity and Gas Inspection Regulations* (EGIR) prescribe that where the amount of electricity supplied and the time-related demand for electricity supplied are the joint basis of a charge for electricity sold to a purchaser, the unit of measurement for the sale of such electricity shall be, with respect to the amount of electricity sold, a unit referred to in paragraph 3(1)(a) of the EGIA and, with respect to the time-related demand for electricity sold: the watt, var, and the volt-ampere. Subsection 5(2) of the EGIR further prescribes that where the unit of measurement for the sale of electricity is the volt-ampere or volt-ampere hour, vector addition shall be used to determine the total number of such units in a combination of polyphase circuits.

Further to item (iii) above, in the provisions specific to gas measurement, section 35 of the EGIR prescribes that a volume of gas measured by any meter that registers in units of volume shall be converted to standard volume by using the following equation, namely, $V_s = V_r \times P_m \times T_m \times (F_{pv})^2$

Deleted: $V_s = V_r \times P_m \times T_m \times (F_{pv})^2$

Where:

- (a) V_s is the standard volume;
- (b) V_r is the volume registered by the meter;
- (c) P_m is the pressure multiplier established for the meter pursuant to section 36;
- (d) T_m is the temperature multiplier established for the meter pursuant to section 38 or 39, whichever is applicable; and
- (e) F_{pv} is the supercompressibility factor established for the meter pursuant to section 40.

This reference is offered to provide an example of the use of multipliers or corrections that can be applied to a LUM. The example comes from the provisions specific to gas measurement, where the basic LUM is defined as the “standard volume” that is traceable to the primary meter. Pressure, temperature and supercompressibility correction factors are then applied.

The above legislative references are considered to clearly demonstrate the legal authority of MC with respect to legal units of measurement used for the sale of electricity (whether established within or outside of a meter). For comparison purposes,

readers are encouraged to review the authority clauses contained in provincial energy acts. In recognition of these requirements the WG has re-affirmed that, the two main purposes of the LUM project are to:

- ensure that whether a LUM is established in a primary device or externally, that the process or methodology used is consistent; and
- ensure that the purported amount delineated on the final bill is based on an approved LUM. It should be noted that this precept does not restrict the use of “surcharges” that can be applied to a final bill to recover infrastructure or delivery costs.

In addition, the goal of MC’s volt-ampere (VA) LUM project is to define the appropriate methods and algorithms that could be used to calculate VA, for the purposes of trade measurement pursuant to the EGIA, (regardless of whether that calculation is done inside a meter or externally). The scope of the VA work objectives was expanded to also include the establishment of demand LUM.

In summary, from MC’s perspective, there is a requirement to ensure that the measured consumption that is stated on the bill is directly traceable to the fundamental LUM that has been used. Beyond that, the contractor has the ability to add as many surcharges as they want for line loss, delivery charges, time-of-use (TOU), infrastructure maintenance, etc. The rationale for this is similar to what constitutes the units of “kilograms” or “litres” pursuant to the *Weights and Measures Act*. MC retains sole responsibility for establishing such LUM for the purposes of trade measurement in Canada, and for ensuring that the units are defined in a manner that is consistent across the country regardless of location or external influence factors. It would be completely unacceptable for a kilogram to mean something different between locations or between two companies. However, it is clearly acceptable for rates (i.e. price per kilogram of a given product) to be structured differently in different locations or between different companies.

The EGIA scope of regulated trade measurement is not limited to only the meter, but extends from the initial measurement of source data to the final calculation of a LUM identified pursuant to the EGIA and EGIR. In cases where a utility has opted to perform final calculation of a LUM within it’s billing system, MC is responsible for establishing regulations and specifications pertaining to the manner in which the LUM is calculated.

2.2 The Impact of LUM Recommendations on current Tariff Structures

2.2.1 Concern has been raised by a couple of major stakeholders about the costs of implementing proposed LUM recommendations on current tariff structures. Several comments suggested that the requirement for the demand subinterval period for totalization purposes be increased from 3 minutes to 5 minutes. Meanwhile, in one jurisdiction, both the contractor and purchaser want to continue under their current tariff structures which apply alternate demand response time and VA demand calculation

methods (deemed unacceptable from a scientific standpoint). It is perceived by some industry stakeholders that the changes proposed under the VA and LUM Recommendations would cause rate inequity among their purchasers in a given rate class and among different classes. Consequently, a request has been made to provide an exception from this requirement for the affected rate group.

2.2.2. With regards to the proposed 3 minute sub-interval for the totalization of demand measurement, both the VA and LUM WGs have agreed to increase this to 5 minutes. A shorter time period would be preferred for optimal demand measurement, however, this can be revisited again in the future when these standards become subject to review (the technology and system capabilities are deemed to change and may well advance in this regard).

2.2.3 The application of demand under the above-mentioned tariff structures affects the basis of determination of the demand LUM which are not recognized as meeting the criteria established by the VA WG with regards to standardized demand calculations. Regarding the establishment of time-related demand LUM outside an approved meter, where utility tariffs are structured on the basis of different demand response intervals (ie. 15, 20, 30 or 60 minute demand intervals - these response intervals can be either block-type or sliding window type which are not required to be determined with a sliding-window sub-interval) that affect the basis of determination of the demand LUM which are not recognized as meeting the criteria established by the VA WG for standardized demand calculations, the LUM WG recognizes the VA WG recommendation that such applications be subject to varied MC intervention levels (low and high).

The low intervention model would reflect the one applied by MC in the gas sector whereby requiring:

- a formal agreement between respective non-vulnerable parties;
Note: Where a tariff structure is in use, this requirement could be met by advising customers that the tariff structure is subject to low intervention by MC, providing a description of the scope and applicable conditions, and providing an option for customers to not participate and be subjected instead to high MC intervention. This could be communicated either via the tariff conditions or by letter sent to the customer.
- the use of MC approved meters; and
- the establishment of a dispute resolution method outside of MC which the contractor would establish and the parties would be subject.

The high intervention model would require a 15 minute demand interval (integration period) with 5 minute (sliding window) subintervals.

With regards to the application of an alternate demand calculation method for VA (as an example), such a consideration is seen as affecting the fundamental LUM. The VA WG has provided very specific direction and parameters with regards to how the fundamental VA LUM is determined. The LUM WG recognizes that utilities over the

years have applied various rate applications which have involved the manipulation of LUM and that have been accepted in some cases by their customers. In principle, the WG recognizes the need for cost recovery mechanisms related to infrastructure costs that can be done through a representative surcharge approved through the rate process. However, the fundamental LUM in terms of what it represents cannot be manipulated for that purpose. In this regard, the WG recommends that a “no regulatory intervention” option be considered by the industry relative to a specific market level where appropriate.

