The Utility Use Case #4

Utility implements integrated management of Distributed Energy Resources

Date 12-15-2009, Version 1.13

1 Descriptions of Function

1.1 Function Name

Utility implements integrated management of Distributed Energy Resources

1.2 Function ID

L-11.1.4

1.3 Brief Description

The utility implements integrated management of Distributed Energy Resources (DER), which includes Distributed Generation (DG), storage and Demand Response (DR). In scenario 1 – The utility monitors and manages feeder voltage profile and may use a smart algorithm. (Voltage Profile). In scenario 2 – The utility uses installed Distributed Energy Resource equipment and other distribution control equipment such as Load Tap Changer and Capacitor Bank Controls to address peaking resource requirements. (Peaking Resource). In the final scenario 3 – The utility uses installed Distributed Energy Resource equipment and other distribution control equipment such as Load Tap Changer and Capacitor Bank Controls to address a transmission constraint contingency. (Transmission Constraint).

1.4 Narrative

Given the level of sophistication of today's electrical grid, there is a limit to the how widespread renewable energy resources can be introduced into the electrical system. The intermittent nature of these resources complicates their integration into the grid. Conditions such as cloud transients can substantially reduce the output of photovoltaic (PV) installations. This variability increases the complexity of scheduling and delivering energy to the grid, and can ultimately reduce grid stability. This use case describes how monitoring the real-time status, with a very granular time stamp (1 second) of renewable energy resources can increase the utility's effectiveness in handling this variability. Possessing real-time status information about renewable resources and feeder loads allows the utility to take

appropriate actions based on sudden increases or decreases in energy needs on the system. The utility could also install distributed renewable generation to supplement or defer grid upgrades where space, economics, or other constraints prevent the expansion of substations or the building of new distribution lines.
A possible means of balancing this intermittency is to deploy energy storage devices as either participating renewable generation or load resources. The integrated use of energy storage devices introduces a need for real-time communications to monitor and control these resources. In general, examples of energy storage resources that can discharge energy instantaneously include batteries, flywheels, superconducting magnetic energy storage, ultra-capacitors, and aggregated plug-in electric vehicles.
Also, Customer Demand Response can be treated in a similar manner to actual Distributed Generation. This requires that the response characteristics of the Customer load be understood and even be dispatchable (load control). Distributed Energy Resource can reduce the peak loading on the grid. It can also help support line voltage at the end of long distribution circuits.

The communications infrastructure for advanced metering can provide mechanisms that enable distributed generation and demand response to be deployed with greater safety and enhanced overall system reliability. The infrastructure should support monitoring of the Distributed Energy Resource operation, identification of Distributed Energy Resource for safety concerns, provide interfaces to the Distributed Energy Resource systems with pricing information and other signals when there are needs or incentives for the Distributed Energy Resource operation, and provide an interface to the Distributed Energy Resource for other applications such as voltage control, VAR control, and harmonic control. Information about Distributed Energy Resource availability and characteristics should be made available as part of the power system operations and for planning purposes (with appropriate aggregation).

The utility monitors the distribution system in real-time. This monitoring includes the system voltage levels, current levels, frequency, power factor, phase balancing, and the status and output of any distributed generation and storage. The information is aggregated and monitored by an integrated Distributed Energy Resource management application. The application is able to determine alarms conditions and provide alarm notifications to system operators along with guidance information on which actions need to be taken. System operators will be able to control utility owned distributed generation, storage, and other resources (such as capacitors, regulators, and tap changers) to help mitigate system disturbances for which local/manual correction is not done. System operators will, also, have access to any control mechanisms agreed upon with the Customer to be able to dispatch the Customer owned distributed generation, distributed storage, or load control options (dynamic pricing and demand response events) to help mitigate the system disturbance.

In addition this application will be able to respond automatically to defined scenarios without human intervention.

Scenario 1

Utility implements integrated management of Distributed Generation, storage and Demand Response. In scenario 1 - Utility monitors and manages feeder voltage profile and may use a smart algorithm. Voltage Profile.
The utility has also implemented a demand response system enabling the utility to request load reductions by the Customer in accordance with applicable tariffs.

The utility implements a Distributed Energy Resource Automation Application that takes field measurements from the AMI system (Net/Billing Meter), Renewable Energy Credit Meter, PV inverters, battery charging systems, Load Tap Changer Controls and capacitor controllers. The Distributed Energy Resource Automation Application automatically determines the optimal energy resource mix to control the voltage on the feeder to achieve a reduction in the duty cycle for the Load Tap Changer and cap bank control equipment while maintaining feeder voltage within ANSI Range A limits.

