

Architecture



Meter Data Management & Repository (MDM/R) Logical Application and Data Architecture (LADA)

Issue 2.0

This document provides a logical architecture for the applications, data, and inter-dependencies related to the Ontario Smart Metering System (in general) and the Meter Data Management & Repository (more specifically)

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Related Documents

Document ID	Document Title	Issue
Bill 21 2006	<i>Energy Conservation Responsibility Act, 2006</i>	
Ontario Regulation 425/06	<i>Functional Specification for an Advanced Metering Infrastructure</i>	July 14, 2006
IESO_SPEC_0241	<i>Meter Data Management and Repository System (MDM/R) - Functional Specification</i>	Issue 2.0
IESO_SPEC_0240	<i>Meter Data Management and Repository System (MDM/R) - Business Process Description</i>	Issue 2.0
IESO_SPEC_0239	<i>Meter Data Management and Repository System (MDM/R) - Service and Performance Levels</i>	Issue 2.0

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Table of Changes

Reference (Section and Paragraph)	Description of Change
Section 2: Figure 2-1	LADA Diagram updated as follows: <ol style="list-style-type: none"> 1) D200 Application Dependency to be a two-way dependency if the AMI/AMCC technology supported two-way communications. 2) D214 Application Dependency changed to connect the OEB to the SME for Rate Structures (CPP, RPP, etc.) 3) D107 Application Dependency was assigned so the SME can instruct the OSP to enter the OEB posted Rate Structures (CPP, RPP, etc.) 4) D113 Application Dependency was created so the OSP can enter the OEB posted Rate Structures (CPP, RPP, etc.) into the MDM/R Master Directory (MMD) as instructed by the SME. 5) D114 Application Dependency was created for the Master Data Synchronization that may be possible from the MDM/R Master Directory to some AMCCs or from some AMCCs to the MDM/R Master Directory.

Section 9: D100	Removed “Acknowledgement of VEE exception reports” from Key data entities passed from Second Application to First Application
Section 9: D101	Application Dependency Description updated to include Pre-VEE checking
Section 9: D102	Application Dependency Description updated to include Pre-VEE checking
Section 9: D104	Application Dependency Description updated to include Pre-VEE checking Key Data Entities updated to include: <ul style="list-style-type: none"> • Point of Delivery to LDC relationships • Point of Delivery to AMCC relationships
Section 9: D105	Application Dependency Description updated to notify the AMI Operator of Master Directory changes entered by the LDC <i>or by the LDC’s CIS System</i> and “(to be confirmed as a requirement)” was deleted. Key Data Entities updated to include: <ul style="list-style-type: none"> • Point of Delivery • Point of Delivery to LDC relationships • Point of Delivery to AMI Operator relationships • Point of Delivery to AMCC relationships
Section 9: D106	Key Data Entities updated to include: <ul style="list-style-type: none"> • Point of Delivery to POD Classification relationships • Point of Delivery to Billing Cycle relationships • Point of Delivery to Meter ID to AMCC relationships • Authorized <i>Interested</i> Party to POD relationships
Section 9: D107	Application Dependency assigned to the dependency between the OEB and SME Key Data Entities updated to include: <ul style="list-style-type: none"> • Hourly Rate Structures • Regulated Price Plan (RPP) Rate Structures • Critical Peak Pricing (CPP) Rate Structures

Section 9: D112	Application Dependency Description updated to include Pre-VEE checking
Section 9: D113	Application Dependency assigned to the dependency between the OSP and the MDM/R Master Directory Interface Key Data Entities updated to include: <ul style="list-style-type: none"> • Hourly Rate Structures • Regulated Price Plan (RPP) Rate Structures • Critical Peak Pricing (CPP) Rate Structures
Section 9: D114	Application Dependency assigned to the dependency between the MDM/R Master Directory Application Space and the AMCC for the purpose of master data synchronization. Key Data Entities updated to include: <ul style="list-style-type: none"> • Points of Delivery • Point of Delivery – AMCC relationships • Point of Delivery – LDC relationships • Point of Delivery – Meter ID relationships • Point of Delivery – AMI Operator relationships
Section 9: D200	Application Dependency Description updated to indicate that two-way communications can be used if the AMI/AMCC technology supports two-way communication. This would permit feedback to the AMI/AMCC directly rather than to the AMI Operator. Key Data Entities updated to include: <ul style="list-style-type: none"> • Acknowledgement of data transfer receipt • Error notifications relating to data transfer and/or structure problems
Section 9: D201	Key Data Entities updated to include: <ul style="list-style-type: none"> • Acknowledgement of data transfer receipt (<i>on manual imports</i>) • <i>Acknowledgements on LDC entered Meter Read edits</i>
Section 9: D203	Application Dependency Description updated to include POD relationships Key Data Entities updated to include:

	<ul style="list-style-type: none"> • Point of Delivery to POD Classification relationships • Point of Delivery to Billing Cycle relationships • Point of Delivery to Meter ID to AMCC relationships • Authorized <i>Interested</i> Party to POD relationships
Section 9: D205	<p>Application Dependency Description updated</p> <ul style="list-style-type: none"> • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” of’ • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” ’ <p>Key Data Entities description updated</p> <ul style="list-style-type: none"> • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” of’
Section 9: D208	<p>Key Data Entities updated to include:</p> <p>Authorized Interested Parties gain access to the MDM/R Ad Hoc Data Reporting Interface by providing:</p> <ul style="list-style-type: none"> • Security Login ID • Password
Section 9: D210	<p>Key Data Entities updated to include:</p> <p>Customers gain access to the MDM/R Ad Hoc Data Reporting Interface by providing:</p> <ul style="list-style-type: none"> • Security Login ID • Password
Section 9: D213	<p>Application Dependency Description updated to include POD relationships and Party Access is authorized <i>by the LDC</i></p> <p>Key Data Entities updated to include:</p> <ul style="list-style-type: none"> • Point of Delivery to POD Classification relationships • Point of Delivery to Billing Cycle relationships • Point of Delivery to Meter ID to AMCC relationships • Authorized <i>Interested</i> Party to POD relationships
Section 9: D214	<p>Application Dependency updated to be between Ontario Energy Board and Smart Metering Entity</p> <p>Application Dependency Description updated to reflect that the OEB provides notification of approved rate structures to the SME</p> <p>Key Data Entities updated to indicate that the dependency involves notification of approved rate structures</p>

Section 9: D215	Corrected spelling error
Section 9: D216	<p>Application Dependency Description updated</p> <ul style="list-style-type: none"> • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” of’ • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” ’ <p>Key Data Entities description updated</p> <ul style="list-style-type: none"> • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” of’
Section 9: D219	<p>Application Dependency Description updated</p> <ul style="list-style-type: none"> • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” of’ • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” ’ <p>Key Data Entities description updated</p> <ul style="list-style-type: none"> • ‘schedule or request’ changed to ‘setup scheduled “pushes” or request “pulls” of’

1. Introduction

The Independent Electricity System Operator (IESO) Smart Metering System Implementation Program (SMSIP) team and the Vendor supporting the IESO in the delivery and operation of the Meter Data Management & Repository (MDM/R) system solution require a common understanding of the scope and definitions of the systems required to support the Smart Metering System.

This Logical Application and Data Architecture (LADA) provides a common reference for all parties to confirm the scope of the required systems development and integration of these required systems.

1.1 Purpose

The LADA is a structured, high level, logical representation of the applications, data stores, and dependencies that may exist today or may be implemented for the Meter Data Management & Repository (MDM/R).

The Solution Space representations included in this document do NOT reflect a solution design but instead represent the inter-dependencies between external applications or parties and the anticipated new applications in the MDM/R Solution Space.

The LADA does not define any of the hardware, network, database management systems or operating systems or technical interfaces that will be used to implement and integrate the applications and information stores. All of this infrastructure will eventually be defined in a Physical Architecture and related technical interface documentation.

1.2 Scope

This document provides an overview of a logical architecture for the applications, data and inter-dependencies related to the Smart Metering System (in general) and the Meter Data Management & Repository (more specifically).

1.3 Who Should Use This Document

This document has been prepared for use by the members of the IESO SMSIP Team and the contracted Vendor for the design of MDM/R Solution Space as part of the Ontario Smart Metering System.

1.4 Assumptions and Limitations

The Logical Application and Data Architecture:

- Makes every effort to represent applications and information store inter-dependencies accurately and completely.
- Does not attempt to represent every application and/or information store being operated and/or required in the other Solution Spaces.
- Does not attempt to represent all applications and information stores to the same level of detail.
- Represents known inter-dependencies with the identified Solution Spaces.

1.5 Standard Conventions

The standard conventions followed for this document are as follows:

- Quotation marks are used to highlight process or component names; and
- Italics are used to highlight publications, titles of procedures, letters and forms.

1.6 Roles and Responsibilities

This document does not impart any specific roles or responsibilities. This document is intended to provide the design basis for development of the systems solutions and documentation associated with the MDM/R system implementation and development of associated interfaces.

1.7 How This Document Is Organized

This document is organized as follows:

- **Section 2** of this document provides an overview of the LADA and descriptions of the components that comprise the LADA. A high-level LADA diagram and legend of symbols and meanings is included to present the envisioned solution spaces, related application spaces and the anticipated dependencies between the MDM/R solution space and other applications and solution spaces.
- **Section 3** of this document provides a description of each Solution Space comprising the Ontario Smart Metering System (SMS),
- **Section 4** of this document provides a description of each Application Space,
- **Section 5** of this document provides a description of each Party,
- **Section 6** of this document provides a description of each Application,

- **Section 7** of this document provides a description of each Data Store,
- **Section 8** of this document provides a description of each Party Relationship,
- **Section 9** of this document provides a description of each Application Dependency, and
- **Section 10** of this document provides a description of each Data Ownership.

– End of Section –

2. LADA Overview

The LADA contains a description of envisioned applications, data stores and dependencies that are applicable in the context of the implementation of the Ontario Smart Metering System.

It covers the scope of the MDM/R system and inter-dependencies with external solutions as documented in the *Functional Specifications for a Meter Data Management and Repository (MDM/R)*.

