AMI Use Case:

B1 – Multiple Clients Read Demand and Energy Data Automatically from Customer Premises

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Author: James McGrath

Document History

Revision History

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Approvals

This document requires following approvals.

Name	Title
James McGrath	*Mega-Team Lead*
James McGrath	*Use Case Team Lead name)*
Kevin Wood	*System Architecture Team Chair*
Erich Gunther	*Engineering Team Chair*

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1.   Use Case Description

1.1 Use Case Title

Multiple Clients Read Demand and Energy Data Automatically from Customer Premises

1.2 Use Case Summary

A basic concept behind the Advanced Metering Infrastructure is the ability to collect information from the customer meter. This scenario describes the process of acquiring interval data from the residential meters. The data includes information presently gathered from traditional meters such as accumulated energy, demand, and time-of-use information. The information gathered must be available to multiple clients. These multiple clients could retrieve the data from a meter, a place within the network, or the back office.

The electric utility can benefit from installation of AMI by reducing Meter Reading forces (as well as other field personnel) and the supporting infrastructure (buildings, vehicles, etc.), streamlining customer service in such areas as billing inquiries, establishing new service connections, improving billing accuracy, providing advanced energy data for forecasting, procurement and settlement, creating additional tariff options, and tracking customer response to demand response programs.

Related to this scenario is gathering newly available data such as net metering, interval energy data, power quality, excessive demand thresholds, results of meter self-test status, and other meter event messages.

This use case does not specify the actual end users of the data, but they may include the billing system, ISO, ESPs, meter reading agents, load research, forecasting and settlements, outage management systems, building management systems, distribution operators, maintenance, markets, and customer service.

Clients may read data for multiple purposes, including periodic billing, off-cycle billing, outage verification, high bill complaints (or other customer service issues), building automation, bill disaggregating, or local energy management.

This scenario excludes gathering of data from customer premise sensors behind the meter (that is covered in case C4).

1.3 Use Case Detailed Narrative

The Automated Data Collection System(s) (ADCS) will be primarily used to collect consumption information from the meter. Additionally, various other pieces of information will be collected when appropriate. On the consumption side, the ADCS will be responsible for setting and managing

the schedule for each meter to follow when reporting its data. This schedule will accommodate, as a default, the ability for each meter to report the previous day's usage in the form of remotely programmable intervals, as well the meter's midnight register read, and to deliver this information from all meters by a standard time (e.g., 8 a.m.). The ADCS will also have the ability to accommodate, on a meter by meter basis, the need to collect data either more frequently (i.e. hourly) or less frequently (i.e. weekly), based on the requirement for that specific customer and/or meter installation. This consumption data will then be passed by each ADCS (if there is more than one) to the Meter Data Management System (MDMS).

The MDMS will accept data passed to it from the ADCS, perform any data conversion that is necessary, such as converting hourly interval pulses to engineering units, and load the converted data into the MDMS database. This data will then be made available to various Data Retrievers (such as Billing Usage System, Load Research, Load Forecasting, Settlements, Energy Service Providers, and end use Customers among others). There may also be Data Retrievers who need their data as quickly as possible. In these cases, the MDMS will provide a direct feed of the appropriate data to those clients after any data conversion is completed, but before it is loaded into the MDMS database.

There is other, non-consumption related data that the meters may report to the utility that will also be stored in the MDMS. Examples of this data are Power Outage indications, Meter Removal indications, Remote connects and disconnects, Tamper Detection indicators, results of self tests, etc. The MDMS will store the requirements of whom to notify upon receipt of each of these indicators, and will then store them along with their timestamp for possible later analyses.

For billing purposes, the Billing System stores the Billing Cycle for each individual metered premised. The Billing Usage System will respond to the billing cycle by automatically retrieving enough consumption data (i.e. intervals) from the MDMS to cover the current billing cycle for each meter in the current cycle, as well as the midnight register read for the billing cycle data,. The Billing Usage System will then run the data through a series of usage data validations. These validations will include such things as a sum check, missing data check, contiguous usage check, zero usage check, and historical high/low check. Validation failures will largely be handled automatically by the billing usage system. There will be cases where human intervention will be required. For example, if there is missing data, and the ADCS is unable to recover that data, a pickup read order would be issued to the field, prompting someone to visit the meter and physically retrieve the usage data (perhaps thru an optical probe) and also troubleshoot the communication problem. The meter shall also have the ability to be read on demand.

1.4 Business Rules and Assumptions

Assumptions:

- On Cycle billing will continue to be monthly .

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Advanced Metering Infrastructure (AMI) Program   ***DRAFT***
B1 - Multiple Clients Read Demand and Energy Data Automatically from Customer Premises

2.   Actors

Describe the primary and secondary actors involved in the use case. This might include all the people (their job), systems, databases, organizations, and devices involved in or affected by the Function (e.g. operators, system administrators, customer, end users, service personnel, executives, meter, real-time database, ISO, power system). Actors listed for this use case should be copied from the global actors list to ensure consistency across all use cases.

Actor Name	Actor Type (person, device, system etc.)	Actor Description
AMI Meter	Device	Device that receives, records, displays and transmits data (e.g. usage, generation, text messages, event logs, etc.) to authorized systems (e.g. ADCS) and provides other advanced utility functions.
Small/Medium Commercial and Residential Billing (aka CSS)	System	A system responsible for producing customer invoices from accurate "bill ready" meter readings. Invoices can be produced periodically (on cycle) or as a result of a specific event (off cycle). Accurate bills require accurate and timely information from meters. AMI will greatly reduce or eliminate the need to estimate meter reads.
Data Retrievers	Person	There are many groups of users within SCE that require access to meter data. Some of these users access the data through programs and some through queries. These users require relatively unlimited, read only access to the data retrieved from the meter.
Customer Representative(s)	Person	Customer Representatives respond to customer requests to activate, modify and/or terminate delivery of service. Many off cycle bill requests are initiated by Customer Representative's action to correct billing errors (due to inaccurate physical reads or estimates).
Field Representative	Person	Field Representatives (FRs) are primarily responsible for meter installations, removals and maintenance. Normally when a FR visits a site a meter reading is captured at the conclusion of the service call, both to provide for a potential off cycle bill (e.g. when service is terminated) or when the meter must be exchanged (a remove reading for the old meter and a "set" reading for the new meter) need to be captured.

Actor Name	Actor Type (person, device, system etc.)	Actor Description
Automated data collection systems (ADCS)	System	Automated data collection systems (ADCS) manages data collection (recognizes when data doesn't come in, automatically attempts to retrieve data from meter that wasn't collected).
ADCS operator	Person	ADCS operator is responsible for using the Automated data collection systems (ADCS) to maintain and monitor the data collection activities.
Meter Data Management System (MDMS)	System	Meter Data Management System represents either the organization or system responsible for capturing and maintaining large quantities of data produced by interval meters.
Meter Data Management System Technician	Person	Meter Data Management System Technician is an individual trained in dealing with the complexities of interval data retrieval and storage.
AMI System	System	The AMI system is made up of various back office systems that are required to enable remote two-way communications and control with meters and allow for data storage and retrieval.
Field Service Terminal	Device	Tool used by authorized SCE Field Service personnel to query AMI meters and manually download all data contained within the meter
Third Parties	Organizations other than SCE	Alternative suppliers of energy or other services to customers who desire to directly read Third Party or SCE Electric meters using the SCE AMI Communications Network

3.   Step by Step analysis of each Scenario

3.1 Primary Scenario 1 - AMI Meter Completes Default Schedule Read Request

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Default read schedule is required	AMI Meter	The AMI meter has been installed	The AMI meters communicates over the AMI Network successfully

3.1.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
1	ADCS	Automated data collection system to set initial default schedule when the meter self provisions	

Step #	Actor	Description of the Step	Additional Notes
2	AMI Meter	Meter provides prior days data at scheduled time • Intervals • Register reads as of midnight • All channels of data • Event logs • Meter Identifier • Time stamp • Other	
3	ADCS	Automated data collection system receives the data	
4	ADCS	Automated data collections system does necessary data translation	
5	ADCS	ADCS transmits data to the Meter Data Management System (MDMS)	
6	ADCS	ADCS also transmits data directly to recipients with real time requirements	
7	MDMS	MDMS verifies that data from all meters was received.	