Scenario 2

Utility implements integrated management of Distributed Generation, storage and Demand Response. Peaking Resource.
Utility communicates to Distributed Generation inverter controllers (via 2-way communications) for the purpose of control and optimization of Distributed Generation, storage and Demand Response.

In scenario 2 the utility uses installed Distributed Energy Resource equipment and other distribution control equipment such as Load Tap Changer and capacitor controls to address peaking resource requirement.

Scenario 3

Utility uses installed Distributed Energy Resource equipment and other distribution control equipment such as Load Tap Changer and capacitor controls to address a transmission constraint.

1.5 Actor (Stakeholder) Roles

Describe all the people (their job), systems, databases, organizations, and devices involved in or affected by the Function (e.g. operators, system administrators, technicians, end users, service personnel, executives, SCADA system, real-time database, RTO, RTU, IED, power system). Typically, these actors are logically grouped by organization or functional boundaries or just for collaboration purpose of this use case. We need to identify these groupings and their relevant roles and understand the constituency. The same actor could play different roles in different Functions, but only one role in one Function. If the same actor (e.g. the same person) does play multiple roles in one Function, list these different actor-roles as separate rows.

Grouping (Community)		*Group Description*
Actors Functioning from the Customer Premises.		*Actors that perform their specific functions from the Customer premises.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
Customer	Person	Residential or small business energy user that has a contract with the utility to receive electrical service from the utility and have a meter installed (possibly an AMI Meter). The Customer may or may not participate in programs provided by the utility including pricing events, load control or distributed generation.
Customer Display Device	Device	Display device that receives energy and event information from the AMI and presents it to the Customer.
Home Area Network	System	HAN. Any Customer side automation that can make use of utility signals to affect energy usage within the premises will be considered as the Home Area Network for this project. Home Area Network can affect Distributed Energy Resource, lighting, security, etc. The Utility will not own Home Area Network.
Customer Storage Battery and Charging System	System	The storage batteries used to store the electrical energy and the monitoring system to change the charge/discharge rate and status of the batteries. Charging system may be capable of communicating key data to other applications. System owned by the Customer.
AMI Premise Interface	System	The AMI Premise Interface is one of the communications radios that could be "under glass" of the AMI Meter. (There are two radios built in to the AMI Meter. One is for the AMI System and is a longer range radio. The other is for the AMI Premise Interface and it has a smaller range.) This is the communication resource to the Inverter and the Home Area Network (if available).
Customer Predefined	System	The Customer completes a profile upon installation that will determine how the Customer premise will function under different circumstances (pricing,

Grouping (Community)		*Group Description*
Actors Functioning from the Customer Premises.		*Actors that perform their specific functions from the Customer premises.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
Profile		etc.). This profile is programmed into the Customer Energy Management System.
Customer Owned Distributed Generation System	Device	Distributed Generation that the Customer or agent of the Customer owns and operates at its premise.
Customer Energy Management System	System	CEMS. Customer owned premise system which interfaces with the Home Area Network and the AMI Premise Interface to provide services for load management and distributed generation. Additionally, may provide the Customer ability to control Customer owned equipment independent of the AMI.
AMI Renewable Energy Credit Meter	Device	AMI Renewable Energy Credit Meter. AMI Renewable Energy Credit Meter is a revenue grade meter used to measure the energy supplied by Customer Owned Ditributed Generation. The Renewable Energy Credit Meter information is recorded and forwarded to the PV Program Manager. Advanced electric revenue meter capable of two-way communications with the utility. A device that serves as a gateway between the utility, Customer site, and load controllers of the Customer. The meter measures, records, displays, and transmits data such as energy usage, generation, text messages, event logs, etc. to authorized systems (i.e., the AMI Network Management System) and provides other advanced utility functions.
AMI Net/Billing Meter	Device	AMI Net/Billing Meter is a bi-directional revenue grade meter used to measure energy supplied by the Distributed Generation or used by the Customer. Advanced electric revenue meter capable of two-way

Grouping (Community)		*Group Description*
Actors Functioning from the Customer Premises.		*Actors that perform their specific functions from the Customer premises.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
		communications with the utility. A device that serves as a gateway between the utility, Customer site, and load controllers of the Customer. The meter measures, records, displays, and transmits data such as energy usage, generation, text messages, event logs, etc. to authorized systems (i.e., the AMI Network Management System) and provides other advanced utility functions.
Customer Inverter	Device	Equipment at the Customer site belonging to the Customer that can be used for control of Distributed Generation real and reactive power output.
AMI Meter	Device	Advanced electric revenue meter capable of two-way communications with the utility. A device that serves as a gateway between the utility, Customer site, and Customer load controllers. The meter measures, records, displays, and transmits data such as energy usage, generation, text messages, event logs, etc. to authorized systems (i.e., the AMI Network Management System) and provides other advanced utility functions.