This document covers primarily the components of the Meter Data Management & Repository (MDM/R) Solution Space. Where components of the other Solution Spaces have identified dependencies with the MDM/R they will also be defined. The LADA does not describe all components of Solution Spaces other than the MDM/R Solution Space.

The Advanced Metering Infrastructure (AMI) and LDC Customer Information Systems (CIS) are numerous and varied. The LADA will describe the dependencies between the MDM/R and these other Solution Spaces in terms that can then be mapped to their specific implementations.

Table 2–1: MDM/R related Solution Spaces

Solution Space	Party responsible for Solution Space
Meter Data Management & Repository (MDM/R)	Smart Meter Entity (SME)
Advanced Metering Infrastructure (AMI)	Local Distribution Company (LDC)
Legacy CIS / Billing	Local Distribution Company (LDC) / Billing Agent

2.1 LADA Diagram

The Logical Application and Data Architecture diagram is a representation of applications and data stores. It represents both known and/or anticipated external systems as well as the expected (or envisioned) internal applications and data stores.

The expected (or envisioned) applications and data stores reflect a logical or conceptual representation of the components required to support the implementation of the MDM/R as documented in the *Functional Specification for a Meter Data Management and Repository (MDM/R)*. These expected Solution Spaces are presented in a generic single application component and single data store form. These representations are simply to aid in communications and do not impose any specific technical architecture or implementation.

The LADA diagram in this document is a high-level representation that will be refined as the functional specification and design for the Meter Data Management and Repository (MDM/R) are refined. As the implementation of the MDM/R progresses, these logical or conceptual representations will be replaced by a more physical representation of the systems that have been acquired or constructed.

As the detailed design for the MDM/R is completed, the LADA diagram will evolve to a physical representation or what will be referred to as the Physical Application and Data Architecture (PADA).

Figure 2–1: High-level Overview of MDM/R Application Spaces and Solution Spaces presents a high-level LADA diagram of the expected (or envisioned) solution spaces and applications spaces.

A complete legend of the symbols used in the diagram is presented in Section 2.2 - LADA Diagram Legend.

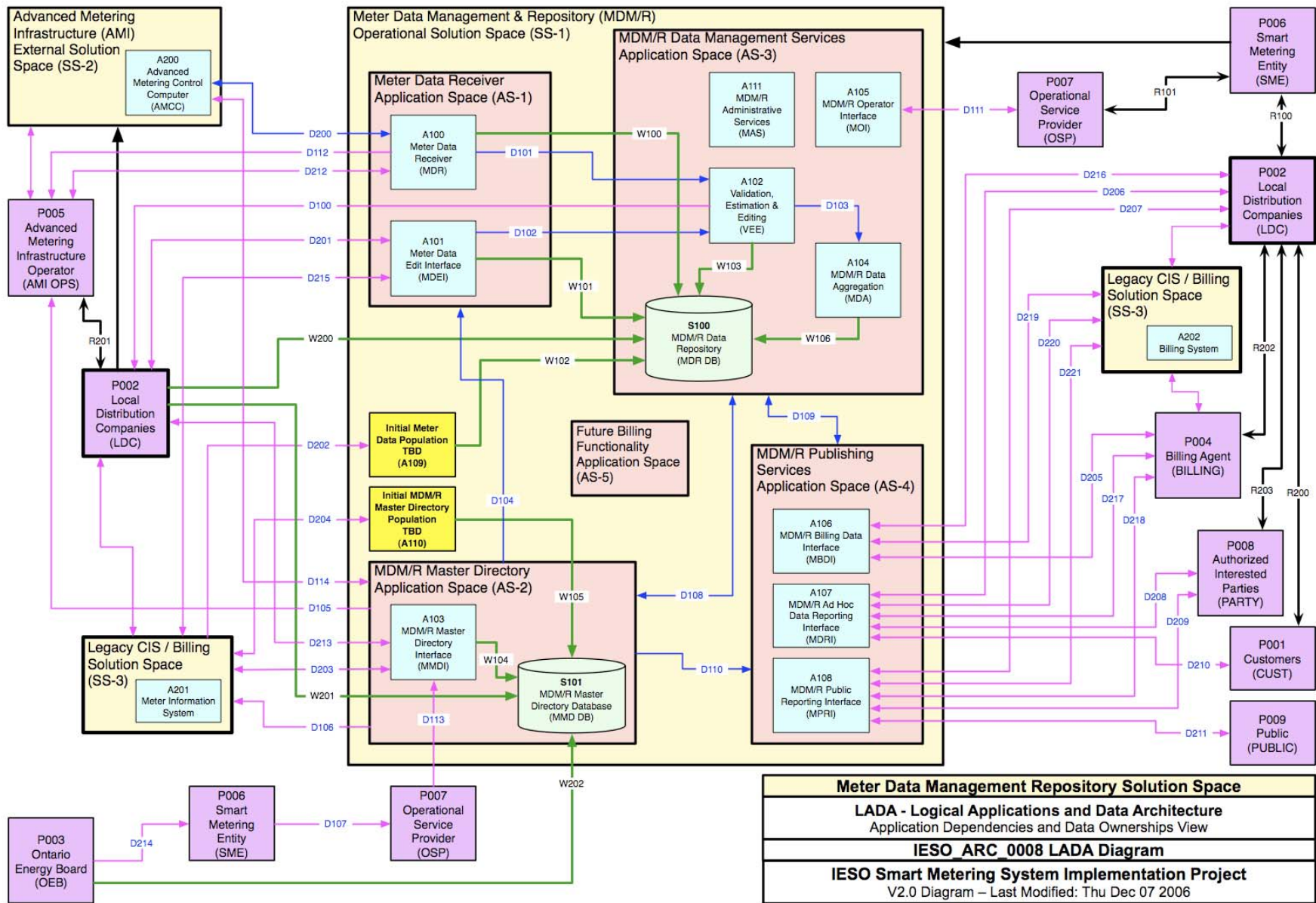


Figure 2–1: High-level Overview of MDM/R Application Spaces and Solution Spaces

2.2 LADA Diagram Legend

The LADA diagram conveys a significant amount of information on many levels. The legend for the LADA is designed to use both colours and shapes to also convey information. Data Stores have a distinctive disk or database shape to represent a container of information. Rectangles are used to represent external Parties and application related spaces. Finally lines represent the relationships between components.

Refer to the Legend when interpreting the diagram and relating it to the subsequent sections of this document which describe in tabular form each of the components and relationships.

The diagram has been constructed in colour, however labeling of all components makes the diagram usable when printed in black and white.

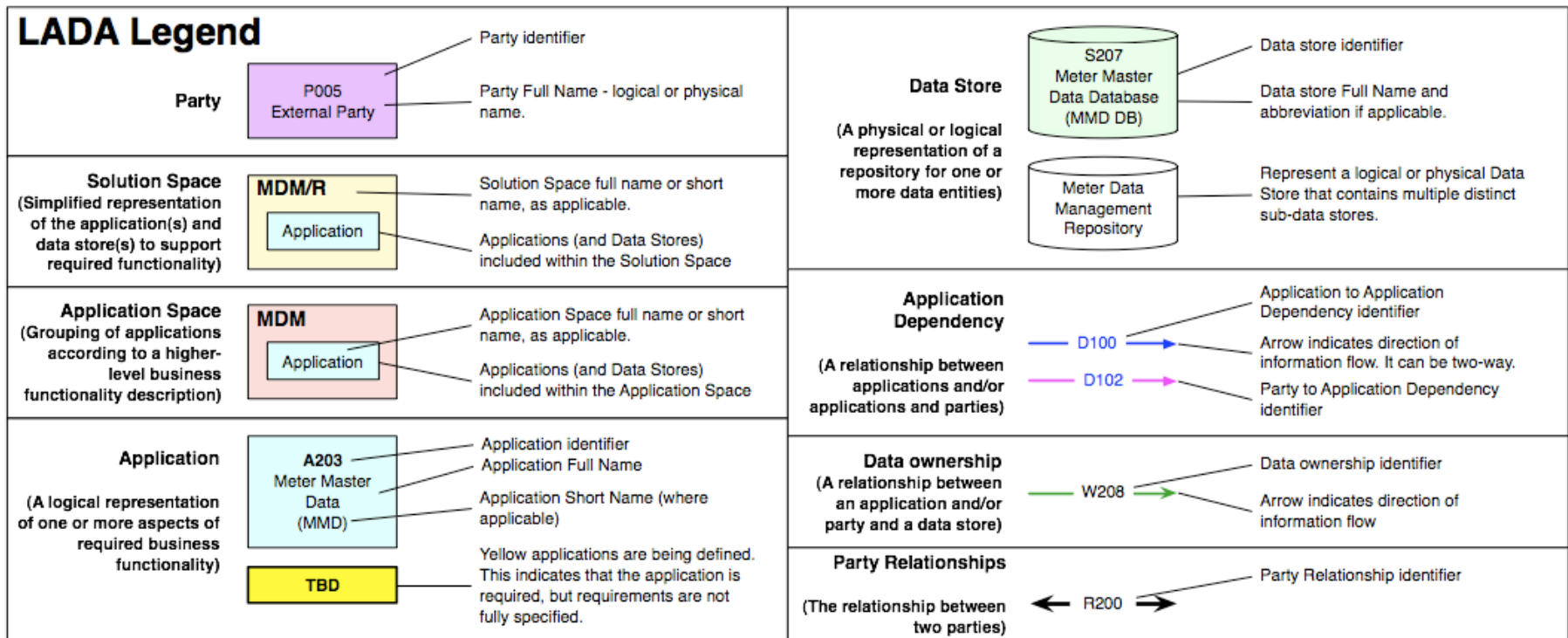


Figure 2–2: Symbols used in the LADA (LADA Legend)

2.3 Component Descriptions

The following provides a description of the components that comprise the LADA. Each component has a corresponding tabular description that includes relevant details and relationships. The descriptions are an integral part of the LADA documentation.