It is recommended that a joint MC/industry workgroup (comprised of representative metering and billing groups from major utilities) be established to explore the establishment of a regulatory amendment which would define the applicable market level scope and either the outright exemption (statutory) or conditional exemption (e.g., establishment of applicable market scope, contractual agreement of parties, etc) from MC intervention.

2.2.4 Regarding the cost impact of implementation for the LUM and VA recommendations, it should be considered that the implementation milestones were established by both the LUM and VA WGs in consideration of the anticipated costs of implementation for the industry. The LUM WG has reviewed the VA WG implementation recommendations and will revise the LUM implementation recommendations so that they are in alignment.

2.3 Totalization of VA LUM

The VA WG has stated that VA is a directionless quantity. For the purposes of totalization, the LUM WG has recommended that this may be done with the VA LUM but on condition that this quantity be qualified and identified in terms of the direction of measurement. The calculation of VA for totalization therefore requires the measurements of individual component watts and vars from each directional quadrant.

2.4 Summarization of LUM and VA Recommendation Documents

Several comments have suggested that the discussion and recommendations provided in the current LUM and VA documents and how they interrelate is not clear and need to be summarized. Regarding the summary of recommendations, the nature of the LUM and VA documents are different and do not lend themselves to be easily summarized in a table. During implementation, consideration will be given to providing a guideline document where applicable.

2.5 Time-of-use Metering

A stakeholder questions why requirements for time-or-use metering were not addressed in the LUM Recommendations. MC only regulates the accuracy of the individual registers used in time-of-use metering. The Agency does not regulate the accuracy of

the mechanism (i.e. in this case, time) used to switch between registers, as this is a rate application tool deemed to be outside of MC's jurisdiction to administer. Accuracy requirements specific to the register are contained in the metering specs of LMB-EG-07 and SE02 and the load profile requirements are addressed under section 7 of the LUM Recommendation for Data Recorders (load profile is a type of Data Recorder).

Further information on MC's policies related to time-of-use metering may be referred to in MC bulletin Gen-31.

3.0 Response to Specific Sections & Clauses

Section 1.2

Comment:

Implementation of LUM definition will cause inequity with existing legal requirements as set out by provincial regulators. They have established rates with distributors which would be directly impacted.

WG Response:

Refer to response in 2.1 above. The WG does not accept the first premise regarding the LUM definition. Standardization of the LUM is the basis for establishing equity. We recognize the impact may be significant and MC will work further with the provincial regulators to determine the implementation of the LUM recommendations.

Section 1.4

Comment:

re: (2) There appears to be a need to safeguard the security and integrity of the consumption data being transported outside an approved meter; and

re: (3) There are inequity concerns as a result. Mitigation strategies need to be developed to address this.

WG Response:

Refer to response in comments for section 9.0 below.

Section 4 - General

Comment:

It is not clear at what point Energy SLUM Load Profile Data becomes Energy PLUM data. Which of the following statements are correct:

(i) $SLUMPULSE \times K_i \text{ (Wh/pulse)} = SLUM \text{ Wh? or PLUM Wh?}$

(ii) $SLUMPULSE \times K_i \text{ (Wh/pulse)} \times CT \text{ ratio} \times VT \text{ ratio} = SLUM \text{ Wh? or PLUMWh?}$

WG Response:

In accordance with the definition for PLUM provided in section 3, the answers are as follows:

- (i) PLUM Wh
- (ii) PLUM Wh

4.1.2

(1) *Comment:*

Please define true value in section 4.1.2?

WG Response:

The term "true value" means that the value (e.g. quantity) that is, or would be, determined using a reference meter that is certified and traceable to national standards, and corrected for any known bias error indicated on the certificate. In sections 4.1.2, 4.5.2 (g) and 6.3.5, the calculation of error "relative to the true value" means establishing the error of the value determined by the measurement process in relation to the value that would be determined using a reference meter, certified and traceable to national standards, corrected for any known bias error indicated on the certificate.

(2) *Comment:*

It is not clear how the measurement error budget for the meter will be calculated. Is instrument transformer accuracy (i.e., current transformers and voltage transformers) and errors introduced by secondary lead cabling and non-Blondel excluded from the budget? Is this a general requirement or is it a requirement for individual meters? Examples showing how this is to be calculated would be useful.

WG Response:

In response to the first question, the instrument transformer accuracy and errors introduced by secondary leads and non-Blondel are excluded from the measurement error budget. The measurement error budget for the meter applies only to individual meters. For example, if the meter error during verification is determined to be 0.5%, the remaining error budget for the validation of PLUM is 0.5%. The calculation portion of the error budget is typically addressed by system design.

(3) *Comment:*

In some provinces, embedded loads metering data is adjusted by the total loss factor (TLF) as required and approved by the provincial rates board. How does this loss adjustment impact the error? Are contract loss errors excluded from the error budget? Determination of this tolerance would increase meter test times during verification. Is this a general requirement or is it a requirement for individual meters? How would this work on in field devices? How often would this have to be verified? What records would have to be maintained? If this recommendation is implemented, costly automated processes would have to be developed to track this error. Meter accuracy is determined during verification and reverification.

WG Response:

In response, the TLF is not included in the error budget. Regarding test times, the validation method will not increase meter verification time: the meter portion of the error budget is the maximum error of the meter determined during meter verification.

(4) *Comment:*

MC's governance resides with the device and not the software that interrogates the devices or the billing systems that use the data. Electrical engineering principles for calculating PLUM from SLUM would not introduce additional errors.

WG Response:

Refer to WG response in 2.1 of this document.

4.1.3

Comment:

(1) In the wholesale and retail market, the totalization of metering data can become very complex involving many meters. How is this error to be calculated? For example how is the error calculated for a mixture of loads and intermittent generators all totalized to the same delivery point? What if dispatch instructions are part of a totalization table – does an error in the dispatch instruction count as part of the error budget?

(2) Though logical, this is not practical. What if meter 1 is 0.25% fast and meter 2 is 0.26% slow. The PLUM here should be same as 4.1.2. Maybe 0.75% Multi-point metering is a function of both timing and metering accuracy.

WG Response:

The error budget is calculated on the basis of the maximum errors of the worst contributing meter (it is not cumulative).