Grouping (Community)		*Group Description*
The Utility Actors.		*Actors that perform their specific function as a part of the Utility.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
The Utility	System	Host utility.
AMI	System	Advanced Metering Infrastructure. Advanced electric revenue metering system capable of two-way communications between the Customer and the

Grouping (Community)		*Group Description*
The Utility Actors.		*Actors that perform their specific function as a part of the Utility.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
		utility. A device that serves as a gateway (AMI Premise Interface) between the utility, Customer site, and load controllers of the Customer. The meter measures, records, displays, and transmits data such as energy usage, generation, text messages, event logs, etc. to authorized systems (i.e., the AMI Network Management System) and provides other advanced utility functions..
Distributed Energy Resource Automation Application	System	DER Automation Application. Works in conjunction with the Distribution Management System and receives field measurements from the AMI system (Net/Billing Meter), Renewable Energy Credit Meter, PV inverters, battery charging systems, Load Tap Changer Controls and capacitor controllers in addition to weather forecast information for the purpose of controlling the distribution network. The utility implements a Distributed Energy Resource Automation Application that takes field measurements from the AMI system (Net/Billing Meter), Renewable Energy Credit Meter, PV inverters, battery charging systems, Load Tap Changer Control and capacitor controllers. The application automatically determines the optimal energy resource mix to control the voltage on the feeder to achieve a reduction in the duty cycle for the Load Tap Changer and cap bank control equipment while maintaining feeder voltage within ANSI Range A limits.
Enterprise Service Bus	System	The ESB will act as a message broker between applications. The applications will communicate via the ESB. Such an approach has the primary advantage that it reduces the number of point-to-point connections required to allow applications to communicate.

Grouping (Community)		*Group Description*
The Utility Actors.		*Actors that perform their specific function as a part of the Utility.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
Utility Storage Battery and Charging System	Device	Storage Battery and Charging System equipment at the utility's site that will be used for the charge/discharge and monitoring of the storage battery system.
AMI Network Management System	System	AMI NMS. AMI Network Management System is the utility back office system that is responsible for remote two-way communications with the AMI Meters to retrieve data and execute commands. The AMI Network Management System has the responsibility to balance load on the communications network resulting from scheduled meter reads and to retry meters when communications fail. AMI Network Management System is the component responsible for monitoring the health of the AMI system, managing and implementing remote firmware updates, configuration changes, provisioning functions, control and diagnostics.
Meter Data Management System	System	MDMS. System that gathers, validates, estimates and permits editing of meter data such as energy usage, generation, and meter logs. It stores this data for a limited amount of time before it goes to a data warehouse (Meter Data Archive), and makes this data available to authorized systems and authorized personnel.
Distributed Resource Availability and Control System	System	DRAACS. System and subsystems responsible for maintaining an estimate, with a known precision, of how much resource is available for dispatch. Distributed Resource Availability and Control System is also responsible for accepting requests for blocks of energy and/or capacity and implementing that request by issuing load control requests. Distributed Resource Availability and Control System contains an optimization function that can determine the optimal Customer set to request curtailment from based upon a

Grouping (Community)		*Group Description*
The Utility Actors.		*Actors that perform their specific function as a part of the Utility.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
		variety of factors/parameters, including the size and location of the desired Demand Response resource. Distributed Resource Availability and Control System is expected to track the "as implemented" response to load control requests and issue additional load reduction requests to selected Customer sets until authorized load reduction target is met. Distributed Resource Availability and Control System uses measured responses to load demand requests to refine its internal model. Note: Any Distributed Resource Availability and Control System in use today may be parts of other systems being used. No platform exists to bring it into an operational tool today.
Customer Information System	System	CIS. Maintains Customer contact information, calculates and formats Customer bills, receives, and applies payments for individual accounts. The system is responsible for storing Customer information such as site data, meter number, rates, and program participation.
Customer Service Representative	Person	CSR. Staff employed by the utility who respond to Customer complaints, to outage notifications, or to Customer requests to activate, modify and/or terminate delivery of service. Customer Service Representatives also enroll a Customer in utility sponsored programs and answer questions related to the energy consumption and cost data of the Customer. Many off-cycle reading, billing, work orders and diagnostics requests are initiated by the Customer Service Representative in response to Customer contact.
Load Tap Changer Controls	Device	Load Tap Changer Controls. Tap changing device that senses voltage and changes taps to raise or lower the voltage to remain in a set bandwidth. These are deices that act automatically generally after sensing the voltage out-of-bandwidth for 30 seconds.
Capacitor Bank	Device	Cap Bank Controls. The control units used to monitor and operate banks of