3.2 Primary Scenario 2 - AMI Meter completes an on-demand read

Triggering Event	Primary Actor	Pre-Condition	Post-Condition

(Identify the name of the event that start the scenario)	(Identify the actor whose point-of-view is primarily used to describe the steps)	(Identify any pre-conditions or actor states necessary for the scenario to start)	(Identify the post-conditions or significant results required to consider the scenario complete)
The need for an on-demand read emerges	AMI System	The AMI meter has been installed	The meter successfully provides data pursuant to an ad-hoc read request on demand

3.2.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	What actor, either primary or secondary is responsible for the activity in this step?	Describe the actions that take place in this step. The step should be described in active, present tense.	Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..
1	N/A	A requirement for an on demand read emerges	
2	User/AMI System	Authorized utility User (manually) or IT System (automatically) initiates an on demand read request	
3	AMI Meter	AMI Meter receives on demand read request	
4	AMI Meter	AMI Meter responds to the request on all channels • Current date and time • Current register read • Complete intervals since midnight • Event logs • Meter Identifier • Time Stamp	
5	ADCS	Automated data collection system receives data	

Step #	Actor	Description of the Step	Additional Notes
6	ADCS	Automated data collection system does necessary translation	
7	ADCS	ADCS transmits data directly to requesting user or system, (data may or may not go through MDMS. User should not have to do additional steps to view the retrieved data). Data is transferred to and stored in Meter Data Management System.	
8	ADCS	ADCS receives an acknowledgment that data was received by requesting user or system.	
9	ADCS	ADCS logs that the on-demand read request was completed successfully	

3.3 Primary Scenario 3 - Automatically receive non-usage (event) messages

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Meter detects event	AMI Meter	AMI Meter has been installed	Non Usage event has been received by MDMS.

3.3.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
1	AMI Meter	AMI Meter detects an event and logs it in the meter event log.	
2	AMI Meter	AMI Meter determines that event type requires message to be sent to the utility in real time	
3	AMI Meter	AMI Meter sends event message to Utility	
4	MDMS	MDMS receives event message and determines routing	
5	MDMS	MDMS forwards event message to identified recipient(s).	
6	MDMS	Receiving party acknowledges message upon receipt by sending a return message to MDMS.	

3.4 Primary Scenario 4 - MDMS transmits data to the billing system

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Data transfer is needed for billing.	Meter Data Management System (MDMS)	The AMI meter has been installed, and has reached the end of the scheduled billing cycle.	Interval usage data is present for the entire billing cycle

3.4.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
1	MDMS	Meter Data Management System (MDMS) successfully receives scheduled or on-demand raw meter read data from Automated Data Collection System (ADCS)	
2	MDMS	MDMS Provides the following data to the Billing Usage System: • All Interval data retrieved (Engineering Units) • Register read • Event Logs • Meter identifier Time Stamp	
3	Billing Usage System	Billing Usage System provides summarization and validation of interval data	
4	Billing Usage System	Billing Usage System returns validated interval data to MDMS for storage/management purposes	
5	Billing Usage System	Billing Usage System forwards summarized billing determinants to service billing system.	

3.5 Primary Scenario 5 - Data users successfully retrieve either raw or bill ready usage

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Data user determines need for specific usage data	Data user	Usage data must be available	Data user will successfully retrieve the usage data needed

3.5.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
1	Data user	Data user determines need for specific usage data	
2	Data user	Authorized User initiates Data request • Routine - i.e. regularly scheduled to automatically retrieve specific usage data on a periodic basis • Ad-hoc - i.e. manual request to retrieve specific usage data on demand.	
3	MDMS	Meter Data Management System (MDMS) receives data request	
4	MDMS	MDMS retrieves usage data and other data requested	

Step #	Actor	Description of the Step	Additional Notes
5	MDMS	MDMS formats data to user defined format	
6	MDMS	MDMS provides file to user or other destination specified by the user	

3.6 Primary Scenario 6 - Automated Data Collection System (ACDS) Manages the Meter Reading Schedule

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	(Identify the actor whose point-of-view is primarily used to describe the steps)	(Identify any pre-conditions or actor states necessary for the scenario to start)	(Identify the post-conditions or significant results required to consider the scenario complete)
This process evaluates the collection of meter data looking for time periods of over/under utilization. It then attempts to balance the collection activities by altering the default schedule for some meters in the "over" committed group and assign them within the "under" utilized schedule times	ADCS	The default reading schedule has become unbalanced, putting unnecessary load on the AMI communication infrastructure.	The default reading schedule is balanced, resulting in steady load on the AMI communication infrastructure.

3.6.1 Steps for this scenario

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Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
1	AMI Meter	As meters self-register, they will be placed in an unscheduled default read group.	
2	ADCS	Each evening (or at a pre-determined low activity time), ADCS will schedule default read times for all unscheduled meters by placing them in a default read group, maintaining balance among the currently scheduled default read groups.	
3	ADCS	ADCS will communicate the initial default schedule update to the affected meters.	
4	ADCS	Each meter will receive the default schedule from ADCS, validate it and process it.	
5	AMI Meter	Upon completion of default schedule being set, an acknowledgement transaction will be sent from the Meter to ADCS.	
6	ADCS	ADCS will receive and record the acknowledgement of the default schedule update.	
7	ADCS	Periodically (weekly?) after the day's meter data collection process has concluded, ADCS reviews the actual meter read data collection timestamps with the meter's default schedule, looking for meters that constantly fail to meet their default schedules. ADCS will also look for time periods (20 min periods) where all default schedules are consistently met. These two results will represent the "over" committed and "under" committed meter data collection schedules.	

Step #	Actor	Description of the Step	Additional Notes
8	ADCS	ADCS will select ten (10) percent (for example) of the meters in the "over" committed schedule periods and reallocate them to the "under" committed schedule time periods.	
9	ADCS	ADCS will communicate the modified default schedule update to the affected meters.	
10	AMI Meter	Each meter will receive the default schedule update from ADCS, validate it and process it.	
11	AMI Meter	Upon completion of default schedule update, an acknowledgement transaction will be sent from the Meter to ADCS.	
12	ADCS	ADCS will receive and record the acknowledgement of the default schedule update.	

3.7 Primary Scenario 8 -Third Party Accesses AMI Data

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
External entities will have access options to AMI Data	Third Party	Third party has a requirement to receive AMI data, and SCE is providing the data from the MDMS system	

3.7.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*

Step #	Actor	Description of the Step	Additional Notes
1	Third Parties	External entities looking to obtain meter usage data will be provided three options: • Bulk data will deal with requests for large amounts of data (e.g. all usage data for a set of premises for a year; all usage data for premises associated with a specific energy retailer for a day/week/month.). These requests can be either one-time or periodically scheduled. (Source: MDMS) • "On Demand" requests for yesterday's meter usage data. Requests will be submitted through a "portal" application available to the external organization. (Limits on the number of "on demand" requests will need to be able to be set and monitored to prevent external entities from attempting to perform "bulk" data retrieval through the "portal".) (Source: MDMS) • "On Demand" requests for current meter usage data (e.g. Energy retailer needs to see today's raw meter usage data up to the last recorded interval"). Requests will be submitted through a "portal" application available to the external organization. (Limits on the number of "on demand" requests will need to be able to be set and monitored to prevent external entities from attempting to perform "bulk" data retrieval through the "portal".) (Source: meter)	
2	MDMS	"Portal" requests are "accounted" for and logged identifying the requesting party and the precise details of the request.	

Step #	Actor	Description of the Step	Additional Notes
3	MDMS	Bulk or "portal" request is sent to MDMS for action	
4	MDMS	MDMS acts on request where it is the source, or sends an "on demand" read request to the meter where appropriate.	
5	MDMS	In the case of "on demand" requests sent to the meter, the meter receives, verifies and provides the usage data requested to the MDMS. (through the normal process defined in Use Case B1, Success Scenario 2)	
6	MDMS	MDMS immediately dispatches the "raw" data returned from the meter to the requesting external recipient.	
7	MDMS	In the case of all "on demand" requests (regardless of where the data is sourced) MDMS logs the response data returned and associates it with the original "on demand" request.	
8		Bulk data requests are packaged for shipment and sent to the requesting external recipient. A log entry of the amount of data accumulated and dispatched to the external entity is recorded	

3.8 Primary Scenario 9 - Third Party uses SCE AMI Network to read their meters

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
AMI reads third party meters	Third Parties	Third party's requirements include	

		directly accessing the AMI meter using SCE's AMI communication infrastructure, without the involvement of SCE.	

