
	American Electric Power	4.5 Advanced Metering Infrastructure	Document ID: Use case # 5.2
	Title: On Demand Meter Reading from CIS Use Case		
Subject Matter Expert:	Author:	Reviewed by:	
Margaret Goodrich	Bill Schleicher	Tim Simmons / Margaret Goodrich	

On Demand Meter Reading from CIS

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Version History			
Rev.	Date	Author	Change description
A	02/25/2011	Bill Schleicher	Initial Release
B	03/02/2011	Bill Schleicher	Modified to fit new format and incorporate changes from document review
C	03/03/2011	Bill Schleicher	Modified after document review
D	08/08/2011	AEP workshop	Various updates
E	08/22/2011	Tim Simmons	Implement various requested updates
F	10/12/2011	Brian D. Green	Add Narrative, Interface Diagram, Notes section and update Actors list and steps
G	10/31/2011	Ron Cunningham	Final team review


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Summary:

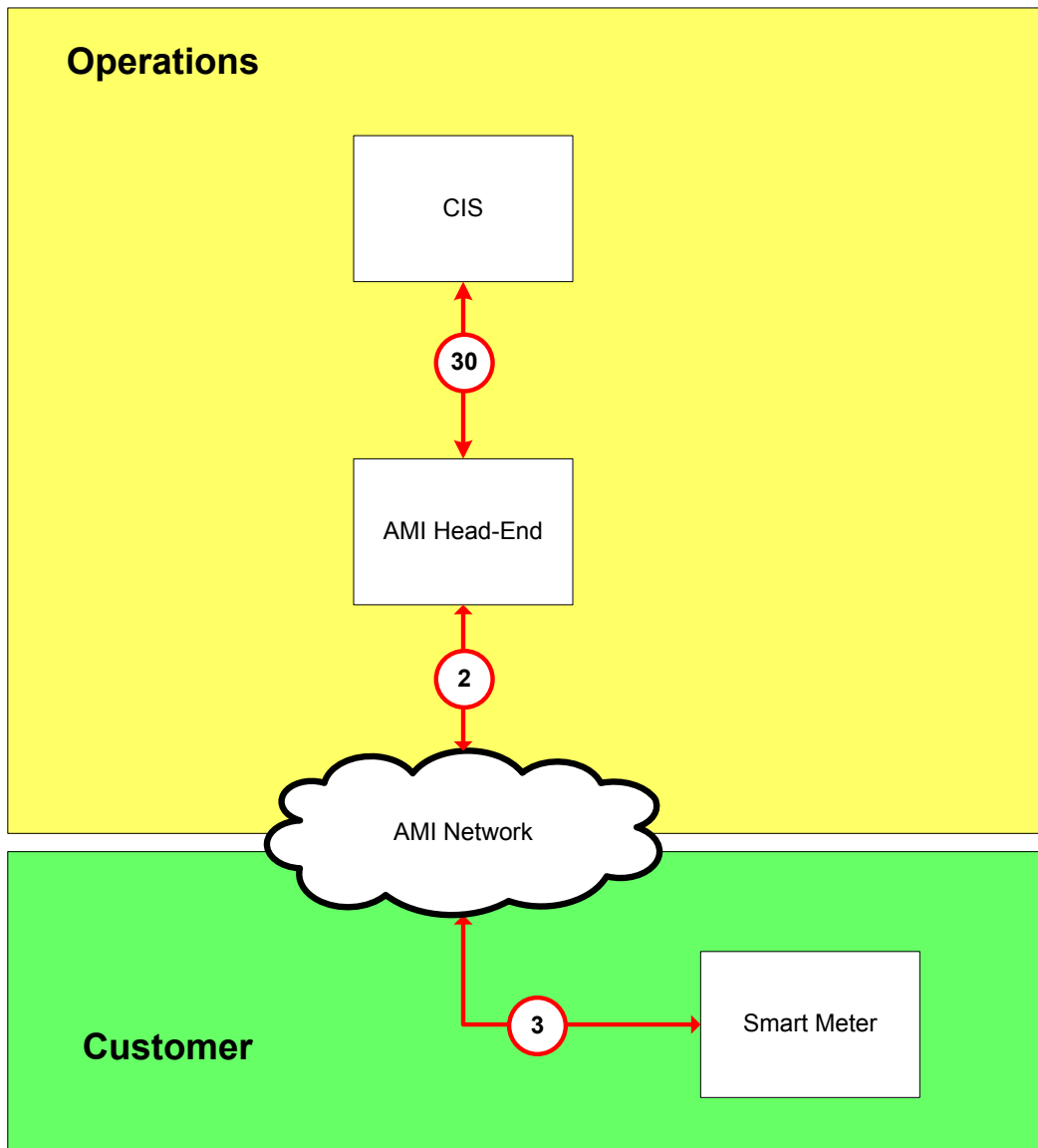
This use case addresses the On Demand Meter Reading message generated by the CIS system.