4.1.4

(1) *Comment:*

The point of sale is unclear. Is it assumed? In many cases the data is corrected to the point of sale then totalized.

WG Response:

It is not the intent of 4.1.4 to define the point of sale. The purpose of the diagrams in Appendix 1 was to demonstrate the effect of the positioning of the tie bus, whether positioned before or after the meter.

(2) *Comment:*

Regarding the diagrams presented in Appendix 1, they do not accurately reflect system conditions; the diagrams should have illustrated that the primary supply continues well upstream when there are multiple network sites.

WG Response:

For purposes of clarification, the wording of the last sentence in 4.1.4 will be revised to read "Example diagrams contained in Appendix 1 are used to demonstrate the relationship between individual supply MVA, coincidental supply MVA, and totalized MVA in various configurations (note: meters M1 and M2 represent one metering position after the switch and meters M3 and M4 represent a metering position before the switch)."

4.1.4 (c)

(1) *Comment:*

It is not clear what "representative" means. Totalizing 1.6 + 1.8 will give 3.4. But is 3.4 representative, or how about 3.5 or 3.0? Please provide a more definitive statement.

WG Response:

"Representative" means that a totalized measurement quantity should be the same as if a single meter had been used to perform the measurement (as demonstrated in Appendix 1).

(2) *Comment:*

According to this statement this applies to loads only. Generation is not considered when the demand is totalized. Is this what was intended?

WG Response:

The word "loads" will be changed to "power" to clarify this further.

(3) *Comment:*

How does this affect summation current transformers (CTs)? Does this mean they can no longer be used and must be broken up when additional metering installations are installed?

WG Response:

The requirements do not prohibit the use of summation Cts.

4.1.5

(1) *Comment:*

Please define "true value"?

WG Response:

In section 4.1.5, the term "true value" is a general term which means that the process used to determine the measured value (of leading var hours) will result in a value that is traceable to national standards. In reviewing this example, we can see that the term "true value" is really not necessary and it will be removed.

(2) *Comment:*

Changes in processing recommended by the VA WG and repeated here in the LUM document imply changes in rates since the historical processing of varh established a net value that allowed to recognize the value of capacitive varh compared to the cost of inductive varh. We made a comment to this effect in the recommendations for VA and we repeat the same comment here.

WG Response:

Comment noted. It is recognized that the changes may result in a need to change rates and tariffs across Canada due to the fact that some rate structures had been previously established based on various definitions of LUM. However, this will benefit all Canadians as the VA LUM will now be established on an equal basis (ie., a VA quantity in British Columbia will not differ from a VA quantity measured in Québec).

4.1.6

(1) *Comment:*

It is recommended that VA/VAh be calculated from watts and vars on a continuous accumulation of incremental values regardless of which quadrant the vars exist during the integration interval. It is argued that requirement to compute VA/VAh from watts and vars may fall outside the practical capability of all meters and outside the legal mandate of MC for the following reasons:

1. The only two quantities which can be directly measured, thus be subjected to verification of measurement accuracy, are VA/VAh and W/Wh.
2. There are no direct means, what-so-ever, to measure vars.
3. In the presence of harmonics and inter-harmonics there is no known mathematical or electricity theory or agreed upon algorithm for the measurement of vars or the conversion of vars to VA or W.
4. It may be possible to perform such conversions by limiting the calculations to the fundamental component only.

Given the above, it is argued that one should not impose a requirement for accuracy or conversion requirement from var, to produce measurable quantities such as VA/VAh and W/Wh.

WG Response:

For the purposes of clarification, sections 4.1.5 and 4.1.6 will be modified as discussed (4.1.5 will address the general utility application of VA demand and leading and lagging

vars; 4.1.6 will be scoped such that the calculation of VA outside the meter is restricted to totalization applications). Regarding MC's legal mandate, refer to WG response in 2.1 of this document.

In response to:

Point 1, this is not correct as voltage and current waveforms are sampled by a meter.

From this information, watts, vars and consequently VA can be determined;

Point 2, vars can be determined directly from voltage and current waveforms;

Point 3, the statement is true and that is exactly the reason why MC needs to establish the defining criteria for VA as a LUM for the purposes of trade measurement in Canada.

MC also needs to establish algorithms for the LUMs of watts and vars within the EGIA, and again will be performed in consultation with industry representatives.

(2) *Comment:*

We do not wish to establish a specific credit on reactive energy, but we want to maintain the integrity of current rates with equilibrium conditions that we consider acceptable.

WG Response:

The approach used by your utility may create a perceived level of equity among your customers, however, the EGI legislation requires that measurement be based on nationally prescribed units of measurement that are consistently established.

Nevertheless, the application of your methods may be addressed through the "varying levels of intervention" policy described in 2.2.3 of this document.

4.1.9

(1) *Comment:*

This level of validation is not practical given the number of meters involved. We may want to look at linking this exercise with compliance sampling. We may also want to have the meter designed with an "approved quantities register". A remote reader can read this register and decode it to determine the approval level of the meter.

WG Response:

The requirements do not require that all meters be involved in the validation.

(2) *Comment:*

At what frequency should the system be validated?

WG Response:

There should be an initial and periodic validation with the frequency based on their quality system. Clarification will be added to 9.3 and 4.1.9 in this regard.

4.1.9 (a)

(1) *Comment:*

Doesn't the process of validation of the SLUM data make it PLUM data? It often includes estimation.

WG Response:

The process of validation does not create PLUM data.

(2) *Comment:*

"Source meter data" needs to be defined. Is the reference pertaining to SLUM meter data?

WG Response:

Source meter data is the SLUM data and meter records prescribed in section 11 of the EGI Regulations.

4.1.9 (a),(b),(c)

Comment:

This policy requires that the source data, transported data, and the PLUM data be retained. This will drive up data storage costs. Have studies be done on what the impact of this increased storage is to the consumer? In our market, data storage is becoming an onerous requirement. With this document it now seems that the following information will have to be stored:

- Source meter data
- Transported data
- PLUM data (that has undergone a validation process)
- Edited data
- Estimated data
- Totalized data without contract adjustments
- Totalized data with contracted adjustments (e.g. losses).

WG Response:

We recognize that the data requirements may raise costs. However, in order to allow LUM to be established outside of an approved meter (which requires more complicated metrological controls), it will be necessary to retain this additional data to help reconcile measurement information during validation and dispute investigation.