Grouping (Community)		*Group Description*
The Utility Actors.		*Actors that perform their specific function as a part of the Utility.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
Controls		capacitors on the lines. The Capacitor Bank Controls are used for power factor correction on the Utility's system. The banks are measured in volt-amperes reactive (VAr). The Capacitor Bank Controls work autonomously or can be controlled by SCADA.
Power Operations	Person	PO. Initiates dynamic pricing data or demand response events to mitigate transmission reliability requirements
Distribution Operations	Person	DO. Operating over the distribution system, using SCADA and Distribution Management System to make decisions concerning the distribution grid. Initiates dynamic pricing data or demand response events to mitigate distribution reliability and voltage profile requirements.
Grid Control Center	System	GCC. The Grid Control Center controls grid operations through the Energy Management System, SCADA and Distribution Management System in the control area. The Grid Control Center will communicate to grid operators to ensure grid reliability and also sends signals.
Distribution Management System	System	DMS. A system that integrates the functions of SCADA, outage management, work management, distribution load management, reactive control, and asset management into a single console and set of applications.
Energy Management System	System	EMS. The Energy Management System controls grid operations in the control area. The Energy Management System will communicate to substation RTUs to ensure grid reliability.
LAMBDA	System	Also called "system lambda," a term describing the cost of the next kilowatt hour that could be produced from dispatchable units on an electric supply

Grouping (Community)		*Group Description*
The Utility Actors.		*Actors that perform their specific function as a part of the Utility.*
Actor Name	*Actor Type (person, device, system etc.)*	*Actor Description*
		system.
Wholesale Power Group	Person	WPG. Takes all resources available and determines optimum generation mix on economic basis
Utility Inverter	Device	Equipment at the utility's site belonging to the utility that can be used for control of Distributed Generation real and reactive power output.
Utility Owned Distributed Generation	Device	Distributed Generation that the Utility owns and operates.

1.6 Information exchanged

Describe any information exchanged in this template.

Information Object Name	*Information Object Description*
Voltage Out of Range Event	When the voltage at a node on a feeder gets out of range in compliance with ANSI A standards. An alert sent from an AMI Meter. This alert jumps queue and is sent to the Distribution Management System. The alert is from voltage being out of ANSI A range. This is taken from ANSI C84.1-1995 Electrical Power Systems and Equipment – Voltage Ratings (60HZ).
Begin Distributed Energy Resource Automation Application	To begin the Distributed Energy Resource Automation Application

Information Object Name	*Information Object Description*
Affected Equipment and Affected Area	Equipment and area information for an event.
Selected Equipment Assets	A listing of Selected Equipment Assets chosen to meet the requirements of the Demand Response Event.
Operational Command	A command that will evoke a change in piece of equipment. Command sent between equipment types to evoke an Equipment Status.
Equipment Status	The operational state of the specific equipment. The Equipment Status is the signal sent from the Utility Inverter to inform the Meter Data Management System and the Distributed Resource Availability and Control System the status of the Utility Storage Battery and Charging System equipment.
System Equipment Status	The operational state of a specific group of system equipment assets.
Block VAR Based Capacitor Switching	A command sent to the Capacitor Bank Controllers that prevents further switching.
Capacitor Bank Controls Operational Command	An Open or Close Command sent to the Capacitor Bank Controls to effect a change on the status of the equipment.
Load Tap Changer Controls Operational Command	A Raise Tap or Lower Tap Command sent to the Load tap Changer. Controls to effect a change on the status of the equipment.
System Condition Data	The condition of the electrical system, including equipment status and voltage, current and load parameters
Demand Response Event Notification	Event notification that will be sent to the Customer Energy Management System and compared to the Customer Predefined Profile. This comparison will affect the status of the equipment controlled at the premise.
Demand Response Selected Customers Listing	Selected set of customers chosen to meet the requirements of the Demand Response Event.

