

# New MDM/R Billing Service Standard Interface

Toronto Congress Centre  
650 Dixon Road, Toronto Ontario  
Date: October 5, 2010 (9:00 am - 2:00 pm)



# Purpose

- The purpose of this one-day workshop is to introduce stakeholders to the structure and functionality of the new MDM/R Billing Service Standard Interface that will be deployed to support Measurement Canada's register reading requirement for TOU billing invoices.

# Objectives

- During this session we will:
  - Provide an overview of the Measurement Canada issues concerning Time Of Use billing formats in the Province of Ontario
  - Provide a summary of the work completed by the Cumulative Register Read Working Group and related consultations with Measurement Canada
  - Review the MDM/R Universal Solution high level design that will provide support for conformance to Measurement Canada register reading requirements
  - Introduce the new MDM/R Billing Service Standard Interface

# Agenda

- Measurement Canada TOU Billing Issues
  - Measurement Canada Requirements
  - Cumulative Register Reads, Core Issues
- Cumulative Register Read Working Group (CRRWG)
  - Formation
  - Progress to-date
- MDM/R Universal Solution High Level Design
  - Process and functional changes to the MDM/R
- MDM/R Billing Service Standard Interface
  - ‘Register Read Billing Window’ and ‘Execution Window’
  - Characteristics and Functionality
  - Data Parity with existing MDM/R Billing Quantity Interface
- Next Steps for the IESO, LDCs and CIS Vendors

# Measurement Canada TOU Billing Issues



# Measurement Canada Concerns

## Background - Timeline

- **September 28, 2009** - As part of the MEI Consultations regarding loss adjusted usage on billing invoices, Measurement Canada raises the issue regarding the requirement to post cumulative register readings on customer TOU billing invoices.
- **October 29, 2009** - The IESO and Measurement Canada meet to describe and discuss the capabilities of the Ontario Smart Metering System, and specifically the billing invoice information to be provided with regard to the basis of the charge for TOU electricity consumption.
- **November 16, 2009** - Measurement Canada advises the IESO and MEI of the requirements governing the relationships between register read data and interval data when used to apply TOU rates, specifically citing Measurement Canada General Bulletin GEN-25-E and General Bulletin GEN-31-E.

# Measurement Canada Concerns

## Background - Timeline

- **January 6, 2010** - The IESO advised Measurement Canada that the IESO and Ministry of Energy and Infrastructure would “... *help facilitate consultations with the Ontario LDC community to establish the best means to deal with the issues.*”
- **February 10, 2010** - Measurement Canada updates Bulletin GEN-31, rev.1 “... *to clarify that only data from an approved and verified meter may be used for the purpose of establishing the basis of a charge for consumption of electricity ...*” Section 5.7 is added.
- **February 11, 2010** - The IESO and Ministry of Energy initiate consultations to address Measurement Canada’s concerns and form the CRRWG.
- **September 21, 2010** - The MDM/R Universal Solution is agreed by the LDC members of the CRRWG to support conformance with Measurement Canada’s requirements and to be technically viable. Measurement Canada’s representatives informally concur.

# Measurement Canada Requirements

## Multi-rate Metering Applications

- Per Measurement Canada General Bulletin 31-E Rev.1, the solution to be provided must comply with the following requirements:
  - **Ref. Section 5.7.1** Where an apportioned measured value of electricity is derived from a meter which has a single cumulative register, the total registered consumption used for billing must be based on the cumulative value provided by the meter register, that is the current register reading minus the previous register reading.
  - **Ref. Section 5.7.2** The recorded meter register readings used to determine the total registered consumption must be presented on the consumer's billing invoice.
  - **Ref. Section 5.7.3** Where interval measurement values are presented for the purposes of rate application or allocation (e.g. TOU quantities, hourly quantities), the summation of the presented values must equal the total registered consumption established from the approved/verified register readings.

# Cumulative Register Reads - Core Issues

## Existing Ontario Smart Metering System

- Measurement Canada requires the reconciliation of the total consumption quantity to actual register readings, and for the register readings themselves to be on the bill.
  - The MDM/R does not reconcile billing quantities to register readings and does not pass register readings to the LDC billing systems.
  - The LDC billing systems do not present register readings on TOU invoices.
- Two realities exist for the Ontario Smart Metering System as it consists of the several AMI systems and the MDM/R:
  - The MDM/R calculates the billing quantities based on interval data from midnight on the billing period start date to midnight on the billing period end date, and
  - All AMI systems may provide register readings at times differing from midnight with some AMI systems providing register readings at any hour or minute of the day.

# Ontario Smart Metering System - As It Is Today

- For the LDCs using the MDM/R:
  - The design of the MDM/R works around fixed midnight to midnight boundaries for the start and end dates of all billing periods.
  - Only interval data is used in determining TOU consumption in the MDM/R.
  - The billing quantities provided to LDCs for their billing purposes do not include cumulative meter register readings because they do not factor into the MDM/R consumption calculations.
  - No LDC billing their customers on TOU rates using MDM/R billing quantity data is either reconciling consumption quantities to cumulative meter register readings or including these register readings on the customer's bill.

# Cumulative Register Read Working Group (CRRWG)



# Cumulative Register Read Working Group Formation

- On January 6, 2010 the IESO advised Measurement Canada that the IESO and Ministry of Energy and Infrastructure would “... *help facilitate consultations with the Ontario LDC community to establish the best means to deal with the issues.*”
- On February 11, 2010 the Ministry of Energy and Infrastructure (MEI) and the IESO initiated consultations regarding inclusion of cumulative register readings on time-of-use bills.
  - The Cumulative Register Read Working Group (CRRWG) consultations have included representatives from (14) LDCs, Retailers, the Ontario Electricity Distributors Association (EDA), and the Ontario Energy Board (OEB).
  - The CRRWG started work on February 24, 2010.
- On July 21st the CRRWG agreed the formation of a Development Sub Committee (DSC) with the EDA identifying self-selected representatives from (7) CRRWG member organizations.
  - The DSC was formed to more efficiently address detailed technical aspects of the MDM/R Universal Solution and its work has been successfully completed.

# Cumulative Register Read Working Group

## Scope of Work and Progress

- The primary scope of the CRRWG is to address the Measurement Canada concerns for register reads appearing and reconciling on billing invoices for low volume consumers.
  - The initial work of the CRRWG consultation will be complete when reconciliation and verification solutions have been agreed with Measurement Canada for low volume consumers where metering of demand is not required.
- Sixteen working group meetings have been conducted to-date.
  - Two meetings with Measurement Canada on June 14th and again on September 21st to review the proposed MDM/R solution.
  - The MDM/R Universal Solution was agreed by the LDC members of the CRRWG to support conformance with Measurement Canada's requirements and to be technically viable on September 15th.
  - Measurement Canada's representatives expressed agreement with the MDM/R Universal Solution during the September 21st consultation and indicated that they would provide written confirmation in response to an IESO request.

# MDM/R Universal Solution High Level Design



# MDM/R Universal Solution

## Why is the proposed solution a “Universal Solution”?

- Support for register read transmission for all existing Smart Meters
  - While most AMI systems deployed in Ontario generally collect register readings at the top of each hour and provide register readings at midnight, all AMI systems may provide register readings at times differing from midnight.
  - Some AMI systems provide register readings predominantly at any hour or minute of the day.
  - Even if all meter read data transmissions always include a midnight register reading, the need to process register readings associated with meter installation and removal - which will occur at any hour and minute of the day - needs to be supported.
- The MDM/R Universal Solution will determine billing quantities based on the date/time and cumulative values provided by register readings and these register readings will form the basis of billing quantities delivered to the LDCs’ billing systems.

# MDM/R Universal Solution

## Support for All Existing Smart Meters

- The IESO will undertake the modifications necessary to provide a MDM/R Universal Solution for all existing smart meters.
  - The modifications will support the GEN-31-E Rev. 1 requirements.
  - The modifications will support all existing AMI systems where the apportioned measured value of electricity is derived from meters with a single cumulative register.
- Move from the current MDM/R implementation of fixed midnight to midnight billing periods to variable length billing periods driven by the date/time of actual cumulative meter register reads.
  - The reconciliation of total electricity consumption will be from a cumulative meter register reading that determines the start of the billing period to a cumulative meter register reading that determines the end of the billing period.
  - This will assure that the register readings provided on the invoice will coincide with the start and end of the billing period and the sum of TOU or Hourly usage will equal the total registered consumption.