Party

People or organizations outside the boundaries of the MDM/R related Solution Spaces and/or Application Spaces that interact with the systems in some manner

- may be the source and/or destination of data
- may be associated with (interfaced to) one or more Application(s) across Solution Spaces or Application Areas

Solution Space

Simplified representation of the application(s) and data store(s) to support the required functionality

- for the MDM/R consistent with the *Functional Specification for a Meter Data Management and Repository (MDM/R)*.
- does not describe all components of Solution Spaces other than the MDM/R Solution Space

Application Space

A grouping of applications, according to a higher-level business functionality description.

Application

A logical representation of one or more aspects of required business functionality

- may be an existing physical application
- may be a logical representation of an application that is expected to be implemented
- could be implemented independent of other physical applications
- **not** an operating system, nor a database management system, nor a transaction processing monitor (e.g. Tivoli), nor infrastructure facility (hardware).

Data Store

A physical or logical representation of a repository for one or more data entities

- associated with (interfaced to) one or more physical and/or logical applications
- may be implemented as a relational database, a data warehouse, a directory of files, a single file (e.g. an excel .XLS file)
- **not** a database management system (e.g. Oracle DBMS)
- note that a Data Store should consist of content only (i.e. no business functionality – which would be considered an application)

Application Dependency

A relationship between two Applications or a relationship between an external Party and an Application.

- indicates that (for example) application or party ‘B’ is dependent on data produced by application or party ‘A’ in order for application or party ‘B’ to complete its business functionality
- may be one-way (“B” is dependent on “A”) or two-way (“B” is dependent on “A” and “A” is dependent on “B”)
- defines the dependency in terms of data entities involved
- note that the definition of the dependency is independent of the physical implementation of the dependency (technology, timing, etc.)
- will describe the mechanism of integration between the two identified applications or external parties. **This information will be documented as the physical design emerges.**

Data Ownership

A relationship between an Application or Party and a Data-store

- indicates that the application or party has authority to write and/or update the specified data entities in the data store
- indicates that the application or party may be responsible for the validation of said data
- defines the relationship in terms of data entities involved
- note that several applications or parties may have data ownership relationships with the same data store and that data stores may in fact be aggregations of smaller subject data stores.

Party Relationship

The relationships between Parties.

- may document authorities, permissions, communications, etc. between the two parties,

2.4 Future MDM/R Applications

The LADA Diagram shows the applications that are either in operations at present, are being implemented or are deemed to be “Future” functionality. Future functionality applications may have been anticipated as part of the overall MDM/R functionality but their implementation is being deferred until a later time.

MDM/R Future Billing Functionality (AS-5) is described in Section 4 – Application Spaces.

Future functionality for LDC submission of Loss Factors for Points of Delivery to support MDM/R Future Billing Functionality (AS-5) is described in Section 9 – Application Dependencies (reference Dependencies 203 and 213).

– End of Section –

3. SMS Solution Spaces

The following table sets out definitions for each of the Solution Spaces included in the LADA as part of the Ontario Smart Metering System.

ID	Name	Solution Space - Description	Remarks/ Examples
SS-1	Meter Data Management & Repository (MDM/R)	<p>The Meter Data Management & Repository (MDM/R) is entirely within the scope of this project. It can be classified as a primarily Operational Solution Space but there are also analytic components. The MDM/R is made up of the following Application Spaces:</p> <ul style="list-style-type: none"> • Meter Data Receiver • MDM/R Master Directory • MDM/R Data Management Services • MDM/R Publishing Services <p>There are potential future optional services that could be incorporated into the MDM/R in general or into specific Application Spaces within the MDM/R. The Future Billing Functionality area is a placeholder for the potential integration of Billing Functionality.</p>	
SS-2	Advanced Metering Infrastructure (AMI)	<p>This Solution Space is outside of the scope of the MDM/R implementation. It is classified as an External Solution Space. It is assumed to already exist.</p>	
SS-3	Legacy CIS / Billing	<p>This solution space is outside the scope of the MDM/R implementation. It is classified as an External Solution Space. It is assumed to already exist. May include:</p> <ul style="list-style-type: none"> • Customer information applications • Meter information applications • Billing and receivables applications 	

– End of Section –

4. Application Spaces

The following table sets out definitions for each of the Applications Spaces identified in the LADA.

ID	Name	Application Space – Description	Remarks/ Examples
AS-1	Meter Data Receiver (MDR)	<p>The Meter Data Receiver application space details the functionality and interfaces required to receive meter readings and related data. This functionality will include:</p> <ul style="list-style-type: none"> Systems interface from the Advanced Metering Infrastructure (AMI) (SS-2) – Advanced Metering Control Computer (AMCC) (A200) User Interface to enable the LDC or their authorized agent to view and edit Meter Readings and related data. <p>All interfaces in this space will acknowledge receipt of data files and related reports.</p>	
AS-2	MDM/R Master Directory (MMD)	<p>The MDM/R Master Directory application space within the MDM/R will maintain the relationships between PODs, meters, LDCs, AMI Operators, other authorized Parties, and reference data.</p> <p>This functionality will include:</p> <ul style="list-style-type: none"> • External User Interface for the LDC or its authorized agent; • External System Interface for the Meter Information System to provide Meter Information to the MDM/R Master Directory • Interfaces to feed submitted updates to the applicable AMI Operator or directly to the AMI if feasible. • Point of Delivery (POD) creation and relationship maintenance <p>The MMD is the reference for all the information about the relationships between meters, premises, LDCs and Interested Parties through the creation of a POD such that the MDM/R can utilize the POD for correctly processing Meter Reads and information requests. These data transfers represent critical data sent by the LDC to allow the MDM/R to update the MMD and identify temporal changes in various attributes associated with the POD that are required for the MDM/R to function.</p>	

ID	Name	Application Space – Description	Remarks/ Examples
AS-3	MDM/R Data Management Services (MMS)	<p>The MDM/R Data Management Service application space details functions that are required to operate, administer, manage and secure the MDM/R System and Repositories.</p> <p>This functionality will include:</p> <ul style="list-style-type: none"> • Auditing; • Versioning; • Process Monitoring; • Information Archiving and Restoration Services; • User Administration; • External Interested Party registration; 	
AS-4	MDM/R Publishing Services (MPS)	<p>The MDM/R Publishing Services application space functionality will include:</p> <ul style="list-style-type: none"> • Publishing of information specifically required by LDC's or their Billing Agent. This is primarily preparation and delivery of scheduled or requested billing quantity information; • Publishing of information requested by LDCs, Billing Agents and Interested Authorized Parties using standard parameter inputs. These ad hoc requests provide the capability for authorized requestors to gather the information that they are authorized to retrieve in various formats for use in their own processes; and • Publishing of information that is classified as Public information. All parties can use this information since it does not represent any specific information that would violate confidentiality or privacy requirements. 	
AS-5	Future Billing Functionality (FBF)	<p>The Future Billing Functionality application space provides for the integration of Billing functionality into the MDM/R. This application space is the placeholder for this future capability.</p>	

– End of Section –

5. Parties

The following table sets out definitions for each of the Parties identified in the LADA.

ID	Name	Party - Description	Remarks / Examples
P001	Customer (CUST)	<p>The Customer is the party that has contracted with the Local Distribution Company (LDC) in their service area for the purpose of the customer consuming electricity delivered by the LDC to the premise.</p> <ul style="list-style-type: none"> • As part of the initial stage of implementation the MDM/R will receive, process, and manage Meter Reads for Small Volume Customers including residential electricity consumers and small general service consumers where there is no requirement to meter demand. • Later stages of implementation may provide support of Commercial & Industrial consumers where metering of demand is required. 	
P002	Local Distribution Companies (LDC)	<p>Local Distribution Companies (LDC) are responsible for the delivery of electricity to customers. This includes the installation and maintenance of the distribution system and meters installed on the Premises of their customers within their service areas. They gather meter readings, prepare customer electricity consumption bills and provide information to third parties as required.</p> <p>LDCs will be deploying Advanced Metering Infrastructure (AMI) systems to collect Meter Reads on an hourly basis from all AMCDs and to transmit these same Meter Reads to the AMCC and MDM/R in accordance with the AMI Specification. The LDCs will therefore be responsible for ensuring that every effort is made to collect, date- and time-stamped Meter Reads and provide this information to the MDM/R. LDCs will temporarily store the Meter Reads in the AMCC, provide customer support and service functions, and perform day-to-day meter-related operations. Pursuant to the AMI Specifications, LDCs are also responsible for providing customer demographic or firmographic information to the MDM/R, for use in populating the MMD.</p>	
P003	Ontario Energy Board (OEB)	Ontario's energy regulator	
P004	Billing Agent (BILLING)	<p>Local Distribution Companies (LDC) use Billing Systems to handling the billing of their customers. The LDC may have an internal group operating their billing services or may outsource these services to a Billing Agent.</p> <p>A Billing Agent is an entity that provides bill calculation and/or presentment services for LDC's and Retailers.</p> <ul style="list-style-type: none"> • A Billing Agent may also be a Retailer. • A Billing Agent may also be an Authorized Interested Party. 	

ID	Name	Party - Description	Remarks / Examples
P005	Advanced Metering Infrastructure Operator (AMI OPS)	The entity responsible for operating the Advanced Metering Infrastructure (AMI). Local Distribution Companies (LDC) use Advanced Metering Infrastructure systems to handle the automated reading of smart meters and the transmission of those meter readings to the MDM/R. The LDC may have an internal group operating their Advanced Metering Infrastructure systems services or may outsource these services to an Advanced Metering Infrastructure Operator.	
P006	Smart Metering Entity (SME)	The Smart Metering Entity as defined by the <i>Energy Conservation Responsibility Act, 2006</i> .	
P007	Operational Service Provider (OSP)	The entity that provides services that enable the operation of the MDM/R and its interfaces to the AMI, distribution company billing systems and other requiring access to MDM/R contents. The SME may act as its own Operational Service Provider.	
P008	Authorized Interested Party (PARTY)	Those entities that are authorized to access specific data from the MDM/R. <ul style="list-style-type: none"> • An Authorized Interested Party may be a Retailer. • An Authorized Interested Party may also be a Billing Agent. The MDM/R shall provide data to authorized Interested Parties, including LDCs, based on requests that use the Point of Delivery (POD). Data will be provided only to those registered to receive such data. The MMD shall maintain records identifying all such relationships.	
P009	Public (PUBLIC)	A person or organization that does not require special permission to access information that is made available by the MDM/R for public use.	