3.8.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
1	Third Party	Third Party has meters or access to SCE Meters • Third Party has contract for SCE for AMI Network Access	
2	Third Party	Third Party logs into secure portal to gain access to SCE AMI Network • Access limited to set of meters pre-authorized by SCE • Third Party meters have been identified and approved by SCE	

Step #	Actor	Description of the Step	Additional Notes
3	Third Party	Third Party reads meters using their own meter reading software • SCE monitors Third Party usage to maintain network reliability • SCE pre-approves Third Party meter reading software for use with AMI Network	
4	AMI System	If meter is an SCE meter, SCE also accesses and reads meter as normal	
5	AMI System	SCE maintains log of Third Party access to and activity on SCE AMI Network • SCE maintains log information for billing, compliance, and dispute resolution with Third Party • Third Party AMI Network activity data retained for at least as long as interval data	

3.9 Alternate Scenario 1 - Meter Does not communicate remotely during default schedule read (up to 10% of meter population)

Triggering Event	Primary Actor	Pre-Condition	Post-Condition

(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Meter does not communicate remotely during a default schedule read	MDMS	Steps 1-7 of Primary Scenario 1 have successfully completed	

3.9.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
A1	N/A	Primary Scenario 1 of Use Case B1, AMI Meter Completes Default Schedule Read Request , is complete	
A2	MDMS	MDMS identifies missing data for previous day.	
A3	MDMS	MDMS notes meters with missing/incomplete data.	
A4	MDMS	MDMS initiates an automated on demand read to recover previous day's data (refer to Primary Scenario 2 of Use Case B1).	
A5	AMI Meter	Automated on demand read request completes.	
A6	MDMS	MDMS identifies meters where data is received by automated on demand read request instead of default schedule, stores the retrieved data, and logs the successful result.	

Step #	Actor	Description of the Step	Additional Notes
A7	MDMS	MDMS identifies meters where previous day's data is still missing/incomplete and logs the failed retry attempt.	
A8	MDMS	MDMS initiates an automated on demand read to recover previous day's data (refer to Primary Scenario 2 of Use Case B1).	
A9	AMI Meter	Automated on demand read request completes.	
A10	MDMS	MDMS identifies meters where data is received by automated on demand read request instead of default schedule, stores the retrieved data, and logs the successful result.	
A11	MDMS	MDMS identifies meters where previous day's data is still missing/incomplete and logs the failed retry attempt.	
A12	MDMS	MDMS initiates an automated on demand read to recover previous day's data (refer to Primary Scenario 2 of Use Case B1).	
A13	MDMS	Automated on demand read request completes.	
A14	MDMS	MDMS identifies meters where data is received by automated on demand read request instead of default schedule, stores the retrieved data, and logs the successful result.	
A15	MDMS	MDMS logs the failed retry attempt and creates an exception report for meters still missing previous day's data	

Step #	Actor	Description of the Step	Additional Notes
A16	MDMS	MDMS makes reports available to ADCS analyst. EXAMPLES: 1. Meters still missing data 2. Meter successfully recovered through automated on demand read request 3. Statistic/Performance reports. Total meters 5 million Successes 4.8 million Automated on demand read request .18 million Unsuccessful .02 million	

3.10   Alternate Scenario 2 - Meter does not communicate remotely during default schedule read (consecutive days)

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*

Meter does not communicate remotely during a default schedule read for consecutive days	MDMS	Alternate Scenario 1 completes	

3.10.1   *Steps for this scenario*

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
B1	N/A	Alternate Scenario 1 of Use Case B1, Meter Does not communicate remotely during default schedule read (up to 10% of meter population), completes.	
B2	MDMS	MDMS identifies missing data for consecutive days prior to previous day.	
B3	MDMS	MDMS notes meters with missing/incomplete data.	
B4	MDMS	MDMS initiates an automated on demand read request (refer to Primary Scenario 2 of Use Case B1) for meters identified in step 3, specifying which days need to be recovered (can be multiple days)	
B5	AMI Meter	Automated on demand read request completes.	
B6	MDMS	MDMS identifies meters where data is received by automated on demand in step 4, stores the retrieved data (indicating quantity of days/intervals), and logs the successful result.	

Step #	Actor	Description of the Step	Additional Notes
B7	MDMS	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.	
B8	MDMS	MDMS performs steps 4, 5 and 6 again for meters identified in step 7	
B9	MDMS	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.	
B10	MDMS	MDMS performs steps 4, 5 and 6 again for meters identified in step 9	
B11	MDMS	MDMS logs the failed retry attempt and creates an exception report for meters still missing data from all days other than previous day's data.	
B12	MDMS	MDMS makes reports available to ADCS analyst. EXAMPLES: 1. Meters still missing data, including # of days missing 2. Meter successfully recovered by this scenario. 3. Statistic/Performance reports. Total meters attempted 25,000 Meters fully recovered 3,000 Meters partially recovered 1,000 Unsuccessful 21,000	

3.11 Alternate Scenario 3 - Meter communicates intermittently

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Meter does not communicate, intermittently data is encountered	AMI Meter	Scenario 1 is complete, the ability to complete a default read schedule	

3.11.1 Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
C1	N/A	Primary Scenario One, Use Case B1, Ability to Complete Default Schedule Read Request , is complete	
C2	MDMS	MDMS identifies missing data for any full or partial days prior to previous day (non-consecutive days).	
C3	MDMS	MDMS notes meters with missing/incomplete data.	
C4	MDMS	MDMS initiates an automated on demand read request (refer to Primary Scenario 2 of Use Case B1) for meters (identified in step 3), specifying which days need to be recovered (can be multiple days) - NOTE: Do we need to specify this, or do we request all days?	
C5	AMI Meter	Automated on demand read request completes.	

Step #	Actor	Description of the Step	Additional Notes
C6	MDMS	MDMS identifies meters where data is received by automated on demand in step 4, stores the retrieved data (indicating quantity of days/intervals), and logs the successful result.	
C7	MDMS	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.	
C8	MDMS	MDMS performs steps 4, 5 and 6 again for meters identified in step 7	
C9	MDMS	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.	
C10	MDMS	MDMS performs steps 4, 5 and 6 again for meters identified in step 9	
C11	MDMS	MDMS logs the failed retry attempt and creates an exception report for meters still missing data from all days other than previous day's data	
C12	MDMS	MDMS makes reports available to ADCS analyst. EXAMPLE: List of meters and number of intermittent read failures	

3.12   Alternate Scenario 4 - Field Service Rep retrieves data directly from AMI Meter (alternate retrieval of meter data)

Triggering Event	Primary Actor	Pre-Condition	Post-Condition

(Identify the name of the event that start the scenario)	(Identify the actor whose point-of-view is primarily used to describe the steps)	(Identify any pre-conditions or actor states necessary for the scenario to start)	(Identify the post-conditions or significant results required to consider the scenario complete)
Communication needs with other non-AMI systems	Field Service Rep	Scenario 1 is complete, the ability to complete a default read schedule	

3.12.1   Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	What actor, either primary or secondary is responsible for the activity in this step?	Describe the actions that take place in this step. The step should be described in active, present tense.	Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..
D1	MDMS	MDMS or other authorized system/party issues a pickup read request.	
D2	Field Service Rep	Field service personnel schedules meter visit for pickup read request and arrives at meter.	
D3	Field Service Rep	Authorized Field service person connects field service terminal to meter	
D4	Field Service Rep	Field service person downloads entire meter data memory into field service terminal	
D5	Field Service Rep	Field service person completes pickup read request by uploading the meter data to MDMS	
D6	MDMS	MDMS stores the retrieved data, indicating that meter data was retrieved by alternate/manual access	

3.13   Alternate Scenario 5 - ADCS sets a Non-Default schedule remotely

The need for a non-default meter read schedule arises. Examples of this might include (but are not limited to) the following:

- Customer purchases a premium service providing for more frequent meter reads

- A Critical Peak Pricing (CPP) event occurs (or other similar demand response program event)

- Customer pre-paid balance approaches zero (for customers on a prepayment program).