4.1.9 (d)

(1) *Comment:*

The contractor is unclear when the meter owner is not the seller. In our province's wholesale market this has been a source of frustration with the EGI Act & Regs. The wholesale metering installation is owned and maintained by the market participant who is therefore both purchaser and contractor.

WG Response:

The definition of contractor is currently defined in the EGI legislation and is beyond the scope of this WG to address. This matter is expected to be addressed during the review of EGI legislation.

(2) Comment:

The contractor is unclear when the meter owner is not the seller. Please provide clarification.

WG Response:

The EGI legislation currently prescribes that the contractor has the same responsibilities as a meter owner, but does not necessarily have to be a meter owner.

4.2.2

Comment:

In many cases, meters that currently have cumulative registers are accessible only by using manufacturer software. This clause would require that these meters would have to be reprogrammed in order to display these quantities. There appears to be no benefit to our ratepayers who would ultimately have to absorb these reprogramming costs. Current inspection activities do verify cumulative register capabilities and accuracy. Remove this clause.

WG Response:

This requirement was established to support the telemetering policy in MC bulletin Gen-33. Under this policy, telemetering devices are permitted to be used without verification on the condition that a purchaser can see the measurement values consumed.

4.2.2 (c)

Comment:

What is the timeline for developing this algorithm? It is our understanding, that currently, there is no process for MC to authorize the energy PLUM calculation outside a meter. Would MC have to authorize totalization tables? In what time frame can approval be expected? This is not a practical requirement and will be very difficult to implement and manage...please provide clarification. Detail regarding the algorithm should be provided such as: authorization form, length of authorization, title of person to perform authorization, and examples of acceptable algorithms.

WG Response:

MC does not intend to review and authorize totalization tables. Where "authorization by MC" was stated, this was meant to mean that the LUM generic algorithms comply with those which will be specified by MC according to the VA and LUM Recommendations (refer to Appendix 2 of the LUM Recommendations).

4.2.3. (d),(e),(f)

Comment:

The method is possible if you use snapshots. The snapshot feature hold a record of the registers at time=0, and then again at time= t minutes. This is the same as with load profile.

WG Response:

This approach is not allowed for a single point of revenue metering: the VA WG has identified that the VAh quantity is influenced by the frequency of calculation when load varies within a given interval (refer to 5.1.5 of VA Final Report). The LUM WG reached consensus that to replicate the required frequency of calculation outside a meter, and sustain the accuracy in measurement, is impractical. It should be noted that the LUM WG recommendations are not intended to limit applications that are not related to revenue metering.

4.2.4. (d)

Comment:

Again, this method is possible if snapshots or load profile used.

WG Response:

The application of snapshots of multiple points of metering is considered to be a form of load profile as defined in the LUM Recommendations. With regards to the application of load profile, please refer to section 4.5.4.

4.2.4 (c),(d)

Comment:

Itron Enterprise Edition (IEE) software can totalize these values and we do not plan on adding any restrictions to this capability.

WG Response:

For the purpose of legal metrology, the totalization of VAh energy SLUM cannot be used to generate VAh PLUM.

4.2.4 (e)

Comment:

IEE supports aggregation on same or wait to aggregate whenever the data arrives. There is no restriction to force calculations on same day.

WG Response:

The utility needs to utilize the software so that the meter data is read and aggregated on the same day, for the purpose of totalization.

4.2.5 (comment also applies to 6.4, 7.5, 9.4, 10.2)

Comment:

Clarify what “authorization” means.

WG Response:

It means upon the acceptance and signature of the responsible MC authority.

4.3.2

Comment:

The cumulative demand register can be used to verify previous max demand readings of existing meters.

WG Response:

This method does not allow you to determine which demand reading was incorrect and is inadequate for the purpose of dispute resolution.

4.3.2 (a)

Comment:

Interval data is in fact demand data which is written over in time. Does this mean meters must track each peak interval based on billing period? How does the meter determine system coincident peak time?

WG Response:

This requirement applies only when a meter has an internal maximum demand register (refer to section 4.5 for calculating demand from load profile data).

4.3.2 (c)

Comment:

This will require a significant change in the meters in our market. At present none of the meters in the wholesale market are programmed to provide 12 previous maximum demand SLUM readings. Two of the province’s system operator’s listed conforming meter types can be reprogrammed to provide the 12 readings, but the rest cannot. They will have to be changed at considerable cost, likely in the millions of dollars.

Recommendation: Complete final cost benefit.

WG Response:

This requirement applies to newly approved meters only. The implementation date in 4.3.5(a) will be revised from Jan 1, 2010 to 2012. The cost-benefit has been considered in the implementation policies established in the LUM Recommendations.

4.3.2 (e)

Comment:

This appears to be “rate making” which in our province is regulated by our energy board.

WG Response:

Where “authorization by MC” was stated, this was meant to mean that the LUM generic algorithms comply with those which will be specified by MC according to the VA and LUM Recommendations (refer to Appendix 2 of the LUM Recommendations).

4.3.5 (comment also applies to 4.4.5, 4.5.5)

Comment:

The meters in the provincial wholesale market cannot be changed out by Jan 2010...this is insufficient time.

WG Response:

The implementation date for the placement of newly approved meters into service in 4.3.5(a) will be revised from Jan 1, 2010 to the same date in 2012. Any new meters installed as of this date shall meet the requirements of the LUM Recommendations. Meters currently in service will be permitted to be used until the end of their service life.

4.3.5 (a)

Comment:

What is the “new compliance sampling plan?”

WG Response:

The EGI legislation authorizes the use of statistical sampling for the purpose of meter verification and reverification at periodic intervals. Compliance sampling is used to select in-service meters from homogeneous lots which will be inspected for reverification (the objective is to determine whether or not meters remain in compliance with requirements established pursuant to the EGI legislation). The implementation date for the LUM Recommendations was selected was intended to coincide with expected milestones of the MC/industry compliance sampling project.

4.3.5. (b)

Comment:

Did you mean “.....date specified in 4.3.5.(d) ? (My doc has 4.3.5.1.)

WG Response:

This was a typographical error...the clause should read 4.3.5(a).

4.3.6. (b)

Comment:

Again, the Cumulative Demand Register (CDR) is intended to verify Previous Max Demands. CDR is a feature in all current electronic meters.

WG Response:

This method does not allow you to determine which demand reading was incorrect and is inadequate for the purpose of dispute resolution.

4.4.2 (a)

Comment:

Please clarify "load profile functionality".

WG Response:

Refer to the definition of load profile in section 3 of the LUM Recommendations.