– End of Section –

6. Applications

The following table sets out definitions for each of the Applications identified in the LADA.

ID	Application Name	Application - Description and Notes	Part of Application Space	Remarks / Examples
A100	Meter Data Receiver (MDR)	<p>The Meter Data Receiver is the MDM/R system interface to the Advanced Metering Control Computer (AMCC) (A200) in the LDC's Advanced Metering Infrastructure (AMI). It will include functionality to:</p> <ul style="list-style-type: none"> • Receive and store all meter reads and related data sent by the AMCC. • Acknowledge receipt of meter related data • Report any anomalies or errors to the appropriate Advanced Metering Infrastructure Operator (AMI OPS) (E005) via the system interface with the AMCC or directly to the AMI Operator if the AMI is not capable of receiving the acknowledgements and error reports. <p>The Meter Data Receiver shall receive and process interval data from all AMI in the province. Meter Reads will be transmitted to the MDM/R from the AMCC as follows:</p> <ul style="list-style-type: none"> • Meter Reads for Small Volume Consumers where there is no requirement to meter demand will be transmitted as hourly interval data taken at the end of each hour. • Meter Reads for Commercial & Industrial Consumers where metering of demand is required will be transmitted as 15 minute interval data taken at the end of each 15 minute interval. 	AS-1	
A101	Meter Data Edit Interface (MDEI)	<p>The Meter Data Edit Interface is an external user interface for Local Distribution Companies (LDC) (P002) to view and edit as required the meter reads data for the meters that they own. This interface will:</p> <ul style="list-style-type: none"> • Allow LDCs to submit or alter meter readings based on errors reported during the automated uploading of meter readings via the AMCC or resulting from anomalies resulting from meter data validation or estimation. • Allow only the appropriate LDC or its authorized agent to perform this function. • Perform Semantic and Syntactical checking of all submitted or altered meter data. 	AS-1	

ID	Application Name	Application - Description and Notes	Part of Application Space	Remarks / Examples
A102	Validation, Estimation & Editing (VEE)	<p>The Validation, Estimation and Editing process (VEE) is applied to all received meter reads to identify and account for missed and inaccurate reads required to derive billing quantity data. The validation algorithm will identify gaps in Meter Reads and other meter read data anomalies. Estimation will automatically or manually rebuild anomalous meter read data based on historical trending or other parameter-based or user-defined estimation algorithms.</p> <p>Exceptions arising from validation anomalies or failure to create an estimate will be reported to the LDC as reports over D100.</p> <p>Editing of meter data will be enabled via the Meter Data Editing Interface (A101).</p>	AS-3	
A103	MDM/R Master Directory Interface (MMDI)	<p>The MDM/R Master Directory Interface provides an external user/system interface for receiving MDM/R Master Data from the LDC and/or its authorized agent related to the LDC's, meters and the relationships between the meters and other entities. The other entities include:</p> <ul style="list-style-type: none"> • Premise – Where the electricity is being delivered to the customer • Advanced Metering Communication Device (AMCD) • AMI Operator 	AS-2	
A104	MDM/R Data Aggregation (MDA)	<p>Aggregates meter data by multiple criteria to produce hourly, Regulated Price Plan (RPP) or Critical Peak Pricing (CPP) billing quantity data. Saves all versions of derived data in the MDM/R (S100).</p> <p>Data aggregations can be performed only any version of meter read data but Billing Quantity derived data will only use meter read data that has been through the VEE process.</p>	AS-3	
A105	MDM/R Operator Interface (MOI)	<p>Internal User Interface to provide the MDM/R Operator functionality to view and control all aspects of the MDM/R system and its operation.</p> <p>Includes ability to view and edit data and manage MDM/R processes.</p>	AS-3	

ID	Application Name	Application - Description and Notes	Part of Application Space	Remarks / Examples
A106	MDM/R Billing Data Interface (MBDI)	<p>The MDM/R Billing Data Interface feeds billing quantity data to the Billing Agent either on a schedule or when requested by the agent.</p> <p>This application is a critical process that must feed billing quantity data to the billing agent. It is not intended for general ad hoc inquiries.</p>	AS-4	
A107	MDM/R Ad Hoc Data Reporting Interface (MDRI)	<p>This is the Ad hoc inquiry/reporting interface for LDCs, Billing Agents and Authorized Interested Parties. The data requests will be built using standard input parameters. All requests for data will be verified to make sure that the party making the request is authorized to access the data being requested.</p> <p>Customers can be authorized by their LDC to access Meter Read and Billing Quantity related data for their specific Points of Delivery through this interface.</p> <p>This interface will give priority to Billing Agent inquiries and to the data produced by the MDM/R Billing Data Interface (MBDI) application.</p> <p>These ad hoc queries can be expected to be built from a menu of parameters, including, as example:</p> <ul style="list-style-type: none"> • Points of Delivery (POD) • Aggregation over time intervals: hourly, TOU or CPP; • Aggregation over a specific time period; and • MMD Data • Type of demographic/firmographic. 	AS-4	
A108	MDM/R Public Reporting Interface (MPRI)	<p>The MDM/R Public Reporting Interface will make available reports that are considered appropriate for public consumption.</p> <p>Any party can access this information since such reports will be specifically tailored for public use. Detailed individual information will not be provided. Reports will present aggregations in such a way as to protect security and privacy requirements of individual customers, LDCs, Retailers and Billing Agents.</p>	AS-4	

ID	Application Name	Application - Description and Notes	Part of Application Space	Remarks / Examples
A109	Initial Meter Data Population (TBD)	<p>The requirement for initial meter data population has not yet been fully defined. If required then this application will have to handle the conversion or creation of historical meter reading data provided by the LDC's in order to pre-populate the MDM/R Data Repository. The related Master Data will be loaded by the Initial MDM/R Master Data Population application (A110).</p> <p>This historical meter reading data would be used by the Validation, Estimation and Editing application (VEE) (A102)</p>	TBD	
A110	Initial MDM/R Master Directory Population (TBD)	<p>The requirement for initial MDM/R Master Directory population has not yet been fully defined. If required then this application will have to convert the historical master data provided by the LDCs in order to pre-populate the Master Directory to line up with the historical meter reading data that would be loaded in the Initial Meter Data Population (A109)</p> <p>The LDC could provide the required information directly, via their information systems or through their third party billing agent.</p>	TBD	
A111	MDM/R Administration Services (MAS)	The MDM/R will require various functions and reports to administer and control the operation of the MDM/R.	AS-3	
A200	Advanced Metering Control Computer (AMCC)	<p>The AMCC is an Advanced Metering Control Computer that is used to retrieve or receive and temporarily store Meter Reads before or as they are being transmitted to the MDM/R. The information stored in the AMCC is available for log maintenance and transmission faults and issue reports on the overall health of the AMI to the LDC.</p> <p>The AMCC provides meter reads and related data to the MDM/R. Interacts with the AMI Operator (AMI OPS) (P005).</p>	SS-2	

ID	Application Name	Application - Description and Notes	Part of Application Space	Remarks / Examples
A201	Meter Information System	<p>The LDC's Meter Information System is responsible for maintaining the LDC's metering inventory and meter identification and related data. This will include registration information about the meters and other entity data with which the meter may be associated. This application may be part of a larger application such as the LDC's Legacy CIS / Billing Solution Space.</p> <p>This application is presented as a logical representation of the source of meter related information that the MDM/R requires as master data within the MDM/R Master Directory.</p>	SS-3	
A202	Billing System	<p>The LDC's legacy billing system.</p> <p>This application is presented as a logical representation of the billing system to which the MDM/R will provide billing quantity data.</p>	SS-3	

– End of Section –

7. Data Stores

The following section details the Data Stores identified in the LADA.

ID	Full Name	Description	Source Application(s)	Data Cluster(s)
S100	MDM/R Data Repository (MDR DB)	<p>The MDM/R Data Repository contains the following Meter Read related data:</p> <ul style="list-style-type: none"> • All received Meter Reads and related data from the AMCC. • All received Meter Read data entered by the LDC in addressing Meter Read exceptions. • All historical meter reading data received from the LDC <p>The MDM/R Data Repository is a single logical data store that may be implemented as an Operational Data Store (ODS) as the MDM/R and a Data Warehouse (DW) for the historical or offline storage.</p>	<ul style="list-style-type: none"> • Advanced Metering Control Computer (AMCC) via the Meter Data Receiver (MDR) • LDC via Meter Data Edit Interface (MDEI) • LDC via Initial Meter Data Population (to Be Defined) 	<ul style="list-style-type: none"> • Meter Readings • Meter related data • Historical Meter Readings and related data
S101	MDM/R Master Directory Database (MMD DB)	<p>The MDM/R Master Directory Database contains the following master reference data as provided by the LDC's:</p> <ul style="list-style-type: none"> • Relationships between LDC and Meters • Relationships between LDC and Premises • Relationship between Meters and Premises • Point of Delivery associated with LDC, Premise, and Meter <p>The MDM/R Master Directory will contain the definition of Time of Use (TOU) period.</p> <p>It will also contain Critical Peak Pricing periods as provided by the Ontario Energy Board (OEB).</p>	<ul style="list-style-type: none"> • MDM/R Master Directory Interface (MMDI) (A103) 	<p>Metadata describing:</p> <ul style="list-style-type: none"> • Meters • Advanced Metering Communication Device (AMCD) • Premise • LDC • AMI Operator • Authorized Interested Parties • Time of Use Periods (TOU) • Critical Peak Pricing periods (CPP)

– End of Section –

8. Party Relationships

The following sections detail the Party Relationships identified in the LADA as they relate to the MDM/R.