- For Utility reasons (i.e. SCE decides to read meters on a non-default schedule)

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
A Non-Default read schedule is needed.	ADCS	Scenario 1 is complete, the ability to complete a default read schedule	

3.13.1   *Steps for this scenario*

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*

Step #	Actor	Description of the Step	Additional Notes
E1	N/A	The need for a non-default meter read schedule arises. Examples of this might include (but are not limited to) the following: • Customer purchases a premium service providing for more frequent meter reads • A Critical Peak Pricing (CPP) event occurs (or other similar demand response program event) • Customer pre-paid balance approaches zero (for customers on a prepayment program). • For Utility reasons (i.e. SCE decides to read meters on a non-default schedule)	
E2	ADCS	Utility user (manually) or IT system (automatically) determines non-default schedule parameters and sets the non-default schedule start time, end time, read frequency in ADCS	
E3	ADCS	ADCS sets the non-default schedule in the meter	
E4	AMI Meter	Meter acknowledges receipt of non-default schedule by sending a return message to ADCS	

3.14   Alternate Scenario 6 - ADCS reads a meter on a Non-Default schedule remotely

Triggering Event	Primary Actor	Pre-Condition	Post-Condition

(Identify the name of the event that start the scenario)	(Identify the actor whose point-of-view is primarily used to describe the steps)	(Identify any pre-conditions or actor states necessary for the scenario to start)	(Identify the post-conditions or significant results required to consider the scenario complete)
Ability to read a AMI meter at a Non-scheduled meter reading schedule.	ADCS	Scenario 1 is complete, the ability to complete a default read schedule	

3.14.1   Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	What actor, either primary or secondary is responsible for the activity in this step?	Describe the actions that take place in this step. The step should be described in active, present tense.	Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..
F1	AMI Meter	AMI Meter provides all read data (since the previous read) at the non-default read schedule time. • Intervals • Register read • All channels of data • Event logs • Meter Identifier • Time Stamp • Other	
F2	ADCS	Automated data collection system receives the data	

Step #	Actor	Description of the Step	Additional Notes
F3	ADCS	Automated data collections system does necessary data translation	
F4	MDMS	Data will be transmitted to Meter Data Management System (MDMS)	
F5	MDMS	Data will also be transmitted directly to recipients with real-time requirements.	
F6	MDMS	MDMS will verify that readings for meters on non-default read schedules are being received as scheduled	

3.15   Alternate Scenario 7 - MDMS issues communications trouble report for failure to retrieve billing data

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Failure to retrieve data, trouble report is needed.	MDMS	Scenario 1 is complete, the ability to complete a default read schedule	

3.15.1   Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
G1	MDMS	MDMS identifies meters where data is missing/incomplete for (3) most recent days	
G2	MDMS	MDMS identifies meters missing (5) non-consecutive previous full or partials days	
G3	MDMS	From results of Step 1 and Step 2, MDMS determines which meters to not have outstanding communications trouble reports.	
G4	MDMS	MDMS issues trouble report to field service person, specifying details on the trouble meter and the missing/incomplete data.	
G5	MDMS	MDMS creates an aging report of outstanding communications trouble reports and provides this to an ADCS analyst.	

3.16   Alternate Scenario 8 - Meter does not respond to an on demand read

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
On Demand Read Request communication failure.	ADCS	Scenario 1 is complete, the ability to complete a default read	

		schedule	

3.16.1   Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	What actor, either primary or secondary is responsible for the activity in this step?	Describe the actions that take place in this step. The step should be described in active, present tense.	Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..
H1	N/A	Steps 1 through 3 of Use Case B1, Success Scenario Two complete - Ability to complete an on-demand read.	
H2	AMI Meter	Meter does not provide a valid response to the on demand read request within 4 minutes.	
H3	ADCS	The ADCS logs the failed on-demand read attempt and re-processes the request.	
H4	AMI Meter	Meter does not provide a valid response to the on demand read request within 4 minutes.	
H5	MDMS	Requesting utility user or IT system is notified of failed on demand read attempt.	
H6	ADCS	ADCS issues a notification to the ADCS operator specifying on-demand read failures and details on the trouble meter..	

3.17   Alternate Scenario 9 - Meter Does not communicate remotely during a non-default schedule read (Failure for Alt Scenario 6)

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Communication failure with a non-default read attempt	ADCS	Scenario 1 is complete, the ability to complete a default read schedule	

3.17.1   Steps for this scenario

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
I1	N/A	Alternate Scenario F of Use Case B1, Successfully read a Non-Default schedule remotely, is complete, but not successful.	
I2	MDMS	MDMS identifies missing data for non-default schedule reads.	
I3	MDMS	MDMS notes meters with missing/incomplete data.	
I4	MDMS	MDMS initiates an automated on demand read to recover non-default schedule read data (refer to Primary Scenario 2 of Use Case B1).	

Step #	Actor	Description of the Step	Additional Notes
I5	ADCS	Automated on demand read request completes.	
I6	MDMS	MDMS identifies meters where data is received by automated on demand read request, stores the retrieved data, verifies that the non-default schedule is properly set in the meter, and logs the successful result.	
I7	MDMS	MDMS identifies meters where non-default read data is still missing/ incomplete, after 10 minutes, and logs the failed retry attempt.	
I8	MDMS	MDMS initiates an automated on demand read to recover non-default schedule read data (refer to Primary Scenario 2 of Use Case B1).	
I9	ADCS	Automated on demand read request completes.	
I10	MDMS	MDMS identifies meters where data is received by automated on demand read request, stores the retrieved data, verifies that the non-default schedule is properly set in the meter, and logs the successful result.	
I11	MDMS	MDMS identifies meters where non-default read data is still missing/ incomplete, after 10 minutes, and logs the failed retry attempt.	
I12	MDMS	MDMS initiates an automated on demand read to recover non-default schedule read data (refer to Primary Scenario 2 of Use Case B1).	
I13	ADCS	Automated on demand read request completes.	

Step #	Actor	Description of the Step	Additional Notes
I14	MDMS	MDMS identifies meters where data is received by automated on demand read request, stores the retrieved data, verifies that the non-default schedule is properly set in the meter, and logs the successful result.	
I15	MDMS	MDMS logs the failed retry attempt and creates an exception report for meters still missing non-default schedule read data.	
I16	MDMS	MDMS makes reports available to ADCS analyst. EXAMPLES: • Meters still missing data • Meter successfully recovered through automated on demand read request • Statistic/Performance reports.	

3.18   Alternate Scenario 10 - Catastrophic/Server failure scenario (> 10% of meter population failing)

Triggering Event	Primary Actor	Pre-Condition	Post-Condition
(Identify the name of the event that start the scenario)	*(Identify the actor whose point-of-view is primarily used to describe the steps)*	*(Identify any pre-conditions or actor states necessary for the scenario to start)*	*(Identify the post-conditions or significant results required to consider the scenario complete)*
Unable to retrieve meter readings.	MDMS	Scenario 1 is complete, the ability to complete a default read	

		schedule	

3.18.1   *Steps for this scenario*

Step #	Actor	Description of the Step	Additional Notes
#	*What actor, either primary or secondary is responsible for the activity in this step?*	*Describe the actions that take place in this step. The step should be described in active, present tense.*	*Elaborate on any additional description or value of the step to help support the descriptions. Short notes on architecture challenges, etc. may also be noted in this column..*
J1	N/A		

4. Requirements

4.1 Functional Requirements

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The AMI Meter shall store a register read at midnight for each channel of data every day.	1	2
The AMI System shall have the ability to provide meter reads on demand	1	2
	A1	4
	A1	8
	A1	13
	A2	4
	A2	8
	A2	10
	A3	4
	A3	8
	A3	10
The ADCS shall manage the default schedule read time for all AMI meters.	1	1
	A5	3
ADCS shall have access to channel multipliers, meter multipliers, unit of measure per channel, and other basic meter info	1	4
	2	6
The interval data time stamps shall NOT self adjust for Day Light Savings time. The internal clock should be remotely programmable.	1	2
	2	4
	4	2

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
	A6	1
Internal AMI Meter clock shall remotely validate its time at least once a day with official AMI system time. Time synchronization must only occur within an interval but not at an interval boundary.	1	2
	2	4
	4	2
	A6	1
The AMI Meter shall keep time even if there is no communication with the network	1	2
	2	4
	4	2
	A6	1
The AMI Meter shall log any internal meter clock time corrections or adjustments	1	2
	2	4
	4	2
	A6	1
The AMI Meter shall log any failed attempts to adjust internal meter clock.	1	2
	2	4
	4	2
	A6	1
The AMI Meter internal clock shall automatically reset during the daily time validation if time is greater than 20 seconds but less than 120 seconds out of synch with official AMI system time.	1	2
	2	4
	4	2
	A6	1
The AMI Meter shall be able to set and specify message type for events/messages sent from the meter to the Utility.	3	2
Recipients of AMI Meter non-usage messages routed by the MDMS shall acknowledge receipt	3	6