4.4.2 (c),(d)

Comments:

(1) This will have a major impact on the province's wholesale market. Our utility completes approximately 500 totalization tables every year and to have them authorized by MC in a timely manner is going to be very difficult, and likely not practical.

(2) This will have a major impact on provincial wholesale markets. Having all totalization tables authorized by MC in a timely manner is going to be very difficult, and likely not practical. Please provide clarification.

(3) In many cases, meters that currently have cumulative registers are accessible only by using manufacturer software. This clause would require that these meters would have to be reprogrammed in order to display these quantities. There appears to be no benefit to ratepayers who would ultimately have to absorb these reprogramming costs. Current inspection activities do verify cumulative register capabilities and accuracy. Remove clause.

(4) Would MC have to authorize totalization tables? In what time frame can approval be expected? This is not a practical requirement and will be very difficult to implement and manage. Please provide clarification.

WG Response:

With respect to comments (1), (2) and (4), MC does not intend to review and authorize totalization tables. Where "authorization by MC" was stated, this was meant to mean that the LUM generic algorithms comply with those which will be specified by MC according to the VA and LUM Recommendations (refer to Appendix 2 of the LUM Recommendations). Regarding comment (3), it should be noted that in-service meters

which currently do not provide an indication display may remain in-service until the end of their service life (as per the implementation recommendations in this document), and will not need to be reprogrammed to provide a display while in service.

4.4.3 (b)

Comment:

The proposal is not clear concerning processing that includes the vars sign or not. We propose to be able to count, outside the meter, the vars while taking the sign into consideration to allow the same processing as that used for subscribers served from a single metering point or from multiple metering points.

WG Response:

Refer to WG response in 4.1.6 of this document.

4.4.3 (d),(e),(f)

Comments:

(1) This recommendation needs to be explained. Why is this not acceptable?

(2) The calculation of Wh load profile data may be converted to W demand and varh load profile data may be converted to var demand; however, Wh load profile data and varh load profile data cannot be used to calculate VA demand. This is a well-established industry practice that makes use of standard engineering principles. This would have a drastic impact to current billing systems, which would require reconfiguring. It would also require the organization to run two independent programs to capture the meters using current programs and those that meet the requirements of this document. This would be extremely costly and could introduce errors into the billing system. Remove this clause. Follow the same principles as for multiple or totalized meter points.

(3) Some meters can record very low intervals, less than one minute. This is the basis of "smart metering". The meter records very low interval data (1-5 min) for one or more hours, sends it up the network, and then overwrites the previous record. Any two meters on a network can be time synched to less than a few seconds.

WG Response:

This approach is not allowed for a single point of revenue metering: the VA WG has identified that the VAh quantity is influenced by the frequency of calculation when load varies within a given interval (refer to 5.1.5 of VA Final Report). The LUM WG reached consensus that to replicate the required frequency of calculation outside a meter, and sustain the accuracy in measurement, is impractical. It should be noted that the LUM WG recommendations are not intended to limit applications that are not related to revenue metering.

4.4.3 (d),(f)

Comment:

Converting SLUMs to energy PLUMS...IEE does not place any restrictions on these unit type of calculations.

WG Response:

Please refer to WG response in 4.2.4.

4.4.4 (d),(i)

(1) *Comment:*

Load Profile interval length does not exceed 3 minutes. This is a business rule and will not be restricted in IEE.

WG Response:

The interval length will be increased to 5 minutes as per the VA Recommendations.

(2) *Comment* (also applies to 4.5.4(d),(i)):

Implementation of the 3 minute subinterval would render the mass majority of interval-metering assets obsolete since current meter memory will not accommodate this requirement. A phase-in approach would impact current billing systems that would require additional reprogramming to meet the metering requirements. This will directly impact an organization's operational costs. Based on our review, the practice of moving to five sub-intervals is not standard in any other jurisdiction, including the United States. That could result in trade barrier restrictions, less competition in meter sales and higher prices to Canadian utilities, and thus Canadian consumers. The interval should align with the sub-interval length as specified by the VA JWG. This clause should be changed to: "The load profile interval length does not exceed five minutes".

- The implementation date should be aligned with the VA Recommendations.

WG Response:

The WG recognizes the limitation raised and has agreed to implement the changes recommended by VA to increase the subinterval requirement. For a totalization application where VAh is calculated, the interval length shall be as short as possible with a maximum of 5 minutes.

4.4.4 (e)

(1) *Comment:*

It is not known whether available devices and systems can ensure that all the meters involved in a totalization table are within 9 seconds of each other. This proposed time requirement needs to be increased. Looking at the results from our market, it is not

practical to meet such a tight tolerance. And what happens if they are not within 9 seconds?

WG Response:

We assume your comment refers to the wholesale market. If so, accurate totalization requires tight time synchronism. Stakeholders may seek the “no intervention” option or apply the requirements recommended by the LUM Workgroup. Regarding the time synch criteria in 4.4.4 (e), this should have been number 4.4.4 (d)(iv) as it is a condition of totalizing Wh energy SLUM load profile data and varh energy SLUM load profile data for conversion into a VAh energy PLUM.

(2) *Comment* (also applies to 4.4.4(f)):

Meter's real time clock synched within tolerance of 9 seconds. Service Mode only supports *minute* limitations today. *Seconds* limitations could be incorporated if communications can support time resolution for *seconds*.

WG Response:

Following the issue of the LUM Recommendations for consultation, we have been advised that Second Mode can support time resolution in seconds.

4.4.4 (f)

Comment:

+/- 90 seconds over what period?

WG Response:

At any point in time, +/- 90 seconds is the tolerance in relation to the national standard time reference.

4.4.5. (b)

Comment:

A more important feature is time “drift”. The meter should stay within +/- x seconds over y interval. Most “smart meters” are without a real-time clock, they do however have a timing mechanism that is clocked or driven by the potential line synch. After the network communication system synchronizes the meter (program real time), the meter continues to maintain time using the potential line synch. From time-to-time the network will check the meter to see if it is “in synch”, if it is not a “time synch” is applied.

WG Response:

Comment noted and will be considered at the review cycle for this document following implementation.

4.5.2 (c)

Comment:

In many cases, meters that currently have cumulative registers are accessible only by using manufacturer software. This clause would require that these meters would have to be reprogrammed in order to display these quantities. There appears to be no benefit to our ratepayers who would ultimately have to absorb these reprogramming costs. Current inspection activities do verify cumulative register capabilities and accuracy. Remove this clause.

WG Response:

Refer to WG response in 4.2.2.