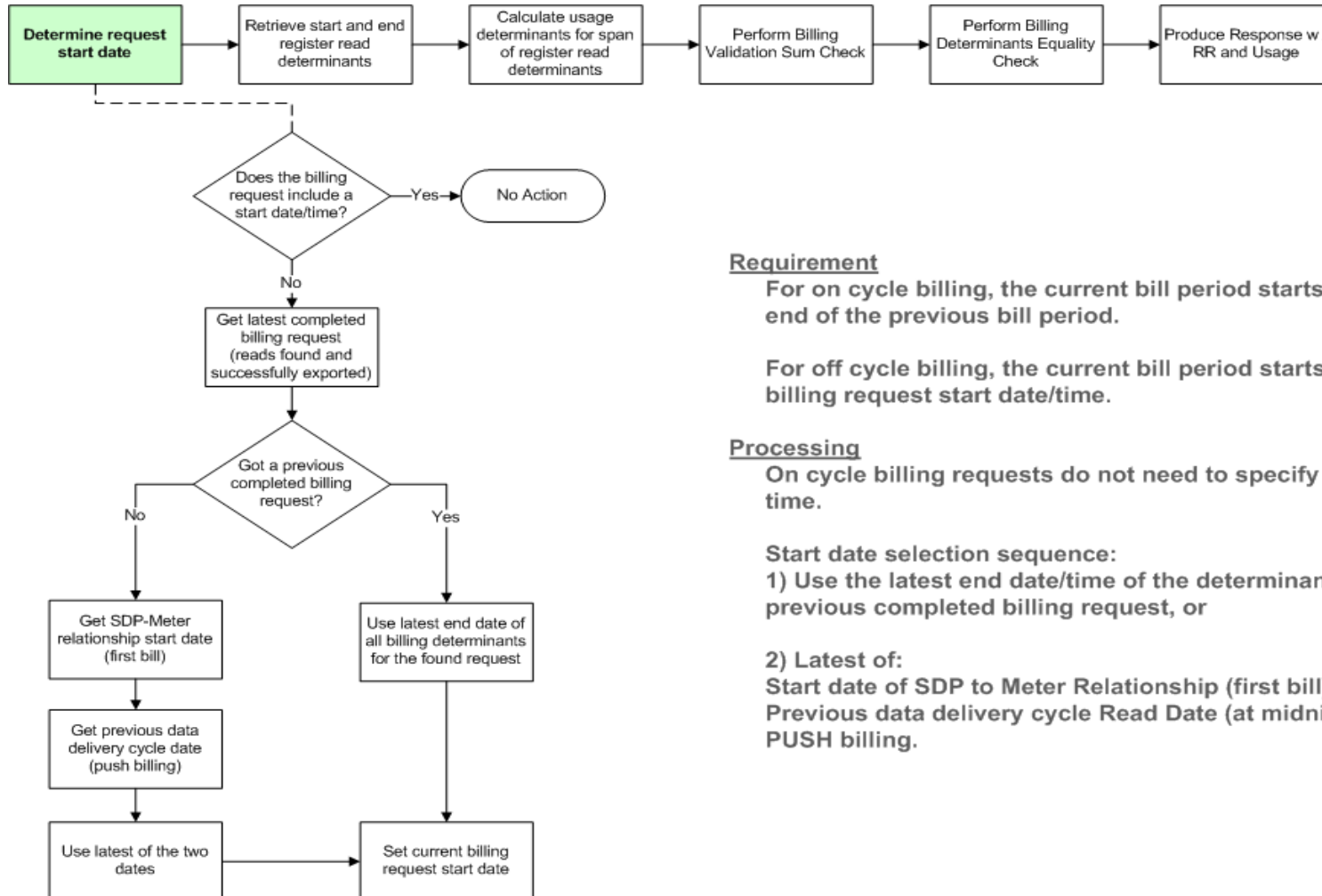
# MDM/R Universal Solution

## High Level Changes Required in *EnergyIP*

- Register Read Billing Period Defined by Start and End Register Reading Date/Times
  - Current TOU and Hourly billing quantity processing uses Billing Request Start and End dates to determine usage and can deliver register readings found within a window around the Billing Request date at midnight.
  - New processing will utilize the date/times of the register readings found within a window around the Billing Request date/times to determine usage.
- Billing Quantity Usage Must Equal Start and End Register Reading Difference
  - Current TOU and Hourly billing quantity processing uses Billing Validation Sum Check to verify that the sum of the intervals between the found register readings are within the sum check tolerance of the register read difference.
  - A new Billing Determinants Equality Check will be used to verify that the total of the usage determinants is equal to the register read consumption.
  - A new Billing Determinants Adjustment process will be used to resolve any variances.

# Universal Solution High Level Design - *EnergyIP*

## Billing Request Start Date Selection Process



### Requirement

For on cycle billing, the current bill period starts from the end of the previous bill period.

For off cycle billing, the current bill period starts from the billing request start date/time.

### Processing

On cycle billing requests do not need to specify start date/time.

Start date selection sequence:

1) Use the latest end date/time of the determinants from previous completed billing request, or

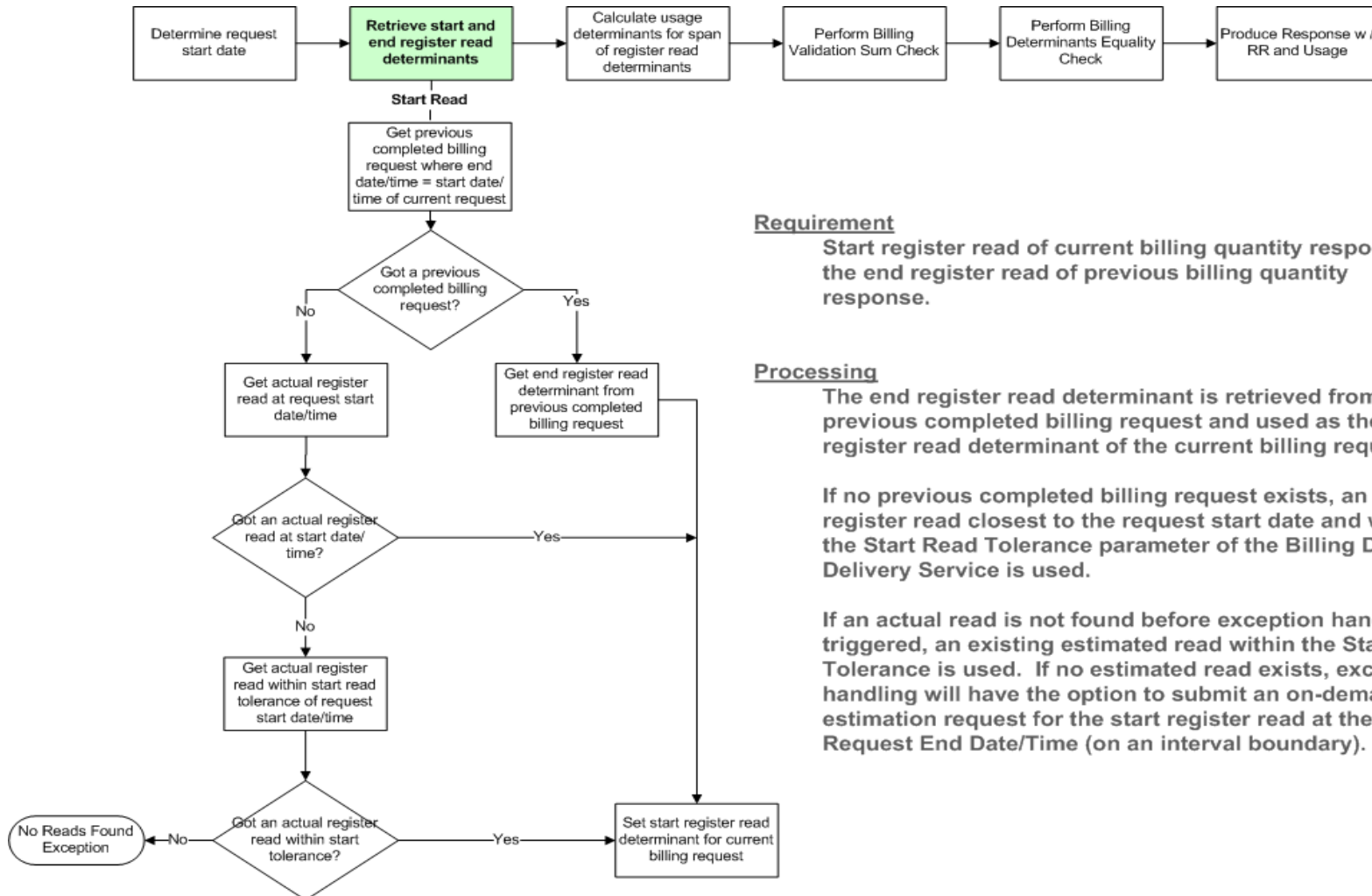
2) Latest of:

Start date of SDP to Meter Relationship (first bill)

Previous data delivery cycle Read Date (at midnight) for PUSH billing.

# Universal Solution High Level Design - *EnergyIP*

## Start Register Read Selection Process



### Requirement

Start register read of current billing quantity response is the end register read of previous billing quantity response.

### Processing

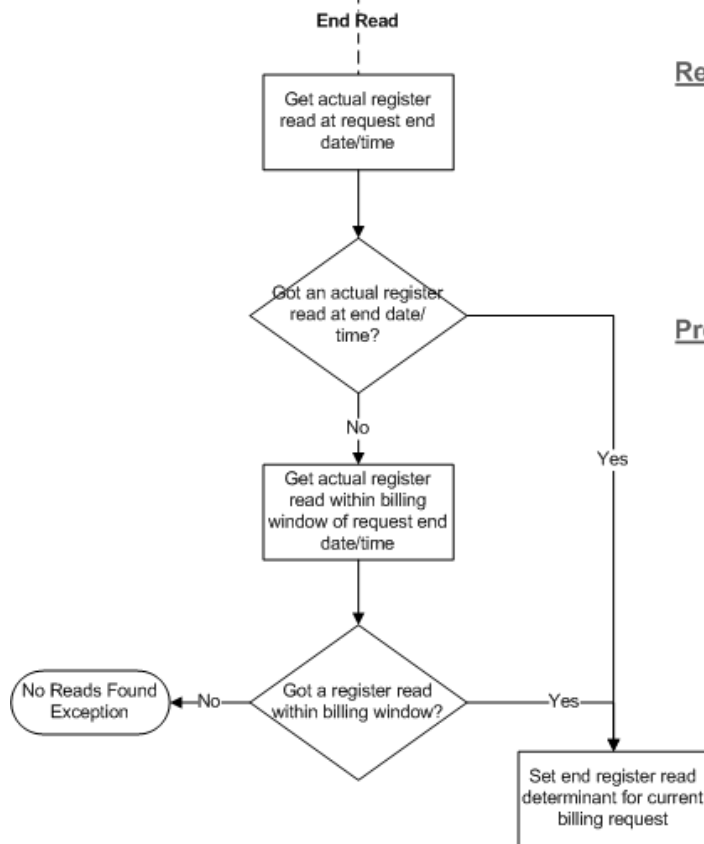
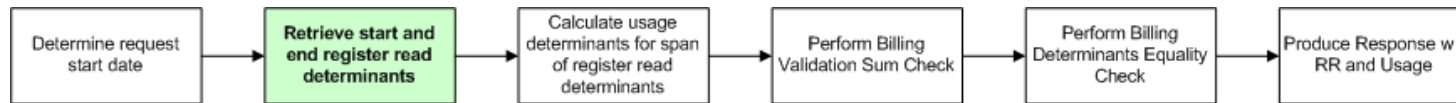
The end register read determinant is retrieved from the previous completed billing request and used as the start register read determinant of the current billing request.

If no previous completed billing request exists, an actual register read closest to the request start date and within the Start Read Tolerance parameter of the Billing Data Delivery Service is used.

If an actual read is not found before exception handling is triggered, an existing estimated read within the Start Read Tolerance is used. If no estimated read exists, exception handling will have the option to submit an on-demand estimation request for the start register read at the Billing Request End Date/Time (on an interval boundary).