<i>Party Relationship ID</i> R100	<i>Party (First)</i> P006	<i>Party (Second)</i> P002	<i>Designated Critical?</i>
<i>Party Name (First)</i> Smart Metering Entity (SME) (P006)		<i>Party Name (Second)</i> Local Distribution Company (LDC) (P002)	
<i>Relationship Description</i> The relationship between the entity responsible for the Meter Data Management & Repository system (MDM/R) and the Local Distribution Companies.			
<i>Relationship of First Party to Second Party</i> <ul style="list-style-type: none"> The SME operates the MDM/R in support of the LDCs billing operations 		<i>Relationship of Second Party to First Party</i> <ul style="list-style-type: none"> The LDCs are responsible for the collection and transmission of Meter Reads and associated data from all smart meters to the MDM/R. 	
<i>Notes / Comments:</i>			
<i>Party Relationship ID</i> R101	<i>Party (First)</i> P006	<i>Party (Second)</i> P007	<i>Designated Critical?</i>
<i>Party Name (First)</i> Smart Metering Entity (SME) (P006)		<i>Party Name (Second)</i> Operational Service Provider (OSP) (P007)	
<i>Relationship Description</i> The relationship between the Smart Metering Entity and the OSP that is responsible for the operation of the Meter Data Management & Repository system (MDM/R) and its interfaces to the AMI, distribution company billing systems and others requiring access to MDM/R contents.			
<i>Relationship of First Party to Second Party</i> <ul style="list-style-type: none"> Smart Metering Entity contracts with an OSP to operate the MDM/R under its direction in accordance with the regulations governing the operation of the MDM/R 		<i>Relationship of Second Party to First Party</i> <ul style="list-style-type: none"> Operational Service Provider provides the day-to-day operation of the MDM/R as contracted with the SME. 	
<i>Notes / Comments:</i>			

<i>Party Relationship ID</i> R200	<i>Party (First)</i> P001	<i>Party (Second)</i> P002	<i>Designated Critical?</i>
<i>Party Name (First)</i> Customer (CUST) (P001)		<i>Party Name (Second)</i> Local Distribution Company (LDC) (P002)	
<i>Relationship Description</i> The contractual relationship between the consumer of electricity and the party that delivers the electricity.			
<i>Relationship of First Party to Second Party</i> <ul style="list-style-type: none"> • Customer consumes electricity delivered by the Local Distribution Company • The Customer has a right to view their Smart Meter data as read and contained in the MDM/R. 		<i>Relationship of Second Party to First Party</i> <ul style="list-style-type: none"> • Local Distribution Company is responsible for the delivery of electricity to the Customer • The LDC provides the Smart Metering data presentment service to the Customer using data retrieved from the MDM/R. 	
<i>Notes / Comments:</i>			
<i>Party Relationship ID</i> R201	<i>Party (First)</i> P002	<i>Party (Second)</i> P005	<i>Designated Critical?</i>
<i>Party Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Party Name (Second)</i> Advanced Metering Infrastructure Operator (AMI OPS) (P005)	
<i>Relationship Description</i> Details the relationship between Local Distribution Company and the entity that is responsible for the operation of the Advanced Metering Infrastructure that the LDC uses to communicate with the Meter Data Receiver interface of the MDM/R.			
<i>Relationship of First Party to Second Party</i> <ul style="list-style-type: none"> • The LDC is responsible for the Advanced Metering Infrastructure required to collect and transmit meter read data from Smart Meters to the MDM/R. • The LDC can operate the AMI itself or can contract with other entities to operate it for them. • 		<i>Relationship of Second Party to First Party</i> <ul style="list-style-type: none"> • The AMI OPS is contracted by the LDC to operate the Advanced Metering Infrastructure. 	
<i>Notes / Comments:</i>			

<i>Party Relationship ID</i> R202	<i>Party (First)</i> P002	<i>Party (Second)</i> P004	<i>Designated Critical?</i>
<i>Party Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Party Name (Second)</i> Billing Agent (BILLING) (P004)	
<i>Relationship Description</i> Details the relationship between the LDC and its Billing Agent. The Billing functionality and service may have been outsourced. If the Billing service is performed within the LDC then this relationship is contained within the LDC.			
<i>Relationship of First Party to Second Party</i> <ul style="list-style-type: none"> The LDC has a requirement to bill its customers. To accomplish this they can operate their own Billing Service or may contract with a third-party Billing Agent to operate a billing service for them. 		<i>Relationship of Second Party to First Party</i> <ul style="list-style-type: none"> A billing Agent provides a billing service for the LDC It may provide bill calculation and/or presentment services. 	
<i>Notes / Comments:</i>			
<i>Party Relationship ID</i> R203	<i>Party (First)</i> P002	<i>Party (Second)</i> P008	<i>Designated Critical?</i>
<i>Party Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Party Name (Second)</i> Authorized Interested Parties (PARTY) (P008)	
<i>Relationship Description</i> Details the relationship between the LDC and those parties requesting access to data within the MDM/R that the LDC is responsible for.			
<i>Relationship of First Party to Second Party</i> <ul style="list-style-type: none"> LDC controls authorized access to the data within the MDM/R that they are responsible for. The LDC considers requests for access from MDM/R registered Interested Parties. Requests for data access are tied to specified Points of Delivery (POD) 		<i>Relationship of Second Party to First Party</i> <ul style="list-style-type: none"> Authorized Interested Parties request access to data within the MDM/R for which the LDC is responsible. An entity that is registered with the MDM/R as an Interested Party can request specific access to data within an LDC's Service Area. The request must be for specific Points of Delivery (POD). The Interested Party becomes an Authorized Interested Party once the LDC approves their request for specific access. 	
<i>Notes / Comments:</i>			

– End of Section –

9. Application Dependencies

The following sections detail the Application Dependencies identified in the LADA.