Information Object Name	*Information Object Description*
Demand Response Event Notification with the Selected Customers	Event notification that will be sent to the Customer Energy Management System and compared to the Customer Predefined Profile. This comparison will affect the status of the equipment controlled at the premise. This notification will also include the selected set of customers chosen to meet the requirements of the Demand Response Event.
Override	When the Customer chooses to "Override" a selected Demand Response Event, they will be required to acknowledge the event on their Customer Display by pushing the "Acknowledge" button and entering the correct "Override Code" onto the Customer Display. When the Customer Display receives the correct "Override Code" it will send a "Demand Response Override Function" to the Customer Energy Management System, which will allow the controlled premise devices to act accordingly.
Customer Status Information	Status of the Customer premise equipment.
AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request	A request for an AMI Net/Billing Meter Read and a request for an AMI Renewable Energy Credit Meter Read.
AMI Net/Billing Meter Read Request	A request for an AMI Net/Billing Meter Read.
AMI Renewable Energy Credit Meter Read Request	A request for an AMI Renewable Energy Credit Meter Read
AMI Net/Billing Meter Data	Meter data for a specific AMI Renewable Energy Credit Meter. This data includes voltage, current, load and power quality parameters.
AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data	Meter data for a specific AMI Renewable Energy Credit Meter and meter data for a specific AMI Net/Billing Meter. This data includes voltage, current, load and power quality parameters.
Total Load Affected Calculation	The calculation for the total load that was affected by the Demand Response Event. This affected load is calculated by the Meter Data Management System from the "before Demand Response Event" and "after Demand Response Event" metering data.

Information Object Name	*Information Object Description*
Total Load Affected	The calculated total load that was affected by the Demand Response Event. This affected load is calculated by the Meter Data Management System from the "before Demand Response Event" and "after Demand Response Event" metering data.
Voltage Out of Range Event Alert History Data	Historical data concerning a specific Voltage Limit Event Alert
Relevant Voltage Out of Range Event Alert History Data	All relevant historical data concerning a specific Voltage Limit Event Alert. This relevant historical data will be compiled and saved.
Peaking Resource Requirements and Distributed Generation Pricing Signal	Asset requirements to meet a Peaking Event that includes Distributed Generation Pricing signals.
Equipment Resources Required for the Next Day	Asset required to meet the expected loading requirements of the next day.
Confirmed Equipment Resources Required for the Next Day	The Confirmation of the assets required to meet the expected loading requirements of the next day.
Request for Scheduled Utility Storage Battery and Charging Systems	Request for the Utility Storage Battery and Charging Systems capabilities to meet system requirements. The system was scheduled for use.
Request for Scheduled Customer Storage Battery and Charging Systems	Request for the Customer Storage Battery and Charging Systems capabilities to meet system requirements. The system was scheduled for use.
Request for Scheduled Utility Owned Distributed Generation	Request for the Utility Owned Distributed Generation capabilities to meet system requirements. The system was scheduled for use.
Request for Scheduled Customer Owned Distributed Generation	Request for the Customer Owned Distributed Generation capabilities to meet system requirements. The system was scheduled for use.
AMI Renewable Energy Credit	Meter data for a specific AMI Renewable Energy Credit Meter. This data includes voltage, current,

Information Object Name	*Information Object Description*
Meter Data	load and power quality parameters.
Insufficient Resources	Insufficient equipment assets to meet the system demands.
Request for a Demand Response Load Reduction Event	A request for a Demand Response Event to assist in meeting the system requirements.
Demand Response Load Reduction Event Notification	Event notification (designed to lower the loading on the system) that will be sent to the Customer Energy Management System and compared to the Customer Predefined Profile. This comparison will affect the status of the equipment controlled at the premise.
Demand Response Load Reduction Event Notification with the Selected Customers	Event notification (designed to lower the loading on the system) that will be sent to the Customer Energy Management System and compared to the Customer Predefined Profile. This comparison will affect the status of the equipment controlled at the premise. This notification will also include the selected set of customers chosen to meet the requirements of the Demand Response Event.
Energy Resource Dispatch Status	A report of the energy resources that have been dispatched.
Transmission Constraint Scenario	Emergency system condition in which the available load is not sufficient to meet the system demands.
Distributed Energy Resource Transmission Report	Report of the Available Distributed Energy Resource Transmission assets.
Available Distributed Energy Resource Strategy	Available Distributed Energy Resources asset required to meet the expected loading requirements of the next day.
Confirmed Distributed Energy Resources	The Confirmation of the assets required to meet the expected loading requirements of the next day.
Event History Data	Historical data concerning a specific Event
Relevant Event History Data	All relevant historical data concerning a specific Event. This relevant historical data will be compiled and saved.