# Universal Solution High Level Design - *EnergyIP*

## End Register Read Selection Process



### Requirement

End register read is an actual register read within a Register Read Billing Window.

If an actual register read is not available within the Register Read Billing Window then an estimate may be used.

### Processing

An actual register read closest to the request end date and within the Register Read Billing Window is used.

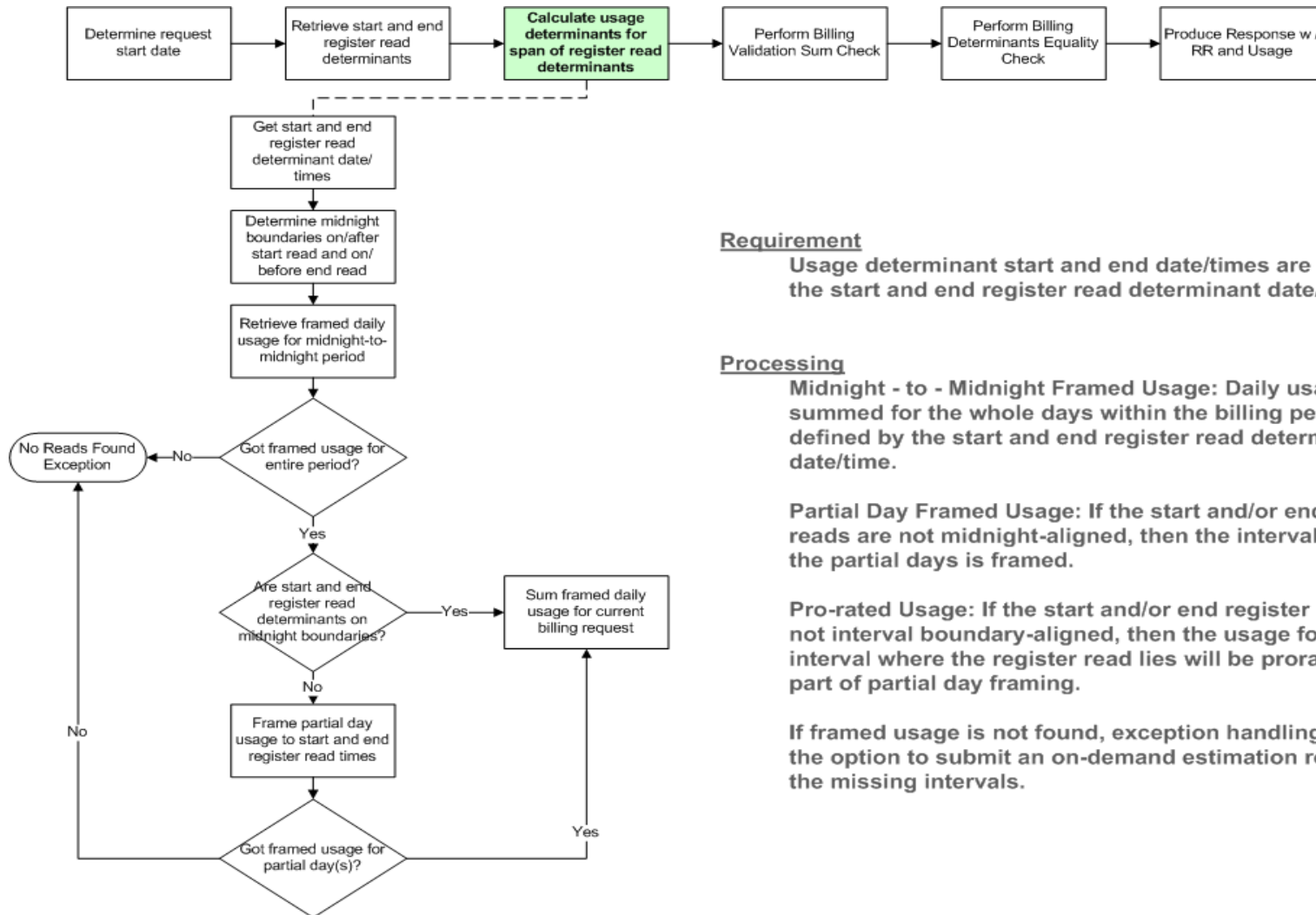
If an actual read is not found before exception handling is triggered, an existing estimated read closest to the request end date/time and within the Register Read Billing Window is used. If no estimated read exists, exception handling will have the option to submit an ODEST estimation request for the end register read.

Register Read Billing Window is used for end register read selection and is established by the Billing Data Delivery Service parameters:

- On cycle request Register Read Billing Window defined by AllowableReadAge and Read Window - Max
- Off cycle request Register Read Billing Window defined by OffCycleAllowableReadAge and OffCycle Read Window - Max

# Universal Solution High Level Design - *EnergyIP*

## Usage Determinants Calculation Process



### Requirement

Usage determinant start and end date/times are defined by the start and end register read determinant date/times.

### Processing

**Midnight - to - Midnight Framed Usage:** Daily usage is summed for the whole days within the billing period defined by the start and end register read determinants date/time.

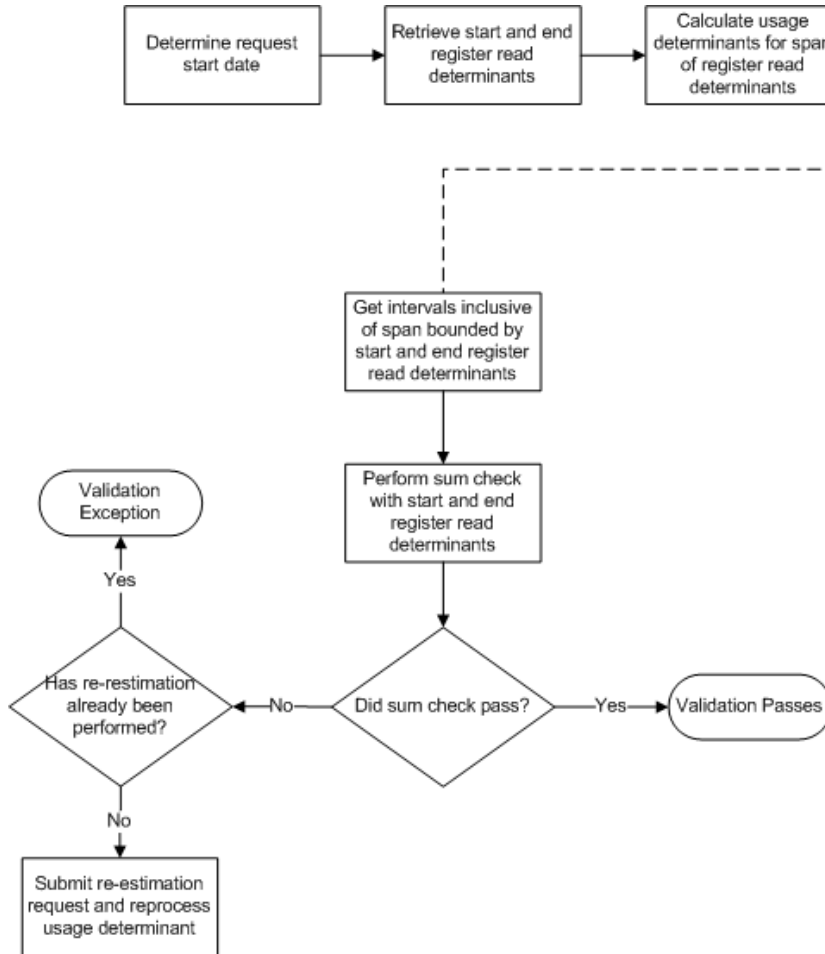
**Partial Day Framed Usage:** If the start and/or end register reads are not midnight-aligned, then the interval usage for the partial days is framed.

**Pro-rated Usage:** If the start and/or end register reads are not interval boundary-aligned, then the usage for the interval where the register read lies will be prorated as part of partial day framing.

If framed usage is not found, exception handling will have the option to submit an on-demand estimation request for the missing intervals.

# Universal Solution High Level Design - *EnergyIP*

## Billing Validation Sum Check Process



### Requirement

Total TOU or Hourly usage must equal the difference between the start and end register reads used for the bill period within a non-zero tolerance.