<i>Dependency Id</i>	<i>Application Space (First)</i>	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
D100	AS-3	Party	
<i>Application Name (First)</i> Validation, Estimation & Editing (VEE) (A102)		<i>Application Name (Second)</i> Local Distribution Company (LDC) (P002)	
<i>Dependency description</i> The LDC depends on the Validation, Estimation and Editing application to provide notification of exceptions encountered during the VEE processing of received meter reads and associated data.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Method by which MDM/R received the meter reading data • AMCC identification (if applicable) • Meter identification • Point of Delivery • Delivery Date and Time information • Exceptions 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D101	<i>Application Space (First)</i> AS-1	<i>Application Space (Second)</i> AS-3	<i>Designated Critical?</i>
<i>Application Name (First)</i> Meter Data Receiver (MDR) (A100)		<i>Application Name (Second)</i> Validation, Estimation & Editing (VEE) (A102)	
<i>Dependency description</i> The VEE application depends on the Meter Data Receiver to: <ul style="list-style-type: none"> • Capture and store all data received in each AMCC Meter Data Transfer • To perform Pre-Vee, Syntactic and Semantic Checks on all received data 			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Meter Reads and associated data 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			
<i>Dependency Id</i> D102	<i>Application Space (First)</i> AS-1	<i>Application Space (Second)</i> AS-3	<i>Designated Critical?</i>
<i>Application Name (First)</i> Meter Data Edit Interface (MDEI) (A101)		<i>Application Name (Second)</i> Validation, Estimation & Editing (VEE) (A102)	
<i>Dependency description</i> The VEE application depends on the Meter Data Edit Interface to: <ul style="list-style-type: none"> • Capture and store all meter read data edits entered by the LDC • To perform Pre-VEE, Syntactic and Semantic Checks on all received data 			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Meter read edits 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D103	<i>Application Space (First)</i> AS-3	<i>Application Space (Second)</i> AS-3	<i>Designated Critical?</i>
<i>Application Name (First)</i> Validation, Estimation & Editing (VEE) (A102)		<i>Application Name (Second)</i> MDM/R Data Aggregation (MDA) (A104)	
<i>Dependency description</i> The MDM/R Data Aggregation depends on VEE to complete validation and estimation on all received meter data so that it can be correctly used in data aggregations.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Meter Read data passing validation and estimation marked to indicate their status for use in the Data Aggregation process. • Meter Read data edited by the LDC marked to indicate their status for use in the Data Aggregation process. 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			
<i>Dependency Id</i> D104	<i>Application Space (First)</i> AS-2	<i>Application Space (Second)</i> AS-1	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Master Directory – Application Space (AS-2)		<i>Application Name (Second)</i> Meter Data Receiver - Application Space (AS-1)	
<i>Dependency description</i> The Meter Data Receiver depends on the MDM/R Master Directory to provide Master Data related to Point of Delivery and data required to perform Pre-VEE, Syntactic and Semantic checking on all received meter data.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Points of Delivery • Point of Delivery – LDC relationships • Point of Delivery – Meter ID relationships • Point of Delivery – AMI Operator relationships • Point of Delivery – AMCC relationships 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D105	<i>Application Space (First)</i> AS-2	<i>Application Space (Second)</i> Party	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Master Directory – Application Space (AS-2)		<i>Application Name (Second)</i> Advanced Metering Infrastructure Operator (AMI OPS) (P005)	
<i>Dependency description</i> The AMI Operator depends on the MDM/R Master Directory to notify it of any additions, deletions or changes received from the LDC or CIS that the AMI Operator is providing services for. It is anticipated that the AMI Operator should have already been informed of the changes by the LDC or CIS but this will confirm that the MDM/R will now be processing data according to the new definitions.			
<i>Key Data entities passed from First Application to Second Application</i> Updates from the LDC or CIS to: <ul style="list-style-type: none"> • Points of Delivery • Point of Delivery – LDC relationships • Point of Delivery – Meter ID relationships • Point of Delivery – AMI Operator relationships • Point of Delivery – AMCC relationships 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i>	<i>Application Space (First)</i>	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
D106	AS-2	SS-3	
<i>Application Name (First)</i> MDM/R Master Directory (MMD) (AS-2)		<i>Application Name (Second)</i> Legacy CIS / Billing Solution Space (SS-3)	
<i>Dependency description</i> The Legacy CIS / Billing Solution Space depends on the MDM/R Master Directory to provide acknowledgements of any additions, deletions and changes to the MDM/R Master Directory as provided directly from the LDC.			
<i>Key Data entities passed from First Application to Second Application</i>		<i>Key data entities passed from Second Application to First Application</i>	
<ul style="list-style-type: none"> • Premise (including time zone) • Premise demographic / firmographic classification(s) • Point of Delivery – Premise relationships • Point of Delivery – POD Classification relationships • Point of Delivery – Billing Cycle relationships • Point of Delivery – Meter ID relationships • Point of Delivery – Meter ID – AMI Operator relationships • Point of Delivery – Meter ID – AMCC relationships • Authorized Interested Party – POD relationships • Flag to indicate that estimation is not allowed 		<ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i>		<i>Mechanism of integration from Second Application to First Application</i>	
<ul style="list-style-type: none"> • 		<ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D107	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> Party	<i>Designated Critical?</i>
<i>Application Name (First)</i> Smart Metering Entity (SME) (P006)		<i>Application Name (Second)</i> Operational Service Provider (OSP) (P007)	
<i>Dependency description</i> The Operational Service Provider depends on the Smart Metering Entity for instructions regarding the entry of Rate Structures into the MDM/R Master Directory			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Hourly Rate Structures • Regulated Price Plan (RPP) Rate Structures • Critical Peak Pricing (CPP) Rate Structures 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			
<i>Dependency Id</i> D108	<i>Application Space (First)</i> AS-2	<i>Application Space (Second)</i> AS-3	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Master Directory – Application Space (AS-2)		<i>Application Name (Second)</i> MDM/R Data Management Services – Application Space (AS-3)	
<i>Dependency description</i> The MDM/R Data Management Services Application Space depends on the MDM/R Master Directory for master data required to manage the MDM/R System. The MDM/R Master Directory depends on the MDM/R Data Management Services for master data entered by the OSP			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Master data related to POD 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Party registrations 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D109	<i>Application Space (First)</i> AS-3	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Data Management Services – Application Space (AS-3)		<i>Application Name (Second)</i> MDM/R Publishing Services – Application Space (AS-4)	
<i>Dependency description</i> The MDM/R Publishing Services Application Space depends on the MDM/R Data Management Services Application Space for meter related data required for publishing/reporting purposes. The MDM/R Data Management Services depends on the MDM/R Publishing Services to provide information on all requests received and processed.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Meter Read data including related status and versioning information • Derived data and versioning information 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Data requests and related data. • Data provided/reported to the requestor 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i> All disseminated data have to be archived per Section 3.6 of the Functional Specification.			
<i>Dependency Id</i> D110	<i>Application Space (First)</i> AS-2	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Master Directory – Application Space (AS-2)		<i>Application Name (Second)</i> MDM/R Publishing Services – Application Space (AS-4)	
<i>Dependency description</i> The MDM/R Publishing Services depends on the MDM/R Master Directory for the master data required to publish all reports and to respond to all queries.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Master data related to POD 		<i>Key data entities passed from Second Application to First Application</i> •	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D111	<i>Application Space (First)</i> AS-3	<i>Application Space (Second)</i> Party	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Operator Interface (MOI) (A105)		<i>Application Name (Second)</i> Operational Service Provider (OSP) (P007)	
<i>Dependency description</i> <ul style="list-style-type: none"> • The Operational Service Provider depends on the MDM/R Operator Interface to provide access to the functions required to control and operate the MDM/R. This includes monitoring the data receive functions as well as data publishing services. • The OSP depends on the MOI to input data required for Party registration. 			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Monitoring information on the various processes within the MDM/R • Operations control information • Feedback on information provided by the OSP via the interface 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Process Operation and Control information • Party registration data 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			
<i>Dependency Id</i> D112	<i>Application Space (First)</i> AS-1	<i>Application Space (Second)</i> Party	<i>Designated Critical?</i>
<i>Application Name (First)</i> Meter Data Receiver (MDR) (A100)		<i>Application Name (Second)</i> Advanced Metering Infrastructure Operator (AMI OPS) (P005)	
<i>Dependency description</i> <ul style="list-style-type: none"> • The Advanced Metering Infrastructure Operator (AMI OPS) depends on the Meter Data Receiver (MDR) to notify it when AMCC data related errors occur. • The MDR provides acknowledgements to the AMI OPS for every meter reading data transfer from the AMI to the MDM/R including any interface or communication errors, Pre-VEE, Syntactic and Semantic Checking errors. 			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Acknowledgement of data transfer receipt • Error notifications relating to data transfer and/or structure problems 		<i>Key data entities passed from Second Application to First Application</i> •	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D113	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-2	<i>Designated Critical?</i>
<i>Application Name (First)</i> Operational Service Provider (OSP) (P007)		<i>Application Name (Second)</i> MDM/R Master Directory Interface (MMDI) (A103)	
<i>Dependency description</i> <ul style="list-style-type: none"> The Operational Service Provider (OSP) enters the OEB Approved Rate Structures into the MDM/R Master Directory Interface as instructed by the Smart Metering Entity (SME) 			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> Hourly Rate Structures Regulated Price Plan (RPP) Rate Structures Critical Price Plan (CPP) Rate Structures 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D114	<i>Application Space (First)</i> AS-2	<i>Application Space (Second)</i> SS-2	<i>Designated Critical?</i>
<i>Application Name (First)</i> MDM/R Master Directory – Application Space (AS-2)		<i>Application Name (Second)</i> Advanced Metering Control Computer (AMCC) (A200)	
<i>Dependency description</i> Where AMI/AMCC technologies are capable of Master Data Synchronization then the LDC or AMI Operator may decide to enable master data updates from either the MDM/R Master Directory to the AMCC or from the AMCC to the MDM/R Master Directory as appropriate. Where the AMCC is not the source of those master data updates and it is capable of receiving master data updates (in the form of master data synchronizations) then the AMCC will depend on the MDM/R Master Directory to notify it of any additions, deletions or changes received from the LDC or CIS for PODs that the AMCC is providing services for. It is anticipated that the AMCC should have already been updated for changes by the LDC or CIS but this will confirm that the MDM/R will now be processing data according to the new definitions. Where the AMCC is the source of specific types of master data then the MDM/R Master Directory depends on the AMCC to provide the applicable master data updates in the form of master data synchronizations.			
<i>Key Data entities passed from First Application to Second Application</i> Master Data Synchronization updates from the MDM/R Master Directory to the AMCC: <ul style="list-style-type: none"> • Points of Delivery • Point of Delivery – AMCC relationships • Point of Delivery – LDC relationships • Point of Delivery – Meter ID relationships • Point of Delivery – AMI Operator relationships 		<i>Key data entities passed from Second Application to First Application</i> Master Data Synchronization updates from the AMCC to the MDM/R Master Directory: <ul style="list-style-type: none"> • Points of Delivery • Point of Delivery – AMCC relationships • Point of Delivery – LDC relationships • Point of Delivery – Meter ID relationships • Point of Delivery – AMI Operator relationships Note: the exact data entities must be confirmed.	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i>	<i>Application Space (First)</i>	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
D200	SS-2	AS-1	
<i>Application Name (First)</i> Advanced Metering Control Computer (AMCC) (A200)		<i>Application Name (Second)</i> Meter Data Receiver (MDR) (A100)	
<i>Dependency description</i> The Meter Data Receiver (MDR) depends on the Advanced Metering Control Computer (AMCC) to transfer Meter Reads and related data to the MDR. Where AMI/AMCC technologies permit or allow two-way communications, the Meter Data Receiver (MDR) will provide acknowledgements to the AMI/AMCC for every meter reading data transfer from the AMI to the MDM/R including any interface or communication errors, Pre-VEE, Syntactic and Semantic Checking errors			
<i>Key Data entities passed from First Application to Second Application</i> General Header Information: <ul style="list-style-type: none"> • AMI Operator that is transferring the data; • LDC Identifier for the data transfer Point of Delivery (POD) Information: <ul style="list-style-type: none"> • POD Identifier assigned by the MDM/R; • Meter ID Meter Reads and Related Data: <ul style="list-style-type: none"> • Hourly interval data taken at the end of each hour with a precision of at least 10 watt-hours (0.01 kWh); • Error or status flags associated with each meter read as appropriate; • Calendar day 		<i>Key data entities passed from Second Application to First Application</i> Where AMI/AMCC technologies permit or allow two-way communications, the Meter Data Receiver (MDR) will feed the following Data Entities back to the AMI/AMCC directly: <ul style="list-style-type: none"> • Acknowledgement of data transfer receipt • Error notifications relating to data transfer and/or structure problems Otherwise see D112 – Meter Data Receiver to Advanced Metering Infrastructure Operator dependency.	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D201	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-1	<i>Designated Critical?</i>
<i>Application Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Application Name (Second)</i> Meter Data Edit Interface (MDEI) (A101)	
<i>Dependency description</i> The Meter Data Edit Interface (MDEI) depends on the LDC to provide the meter read edits as required addressing meter read exceptions and other LDC edits. The LDC depends on the Meter Data Edit Interface to provide immediate checking on submitted data and acknowledgement of data acceptance.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Meter Read edits • Manual imports of meter read edits 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Acknowledgement of data transfer receipt (on manual imports) • Acknowledgements on LDC entered Meter Read edits • Error notifications relating to file content and/or structure problems 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i>	<i>Application Space (First)</i>	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
D202	SS-3	SS-1	
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> Initial Meter Data Population (To Be Defined) (A109)	
<i>Dependency description</i> The Initial Meter Data Population process (if required and delivered) depends on the LDC to provide the required historical meter related data. This data would provide the historical basis for processes such as VEE where the Estimation process can use historical data.			
<i>Key Data entities passed from First Application to Second Application</i>		<i>Key data entities passed from Second Application to First Application</i>	
<ul style="list-style-type: none"> • LDC Identifier • Premise • Point of Delivery (optional) • Meter Read data (including date) • Load class • Class load shapes 		<ul style="list-style-type: none"> • 	
<i>Mechanism of integration from First Application to Second Application</i>		<i>Mechanism of integration from Second Application to First Application</i>	
<ul style="list-style-type: none"> • 		<ul style="list-style-type: none"> • 	
<i>Notes/comments</i> The requirement to provide this conversion is still being considered.			