Narrative:

An on-demand meter read is issued in the **Customer Information System (CIS)** for any legitimate reason. The message is sent to the **AMI Head-End** and routed to the appropriate **Smart Meter**. When the message is received at the **NIC** (part of the **Smart Meter**), it is converted and sent on to the **Meter Metrology Board** (part of the **Smart Meter**) which performs the meter reads and sends the data back to the **NIC**, which sends it on to the **AMI Head-End**. The **AMI Head-End** sends the information to the **CIS**.


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Interface Diagram:



Note(s):

The NIC and the Meter Metrology Board are part of the Smart Meter.

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Actor(s):


The list of the actors and the roles that are participating in this use case described in the table below.

Name	Role description
AMI Head-End	The AMI Head-End is the back office system than controls the Advanced Metering Infrastructure, which serves as a repository for data extracted from the meters and manages routing and schedules of the network.
CIS	System of record for customer data and billing.
Meter Metrology Board	The board, internal to the smart meter, on which the functions of the Smart Meter are configured and performed.
NIC	AMI network interface component with Meter Metrology Board within the Smart Meter.

Participating Business Functions:

The participating business function, its acronym and what they provide in this use case are detailed in the table below.

Acronym	Business Function/Abstract Component	Services or Information Provided
AMI	Advanced Metering Infrastructure for energy monitoring and recording, load control capability, tariff/rate data collection.	Energy monitoring and control, configuration of advanced meters, offers new rate programs, distribution automation, Meter Readings, Meter Events and Alarms.
CIS	Customer Information System the system in place for customer data and billing	Publishes changes to customer accounts, customer agreements, pricing, service location to Metering System (MS). CIS also issues End Device Control messages such as the On Demand Request.

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Assumptions / Design Considerations:

Standard International Electrotechnical Commission (IEC) 61968 Message Definition format will be followed to provide the Header, Request, Reply, and Payload used when defining the messages for the design specifications. For the purpose of the use cases identified in this document these have been omitted as they are to be provided in the design specification for the On Demand Meter Reading use cases.


Normal Sequence:

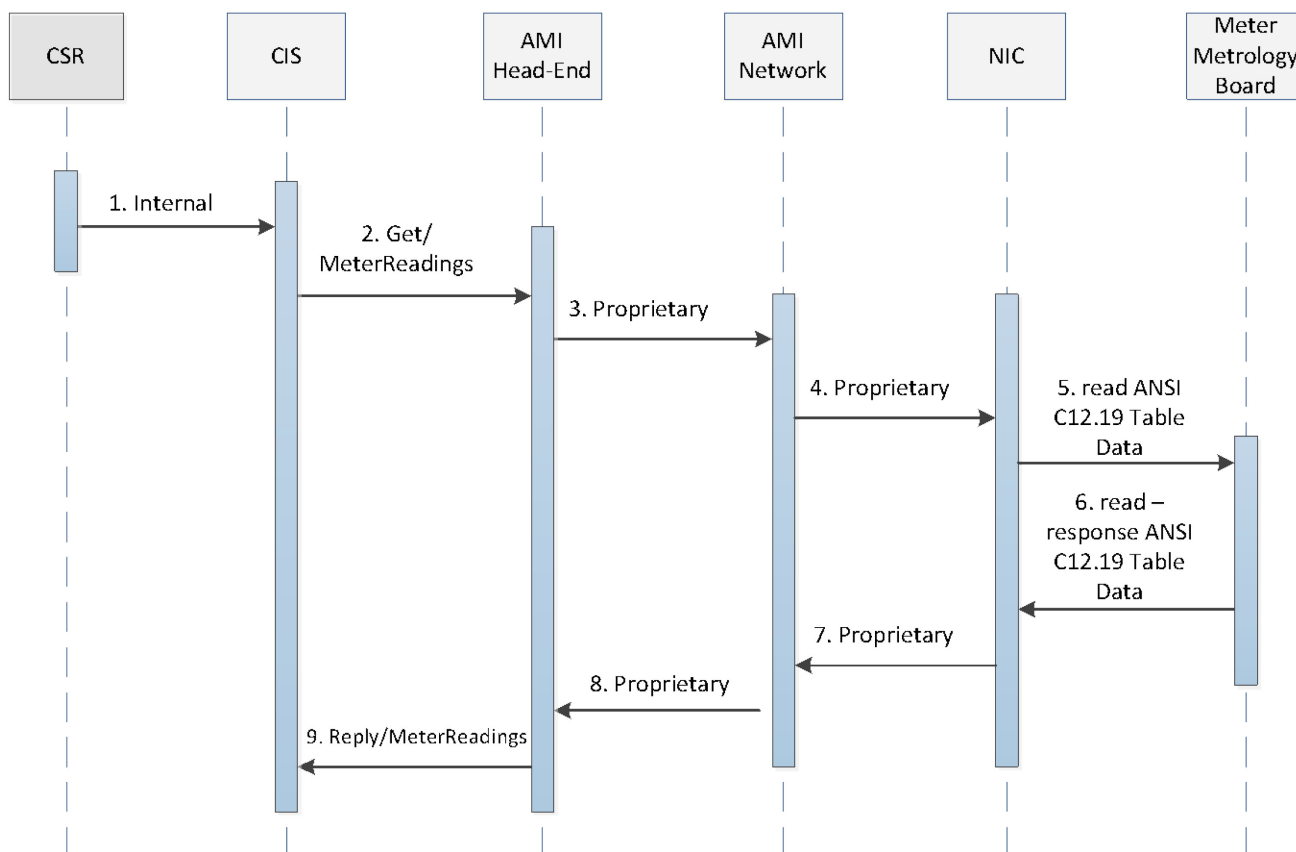
The sequences of events, showing the order in which they occur during the typical progression of this use case are provided in the table below. The Sequence Diagram that graphically depicts the events is presented immediately following the table.