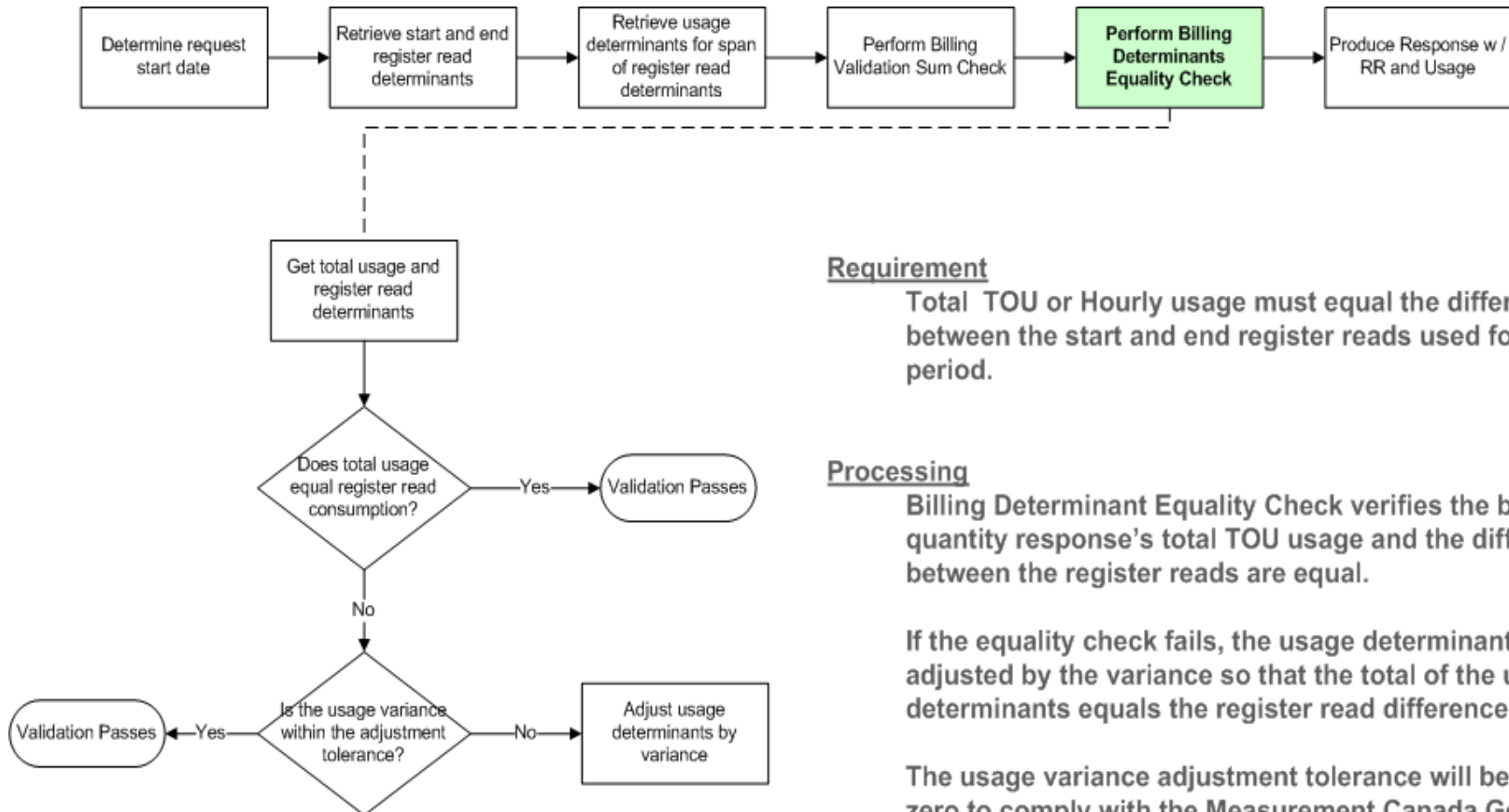
### Processing

Billing Validation Sum Check verifies the difference between interval usage and register read consumption is within the sum check threshold.

Billing Validation Sum Check failures will trigger re-estimation and re-scaling of estimated interval data. The updates to the estimated intervals will trigger re-framing and re-processing of the billing request. The re-estimation process is only triggered once and subsequent failures result in a billing request exception.

# Universal Solution High Level Design - *EnergyIP*

## Billing Determinants Equality Check Process



### Requirement

Total TOU or Hourly usage must equal the difference between the start and end register reads used for the bill period.

### Processing

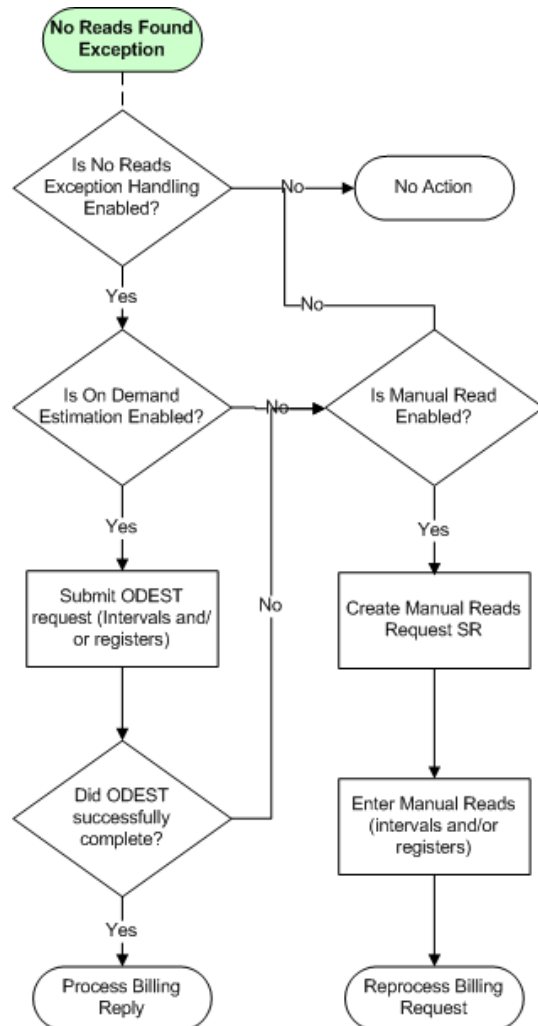
Billing Determinant Equality Check verifies the billing quantity response's total TOU usage and the difference between the register reads are equal.

If the equality check fails, the usage determinants are adjusted by the variance so that the total of the usage determinants equals the register read difference.

The usage variance adjustment tolerance will be set to zero to comply with the Measurement Canada Gen. 31 - E Rev. 1 Section 5.7.3.

# Universal Solution High Level Design - *EnergyIP*

## No Register Reads Found Exception Handling



### Requirement

If an actual register read is not available within the Register Read Billing Window, then an estimate may be used.

### Processing

New billing exception handling will calculate a register read using valid and/or estimated interval data from the latest actual or estimated register reads.

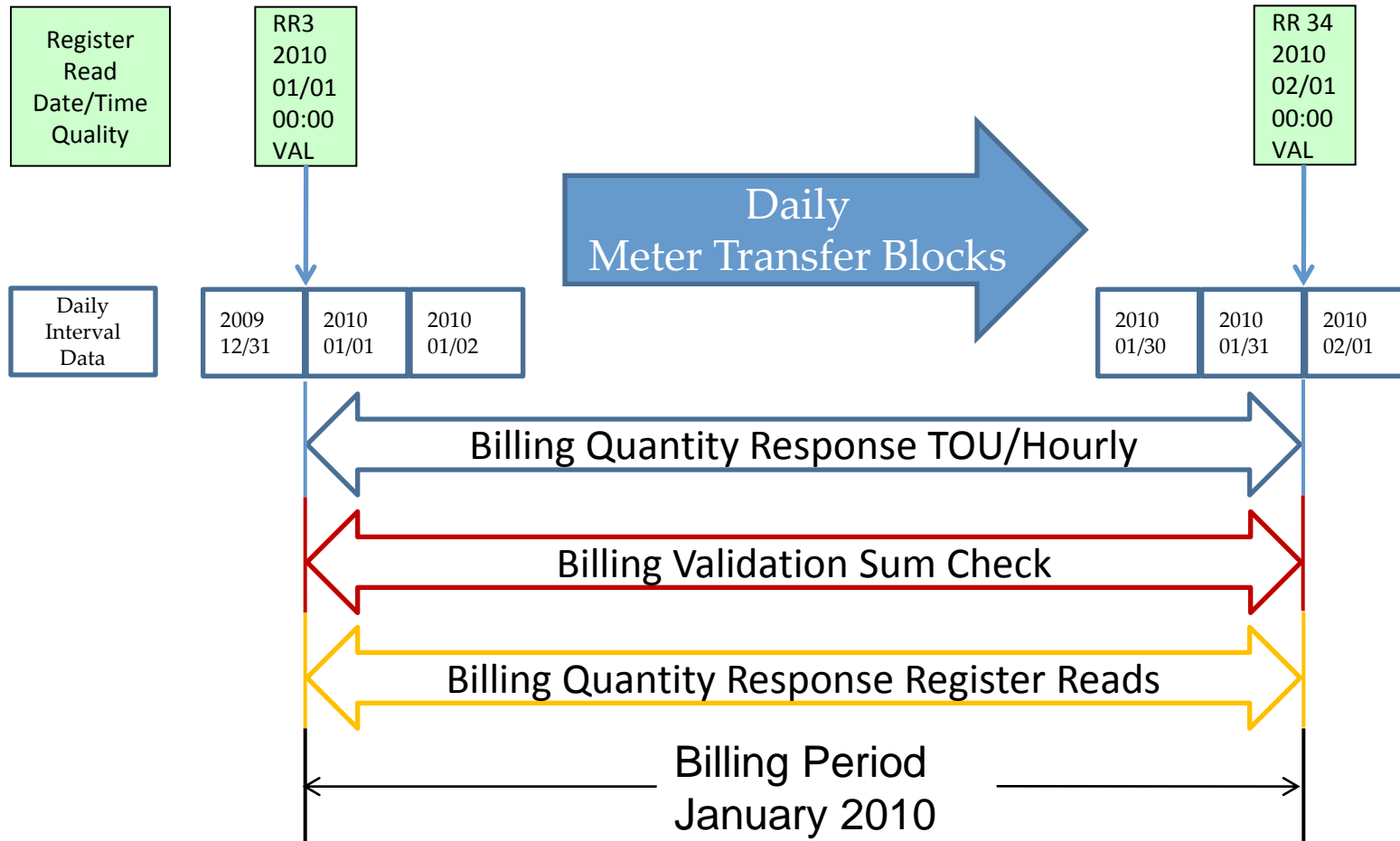
Estimated register reads will have new codes to indicate the quality of the register read estimate on the basis of the intervals used in the calculations. An estimated register read calculated from usage of all Valid intervals is higher quality than an estimate based on all Estimated intervals.

New table will retain the register and interval data used as the basis for the calculation and will be used to flag data changes that affect the estimated register read so re-bill processing can be initiated.

Universal AMI adapter will be deployed for submission of estimated or valid manual register readings.