Information Object Name	*Information Object Description*
Available Distributed Energy Resources	Distributed Energy Resources available to meet system requirements or Customer needs.

1.7 Activities/Services

Describe or list the activities and services involved in this Function (in the context of this Function). An activity or service can be provided by a computer system, a set of applications, or manual procedures. These activities/services should be described at an appropriate level, with the understanding that sub-activities and services should be described if they are important for operational issues, automation needs, and implementation reasons. Other sub-activities/services could be left for later analysis.

Activity/Service Name	*Activities/Services Provided*

1.8 Contracts/Regulations

Identify any overall (human-initiated) contracts, regulations, policies, financial considerations, engineering constraints, pollution constraints, and other environmental quality issues that affect the design and requirements of the Function.

Contract/Regulation	*Impact of Contract/Regulation on Function*
Customer Distributed Generation Service Contract	No Customer can operate on the Utility's system in a manner that is detrimental to the Utility or other customers.
Customer Pricing Contract	The Customer has signed a Customer Pricing Contract to allow them to adjust their loads and/or Distributed Generation source with pricing.

Policy	*From Actor*	*May*	*Shall Not*	*Shall*	*Description (verb)*	*To Actor*

Constraint	Type	Description	Applies to

2 Step by Step Analysis of Function

2.1 Steps to implement function – Scenario 1

Utility monitors and manages feeder voltage profile and may use a smart algorithm. Voltage Profile.

2.1.1 Preconditions and Assumptions

Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities

Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place

Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.

Actor/System/Information/Contract	Preconditions or Assumptions
The Utility	PV inverters are set up to autonomously respond to ANSI A out-of-range voltage conditions.
The Utility	Utility PV can be at substation or anywhere on the feeder.
Customer	Customer PV can be anywhere the Customer residence is located, anywhere on the feeder.
Customer	All controllable Distributed Energy Resource are utility controlled within tariff agreements
The Utility	Assuming a full AMI system
The Utility	IEEE 1547 and other standards have evolved to support advanced applications.
The Utility	SCADA Distribution Management System has the logic to determine priorities and control between volt or VAR control.

Actor/System/Information/Contract	*Preconditions or Assumptions*
The Utility	Distribution Management System will block switching of capacitor control for VARs/Power Factor if control is already being used for voltage control.
The Utility	The cause of the voltage being out-of-range is due to cloud transient and therefore requires a "system" control response vs. an individual Customer control (due to energy storage) resulting in low voltage.
Customer	PV inverter is providing voltage regulation within its capabilities and VAR support.
Customer	When PV and the inverter are combined with storage, the control is integrated together as one actor.
Customer	The Utility has control over the inverter.
Customer	During an emergency situation, grid stability, the Utility can isolate the Customer inverter from the grid. The Customer will not be able to override this situation with their Customer Energy Management System. This is only for emergency situations.
The Utility	The Distributed Energy Resource Automation Application uses a smart algorithm to determine the optimum asset dispatch including storage, Distributed Generation, capacitor bank, Load Tap Changer and Demand Response.
The Utility	The smart algorithm will be a part of the Distribution Management System.
The Utility	Distribution Operations can call a Demand Response event in this scenario.

2.1.2 Steps

Describe the normal sequence of events, focusing on steps that identify new types of information or new information exchanges or new interface issues to address. Should the sequence require detailed steps that are also used by other functions, consider creating a new "sub" function, then referring to that "subroutine" in this function. Remember that the focus should be less on the algorithms of the applications and more on the interactions and information flows between "entities", e.g. people, systems, applications, data bases, etc. There should be a direct link between the narrative and these steps.

The numbering of the sequence steps conveys the order and concurrency and iteration of the steps occur. Using a Dewey Decimal scheme, each level of nested procedure call is separated by a dot '.'. Within a level, the sequence number comprises an optional letter and an integer number. The letter specifies a concurrent sequence within the next higher level; all letter sequences are concurrent with other letter sequences. The

number specifies the sequencing of messages in a given letter sequence. The absence of a letter is treated as a default 'main sequence' in parallel with the lettered sequences.