<i>Dependency Id</i>	<i>Application Space (First)</i>	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
D203	SS-3	AS-2	
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> MDM/R Master Directory Interface (MMDI) (A103)	
<i>Dependency description</i> The MDM/R Master Directory Interface depends on the Legacy CIS / Billing Solution Space to provide any additions, deletions and changes required regarding Points of Delivery, POD relationships and related data. This includes authorizations for Parties to become authorized to view specified points of delivery (POD). Future Functionality: Submission of Loss Factors for Points of Delivery (POD) for use in future billing functionality.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Premise (including time zone) • Premise demographic / firmographic classification(s) • Point of Delivery – Premise relationships • Point of Delivery – POD Classification relationships • Point of Delivery – Billing Cycle relationships • Point of Delivery – Meter ID relationships • Point of Delivery – Meter ID – AMI Operator relationships • Point of Delivery – Meter ID – AMCC relationships • Authorized Interested Party – POD relationships • Flag to indicate that estimation is not allowed <u>Future Key Data</u> <ul style="list-style-type: none"> • POD Loss Factors 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • The MDM/R Master Directory Interface should provide the current state of any requested Master Data in the Master Directory for the LDC. • The MDM/R Master Directory Interface shall provide a unique Point of Delivery (POD) for each premise that the LDC registers. 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i>	<i>Application Space (First)</i>	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
D204	SS-3	SS-1	
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> Initial MDM/R Master Directory Population (To Be Defined) (A110)	
<i>Dependency description</i> If the Initial Meter Data Population process is required and delivered then the Initial MDM/R Master Directory Population process will depend on the LDC and its systems to provide the Master data that relates to the historical meter data.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> Premise (including time zone) 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> The Initial MDM/R Master Directory Population process shall provide a unique Point of Delivery (POD) for each premise that the LDC registers. 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D205	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Billing Agent (BILLING) (P004)		<i>Application Name (Second)</i> MDM/R Billing Data Interface (MBDI) (A106)	
<i>Dependency description</i> The MDM/R Billing Data Interface depends on the Billing Agent to setup scheduled “pushes” or request “pulls” of the Point of Delivery related meter reads and billing quantity data in a manner that allows the Billing Agent to perform its required billing processes. The Billing Agent depends on the MDM/R Billing Data Interface to respond to the scheduled “pushes” or request “pulls” with the appropriate meter reads and billing quantity data.			
<i>Key Data entities passed from First Application to Second Application</i> The Billing Agent may have to schedule “pushes” or request “pulls” of the billing data that they require to support their billing operations. <ul style="list-style-type: none"> • Points of Delivery (POD) • Dates or period • Billing Cycles 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • LDC identifier; • Billing cycle identifier; • Billing Quantities for each POD • Meter reads related to each Billing Quantity 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D206	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Application Name (Second)</i> MDM/R Ad Hoc Data Reporting Interface (MDRI) (A107)	
<i>Dependency description</i> The MDM/R Ad Hoc Data Reporting Interface must respond to ad hoc inquiries from the LDC.			
<i>Key Data entities passed from First Application to Second Application</i> The LDC may request the billing quantity data and meter read data by: <ul style="list-style-type: none"> • Points of Delivery (POD) • Aggregation over time intervals: hourly, TOU or CPP; • Aggregation over a specific time period; and • MMD Data • Type of demographic/firmographic. 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Billing Quantity data • Meter Reads 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			
<i>Dependency Id</i> D207	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Application Name (Second)</i> MDM/R Public Reporting Interface (MPRI) (A108)	
<i>Dependency description</i> The MDM/R Public Reporting Interface must provide to the LDC those reports and information that are routinely produced and/or published for use by the Public.			
<i>Key Data entities passed from First Application to Second Application</i> •		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Requested public reports 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D208	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Authorized Interested Parties (PARTY) (P008)		<i>Application Name (Second)</i> MDM/R Ad Hoc Data Reporting Interface (MDRI) (A107)	
<i>Dependency description</i> The MDM/R Ad Hoc Data Reporting Interface must respond to ad hoc inquiries from Authorized Interested Parties according to the access authorizations provided by the appropriate LDC.			
<i>Key Data entities passed from First Application to Second Application</i> Authorized Interested Parties gain access to the MDM/R Ad Hoc Data Reporting Interface by providing: <ul style="list-style-type: none"> • Security Login ID • Password Authorized Interested Parties may request the billing quantity data and meter read data by: <ul style="list-style-type: none"> • Points of Delivery (POD) • Aggregation over time intervals: hourly, TOU or CPP; • Aggregation over a specific time period; and • MMD Data • Type of demographic/firmographic. 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Billing Quantity data • Meter Reads 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D209	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Authorized Interested Parties (PARTY) (P008)		<i>Application Name (Second)</i> MDM/R Public Reporting Interface (MPRI) (A108)	
<i>Dependency description</i> The MDM/R Public Reporting Interface must provide to the Authorized Interested Parties those reports and information that are routinely produced and/or published for use by the Public.			
<i>Key Data entities passed from First Application to Second Application</i> •		<i>Key data entities passed from Second Application to First Application</i> • Requested public reports	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D210	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Customer (CUST) (P001)		<i>Application Name (Second)</i> MDM/R Ad Hoc Data Reporting Interface (MDRI) (A107)	
<i>Dependency description</i> The MDM/R Ad Hoc Data Reporting Interface must respond to ad hoc inquiries from Customers according to the access authorizations provided by the appropriate LDC.			
<i>Key Data entities passed from First Application to Second Application</i> Customers gain access to the MDM/R Ad Hoc Data Reporting Interface by providing: <ul style="list-style-type: none"> • Security Login ID • Password Customers may request the billing quantity data and meter read data by: <ul style="list-style-type: none"> • Points of Delivery (POD) • Aggregation over time intervals: hourly, TOU or CPP; • Aggregation over a specific time period; and • MMD Data • Type of demographic/firmographic. 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Billing Quantity data • Meter Reads 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D211	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Public (PUBLIC) (P009)		<i>Application Name (Second)</i> MDM/R Public Reporting Interface (MPRI) (A108)	
<i>Dependency description</i> The MDM/R Public Reporting Interface must provide to the Public those reports and information that are routinely produced and/or published for use by the Public.			
<i>Key Data entities passed from First Application to Second Application</i> •		<i>Key data entities passed from Second Application to First Application</i> • Requested public reports	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D212	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-1	<i>Designated Critical?</i>
<i>Application Name (First)</i> Advanced Metering Infrastructure Operator (AMI OPS)		<i>Application Name (Second)</i> Meter Data Receiver (MDR) (A100)	
<i>Dependency description</i> The MDR relies on the AMI OPS to transfer meter reads and other data that can be retrieved from a meter but can not be transferred by the AMCC. The AMI OPS can transfer such meter data through the use of a manual import into the MDR.			
<i>Key Data entities passed from First Application to Second Application</i> General Header Information: <ul style="list-style-type: none"> • AMI Operator that is transferring the data; • LDC Identifier for the data transfer Point of Delivery (POD) Information: <ul style="list-style-type: none"> • POD Identifier assigned by the MDM/R; • Meter ID Meter Reads and Related Data: <ul style="list-style-type: none"> • Hourly interval data taken at the end of each hour with a precision of at least 10 watt-hours (0.01 kWh); • Error or status flags associated with each meter read as appropriate; • Calendar day 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Acknowledgement of data transfer receipt • Error notifications relating to data transfer and/or structure problems 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D213	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-2	<i>Designated Critical?</i>
<i>Application Name (First)</i> Local Distribution Company (LDC) (P002)		<i>Application Name (Second)</i> MDM/R Master Directory Interface (MMDI) (A103)	
<i>Dependency description</i> The MDM/R Master Directory Interface depends on the LDC to provide any additions, deletions and changes required regarding Points of Delivery, POD relationships and related data. This includes authorizations for Parties to become authorized by the LDC to view specified points of delivery (POD). Future Functionality: Submission of Loss Factors for Points of Delivery (POD) for use in future billing functionality.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> • Premise (including time zone) • Premise demographic / firmographic classification(s) • Point of Delivery – Premise relationships • Point of Delivery – POD Classification relationships • Point of Delivery – Billing Cycle relationships • Point of Delivery – Meter ID relationships • Point of Delivery – Meter ID – AMI Operator relationships • Point of Delivery – Meter ID – AMCC relationships • Authorized Interested Party – POD relationships • Flag to indicate that estimation is not allowed <u>Future Key Data</u> <ul style="list-style-type: none"> • POD Loss Factors 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • The MDM/R Master Directory Interface should provide the current state of any requested Master Data in the Master Directory for the LDC. • The MDM/R Master Directory Interface shall provide a unique Point of Delivery (POD) for each premise that the LDC registers. 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> • 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> • 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D214	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> Party	<i>Designated Critical?</i>
<i>Application Name (First)</i> Ontario Energy Board (OEB) (P003)		<i>Application Name (Second)</i> Smart Metering Entity (SME) (P006)	
<i>Dependency description</i> The Ontario Energy Board provides notification of Approved Rate Structures to the Smart Metering Entity			
<i>Key Data entities passed from First Application to Second Application</i> Notification of Approved Rate Structures: <ul style="list-style-type: none"> Hourly Rate Structures Regulated Price Plan (RPP) Rate Structures Critical Peak Pricing (CPP) Rate Structures 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> 	
<i>Notes/comments</i>			
<i>Dependency Id</i> D215	<i>Application Space (First)</i> SS-3	<i>Application Space (Second)</i> AS-1	<i>Designated Critical?</i>
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> Meter Data Edit Interface (MDEI) (A101)	
<i>Dependency description</i> The Meter Data Edit Interface (MDEI) depends on the Legacy CIS / Billing Solution Space to provide the meter read edits as required addressing meter read exceptions and other LDC edits. The Legacy CIS / Billing Solution Space depends on the Meter Data Edit Interface to provide immediate checking on submitted data and acknowledgement of data acceptance.			
<i>Key Data entities passed from First Application to Second Application</i> <ul style="list-style-type: none"> Meter Read edits Manual imports of meter read edits 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> Acknowledgement of data transfer receipt Error notifications relating to file content and/or structure problems 	
<i>Mechanism of integration from First Application to Second Application</i> <ul style="list-style-type: none"> 		<i>Mechanism of integration from Second Application to First Application</i> <ul style="list-style-type: none"> 	
<i>Notes/comments</i>			