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
by sending a return message from the recipient to MDMS.		
MDMS shall be able to determine message routing for all non-usage messages sent from AMI Meters to the utility	3	4
The AMI Meter shall log all non-usage messages sent to the utility including internal clock Date/Time of the triggering event.	3	1
The AMI Meter shall send non-usage messages that contain date/time from internal meter clock, message code/type, and meter identifier.	3	3
MDMS shall have the ability to generate exception reports for missing/incomplete meter data.	A1	16
	A2	12
	A3	12
MDMS shall identify and log meters where missing/incomplete meter data for the previous day was successfully recovered through the automated on-demand read request.	A1	6
	A1	10
	A1	15
	A2	6
	A2	8
	A2	10
	A3	6
	A3	8
	A3	10
MDMS shall have the ability to automatically initiate an on-demand read request	A1	4
	A1	8
	A1	13
	A2	4
	A2	8
	A2	10

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
	A3	4
	A3	8
	A3	10
MDMS shall have the ability to identify and log meters that have had missing/incomplete data in the past.	A1	3
	A1	7
	A1	12
	A1	16
	A2	3
	A2	7
	A2	9
	A2	11
	A3	3
	A3	7
	A3	9
	A3	11
MDMS shall have the ability to automatically identify and immediately log missing/incomplete data from the previous day.	A1	2
	A1	7
	A1	12
	A1	16
MDMS log data shall be available to other supporting systems and organizations immediately upon request. (e.g. available to Customer/Billing System)	A1	2
	A2	2
	A3	2

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
MDMS shall have the ability to automatically identify and immediately log missing/incomplete data from prior to the previous day.	A2	2
	A2	7
	A2	9
	A2	11
	A3	2
	A3	7
	A3	9
	A3	11
The MDMS shall have the ability to issue an on demand read request to retrieve missing/incomplete data for any period(s) present in the meter (i.e. at least 45 days), for all meters with missing/incomplete data	A2	4
	A2	8
	A2	10
	A3	4
	A3	8
	A3	10
Utility field service personnel shall have the ability to locally download meter's memory.	A4	4
AMI meter shall log all local meter data download attempts.	A4	3
AMI meter shall include authorization/authentication for local meter data download attempts.	A4	3
Meter data downloaded to the AMI System shall include all recorded data stored in the meter at time of download (e.g. default read data, PQ data, messages/logs, etc.)	A4	4
MDMS shall have the ability to accept all meter data from a field service terminal (e.g. default read data, PQ data, messages/logs, etc.)	A4	5
MDMS shall record the source of all meter data (e.g. default retrieval process, on-demand/exception process, manual upload, etc.)	A4	6

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
ADCS shall have the ability to remotely set a non-default meter read schedule at a configurable frequency of greater than once per day but not more frequently than the meter's recording interval.	A5	2
ADCS shall have the ability to remotely set/update/cancel a meter's read schedule for a specified or on-going duration.	A5	2
ADCS shall log details of all non-default meter read schedules including the source (system/party) of each non-default schedule.	A5	2
The AMI Meter shall store, log, and acknowledge any changes to the read schedule.	A5	4
The AMI Meter shall be able to send all read data at scheduled read times.	A6	1
For the first occurrence of a non-default read (more frequently than once per day), the AMI meter shall send data beginning at midnight this morning through current time.	A6	1
For second and later occurrences of a non default read (more frequently than once per day), the AMI meter shall send data beginning at the previous read time through current time.	A6	1
The AMI Meter shall send an event message to the utility in the event that its internal clock is greater than 120 seconds out of synch with official AMI system time.	1 2 4 A6	2 4 2 1
The AMI Meter will collect interval data	1	2
The AMI Meter will store interval data for a minimum of 45 days	1	2
MDMS (Meter Data Management System) will store all retrieved meter data	1	5
The ADCS shall allow for multiple collection protocols to be involved in accessing AMI meter data and will manage the relationship between the collection method and the AMI meters.	1	3
The AMI Meter interval duration will be remotely programmable.	1	2
The AMI Meter shall store its own read schedule	6	4
The AMI Meter shall be capable of transmitting data according to its stored read schedule (without being prompted by any external command or communication)	6	4

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The AMI Meter shall be able to store multiple read schedules (minimum of 4 schedules)	6	4
The AMI Meter shall be capable of transmitting data according to multiple read schedules (without being prompted by any external command or communication) (minimum of 4 schedules)	6	4
The AMI Meter shall acknowledge receipt and setup of a read schedule	6	5
The ADCS shall receive acknowledgement of a read schedule setup from the meter within 15 minutes	6	6
The ADCS shall have the ability to place meters into read schedule groups	6	7
The ADCS shall have the ability to identify those read groups that consistently fail to meet targeted schedule read times	6	7
The ADCS shall have the ability to identify read groups that consistently retrieve all reads within scheduled time parameters	6	7
ADCS shall record the results of read group analysis and the resulting actions taken	6	7
ADCS shall have the ability to select meters from "over" committed groups and reallocate them to one or more "under" committed groups, in order to balance/optimize the overall meter read schedule performance	6	8
ADCS shall have the ability to communicate updated/replacement read schedule information to AMI meters	6	9
The AMI Meter shall have the ability to recognize when it cannot respond to an on demand read request	A8	2
The AMI Meter shall log failed on demand read requests when it is unable to respond to such requests	A8	2
The AMI Meter shall have the ability to recognize when it cannot send a scheduled read	A9	0
The AMI Meter shall log failed scheduled reads	A9	0
Following a failed scheduled read, for the next scheduled read time the meter shall send all interval read data since the last successful scheduled read transmission	A9	0
For non-default read frequencies (i.e. more frequent than daily reads), MDMS will identify missing data within 2 read intervals (elapsed time)	A9	2

Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The ADCS shall have the ability to execute a mass on demand read for all meters which are missing data within a specified timeframe.	A10	0
The ADCS shall have the ability to execute mass on demand reads in an optimized manner to prevent system overload problems	A10	0
The AMI meter shall support two way communications to permit maintenance of meter read schedule information	1	1
The AMI Meter default read time will be remotely programmable/ updateable.	1	1
SCE shall have the ability to grant third parties access to specified SCE meters.	9	1
Third Parties shall have the ability to retrieve meter data (SCE meters or third party meters) using the SCE AMI communications network.	9	3
The AMI System shall have a secure portal that permits authorized third parties to access the SCE AMI Network	9	2
SCE shall have the ability to curtail third party activity to retain network reliability	9	3
AMI Back Office System shall retain third party activity logs for at least as long as interval data is retained.	9	5
The AMI System is configurable to allow individual third parties access to a limited set of meters pre-authorized by SCE.	9	2

4.2 Non-functional Requirements

Non-Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The AMI System shall collect scheduled meter read data for all AMI meters starting at 12:01 AM and complete upload to MDMS by 8:00 AM every day.	1	0

Non-Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
The AMI System when responding to requests for data shall convert from its internal format/time zone to the time format/time zone specified by the data requestor.	1	2
	2	4
	4	2
	A6	1
Under normal operating conditions, an on demand meter read shall be complete (data returned to requesting system or operator) within 30 seconds 80% of the time and within 60 seconds 99% of the time.	1	2
	A1	4
	A1	8
	A1	13
	A2	4
	A2	8
	A2	10
	A3	4
	A3	8
	A3	10
ADCS shall balance the meter read schedule across the data collection period	1	1
ADCS shall periodically rebalance the meter read schedule automatically.	1	1
MDMS will route event messages from AMI Meters within 60 seconds of receipt from source meter to the appropriate system(s).	3	5
The AMI Meter shall provide a read at least once daily	1	2
MDMS shall be able to remotely manage work load and priority of ad hoc and routine requests for usage data to provide reasonable system response time.	5	3
The AMI Meter shall have a security mechanism in place to restrict reads/downloads of meter data to authorized utility or third party personnel only.	A4	3
MDMS shall log information (i.e. retrieval pathway) associated with successful retrieval of missing/incomplete meter data through automated on-demand read requests to aid in future	A1	6