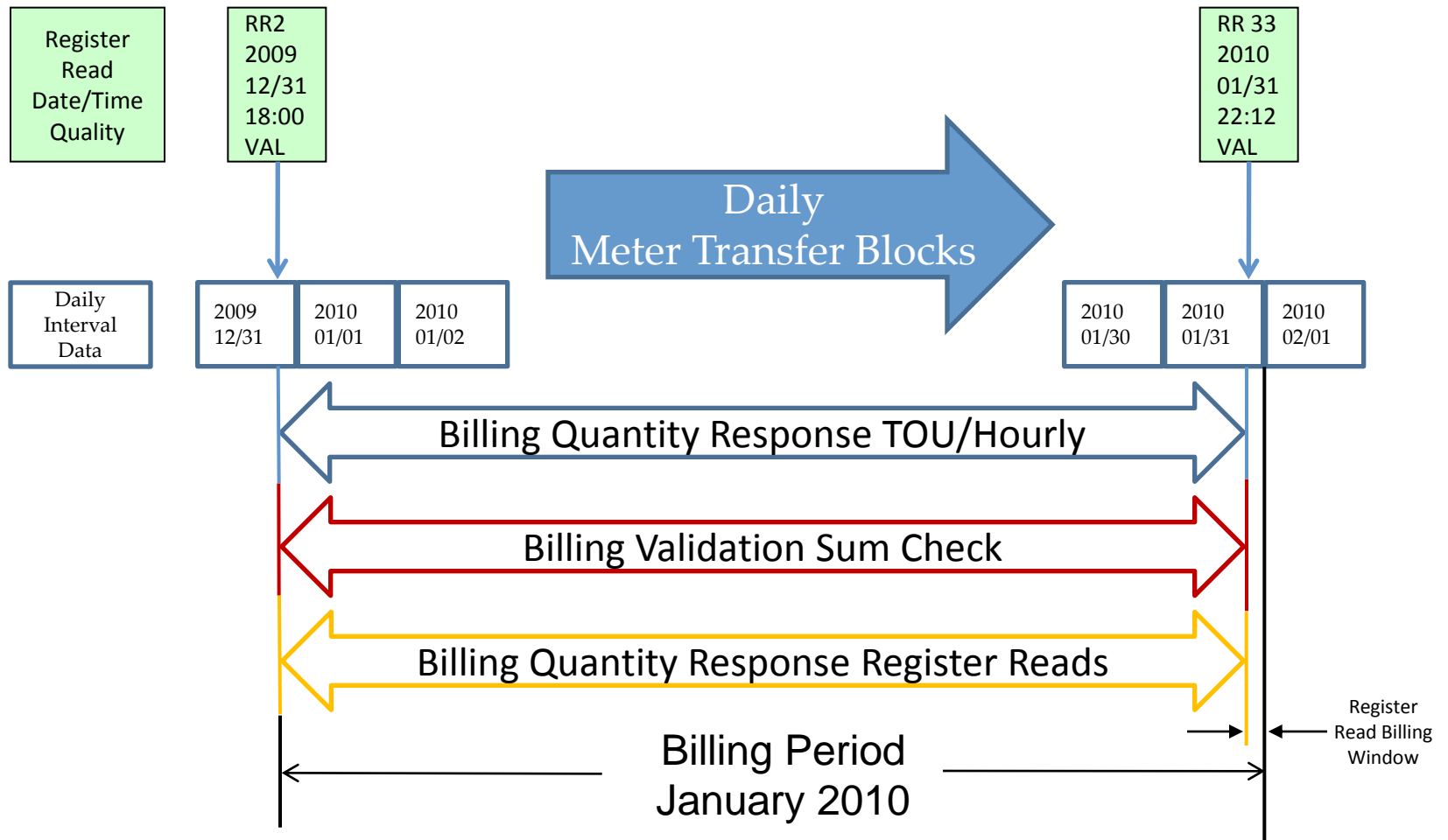
# MDM/R Universal Solution

## Billing Quantity Delivery: Register Reads at Midnight



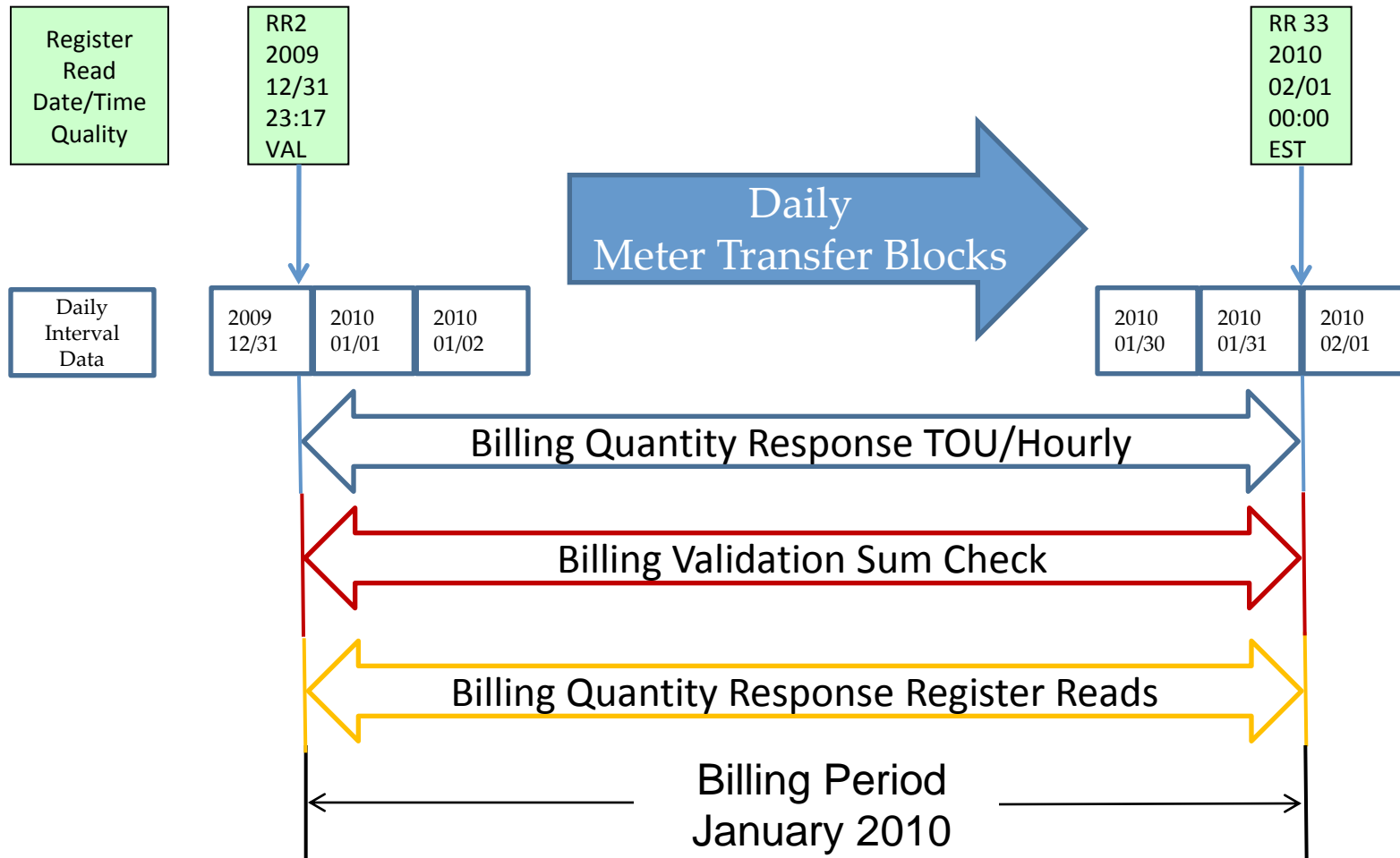
# MDM/R Universal Solution

## Billing Quantity Delivery: Register Reads Not at Midnight



# MDM/R Universal Solution

## Billing Quantity Delivery: Estimated End Register Read



# MDM/R Billing Service Standard Interface



# MDM/R Billing Service Standard Interface

## Why move to a new interface design?

- The existing MDM/R Billing Quantity Request and Response Interface (BQI) is a custom interface and is not part of eMeter's core product.
  - The BQI was developed and deployed before a standard billing interface was available as part of the core *EnergyIP* product.
  - The BQI does not support delivery of register read billing determinants.
  - The BQI does not support specification of billing period start date/time and end date/time made necessary by the Measurement Canada requirements.
- The *EnergyIP* Standard Billing XML Interface is part of the core eMeter product.
  - Transmission of register read billing determinants is supported by extension of the Measurement Profiles configured for the MDM/R.
  - Billing period start date/time and end date/time are supported by the 'startTime' and 'endTime' attributes of the standard request/reply.
  - The 'startTime' and 'endTime' request attributes provide access to existing *EnergyIP* partial day framing functionality required for the MDM/R Universal Solution.
  - New attributes available as part of the *EnergyIP* Standard Billing XML Interface provide functionality valuable to normal LDC on-cycle and off-cycle billing processes.

# Billing Service Process Parameters

## Available in *EnergyIP* Release 7.1 (1 of 4)

- *EnergyIP* Release 7.1 provides the following billing service process parameters largely consistent with release 6.3
  - **AllowableReadAge** (used in 7.1 only for register reads)
  - **OffCycleAllowableReadAge** (used in 7.1 only for register reads)
  - **LatestReportDays**
  - **OffCycleLatestReportDays**
  - **TriggerAfterDays**
  - **OffCycleTriggerAfterDays**
- **AllowableReadAge** and **OffCycleAllowableReadAge** are used in *EnergyIP* Release 7.1 to determine the start of a “register read billing window”
  - Defines the time prior to the billing quantity request end date/time (i.e. billing period end date/time) for which register reads will be valid.
  - The end of this “register read billing window” is determined by an new **Read Window - Max** parameter.

# Billing Service Process Parameters

Available in *EnergyIP* Release 7.1 (2 of 4)

- Additional new parameters will support the MDM/R Universal Solution:
  - **Read Window - Max**
    - Is used for On Cycle Billing Quantity Requests where this parameter establishes the latest acceptable meter register read relative to the Billing Service Standard Request 'endTime'
  - **OffCycle Read Window - Max**
    - Is used for Off Cycle Billing Quantity Requests where this parameter establishes the latest acceptable meter register read relative to the Billing Service Standard Request 'endTime'
  - **Read Window Type**
    - Defines the day type (either Calendar or Business) associated with the 'Read Window - Max' or 'OffCycle Read Window - Max' parameter
- The values for all billing service process parameters can be configured for Days, Hours, Minutes, or Seconds in *EnergyIP* Release 7.1

# Billing Service Process Parameters

Available in *EnergyIP* Release 7.1 (3 of 4)

- Billing service process parameters establish a 'Register Read Billing Window' and an 'Execution Window' for each Request/Reply
- For On Cycle Requests
  - The 'Register Read Billing Window' relative to the request 'endTime' is determined by:
    - **AllowableReadAge** parameter setting, and the
    - **Read Window - Max** parameter setting
  - The 'Execution Window' is determined by:
    - The 'endTime' specified in the Billing Service Standard Request, and the
    - **LatestReportDays** parameter setting
- The 'Execution Window' for On Cycle requests can also be controlled by the use of the 'processStartDate' and 'processEndDate' attributes of the Billing Service Standard Interface Request.