4.5.2 (d)

Comments:

(1) If this includes all the totalization tables for the transmission capacity charges in our province, then as noted before, this is likely not practical.

(2) What is the timeline for developing this algorithm? It is our understanding, that currently, there is no process for MC to authorize the demand calculation outside a meter. Would MC have to authorize totalization tables? In what time frame can approval be expected? This is not a practical requirement and will be very difficult to implement and manage. Please provide clarification. Detail regarding the algorithm should be provided such as: authorization form, length of authorization, title of person to perform authorization, and examples of acceptable algorithms.

WG Response:

MC does not intend to review and authorize totalization tables. Where “authorization by MC” was stated, this was meant to mean that the LUM generic algorithms comply with those which will be specified by MC according to the VA and LUM Recommendations (refer to Appendix 2 in LUM Recommendations). With respect to the timeline for developing/applying the algorithms the implementation policies in 4.5.5 will apply.

4.5.2 (e)

Comment:

Implementation of the 3 minute sub-interval would render the mass majority of interval-metering assets obsolete since current meter memory will not accommodate this requirement. A phase-in approach would impact current billing systems that would require additional reprogramming to meet the metering requirements. This will directly impact an organization’s operational costs. Based on our review, the practice of moving to five sub-intervals is not standard in any other jurisdiction, including the United States. That could result in trade barrier restrictions, less competition in meter sales and higher prices to Canadian utilities, and thus Canadian consumers. The interval should align with the sub-interval length as specified by the VA JWG. The clause should be changed to: “The length of a demand interval shall be 15 minutes, comprised of 3 five-minute

sub-intervals". The implementation date should be aligned with the grandfathering clause as specified by the VA JWG

WG Response:

Pursuant to the VA WG recommendation, the LUM WG has agreed to increase the sub-interval for calculating demand to 5 minutes. For a totalization application where VAh is calculated, the interval length shall be as short as possible with a maximum of 5 minutes. The implementation dates will be reviewed and re-aligned.

4.5.2 (f)

(1) *Comment:*

How is this to be verified? Does this apply to type testing only?

WG Response:

This would be done during both type approval and data validation. For the purpose of data validation, the time error per download frequency (e.g., every 24 hours) divided by the number of 15 minute intervals downloaded since the last time synchronization represents the average demand interval timing error.

(2) *Comment:*

What standard is this based on? Remove this clause.

WG Response:

This was based on a common metrological practice for electricity devices in which the contributing elements for the measurement are 1/10th of the total allowable tolerance (in this case, the tolerance for the meter is 1% so the contributing demand interval tolerance is 0.1%).

4.5.2 (g)

(1) *Comment:*

Please define true value in this section?

WG Response:

The calculation of error "relative to the true value" means establishing the error of the value determined by the measurement process in relation to the value that would be determined using a reference meter, certified and traceable to national standards, corrected for any known bias error indicated on the certificate.

(2) *Comments:*

- Does this exclude instrument transformer errors? The SLUM load profile data in the meter would include such inaccuracies and perhaps it should be made clear that they are to be excluded from the error tolerance.

- It is not clear how the measurement error budget for the meter will be calculated. Is instrument transformer accuracy and errors excluded from the budget? Determination of this tolerance would increase meter test times during verification. Is this a general requirement or is it a requirement for individual meters? How would this work on in field devices? How often would this have to be verified? What records would have to be maintained? If this recommendation is implemented, costly automated processes would have to be developed to track this error. Meter accuracy is determined during verification and reverification. MC's governance resides with the device and not the software that interrogates the devices or the billing systems that use the data. Electrical engineering principles for calculating PLUM from SLUM would not introduce additional errors. Examples showing how the error is to be calculated would be beneficial. Also, clarify whether instrument transformer errors are excluded from the budget.

WG Response:

This excludes instrument transformer errors. Regarding MC regulation authority, refer to WG response in clause 2.1 of this document.

4.5.2 (i)

Comment:

This is an onerous requirement. The daily time adjustments in our market can often exceed +/- 2 seconds. Having to discard data that exceeds this limit and use estimated data instead, may in fact degrade the accuracy of the data. And to do this for all intervals that exceed this limit will be a daily manual task at additional expense.

WG Response:

Only one 5 minute subinterval would need to be discarded if it was involved in the establishment of maximum peak demand. In this case, the demand could be determined using the remaining 5 minute interval data. For the purpose of clarification, the second sentence in this clause will be removed from the LUM Recommendations: "Intervals where the time adjustment exceeds 0.2% of the interval length (e.g. 15 min +/- 2 sec) shall be discarded."

4.5.2 (j)

Comment:

Unless the corresponding cumulative register (CCR) has the same start and stop time as the load profile record, you cannot use the CCR to verify the load profile.

WG Response:

The WG recognizes that using the CCR for validation of load profile data is not the most precise method, however, with a daily download frequency (every 24 hours) of meter data using the maximum 5 minute data interval, the maximum timing error would be 0.35% per day.

4.5.2 (k)

(1) *Comment:*

We can provide documentation on our calculations...it is unrealistic to change calculations based on every meter.

WG Response:

Using the same algorithm will permit meaningful validation of the PLUM calculation.

(2) *Comment:*

Demand quantities are sometimes totalized system demands that are not always done on a per meter basis.

WG Response:

With regards to the display of SLUM demand, this applies only to the demand measured by contributing meters. In the case of totalization, the WG does not intend to require the display of either the PLUM or the totalized values of demand.

(3) *Comment:*

Some of the LUM JWG's recommendations will make it extremely difficult for utilities to implement a smooth transition to the VA JWG's recommendations and will create inequity between customers in the same rate class. As an example, consider a utility that needs to transition from a 30-minute block demand to a 15-minute sliding window with 5-minute sub-intervals. Because 15-minute sliding window demand readings will generally be higher than a 30-minute block, this transition will likely require a rate change. The utility would generally prefer to move all customers in a particular rate class to the new rate at the same time to avoid any potential inequity. This transition could be facilitated by recording 5-minute interval data and calculating demand outside of the meter. On the date of the transition, the utility could change this external demand calculation from a 30-minute block to a 15-minute sliding window because the 5-minute interval data supports both demand calculations. However, this option is precluded by the requirement to calculate and display the maximum demand SLUM in the meter using the same algorithm as the demand PLUM calculation outside the meter, because it means that the external calculation can't be changed until the meter can be removed from service and reprogrammed. This makes it impossible to transition all customers to the new rate at the same time, resulting in inequity.