Sequence 1:

```
1.1 - Do step 1
1.2A.1 - In parallel to activity 2 B do step 1
1.2A.2 - In parallel to activity 2 B do step 2
1.2B.1 - In parallel to activity 2 A do step 1
1.2B.2 - In parallel to activity 2 A do step 2
1.3 - Do step 3
1.3.1 - nested step 3.1
1.3.2 - nested step 3.2
```

Sequence 2:

```
2.1 - Do step 1
2.2 – Do step 2
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#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
#	*Triggering event? Identify the name of the event*	*What other actors are primarily responsible for the Process/Activity? Actors are defined in section1.5.*	*Label that would appear in a process diagram. Use action verbs when naming activity.*	*Describe the actions that take place in active and present tense. The step should be a descriptive noun/verb phrase that portrays an outline summary of the step. "If …Then…Else" scenarios can be captured as multiple Actions or as separate steps.*	*What other actors are primarily responsible for Producing the information? Actors are defined in section1.5.*	*What other actors are primarily responsible for Receiving the information? Actors are defined in section1.5.* *(Note – May leave blank if same as Primary Actor)*	*Name of the information object. Information objects are defined in section 1.6*	*Elaborate architectural issues using attached spreadsheet. Use this column to elaborate details that aren't captured in the spreadsheet.*	*Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.*

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.1	A distribution node (AMI Net/Billing Meter) detects a Voltage Out of Range Event.	AMI Net/Billing Meter	Voltage Out of Range Event	AMI Net/Billing Meter (distribution node) detects a Voltage Out of Range Event Alert (voltage out of ANSI A standards) and sends the alert, jumping queue, to the AMI Network Management System via the AMI Infrastructure.	AMI Net/Billing Meter	AMI Network Management System	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	
1.1.1	Voltage Out of Range Event to the Meter Data Management System	AMI Network Management System	Voltage Out of Range Event to the Meter Data Management System	The AMI Network Management System sends the Voltage Out of Range Event Alert to the Meter Data Management System	AMI Network Management System	Meter Data Management System	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.1.2	Voltage Out of Range Event to the Distributed Energy Resource Automation Application	AMI Network Management System	Voltage Out of Range Event to the Distributed Energy Resource Automation Application	The AMI Network Management System sends the Voltage Out of Range Event Alert to the Distributed Energy Resource Automation Application	AMI Network Management System	Distributed Energy Resource Automation Application	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	
1.1.3	Voltage Out of Range Event to the Distribution Management System.	AMI Network Management System	Voltage Out of Range Event to the Distribution Management System.	The AMI Network Management System sends the Voltage Out of Range Event Alert to the Distribution Management System.	AMI Network Management System	Distribution Management System	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.1.4	Voltage Out of Range Event acknowledged.	Distribution Operations	Voltage Out of Range Event acknowledged.	The Distribution Operations acknowledges the Voltage Out of Range Event Alert at the Distribution Management System.	Distribution Operations	Distribution Operations	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	
1.2	Distributed Energy Resource Automation Application Begins	Distribution Operations	Distributed Energy Resource Automation Application Begins	The Distribution Operations acknowledges the Voltage Out of Range Event Alert and begins the Distributed Energy Resource Automation Application. (From the Distribution Management System station.)	Distribution Operations	Distributed Energy Resource Automation Application	Begin Distributed Energy Resource Automation Application		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2.1	Distributed Energy Resource Automation Application Collects Data	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application Collects Data	The Distributed Energy Resource Automation Application collects data from the Distribution Management System concerning affected equipment and area.	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application	Affected Equipment and Affected Area		
1.2.2	Distributed Energy Resource Automation Application Selects Assets	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application Selects Assets	The Distributed Energy Resource Automation Application, using an algorithm, selects certain Utility Battery Storage and Charging System, certain Capacitor Bank Controls and certain Load Tap Changer Controls to help correct the Voltage Out of Range Event Alert.	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application	Selected Equipment Assets	Asset list developed from algorithm	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2.3	Distributed Energy Resource Automation Application Sends selected Assets to the Distribution Management System	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application Sends selected Assets to the Distribution Management System	The Distributed Energy Resource Automation Application sends Utility Storage Battery and Charging System Operational Command for the selected Utility Storage Battery and Charging Systems to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Selected Equipment Assets		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.3	Distribution Management System sends Operational Command to AMI Network Management System	Distribution Management System	Distribution Management System sends Operational Command to AMI Network Management System	The Distribution Management System sends Utility Storage Battery and Charging System Operational Command for the selected Utility Storage Battery and Charging Systems to the AMI Network Management System	Distribution Management System	AMI Network Management System	Operational Command		