Non-Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
communication troubleshooting processes.	A1	10
	A1	15
	A2	6
	A2	8
	A2	10
	A3	6
	A3	8
	A3	10
The AMI System shall have the ability to complete an automatically initiated on-demand read request for the entire population of meters with missing/incomplete data within 2 hours (normal failure circumstances – up to 10% of total AMI meter population).	A1	4
	A1	8
	A1	13
	A2	4
	A2	8
	A2	10
	A3	4
	A3	8
	A3	10
All meter data shall be able to be locally downloaded to a field service terminal in 10 seconds or less.	A4	4
The AMI Meter shall have the ability to store at least 4 read schedules. (e.g. Multiple CPP events, prepaid balance approaches zero, etc.)	A5	3
Scheduled read data shall be transmitted to all recipients with real-time requirements within 60 seconds of the scheduled read time.	A6	5
As meters self-register, they will be placed in an unscheduled read group within ADCS.	6	1

Non-Functional Requirements	Associated Scenario # (if applicable)	Associated Step # (if applicable)
ADCS shall have the ability to determine the most efficient read group to place the meters into	6	2
ADCS shall have the ability to communicate initial read schedule information to AMI meters.	6	3
The ADCS shall receive and log the meter's acknowledgement of successful default read schedule setup	6	6
The AMI Meter will store at a minimum, the previous 45 days of recorded interval data	1	2

4.3 Business Requirements

Business Requirement	Associated Scenario # (if applicable)	Associated Step # (if applicable)
MDMS must begin the process to identify missing daily read data no later than 8AM each day. (i.e. Alternate Scenario 1)	A1	0
Third Parties must ensure that their meter read software is compatible with the SCE AMI Network	9	3

5.   Use Case Models (optional)

This section is used by the architecture team to detail information exchange, actor interactions and sequence diagrams

5.1 Information Exchange

For each scenario detail the information exchanged in each step

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
#	*Name of the step for this scenario.*	*What actors are primarily responsible for Producing the information?*	*What actors are primarily responsible for Receiving the information?*	*Describe the information being exchanged*
Primary 1	Automated data collection system to set initial default schedule when the meter self provisions	ADCS	AMI Meter	Set default schedule for data retrieval
	Meter provides prior days data at scheduled time • Intervals • Register reads as of midnight • All channels of data • Event logs • Meter Identifier • Time stamp • Other	AMI Meter	ADCS	Prior days data: • Intervals • Register reads as of midnight • All channels of data • Event logs • Meter Identifier • Time stamp • Other
	Automated data collection system receives the data			
	Automated data collections system does necessary data translation			

Advanced Metering Infrastructure (AMI) Program
B1 - Multiple Clients Read Demand and Energy Data Automatically from Customer Premises

DRAFT

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Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	data to the Meter Data Management System (MDMS)	ADCS	MDMS	Prior days data: • Intervals • Register reads as of midnight • All channels of data • Event logs • Meter Identifier • Time stamp • Other
	also transmits data directly to recipients with real time requirements	ADCS		Prior days data: • Intervals • Register reads as of midnight • All channels of data • Event logs • Meter Identifier • Time stamp • Other
	MDMS verifies that data from all meters was received.			
Primary 2	A requirement for an on demand read emerges			
	Authorized utility User (manually) or IT System (automatically) initiates an on demand read request	Authorized Utility User IT System	ADCS	On demand read request
	AMI Meter receives on demand read request	ADCS	AMI Meter	On demand read request
	AMI Meter responds to the request on all channels • Current date and time • Current register read • Complete intervals since midnight • Event logs • Meter Identifier • Time Stamp	AMI Meter	ADCS	On demand read reply • Current date and time • Current register read • Complete intervals since midnight • Event logs • Meter Identifier • Time Stamp

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Automated data collection system receives data			
	Automated data collection system does necessary translation			
	transmits data directly to requesting user or system, (data may or may not go through MDMS. User should not have to do additional steps to view the retrieved data). Data is transferred to and stored in Meter Data Management System.	ADCS	MDMS	On demand read reply • Current date and time • Current register read • Complete intervals since midnight • Event logs • Meter Identifier • Time Stamp
	transmits data directly to requesting user or system, (data may or may not go through MDMS. User should not have to do additional steps to view the retrieved data). Data is transferred to and stored in Meter Data Management System.	ADCS	MDMS	On demand read reply • Current date and time • Current register read • Complete intervals since midnight • Event logs • Meter Identifier • Time Stamp
	transmits data directly to requesting user or system, (data may or may not go through MDMS. User should not have to do additional steps to view the retrieved data). Data is transferred to and stored in Meter Data Management System.	MDMS	Authorized Utility User IT System	On demand read reply • Current date and time • Current register read • Complete intervals since midnight • Event logs • Meter Identifier • Time Stamp
	ADCS receives an acknowledgment that data was received by requesting user or system.	Authorized Utility User IT System	MDMS	Receipt acknowledgement
	ADCS receives an acknowledgment that data was received by requesting user or system.	MDMS	ADCS	Receipt acknowledgement

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	ADCS logs that the on-demand read request was completed successfully	ADCS	MDMS	Log that the on-demand read request was completed successfully
Primary 3	AMI Meter detects an event and logs it in the meter event log.	AMI Meter	AMI Meter	Meter Log Event
	AMI Meter determines that event type requires message to be sent to the utility in real time			
	AMI Meter sends event message to Utility	AMI Meter	ADCS	Event message
	AMI Meter sends event message to Utility	ADCS	MDMS	Event message
	MDMS receives event message and determines routing			
	MDMS forwards event message to identified recipient(s).	MDMS		Event message
	Receiving party acknowledges message upon receipt by sending a return message to MDMS.		MDMS	Receipt acknowledgement
	Receiving party acknowledges message upon receipt by sending a return message to MDMS.	MDMS	ADCS	Receipt acknowledgement
Primary 4	MDMS) successfully receives scheduled or on-demand raw meter read data from Automated Data Collection System (ADCS)	ADCS	MDMS	Scheduled or on demand raw meter read data • All Interval data retrieved (Engineering Units) • Register read • Event Logs • Meter identifier • Time Stamp

Advanced Metering Infrastructure (AMI) Program
B1 - Multiple Clients Read Demand and Energy Data Automatically from Customer Premises

DRAFT

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	MDMS Provides the following data to the Billing Usage System: • All Interval data retrieved (Engineering Units) • Register read • Event Logs • Meter identifier • Time Stamp	MDMS	Billing Usage System	Scheduled or on demand raw meter read • All Interval data retrieved (Engineering Units) • Register read • Event Logs • Meter identifier • Time Stamp
	Billing Usage System provides summarization and validation of interval data	Billing Usage System		Summarization and validation of interval data
	Billing Usage System returns validated interval data to MDMS for storage/management purposes	Billing Usage System	MDMS	Summarization and validation of interval data
	Billing Usage System forwards summarized billing determinants to service billing system.	Billing Usage System	Service Billing System	Summarized billing determinants
Primary 5	Data user determines need for specific usage data			
	Authorized User initiates Data request • Routine – i.e. regularly scheduled to automatically retrieve specific usage data on a periodic basis • Ad-hoc – i.e. manual request to retrieve specific usage data on demand.	Authorized User	MDMS	Data request
	MDMS) receives data request			
	MDMS retrieves usage data and other data requested	MDMS	ADCS	Data request
	MDMS retrieves usage data and other data requested	ADCS	AMI Meter	Data request

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	MDMS retrieves usage data and other data requested	AMI Meter	ADCS	Requested data
	MDMS retrieves usage data and other data requested	ADCS	MDMS	Requested data
	MDMS formats data to user defined format			
	MDMS provides file to user or other destination specified by the user	MDMS	Authorized User	Requested data
Primary 6	As meters self-register, they will be placed in an unscheduled default read group.	AMI Meter	ADCS	Self register information
	Each evening (or at a pre-determined low activity time), ADCS will schedule default read times for all unscheduled meters by placing them in a default read group, maintaining balance among the currently scheduled default read groups.			
	ADCS will communicate the initial default schedule update to the affected meters.	ADCS	AMI Meter	Initial default schedule update
	Each meter will receive the default schedule from ADCS, validate it and process it.			
	Upon completion of default schedule being set, an acknowledgement transaction will be sent from the Meter to ADCS.	AMI Meter	ADCS	Validation of schedule update
	ADCS will receive and record the acknowledgement of the default schedule update.	ADCS	ADCS	Record of validation of schedule update