- Remove clause 4.5.2 (k). Since the LUM JWG's mandate is to reduce potential inequity, requirements such as this which could create inequity should be removed. Alternatively, this could be addressed through a grandfathering clause in the LUM requirements.

- Review the remainder of the document to ensure that there are no other requirements that could prevent a utility from implementing an equitable transition to a new rate.

WG Response:

We recognize that a transition period will be required by the industry to align the PLUM algorithm with the SLUM algorithm and that this may take a number of years. We also understand that a potential inequity may exist during the transition period, however, this is considered normal given that an extended period has been provided to implement the necessary changes (note that the implementation schedule has been established to offset the cost impact associated with the required changes). As a result of comments received, the implementation policy has been amended to allow meters currently in use to remain in service until the end of their service life. This is intended to address the issues raised by many industry stakeholders about stranded assets.

4.5.2 (m)

Comment:

This will require a significant change in the meters for some CEA member utilities at a considerable cost. At present, meters in the wholesale markets are not programmed to provide 12 previous maximum demand SLUM readings. The vast majority of these meters cannot be reprogrammed to be compliant with this requirement. Therefore, all these meters would have to be replaced with new meters at a significant cost. Retaining the last 12 demand reads within the meter will have an impact on the memory capabilities of the meter. This will be magnified in the case of a multi-function meter, which contains multiple demand quantities. In addition, the increased intervals that will be required, the meters may become obsolete and will need to be replaced. Since this will have direct impact on our ratepayer an assessment must be conducted. We are already obligated as per the EGIA to retain all billable readings for the life of the meter; therefore, this requirement seems redundant. Existing meters should be exempt from this clause.

WG Response:

It should be noted that recommendation pertains to new meters only. As per the LUM implementation recommendations, in-service meters which currently do not provide this required feature may remain in-service until the end of their service life (as per the recommendations in this document), and will not need to be reprogrammed to provide this feature while in service.

4.5.2 (n)

Comment:

However it needs to be made clear what is meant by 0.6%, namely to what standard.

WG Response:

Refer the MC type approval specification LMB-EG-07

4.5.3 (d)

(1) *Comment:*

The calculation of Wh load profile data may be converted to W demand and varh load profile data may be converted to var demand; however, Wh load profile data and varh load profile data cannot be used to calculate VA demand. This is a well-established industry practice that makes use of standard engineering principles. This would have a drastic impact to current billing systems, which would require reconfiguring. It would also require the organization to run two independent programs to capture the meters using current programs and those that meet the requirements of this document. This would be extremely costly and could introduce errors into the billing system. Remove clause. Follow the same principles as for multiple or totalized meter points.

WG Response:

This approach is not allowed for a single point of revenue metering: the VA WG has identified that the Vah/VA quantities are influenced by the frequency of calculation when load varies within a given interval (refer to 5.1.5 of VA Final Report). The VA WG reports that from the perspective of demand calculation, an interval of 180 seconds with an update cycle of less than 1 second could result in a calculation error of approximately 0.5% of the change in load over the sample interval. The LUM WG reached consensus that to replicate the required frequency of calculation outside a meter, and sustain the accuracy in measurement, is impractical. It should be noted that the LUM WG recommendations are not intended to limit applications that are not related to revenue metering.

(2) *Comment:*

This is in conflict with section 4.1.6

WG Response:

Refer to WG response in 4.1.6 of this document.

4.5.3 (d),(e),(f)

(1) *Comment:*

Possible if the LP interval is very small. In high end meters the interval can be programmed for very small intervals (Q1000 2 Seconds, Sentinel 1 Minute).

WG Response:

This approach is not allowed for a single point of revenue metering, the VA WG has identified that the Vah/VA is influenced by the frequency of calculation when load varies within a given interval (refer to 5.1.5 of VA Final Report). The VA WG reports that from the perspective of demand calculation, an interval of 180 seconds with an update cycle of less than 1 second could result in a calculation error of approximately 0.5% of the change in load over the sample interval. The LUM WG reached consensus that to replicate the required frequency of calculation outside a meter, and sustain the accuracy

in measurement, is impractical. It should be noted that the LUM WG recommendations are not intended to limit applications that are not related to revenue metering.

(2) Comment:

Converting SLUMs to maximum demand PLUMS. IEE software does not place any restrictions on these unit type of calculations.

WG Response:

Refer to other WG responses regarding IEE software in this document.

4.5.4 (e)

Comments:

(1) This is a very onerous requirement. Synchronizing time, collecting the meter data using differing means of communication (land line, cell phone, satellite), and totalizing over a province wide system is a challenging task. Compound this with the reality that electrical system time can vary from atomic clock time by more than 10 seconds, and this requirement will be difficult to meet. Add to this the task of negotiating of settlement in all cases, and it makes it harder still. This section should be re-examined. Left untouched, the section may mean that all the meters have to be converted to a GPS clock - at considerable expense.

(2) The wording is unclear and appears to relate to the synchronization of multiple profiles of a given meter; we have interpreted that the recommendation applied to profiles from several meters required for totalization. In this context and in light of the size of large business customer loads and the technologies available, a margin of 9 seconds for synchronizing meter profiles is in our opinion far too high and should be set at a maximum of one second for customers who use more than 5 MW of electricity.

WG Response:

Refer to WG Response in 4.4.4(e).

4.5.4 (e),(f)

Comment:

Meter's real time clock synched within tolerance of x seconds. Service Mode only supports *minute* limitations today. *Seconds* limitations could be incorporated if communications can support time resolution for *seconds*.

WG Response:

Refer to WG Response in 4.4.4(f). We have subsequently been advised that Service Mode can now support the time resolution in seconds.

4.5.4 (f)

(1) *Comment:*

We would support “drift” more than synchronization to a reference standard.

WG Response:

Refer to WG Response in 4.4.5(b).

(2) *Comment:*

Why must multiple meters be within 45 seconds when the previous section for single meters the requirement was within 90 seconds? Please explain.

WG Response:

The 90 second requirement applied to totalizing energy whereas 45 seconds was chosen for totalizing demand (which is required to remain consistent in the resolution of measurement data).

4.5.5 (a)

Comment:

Implementation target date is too onerous and does not provide sufficient time. Utility billing systems would have to be reformatted and metering fleets would have to be reprogrammed or disposed of. Target dates should be extended to allow for implementation and other stakeholders such as provincial regulators need to be consulted with to determine a reasonable target date.

WG Response:

The implementation date has been revised to 2012.