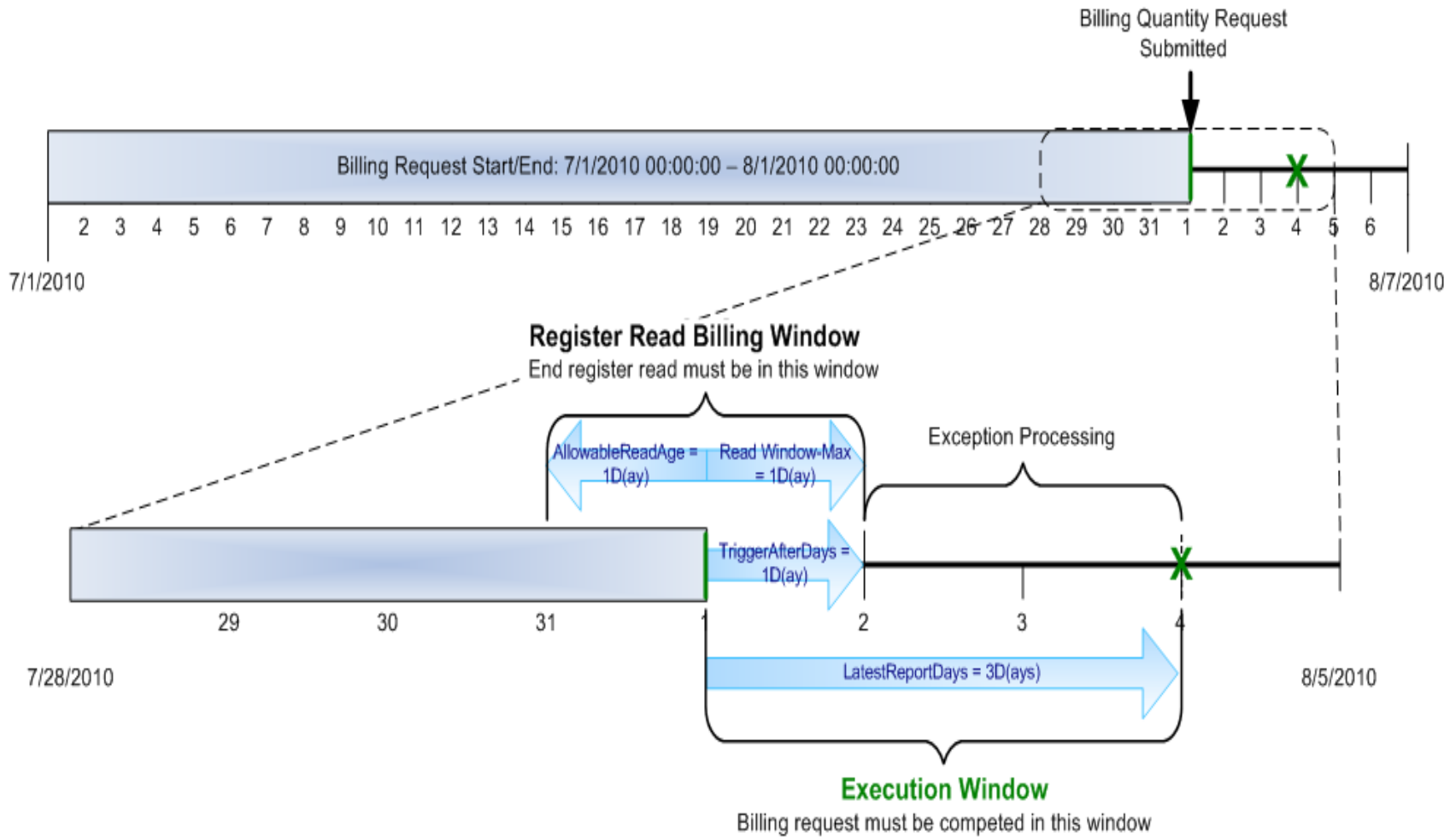
# Billing Service Process Parameters

Available in *EnergyIP* Release 7.1 (4 of 4)

- OffCycle parameters are used when the <offcycle> attribute of the Billing Service Standard Interface Request is set to 'true'
- For Off Cycle Requests
  - The 'Register Read Billing Window' relative to the request 'endTime' is determined by:
    - **OffCycleAllowableReadAge** parameter setting, and the
    - **OffCycle Read Window - Max** parameter setting
  - The 'Execution Window' is determined by:
    - The 'endTime' specified in the Billing Service Standard Request, and the
    - **OffCycleLatestReportDays** parameter setting
- The 'Execution Window' for Off Cycle requests can also be controlled by the use of the 'processStartDate' and 'processEndDate' attributes of the Billing Service Standard Request.