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Periodically (weekly?) after the day's meter data collection process has concluded, ADCS reviews the actual meter read data collection timestamps with the meter's default schedule, looking for meters that constantly fail to meet their default schedules. ADCS will also look for time periods (20 min periods) where all default schedules are consistently met. These two results will represent the "over" committed and "under" committed meter data collection schedules.			
	ADCS will select ten (10) percent (for example) of the meters in the "over" committed schedule periods and reallocate them to the "under" committed schedule time periods.			
	ADCS will communicate the modified default schedule update to the affected meters.	ADCS	AMI Meter	Modified default schedule
	Each meter will receive the default schedule update from ADCS, validate it and process it.			
	Upon completion of default schedule update, an acknowledgement transaction will be sent from the Meter to ADCS.	AMI Meter	ADCS	Validation of modified schedule
	ADCS will receive and record the acknowledgement of the default schedule update.	ADCS	ADCS	Record of validation of modified schedule

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
Primary 8	External entities looking to obtain meter usage data will be provided three options: • Bulk data will deal with requests for large amounts of data (e.g. all usage data for a set of premises for a year; all usage data for premises associated with a specific energy retailer for a day/week/month.). These requests can be either one-time or periodically scheduled. (Source: MDMS) • "On Demand" requests for yesterday's meter usage data. Requests will be submitted through a "portal" application available to the external organization. (Limits on the number of "on demand" requests will need to be able to be set and monitored to prevent external entities from attempting to perform "bulk" data retrieval through the "portal".) (Source: MDMS) • "On Demand" requests for current meter usage data (e.g. Energy retailer needs to see today's raw meter usage data up to the last recorded interval"). Requests will be submitted through a "portal" application available to the external organization. (Limits on the number of "on demand" requests will need to be able to be set and monitored to prevent external entities from attempting to perform "bulk" data retrieval through the "portal".) (Source: meter)			
	"Portal" requests are "accounted" for and logged identifying the requesting party and the precise details of the request.	Requesting party	AMI Back Office System	Portal request
	Bulk or "portal" request is sent to MDMS for action	AMI Back Office System	MDMS	Portal request

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	MDMS acts on request where it is the source, or sends an "on demand" read request to the meter where appropriate.	MDMS	ADCS	Portal request
	MDMS acts on request where it is the source, or sends an "on demand" read request to the meter where appropriate.	ADCS	AMI Meter	Portal request
	In the case of "on demand" requests sent to the meter, the meter receives, verifies and provides the usage data requested to the MDMS. (through the normal process defined in Use Case B1, Success Scenario 2)	See primary scenario 2 AMI Meter -> ADCS ADCS -> MDMS		Requested portal data
	MDMS immediately dispatches the "raw" data returned from the meter to the requesting external recipient.	MDMS	Requesting party	Requested portal data
	In the case of all "on demand" requests (regardless of where the data is sourced) MDMS logs the response data returned and associates it with the original "on demand" request.	MDMS	MDMS	Log of the response data along with the original "on demand" request
	Bulk data requests are packaged for shipment and sent to the requesting external recipient. A log entry of the amount of data accumulated and dispatched to the external entity is recorded	MDMS	External Recipient	Log of the amount of data accumulated and dispatched to the external entity along with the original request
Primary 9	Third Party has meters or access to SCE Meters • Third Party has contract for SCE for AMI Network Access			

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Third Party logs into secure portal to gain access to SCE AMI Network • Access limited to set of meters pre-authorized by SCE • Third Party meters have been identified and approved by SCE	Third party	AMI Network	Logon information Authorization Validation
	Third Party reads meters using their own meter reading software • SCE monitors Third Party usage to maintain network reliability • SCE pre-approves Third Party meter reading software for use with AMI Network	Third party	Third party meter	Meter read request
	Third Party reads meters using their own meter reading software • SCE monitors Third Party usage to maintain network reliability • SCE pre-approves Third Party meter reading software for use with AMI Network	Third party meter	Third party	Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	Third party	CSS	Meter read request
	If meter is an SCE meter, SCE accesses and reads meter as normal	CSS	ADCS	Meter read request
	If meter is an SCE meter, SCE accesses and reads meter as normal	ADCS	AMI Meter	Meter read request
	If meter is an SCE meter, SCE accesses and reads meter as normal	AMI Meter	ADCS	Meter read data

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	If meter is an SCE meter, SCE accesses and reads meter as normal	ADCS	MDMS	Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	MDMS	CSS	Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	CSS	Third party	Meter read data
	SCE maintains log of Third Party access to and activity on SCE AMI Network • SCE maintains log information for billing, compliance, and dispute resolution with Third Party • Third Party AMI Network activity data retained for at least as long as interval data	AMI Back Office System	AMI Back Office System	Log of Third Party Access
Alternate 1	Primary Scenario 1 of Use Case B1, AMI Meter Completes Default Schedule Read Request , is complete			
	MDMS identifies missing data for previous day.			
	MDMS notes meters with missing/incomplete data.			
	MDMS initiates an automated on demand read to recover previous day's data (refer to Primary Scenario 2 of Use Case B1).	MDMS	ADCS	Demand meter read request
	Automated on demand read request completes.	ADCS	AMI Meter	Demand meter read request
	Automated on demand read request completes.	AMI Meter	ADCS	Demand meter read data

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Automated on demand read request completes.	ADCS	MDMS	Demand meter read data
	MDMS identifies meters where data is received by automated on demand read request instead of default schedule, stores the retrieved data, and logs the successful result.	MDMS	MDMS	Log of successful result
	MDMS identifies meters where previous day's data is still missing/incomplete and logs the failed retry attempt.			
	MDMS initiates an automated on demand read to recover previous day's data (refer to Primary Scenario 2 of Use Case B1).	MDMS	ADCS	Demand meter read request
	Automated on demand read request completes.	ADCS	AMI Meter	Demand meter read request
	Automated on demand read request completes.	AMI Meter	ADCS	Demand meter read data
	Automated on demand read request completes.	ADCS	MDMS	Demand meter read data
	MDMS identifies meters where data is received by automated on demand read request instead of default schedule, stores the retrieved data, and logs the successful result.			
	MDMS identifies meters where previous day's data is still missing/incomplete and logs the failed retry attempt.	MDMS		Log of failed retry attempt
	MDMS initiates an automated on demand read to recover previous day's data (refer to Primary Scenario 2 of Use Case B1).	MDMS	ADCS	Demand meter read request

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Automated on demand read request completes.	ADCS	AMI Meter	Demand meter read request
	Automated on demand read request completes.	AMI Meter	ADCS	Demand meter read data
	Automated on demand read request completes.	ADCS	MDMS	Demand meter read data
	MDMS identifies meters where data is received by automated on demand read request instead of default schedule, stores the retrieved data, and logs the successful result.	MDMS		Log of successful result
	MDMS logs the failed retry attempt and creates an exception report for meters still missing previous day's data	MDMS	MDMS	Log of Failed Retry Attempt Exception Report for meters still missing previous day data
	MDMS makes reports available to ADCS analyst. EXAMPLES: • Meters still missing data • Meter successfully recovered through automated on demand read request • Statistic/Performance reports. Total meters 5 million Successes 4.8 million Automated on demand read request .18 million Unsuccessful .02 million	MDMS	ADCS Analyst	- Meters still missing data - Meter successfully recovered through automated on demand read request - Statistic/Performance reports

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
Alternate 2	Alternate Scenario 1 of Use Case B1, Meter Does not communicate remotely during default schedule read (up to 10% of meter population), completes.			
	MDMS identifies missing data for consecutive days prior to previous day.			
	MDMS notes meters with missing/incomplete data.			
	MDMS initiates an automated on demand read request (refer to Primary Scenario 2 of Use Case B1) for meters identified in step 3, specifying which days need to be recovered (can be multiple days) - NOTE: Do we need to specify this, or do we request all days?			
	Automated on demand read request completes.			
	MDMS identifies meters where data is received by automated on demand in step 4, stores the retrieved data (indicating quantity of days/intervals), and logs the successful result.			
	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.			
	MDMS performs steps 4, 5 and 6 again for meters identified in step 7			
	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.			

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	MDMS performs steps 4, 5 and 6 again for meters identified in step 9			
	MDMS logs the failed retry attempt and creates an exception report for meters still missing data from all days other than previous day's data.			
	MDMS makes reports available to ADCS analyst. EXAMPLES: • Meters still missing data, including # of days missing • Meter successfully recovered by this scenario. • Statistic/Performance reports. Total meters attempted 25,000 Meters fully recovered 3,000 Meters partially recovered 1,000 Unsuccessful 21,000			
Alternate 3	Primary Scenario One, Use Case B1, Ability to Complete Default Schedule Read Request , is complete			
	MDMS identifies missing data for any full or partial days prior to previous day (non-consecutive days).			
	MDMS notes meters with missing/incomplete data.			