4.5.5 (c)

Comment:

Reprogramming all devices at end of initial seal period is not practical, and may not sit well with utilities.

WG Response:

For the purposes of clarification, this requirement only applies to meters where demand is being calculated outside of the meter. The WG understands that this will only involve a very small number of meters.

5 - General

Comment:

What would the different levels of verification be? Will MC be auditing MV90 and billing systems? Please provide clarification.

WG Response:

The functions on contributing devices used in the generation of SLUM will first be examined during type approval and inspected during verification (criteria with regards to timing and resolution will vary depending the anticipated application). MV90 does not generate SLUM and will not be subject to approval and verification. However, it may be subject to review as part of the PLUM validation process.

5.1

Comment:

This is an onerous requirement as it requires software systems and totalization tables in use by our utility to be approved by MC. Our utility builds about 500 totalization tables per annum with strict time requirements and it will not be practical to get approval in each case. Any changes to the software will also require MC approval. This will be a very restrictive requirement.

WG Response:

This requirement applies only to SLUMs and not PLUMs. Refer to previous WG response in 4.2.2©).

6.2.1

Comment:

The comment appears to us to contradict Annex 1, which clearly shows that a distinction must be made between inductive reactive power and capacitive reactive power in VA calculation to arrive at a physically correct value.

WG Response:

Clarification will be provided through an editorial amendment to this clause.

6.3.5.

Comment:

Please define true value in section 6.3.5?

WG Response:

The calculation of error "relative to the true value" means establishing the error of the value determined by the measurement process in relation to the value that would be determined using a reference meter, certified and traceable to national standards, corrected for any known bias error indicated on the certificate.

7. General

Comment:

An amendment and adaptation of standard LMB-EG-07 (section 7.3) is recommended with regard to testing and technical requirements. Also, MC wishes to adopt the standards of the *Organization Internationale de la Métrologie Légale* (OIML) IR46. Do the amendments proposed in your document and the referenced OIML standard refer to the same amendments?

WG Response:

MC has not adopted any applicable OIML standard at this time but is working as a workgroup on the OIML committee overseeing these requirements. The Agency's policies are developed in consideration of the recommendations and direction of OIML standards.

7.3.2

Comment:

The maximum permissible error for a conversion device at +/- 0.01% is too low. At present the province's system operator cannot achieve this value in all circumstances. To get below this limit some of the system operator software will have to be reworked at considerable expense. Considering the accepted inaccuracies in measurement (current transformers: 0.3%, voltage transformers: 0.2%, meters: 0.2%, the errors due to secondary leads, non-Blondel configurations, etc), is it reasonable to have such a low limit?

WG Response:

The intent of this requirement has been misunderstood. The requirement applies only to the devices generating the original SLUM.

8.2.1

Comment:

This should be left as is. For a certain customer in the provincial wholesale market, this level of error will not be attainable

WG Response:

The intent of this requirement has been misunderstood. The requirement applies only to the devices generating the original SLUM.

8.3.3

Comment:

Is this 9 or 90 seconds? OK for 90, not OK for 9 seconds which as noted before is difficult to achieve

WG Response:

The requirement is 90 seconds as this does not apply to the calculation of demand or VAh.

8.3.4

Comment:

Given the size of the large business customer loads and the technologies available, a tolerance of 9 seconds on the comparison of the data seems far too long and should be set at a maximum of one second for customers that use more than 5 MW of electricity.

WG Response:

Comment noted by WG and we recognize that tighter time synchronization would be preferable. A clarification in this regard will be added to the rationale notes.

8.3.6

Comment:

No decision rationale in the appendix

WG Response:

The rationale was moved within this clause.

9. General

Comment:

It is not clear how MC intends on monitoring data transportation. Encoder register comparison to load profile data may be the only way to guarantee data transport accuracy, however, it would require the replacement of some metering assets. How would this impact other interrogation platforms? What about ERT module devices?
- Please provide clarification.

WG Response:

It is the responsibility of the contractor to evaluate their system using the data validation method referred to in 9.3 (section 4.1.9) This system may also be subject to MC review. This clarification will be included in the LUM Recommendation in this section.

9.1

Comment:

The Measurement Canada Task Force on Data Communications Protocol for Electronic Metering Devices has collaborated for over 10 years with ANSI and IEEE to produce metering Standards the address and implementations that address these requirements. As a minimum it is recommended that the following Standards should be reference as practical solution that can be deployed and tested as per Measurement Canada requirements:

1. MC12.19 / IEEE 1377 / ANSI C12.19 - 2008, Utility Industry Metering Communication Protocol Application Layer Standard (End Device Data Tables);

2. MC12.22 / IEEE 1704 / ANSI C12.22 - 2008, Local Area Network/Wide Area Network (LAN/WAN) Node Communication Protocol to complement the Utility Industry End Device Data Tables

These Standards were developed over the past 10 years and work concluded in 2007. The Standards give full consideration to MC requirements as indicated in the LUM Recommendations and the EGI legislation and derivative documents.

WG Response:

The application of recognized communications protocols remains an important consideration and will be evaluated further (in consideration of the assessment criteria specified in 9.2) once clear requirements have been created in this regard.

9.2.1 (c)

Comment:

It is likely this requirement will result in the replacement of all the meters in the provincial wholesale market. Recommendation: A separate working group be convened to review this policy recommendation in detail.

WG Response:

The intent of the requirement has been misunderstood. Contractors are not required to use automated means of authentication of transported data. The validation method prescribed in 4.1.6 can be used to perform this authentication. Automatic authentication processes may be used in the future when acceptable standards become available.

11.1

Comment:

It is not clear how these criteria will be applied...for example: the frequency of time adjustments. Does this mean that many time adjustments is as a result of the requirements not being met, or is it as a result of diligent time synchronization and hence meets the requirements.

WG Response:

The criteria established pursuant to the LUM Recommendations are subject to periodic review (refer to section 12 of the Recommendations). The intent of the key performance indicators is to provide the next iteration of the JWGs to be able to make informed decisions in the future.

12.1

Comment:

When will the standards policy and requirements be developed? Will they be submitted for stakeholder review? Who will review these and why would they need reviewing?

WG Response:

Refer to Issue Resolution Process developed by MC and industry (on MC website).

8. Conclusion

MC wishes to thank and express its sincere gratitude to all stakeholders who have taken the time to contribute comments and participate in this consultation. The Agency will begin to work on the implementation of the LUM WG Recommendations once approved by MC senior management.

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