Use Case Step	Triggering Event	Description Of Process	Information To Be Exchanged	Producer	Receiver	Message Type
1	On Demand Read Request Initiated by CSR	CSR requests an On Demand Read in CIS	Internal	CSR	CIS	
2		CIS requests AMI Head-End to create an On Demand Read Request message	GetMeterReadings	CIS	AMI Head-End	Get /MeterReadings
3		AMI Head-End sends On Demand Read Request to NIC of the appropriate Smart Meter through the AMI Network	On Demand Read Request	AMI Head-End	AMI Network	Proprietary
4		AMI Network routes On Demand Read Request to NIC	On Demand Read Request	AMI Network	NIC	Proprietary
5		NIC relays the On Demand Read Request to the Meter Metrology Board to collect data	On Demand Meter Read Request (ANSI C12.19 Table Data)	NIC	Meter Metrology Board	read ANSI C12.19 Table Data

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Use Case Step	Triggering Event	Description Of Process	Information To Be Exchanged	Producer	Receiver	Message Type
6	On Demand Read Request received	Meter Metrology Board retrieves Meter Read in formatted table and sends to NIC	On Demand Meter Read response (ANSI C12.19 Table Data)	Meter Metrology Board	NIC	read-response ANSI C12.19 Table Data
7		NIC sends Meter Read in formatted table to the AMI Head-End via AMI Network	Meter Read in formatted table	NIC	AMI Network	Proprietary
8		AMI Network routes Meter Read in formatted table to the AMI Head-End.	Meter Read in formatted table	AMI Network	AMI Head-End	Proprietary
9		AMI Head-End sends Meter Read Data to CIS	ReplyMeterReadings	AMI Head-End	CIS	Reply /MeterReadings

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Integration Scenarios:

Adapters will use the Common Information Model (CIM) in Extensible Markup Language (XML) to send and receive messages and events.

The following are the points of integration that must be tested for this use case. Other non-CIM message interfaces may be testable in this use case.

Actor	Interface Points
CIS	• AMI Head-End
AMI Head-End	• NIC
NIC	• Meter Metrology Board

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Pre-conditions:

Following are the list of events that must occur prior to requesting an On Demand Read Request.

- Meter must be installed and registered with the AMI head-end system

Post-conditions:

The following events or actions that may happen after or be caused by the completion of the normal use case events, as well as the exceptions or alternative sequences are:


The following systems must be updated once the On Demand read results are returned by the AMI Head-End system.

- Meter readings and flag records sent in CIS.