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	MDMS initiates an automated on demand read request (refer to Primary Scenario 2 of Use Case B1) for meters (identified in step 3), specifying which days need to be recovered (can be multiple days) - NOTE: Do we need to specify this, or do we request all days?			
	Automated on demand read request completes.			
	MDMS identifies meters where data is received by automated on demand in step 4, stores the retrieved data (indicating quantity of days/intervals), and logs the successful result.			
	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.			
	MDMS performs steps 4, 5 and 6 again for meters identified in step 7			
	MDMS identifies meters where prior to previous day data is still missing/incomplete and logs the failed retry attempt.			
	MDMS performs steps 4, 5 and 6 again for meters identified in step 9			
	MDMS logs the failed retry attempt and creates an exception report for meters still missing data from all days other than previous day's data			
	MDMS makes reports available to ADCS analyst. EXAMPLE: List of meters and number of intermittent read failures	MDMS	ADCS	- List of meters - Number of intermittent read failures

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
Alternate 4	MDMS or other authorized system/party issues a pickup read request.	MDMS Authorized system/party	MDMS	Pickup read request
	MDMS or other authorized system/party issues a pickup read request.	MDMS	Field personnel	Pickup read request
	Field service personnel schedules meter visit for pickup read request and arrives at meter.			
	Authorized Field service person connects field service terminal to meter			
	Field service person downloads entire meter data memory into field service terminal	Authorized Field service person	Field tool	Read meter data request
	Field service person downloads entire meter data memory into field service terminal	Field tool	AMI Meter	Read meter data request
	Field service person downloads entire meter data memory into field service terminal	AMI Meter	Field tool	Meter data
	Field service person completes pickup read request by uploading the meter data to MDMS	Authorized Field service person / Field tool	MDMS	Upload to MDMS command
	Field service person completes pickup read request by uploading the meter data to MDMS	Authorized Field service person / Field tool	MDMS	Upload authorization and validation request
	Field service person completes pickup read request by uploading the meter data to MDMS	Authorized Field service person / Field tool	MDMS	Upload authorization and validation
	Field service person completes pickup read request by uploading the meter data to MDMS	Authorized Field service person / Field tool	MDMS	Meter data

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	MDMS stores the retrieved data, indicating that meter data was retrieved by alternate/manual access	MDMS		Manually retrieved data Log of manually retrieved data
Alternate 5	The need for a non-default meter read schedule arises. Examples of this might include (but are not limited to) the following: • Customer purchases a premium service providing for more frequent meter reads • A Critical Peak Pricing (CPP) event occurs (or other similar demand response program event) • Customer pre-paid balance approaches zero (for customers on a prepayment program). • For Utility reasons (i.e. SCE decides to read meters on a non-default schedule)			
	Utility user (manually) or IT system (automatically) determines non-default schedule parameters and sets the non-default schedule start time, end time, read frequency in ADCS	Authorized Utility User IT System	ADCS	Non-default schedule parameters - non-default schedule start time, - end time, - read frequency
	ADCS sets the non-default schedule in the meter	ADCS	AMI Meter	Non-default schedule parameters - non-default schedule start time, - end time, - read frequency
	Meter acknowledges receipt of non-default schedule by sending a return message to ADCS	AMI Meter	ADCS	Receipt confirmation of non default schedule

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
Alternate 6	AMI Meter provides all read data (since the previous read) at the non-default read schedule time. • Intervals • Register read • All channels of data • Event logs • Meter Identifier • Time Stamp • Other	AMI Meter	ADCS	All read data (since the previous read) at the non-default read schedule time. • Intervals • Register read • All channels of data • Event logs • Meter Identifier • Time Stamp • Other
	Automated data collection system receives the data			
	Automated data collections system does necessary data translation			
	Data will be transmitted to Meter Data Management System (MDMS)	ADCS	MDMS	All read data (since the previous read) at the non-default read schedule time. • Intervals • Register read • All channels of data • Event logs • Meter Identifier • Time Stamp • Other
	Data will also be transmitted directly to recipients with real-time requirements.	MDMS	various data recipients	All read data (since the previous read) at the non-default read schedule time. • Intervals • Register read • All channels of data • Event logs • Meter Identifier • Time Stamp • Other

Scenario #	*Step #, Step Name*	*Information Producer*	*Information Receiver*	*Name of information exchanged*
	MDMS will verify that readings for meters on non-default read schedules are being received as scheduled			
Alternate 7	MDMS identifies meters where data is missing/incomplete for (3) most recent days			
	MDMS identifies meters missing (5) non-consecutive previous full or partials days			
	From results of Step 1 and Step 2, MDMS determines which meters to not have outstanding communications trouble reports.			
	MDMS issues trouble report to field service person, specifying details on the trouble meter and the missing/incomplete data.	MDMS	Authorized Field service person	Trouble report including details about the trouble meter and the missing / incomplete data
	MDMS creates an aging report of outstanding communications trouble reports and provides this to an ADCS analyst.	MDMS	ADCS analyst	Aging report of outstanding communications trouble reports
Alternate 8	Steps 1 through 3 of Use Case B1, Success Scenario Two complete – **Ability to complete an on-demand read.**			
	Meter does not provide a valid response to the on demand read request within 4 minutes.			
	The ADCS logs the failed on-demand read attempt and re-processes the request.	ADCS	ADCS	Failed on demand read

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Meter does not provide a valid response to the on demand read request within 4 minutes.			
	Requesting utility user or IT system is notified of failed on demand read attempt.	ADCS	MDMS	Failed on demand read for specific meter
	ADCS issues a notification to the ADCS operator specifying on-demand read failures and details on the trouble meter..	ADCS	Authorized Field service person	Trouble report
Alternate 9	Third Party has meters or access to SCE Meters • Third Party has contract for SCE for AMI Network Access			
	Third Party logs into secure portal to gain access to SCE AMI Network • Access limited to set of meters pre-authorized by SCE • Third Party meters have been identified and approved by SCE	Third party	AMI Network	
	Third Party reads meters using their own meter reading software • SCE monitors Third Party usage to maintain network reliability • SCE pre-approves Third Party meter reading software for use with AMI Network	Third party	Third party meter	Meter read request

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	Third Party reads meters using their own meter reading software • SCE monitors Third Party usage to maintain network reliability • SCE pre-approves Third Party meter reading software for use with AMI Network	Third party meter	Third party	Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	Third party	AMI Back Office System	Meter read request
	If meter is an SCE meter, SCE accesses and reads meter as normal	AMI Back Office System	ADCS	Meter read request
	If meter is an SCE meter, SCE accesses and reads meter as normal	ADCS	AMI Meter	Meter read request
	If meter is an SCE meter, SCE accesses and reads meter as normal	AMI Meter	ADCS	Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	ADCS	MDMS	Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	MDMS		Meter read data
	If meter is an SCE meter, SCE accesses and reads meter as normal	MDMS	Third party	Meter read data

Scenario #	Step #, Step Name	Information Producer	Information Receiver	Name of information exchanged
	SCE maintains log of Third Party access to and activity on SCE AMI Network • SCE maintains log information for billing, compliance, and dispute resolution with Third Party • Third Party AMI Network activity data retained for at least as long as interval data	AMI Back Office System		Log of third party access and activity

5.2 Diagrams

The architecture team shall use this section to develop an interaction diagram that graphically describes the step-by-step actor-system interactions for all scenarios. The diagrams shall use standard UML notation. Additionally, sequence diagrams may be developed to help describe complex event flows.

6.   Use Case Issues

Capture any issues with the use case. Specifically, these are issues that are not resolved and help the use case reader understand the constraints or unresolved factors that have an impact of the use case scenarios and their realization.

Issue
Describe the issue as well as any potential impacts to the use case.

7. Glossary

Insert the terms and definitions relevant to this use case. Please ensure that any glossary item added to this list should be included in the global glossary to ensure consistency between use cases.

Glossary	
Term	**Definition**
Default Read Schedule **Default Schedule** **Default Read**	The Default read schedule is the schedule that will be set for the meter to provide it's register read, interval data, and any event messages which exist. In general, the default schedule will be set when there are no other schedules. The time will be daily between midnight and 8 AM.

8.   References

Reference any prior work (intellectual property of companies or individuals) used in the preparation of this use case.

9. Bibliography (optional)

Provide a list of related reading, standards, etc. that the use case reader may find helpful.