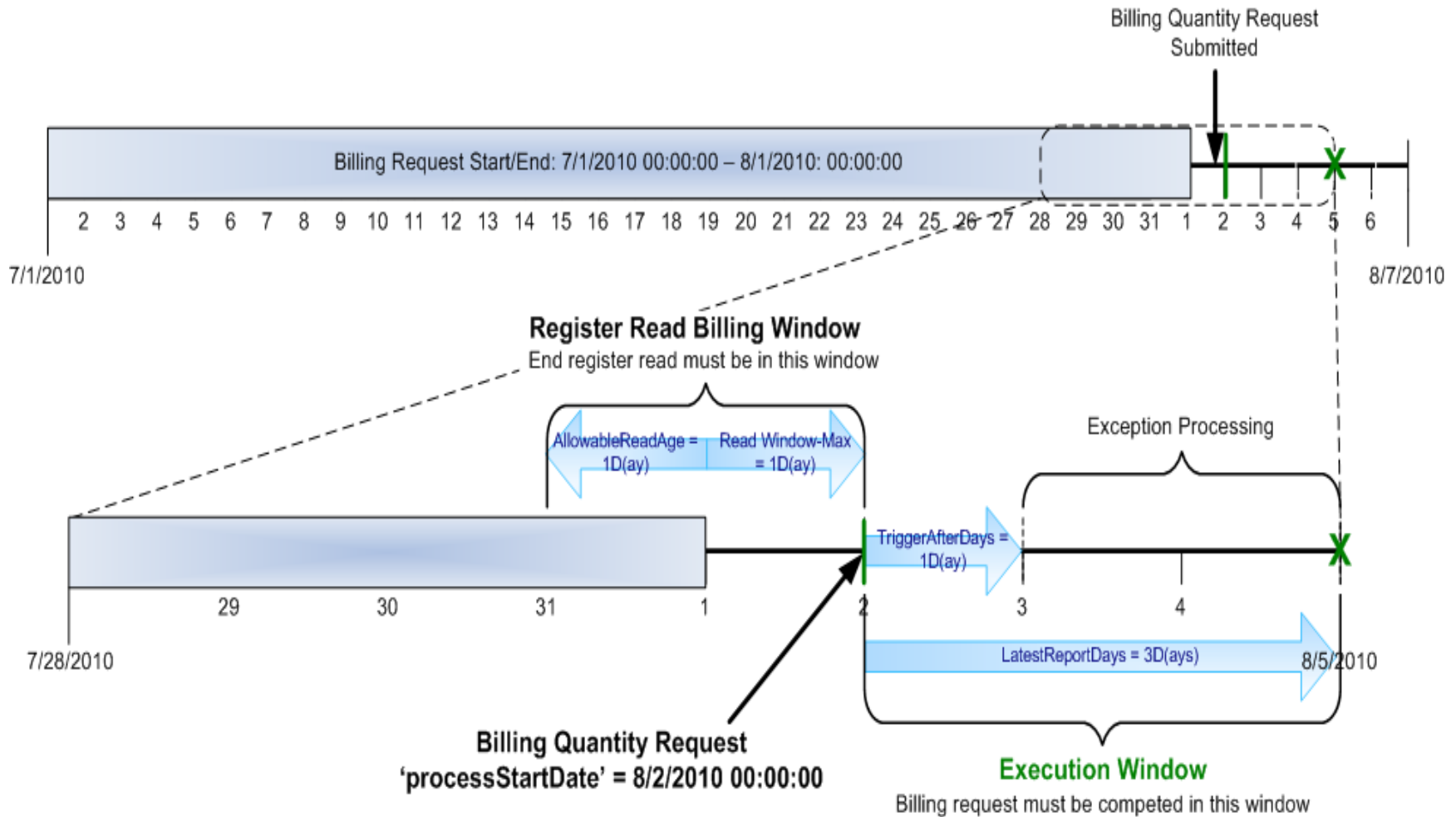
# Billing Window and Execution Window

## Request utilizing Billing Service Parameters



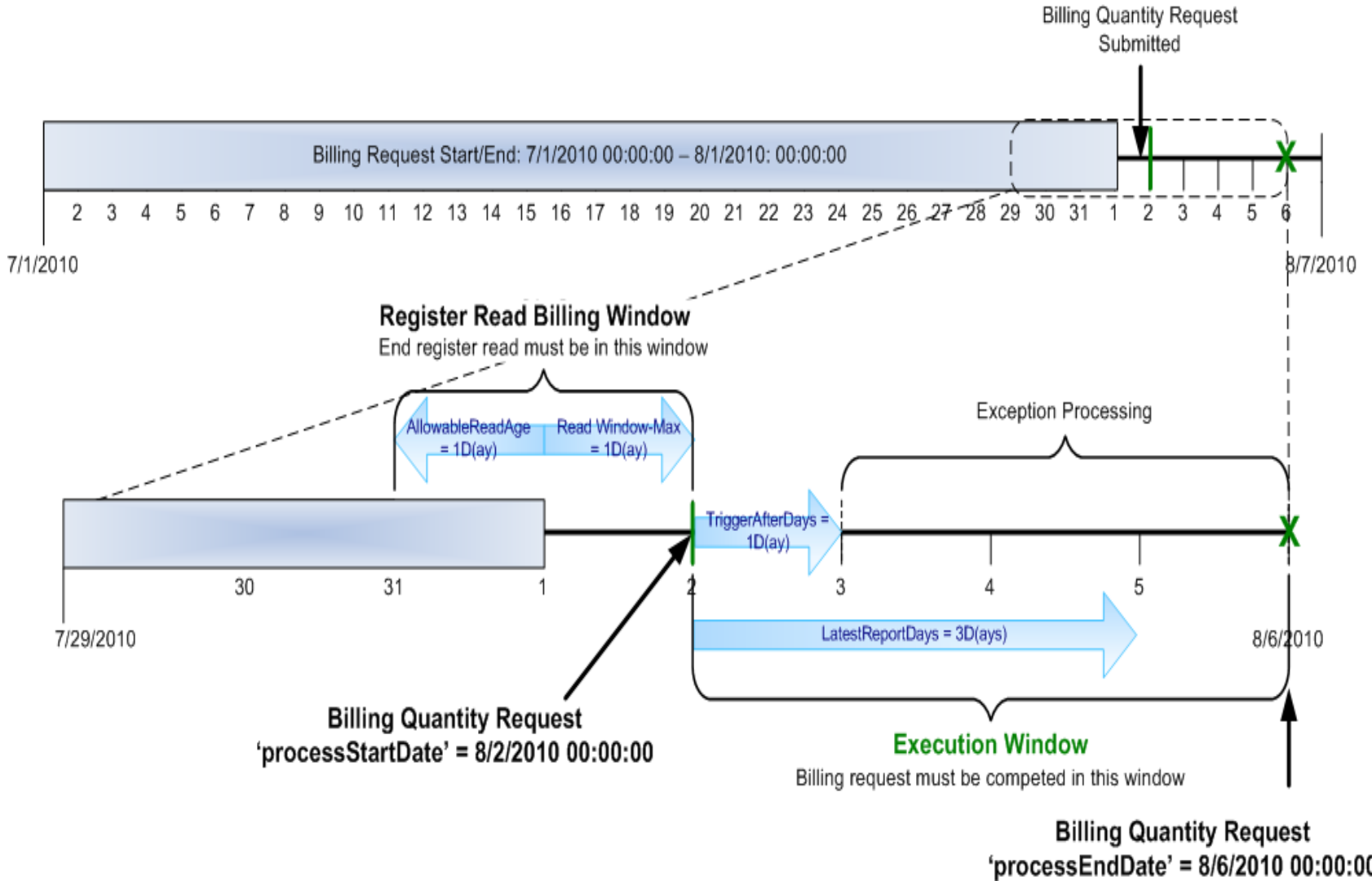
# Billing Window and Execution Window

## Request specifying 'processStartDate'

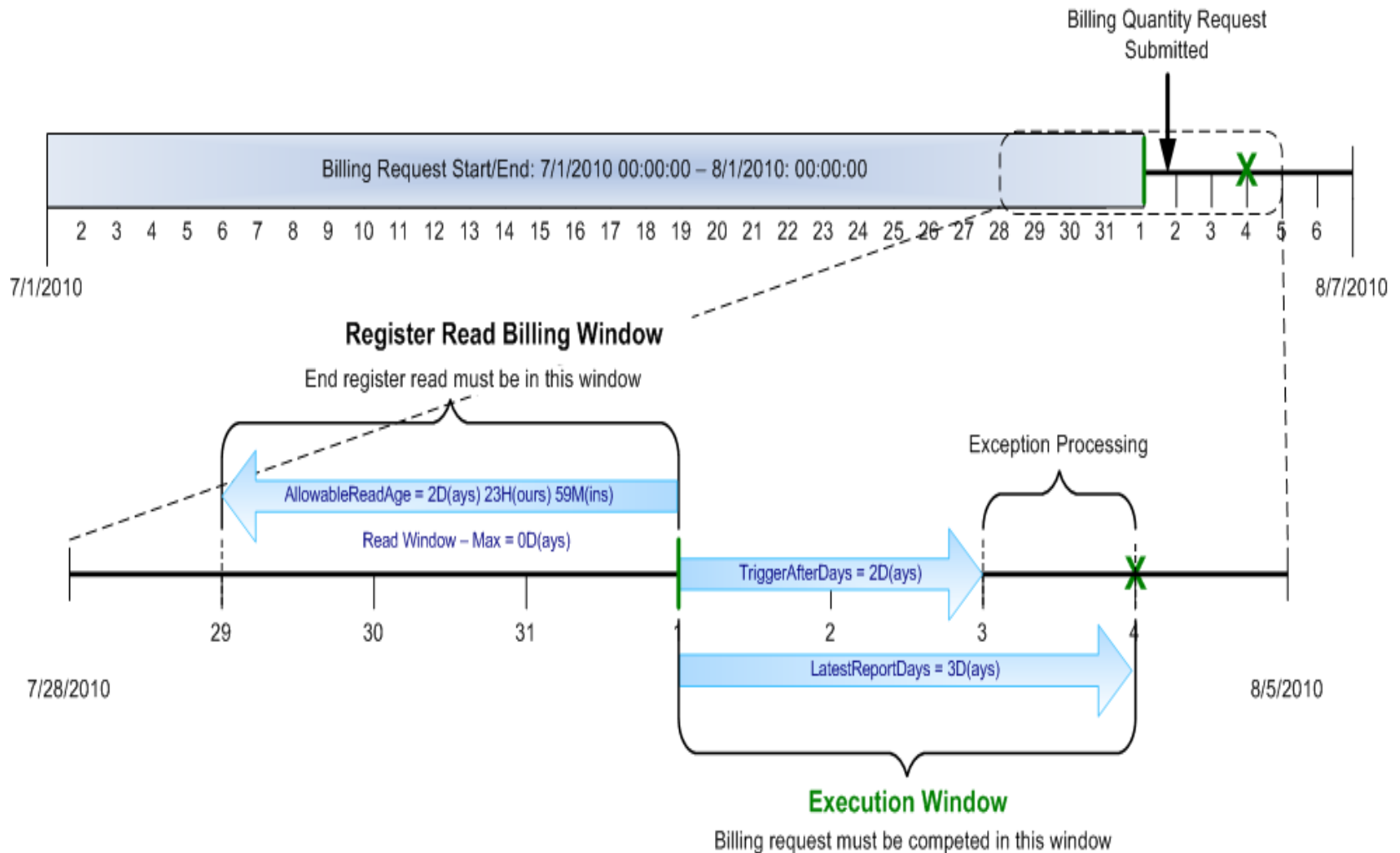


# Billing Window and Execution Window

## Request specifying 'processStartDate' and 'processEndDate'

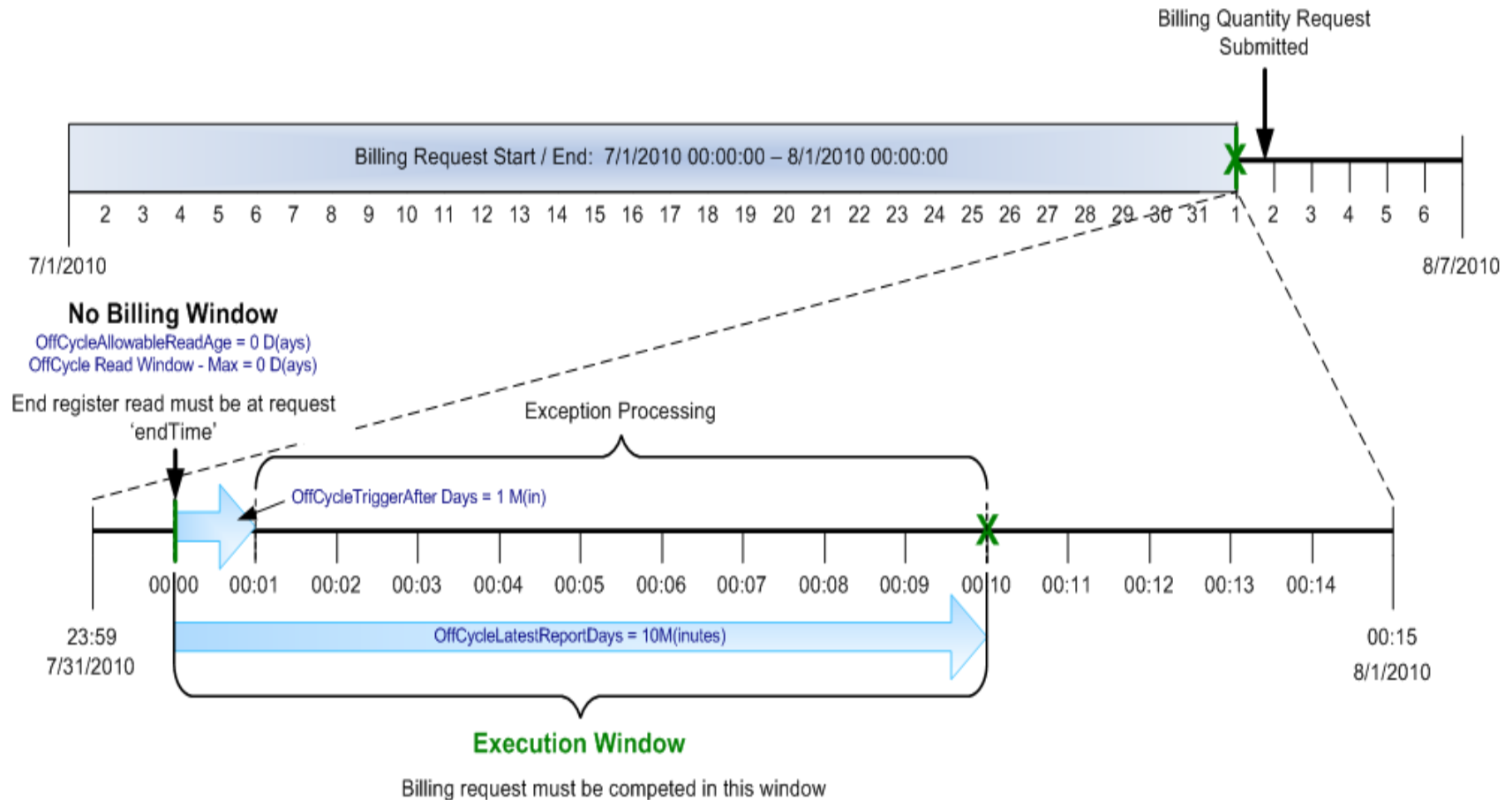


# Billing Window and Execution Window On Cycle Configuration considered by the DSC



# Billing Window and Execution Window

## Off Cycle Configuration considered by the DSC



# *EnergyIP* Standard Billing XML Interface Characteristics

- The Billing Service Standard Interface Request and Reply are batch processes utilizing the standard *EnergyIP* RequestMessage and ReplyMessage files transmitted in an .xml file format.
- Both request and reply .xml files will be delivered using AS2 via File Transfer Services (FTS).
  - The new FTS file type for the RequestMessage will be File ID “5500”.
  - The new FTS file type for the ReplyMessage will be File ID “6500”.
- The new Billing Service Standard Interface Request/Reply files will replace the existing MDM/R BQI Request and Response files.
  - In any one environment each LDC can only use either the new standard billing .xml Request/Reply or the MDM/R BQI Request/Response.
  - Start and end register readings, provided by an extended Measurement Profile, if available for export will not be delivered by the existing MDM/R BQI Response.