<i>Dependency Id</i> D216	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Local Distribution Companies (LDC) (P002)		<i>Application Name (Second)</i> MDM/R Billing Data Interface (MBDI) (A106)	
<i>Dependency description</i> The MDM/R Billing Data Interface depends on the LDC to setup scheduled “pushes” or request “pulls” of the Point of Delivery related meter reads and billing quantity data in a manner that allows the LDC to perform its required billing processes. The LDC depends on the MDM/R Billing Data Interface to respond to the scheduled “pushes” or request “pulls” with the appropriate meter reads and billing quantity data.			
<i>Key Data entities passed from First Application to Second Application</i> The LDC may have to schedule “pushes” or request “pulls” of the billing data that they require to support their billing operations. <ul style="list-style-type: none"> • Points of Delivery (POD) • Dates or period • Billing Cycles 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • LDC identifier; • Billing cycle identifier; • Billing Quantities for each POD • Meter reads related to each Billing Quantity 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D217	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Billing Agent (BILLING) (P004)		<i>Application Name (Second)</i> MDM/R Ad Hoc Data Reporting Interface (MDRI) (A107)	
<i>Dependency description</i> The MDM/R Ad Hoc Data Reporting Interface must respond to ad hoc inquiries from the Billing Agent.			
<i>Key Data entities passed from First Application to Second Application</i> The Billing Agent may request the billing quantity data and meter read data by: <ul style="list-style-type: none"> • Points of Delivery (POD) • Aggregation over time intervals: hourly, TOU or CPP; • Aggregation over a specific time period; and • MMD Data • Type of demographic/firmographic. 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Billing Quantity data • Meter Reads 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			
<i>Dependency Id</i> D218	<i>Application Space (First)</i> Party	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Billing Agent (BILLING) (P004)		<i>Application Name (Second)</i> MDM/R Public Reporting Interface (MPRI) (A108)	
<i>Dependency description</i> The MDM/R Public Reporting Interface must provide to the Billing Agent those reports and information that are routinely produced and/or published for use by the Public.			
<i>Key Data entities passed from First Application to Second Application</i> •		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Requested public reports 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D219	<i>Application Space (First)</i> SS-3	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> MDM/R Billing Data Interface (MBDI) (A106)	
<i>Dependency description</i> The MDM/R Billing Data Interface depends on the Legacy CIS / Billing Solution Space to setup scheduled “pushes” or request “pulls” of the Point of Delivery related meter reads and billing quantity data in a manner that allows the Legacy CIS / Billing Solution Space to perform its required billing processes. The Legacy CIS / Billing Solution Space depends on the MDM/R Billing Data Interface to respond to the scheduled “pushes” or request “pulls” with the appropriate meter reads and billing quantity data.			
<i>Key Data entities passed from First Application to Second Application</i> The Legacy CIS / Billing Solution Space may have to schedule “pushes” or request “pulls” of the billing data that is required to support billing operations. <ul style="list-style-type: none"> • Points of Delivery (POD) • Dates or period • Billing Cycles 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • LDC identifier; • Billing cycle identifier; • Billing Quantities for each POD • Meter reads related to each Billing Quantity 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D220	<i>Application Space (First)</i> SS-3	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> MDM/R Ad Hoc Data Reporting Interface (MDRI) (A107)	
<i>Dependency description</i> The MDM/R Ad Hoc Data Reporting Interface must respond to ad hoc inquiries from the Legacy CIS / Billing Solution Space.			
<i>Key Data entities passed from First Application to Second Application</i> The Legacy CIS / Billing Solution Space may request the billing quantity data and meter read data by: <ul style="list-style-type: none"> • Points of Delivery (POD) • Aggregation over time intervals: hourly, TOU or CPP; • Aggregation over a specific time period; and • MMD Data • Type of demographic/firmographic. 		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Billing Quantity data • Meter Reads 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			
<i>Dependency Id</i> D221	<i>Application Space (First)</i> SS-3	<i>Application Space (Second)</i> AS-4	<i>Designated Critical?</i>
<i>Application Name (First)</i> Legacy CIS / Billing Solution Space (SS-3)		<i>Application Name (Second)</i> MDM/R Public Reporting Interface (MPRI) (A108)	
<i>Dependency description</i> The MDM/R Public Reporting Interface must provide to the Legacy CIS / Billing Solution Space those reports and information that are routinely produced and/or published for use by the Public.			
<i>Key Data entities passed from First Application to Second Application</i> •		<i>Key data entities passed from Second Application to First Application</i> <ul style="list-style-type: none"> • Requested public reports 	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

<i>Dependency Id</i> D222	<i>Application Space (First)</i> Not assigned	<i>Application Space (Second)</i>	<i>Designated Critical?</i>
<i>Application Name (First)</i> Not assigned		<i>Application Name (Second)</i>	
<i>Dependency description</i>			
<i>Key Data entities passed from First Application to Second Application</i> •		<i>Key data entities passed from Second Application to First Application</i> •	
<i>Mechanism of integration from First Application to Second Application</i> •		<i>Mechanism of integration from Second Application to First Application</i> •	
<i>Notes/comments</i>			

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10. Data Ownerships

The following table sets out definitions for each of the Data Ownerships identified in the LADA.

<i>Ownership Id</i>	<i>Ownership description</i>	
W100	The Meter Data Receiver sets the Meter Reading check-in related data as meter readings are stored in the MDM/R Data Repository.	
<i>Application</i>		<i>Database</i>
Meter Data Receiver (MDR) (A100)		MDM/R Data Repository (MDR DB) (S100)
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Meter Reading – Check Status from Semantic and Syntactic checking • Meter Reading – Transfer Status and Errors identified 		
<i>Notes/Comments</i>		
<i>Ownership Id</i>	<i>Ownership description</i>	
W101	The Meter Data Edit Interface sets the Meter Reading check-in related data as meter readings are stored in the MDM/R Data Repository.	
<i>Application</i>		<i>Database</i>
Meter Data Edit Interface (MDEI) (A101)		MDM/R Data Repository (MDR DB) (S100)
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Meter Reading – Check Status from Semantic and Syntactic checking • 		
<i>Notes/Comments</i>		

<i>Ownership Id</i> W102	<i>Ownership description</i> The Initial Meter Data Population transfers all meter reading and related data during all historical meter reading data loads into the MDM/R Data Repository.	
<i>Application</i> Initial Meter Data Population (TBD) (A109)	<i>Database</i> MDM/R Data Repository (MDR DB) (S100)	
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Meter Reading – Check Status from Semantic and Syntactic checking • Meter Reading – File Received and Errors identified 		
<i>Notes/Comments</i>		
<i>Ownership Id</i> W103	<i>Ownership description</i> The Validation, Estimation and Editing process stores all versions of VEE results in the MDM/R Data Repository.	
<i>Application</i> Validation, Estimation & Editing (VEE) (A102)	<i>Database</i> MDM/R Data Repository (MDR DB) (S100)	
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Meter Reading – Validation results • Meter Reading – Estimated Readings 		
<i>Notes/Comments</i> The LDC is responsible for providing the edited Meter Readings and therefore owns that data.		
<i>Ownership Id</i> W104	<i>Ownership description</i> The MDM/R Master Directory Interface is responsible for storing all Master Data into the MDM/R Master Directory Database.	
<i>Application</i> MDM/R Master Directory Interface (MMDI) (A103)	<i>Database</i> MDM/R Master Directory Database (MMD DB) (S101)	
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Point of Delivery registration based on LDC providing LDC – Premises pair. • 		
<i>Notes/Comments</i> The LDC provides the majority of this data but the MMDI will have related administrative internal information that it stores.		

<i>Ownership Id</i> W105	<i>Ownership description</i> The Initial MDM/R Master Directory Population stores all LDC provided historical Meter, Premise and related data into the MDM/R Master Directory Database.	
<i>Application</i> Initial MDM/R Master Directory Population (TBD) (A110)	<i>Database</i> MDM/R Master Directory Database (MMD DB) (S101)	
<i>Key data entities owned</i> <ul style="list-style-type: none"> • Point of Delivery registration based on LDC providing LDC – Premises pair. 		
<i>Notes/Comments</i>		
<i>Ownership Id</i> W106	<i>Ownership description</i> The MDM/R Data Aggregation application is responsible for all aggregations (and versions) that are derived and stored in the MDM/R Data Repository.	
<i>Application</i> MDM/R Data Aggregation (MDA) (A104)	<i>Database</i> MDM/R Data Repository (MDR DB) (S100)	
<i>Key data entities owned</i> <ul style="list-style-type: none"> • Hourly billing quantities • Time of Use (TOU) billing quantities • Critical Peak Pricing period billing quantities 		
<i>Notes/Comments</i>		
<i>Ownership Id</i> W200	<i>Ownership description</i> The Local Distribution Company has primary responsibility for all Meter Readings and related meter data within its service area.	
<i>Application</i> Local Distribution Company (LDC) (P002)	<i>Database</i> MDM/R Data Repository (MDR DB) (S100)	
<i>Key data entities owned</i> <ul style="list-style-type: none"> • Meter Reads • Meter Read related data 		
<i>Notes/Comments</i>		

<i>Ownership Id</i> W201	<i>Ownership description</i> The Local Distribution Company manages Meter related information within its service area.	
<i>Application</i> Local Distribution Company (LDC) (P002)	<i>Database</i> MDM/R Master Directory Database (MMD DB) (S101)	
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Meter ID • Premise ID • Meter – Premise temporal relationship • 		
<i>Notes/Comments</i> This information is typically managed within a Meter Information System that is part of the LDC's Legacy CIS / Billing Solution Space.		
<i>Ownership Id</i> W202	<i>Ownership description</i> The Ontario Energy Board provides Rate Structure information for use in determining Billing Quantities in MDM/R.	
<i>Application</i> Ontario Energy Board (OEB) (P003)	<i>Database</i> MDM/R Master Directory Database (MMD DB) (S101)	
<i>Key data entities owned</i>		
<ul style="list-style-type: none"> • Hourly Rate Structures • Regulated Price Plan (RPP) Rate Structures • Critical Peak Pricing (CPP) Rate Structures 		
<i>Notes/Comments</i>		

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