Exceptions / Alternate Sequences:

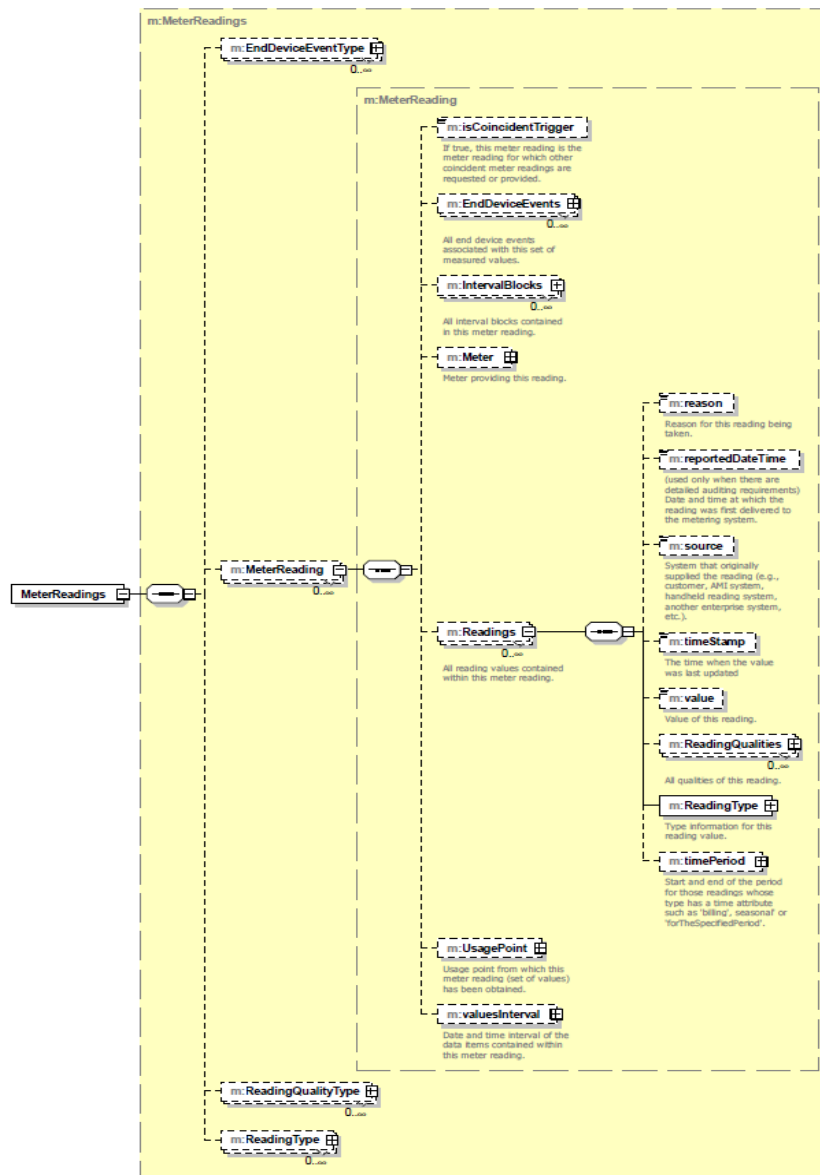
There are no exceptions, unusual events or alternate sequences defined for this use case.


Use Case Step	Triggering Event	Description Of Process	Information To Be Exchanged	Producer	Receiver	Message Type

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Message Type(s) Diagram:

The following XML Schema Definition (XSD) diagram shows the normative and informative parts of the message. Not all of the International Electrotechnical Commission’s (IEC) – CIM message optional elements must or will be used in the use of IEC – CIM for this specific use case.



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References:

Use Cases or other documentation referenced by this use case include:

- **20100625 AEP Ohio Interoperability Plan V1.docx:** Section 4.5.3 (On Demand Meter Read from CIS)
- **20100625 Use Cases EPRI Report_V2.4.docx:** Section 5.2 (On-Demand Meter Read from CIS)
- **61968_9_MeterReadingAndControl_2ed-working-draft-20110204.docx:** Section 5.4 (Meter Reading Messages); Annex H.6 (XML Schemas for MeterReadings) Section J.2 (GetMeterReadings)

Issues: None

ID	Description	Status

Miscellaneous Notes:

In some BackOffice systems, On Demand reads may also be generated by the MDM for various purposes including verification for Connect / Disconnect messages and acquiring missing reads. It is assumed that the Get/MeterReadings and Reply/MeterReadings messages would conform to the same formats as the request from CIS.