# EnergyIP Standard Billing XML Interface

## Date/time Functionality (1 of 3)

- The Billing Service Standard Interface is used to retrieve billing determinants for an SDP for a specific time span.
  - Request date/time can be specified to increments of Interval Length.
  - Interval Length is an attribute of the Meter Asset associated with the SDP through the synchronization processes.
- Request Message / Request tag
  - 'startTime': Start date and time for the requested billing period. If not specified previous billing period end time will be the start time.
  - 'endTime': Required, specifies the end date and time for the requested billing period
- Reply Message / MeterReading / Reading tag
  - For usage-based measurements returns the 'startTime' and 'endTime' for each TOU quantity
  - For register-based measurements returns the date/time as an 'endTime' value for the start register read and the end register read

# *EnergyIP* Standard Billing XML Interface

## Date/time Functionality (2 of 3)

- Use of the Billing Service Standard Interface allows the *EnergyIP* Billing Service Reads Processor (BSRP) to compute usage based measurements involving partial days.
  - Date/time for partial day framing is determined by the time span specified by the request 'startTime' and 'endTime'.
  - BSRP uses partial day framing for any billing quantity response that is not midnight aligned by a direct call to the *EnergyIP* Framer.
- To compute usage-based measurements the BSRP will:
  - Check if the request is midnight aligned. If not, use partial day framing.
  - If the billing period is not midnight aligned and spans multiple days the response will be aggregated from the partial day periods (start date-time and/or end date-time) and the midnight aligned periods.
  - If either the 'startTime' or 'endTime' is not midnight aligned and both fall in the same day, TOU response will be computed entirely by the partial day framing call.

# *EnergyIP* Standard Billing XML Interface

## Date/time Functionality (3 of 3)

### Current State

- The Billing Service Standard Interface is available in *EnergyIP* Release 7.1 (delivered to the IESO in April 2010).
- BSRP partial day framing functionality is available in *EnergyIP* Release 7.0 and 7.1.
- Measurement Profiles providing TOU usage-based measurements can be extended to provide measurements for start and end register readings.
  - Such extended Measurement Profiles are expected to be added to the Release 7.1 configuration in a test environment for testing purposes.
  - Midnight aligned billing requests will return both TOU quantities and register reads if and only if midnight register reads are available at the specified midnight request 'startTime' and 'endTime'.
  - Interval aligned billing requests will return both TOU quantities and register reads if and only if register reads are available at the specified request 'startTime' and 'endTime'.

# *EnergyIP* Standard Billing XML Interface

## Request Message Data Parity (1 of 2)

- The specification for the Billing Service Standard Interface - Request can be found in the MDM/R Technical Interface Specifications, Version 3.0, Section 2.4
  - Version 3.0 was published on September 24, 2010.
  - Section 2.4 is an initial specification with the exceptions noted below currently under active design review.
- Parity with existing MDM/R Billing Quantity Request
  - XML attributes provide data parity with most data fields specified by the MDM/R BQI Request.
- Exceptions
  - The 'Request File Identifier' provided in the MDM/R BQI Request is not supported in the *EnergyIP* standard billing xml request.
  - The *EnergyIP* standard billing .xml file does not currently support a Billing Agent organization identifier used to verify the SDP to BILLING AGENT Relationship.

# *EnergyIP* Standard Billing XML Interface

## Request Message Data Parity (2 of 2)

- New Attributes
  - Header <noun> “ReadsForBilling”, “ReadsForBilling Informational”
    - Allows Billing Quantities to be requested for informational purposes only.
    - Such informational Billing Quantity responses do not set the data flags that trigger the BR03: Re-Billing Report when meter read data changes after Billing Quantity data is successfully delivered.
  - Request <offcycle> attribute
    - Allows LDC control of the billing services process parameters that will be invoked in processing the Request/Reply (i.e. On Cycle or Off Cycle billing service process parameters).
    - Enables Off Cycle exception handling providing On Demand Estimation processing for Off Cycle requests submitted after the normal close of the ‘Execution Window’ (not available using the existing MDM/R BQI).
  - Request <processStartDate> and <processEndDate> attributes
    - Allows LDC control of the “Execution Window”.

# *EnergyIP* Standard Billing XML Interface

## Reply Message Data Parity (1 of 4)

- The specification for the Billing Service Standard Interface - Reply can be found in the MDM/R Technical Interface Specifications, Version 3.0, Section 2.5
  - Version 3.0 was published on September 24, 2010.
  - Section 2.5 is an initial specification with the exceptions noted below currently under active design review.
  - Other elements subject to testing or further specification are identified by comments annotated in the published MDM/R TIS Version 3.0.
- Parity with existing MDM/R Billing Quantity Response
  - XML attributes provide data parity with most fields specified by the MDM/R BQI response.
  - A single ReplyMessage .xml file is used for response types TOU/CPP, Periodic, and Hourly.
  - Use of the Billing Service Standard Interface - Reply to support Demand Framing Structures has not yet been assessed.

# *EnergyIP* Standard Billing XML Interface

## Reply Message Data Parity (2 of 4)

- Exceptions
  - The ‘Request File Identifier’ provided in the MDM/R BQI Response is not supported in the *EnergyIP* standard billing .xml reply.
  - The *EnergyIP* standard billing .xml reply is intended to return the ‘Universal SDP ID’ but currently only returns the ‘SDP ID’.
  - ‘Framing Structure’ provided in the MDM/R BQI response (to distinguish TOU/EST and TOU/CST) is not provided in the *EnergyIP* standard billing .xml
    - This data element will not be provided in future.
  - ‘Unit of Measure UOM’ is not provided in the *EnergyIP* standard billing .xml
    - Unit of Measure information is provided by the <readingTypeId> attribute.
  - ‘Transaction Status’ codes are returned in two split ReplyMessage areas:
    - Reply <replyCode> providing billing processing status codes consistent with the values currently returned in the MDM/R BQI Response.
    - Reading <validationCode> providing billing validation failure codes consistent with the values currently returned in the MDM/R BQI Response.

# EnergyIP Standard Billing XML Interface

## Reply Message (3 of 4)

- Exceptions (continued)
  - ‘Estimated Energy Consumption’ (providing total interval data estimated kWh) is provided in the *EnergyIP* standard billing .xml as ‘KWH Estimated Usage’ identified by the <readingTypeId> attribute.
  - ‘Billing Quantity Identifier’ values are replaced by:
    - ‘MEAS\_EXTENSION\_CODE’ values in the Reading <readingTypeId> attribute
    - NOTE: Identifiers for CPP Events were inadvertently omitted in the MDM/R Technical Interface Specifications Version 3.0 and will be added in the next update.
- New Attributes
  - Header <noun> “ReadsForBilling”, “ReadsForBilling Informational”
    - Allows Billing Quantities to be delivered for informational purposes only.
  - MeterReading/Meter <id> provides the identifier of the currently installed meter. This is the ‘Meter ID’ submitted with the synchronization Asset File.
    - For a meter removal and install the Meter ID is provided for each reply segment based on the changed SDP to Meter Relationship.

# EnergyIP Standard Billing XML Interface

## Reply Message (4 of 4)

- New Attributes (continued)
  - MeterReading <transformerRatio> provides the CT/PT Multiplier parameter submitted in the Parameter Data File of the synchronization file set.
    - Usage determinants (TOU, Hourly, Periodic quantities) are multiplied by this value.
    - Register read determinants are not multiplied by this parameter.
  - Reading/Quality <validationStatus> provides a new ‘percentage of intervals’ threshold to indicate TOU quantities as ‘EST’ or ‘VAL’.
    - For usage determinants, if the ratio of the total number of estimated intervals to total number of intervals in the billing period exceeds the ‘Interval Est-Th’ parameter in the Data Delivery Service, the <validationStatus> = ‘EST’.
    - For interval billing measurements, if the ratio of the total number of intervals to total number of estimated intervals exceeds the ‘Interval Est-Th’ parameter in the Data Delivery Service, the <validationStatus> = ‘EST’.

# Next Steps for the IESO, LDCs and CIS Vendors



# Next Steps IESO, LDCs and CIS Vendors

(1 of 2)

- IESO
  - Finalize On Cycle and Off Cycle billing service process parameters
  - Deployment and testing of the Billing Service Standard Interface
  - FTS modifications and deployment
  - Technical interface specification update
  - Assess implementation and schedule impacts and provide feedback to LDCs by mid to late November.
    - Provide key target dates for Measurement Canada solution for planning purposes.

# Next Steps IESO, LDCs and CIS Vendors

(2 of 2)

- LDCs and CIS Vendors

- Assess potential process changes related to ‘Register Read Billing Window’ and ‘Execution Window’.
- Assess potential process changes related to On Cycle and Off Cycle billing requests.
  - Assess potential benefits of using ‘processStartDate’ and ‘processEndDate’
- Plan interface changes required to support replacement of the existing MDM/R BQI by the new MDM/R Billing Service Standard Interface.
  - Assess impact of billing periods defined by date/time of register readings.
- Plan necessary changes to billing systems to support Measurement Canada requirements.

# Further Information

## Contacts and Information

### Contact Us!

- Presentation feedback and general questions  
[smartmeteringentity@ieso.ca](mailto:smartmeteringentity@ieso.ca)
- MDM/R Registration and Enrolment  
[mdmr.registration@ieso.ca](mailto:mdmr.registration@ieso.ca)

### Resources:

- Smart Metering Entity website  
[www.smi-ieso.ca](http://www.smi-ieso.ca)