1.3.1	AMI Network Management System sends Operational Command to AMI Premise Interface	AMI Network Management System	AMI Network Management System sends Operational Command to AMI Premise Interface	The AMI Network Management System sends Utility Storage Battery and Charging System Operational Command for the selected Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Operational Command		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.3.2	AMI Premise Interface sends Operational Command to the Utility Inverter	AMI Premise Interface	AMI Premise Interface sends Operational Command to the Utility Inverter	The AMI Premise Interface sends Utility Storage Battery and Charging System Operational Command for the selected Utility Storage Battery and Charging Systems to the Utility Inverter	AMI Premise Interface	Utility Inverter	Operational Command		
1.3.3	Utility Inverter sends Operational Command to the Utility Storage Battery and Charging System.	Utility Inverter	Utility Inverter sends Operational Command to the Utility Storage Battery and Charging System.	The Utility Inverter processes Utility Storage Battery and Charging System Operational Command and sends it to the selected Utility Storage Battery and Charging System.	Utility Inverter	Utility Storage Battery and Charging System	Operational Command		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.3.4	Utility Storage Battery and Charging System responds to Operational Command	Utility Storage Battery and Charging System	Utility Storage Battery and Charging System responds to Operational Command	The selected Utility Storage Battery And Charging System processes Utility Storage Battery and Charging System Operational Command and responds accordingly.	Utility Storage Battery and Charging System	Utility Storage Battery and Charging System	Operational Command		
1.3.5	Utility Storage Battery and Charging System sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging System	Utility Storage Battery and Charging System sends Equipment Status to the Utility Inverter.	The selected Utility Storage Battery And Charging System sends a Utility Storage Battery And Charging System Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging System	Utility Inverter	Equipment Status		
1.4	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	Utility Inverter sends Equipment Status to the AMI Premise Interface.	The Utility Inverter sends a Utility Storage Battery And Charging System Equipment Status to the AMI Premise Interface.	Utility Inverter	AMI Premise Interface	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.4.1	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	The AMI Premise Interface sends a Utility Storage Battery And Charging System Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		
1.4.2	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	The AMI Network Management System sends a Utility Storage Battery And Charging System Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
1.4.3	Distribution Management System updates System Equipment Status.	Distribution Management System	Distribution Management System updates System Equipment Status.	The Distribution Management System updates the System Equipment Status.	Distribution Management System	Distribution Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.4.4	Distribution Management System sends Equipment Profile to the Distributed Energy Resource Automation Application.	Distribution Management System	Distribution Management System sends Equipment Profile to the Distributed Energy Resource Automation Application.	The Distribution Management System Sends the Updated System Equipment Status to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	System Equipment Status	--END of the Storage Battery and Charging System Steps--	
1.5	Distribution Management System blocks VAR Based Capacitor Switching	Distribution Management System	Distribution Management System blocks VAR Based Capacitor Switching	Distribution Management System blocks VAR based capacitor switching decision logic when ANSI A voltage is out-of-range	Distribution Management System	Capacitor Bank Controls	Block VAR Based Capacitor Switching		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.6	Distributed Energy Resource Automation Application sends Capacitor Bank Controls Operational Commands to The Distribution Management System	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application sends Capacitor Bank Controls Operational Commands to The Distribution Management System	The Distributed Energy Resource Automation Application sends Capacitor Bank Controls Operational Command for the selected Capacitor Bank Controls to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Capacitor Bank Controls Operational Command		
1.6.1	Distribution Management System sends Capacitor Bank Controls Operational Commands to Capacitor Bank Controls	Distribution Management System	Distribution Management System sends Capacitor Bank Controls Operational Commands to Capacitor Bank Controls	The Distribution Management System sends Capacitor Bank Controls Operational Command for the selected Capacitor Bank Controls via SCADA.	Distribution Management System	Capacitor Bank Controls	Capacitor Bank Controls Operational Command		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.6.2	Capacitor Bank Controls respond accordingly.	Capacitor Bank Controls	Capacitor Bank Controls respond accordingly.	The selected Capacitor Bank Controls respond accordingly.	Capacitor Bank Controls	Capacitor Bank Controls	Capacitor Bank Controls Operational Command		
1.7	Capacitor Bank Controls send Equipment Status to Distribution Management System	Capacitor Bank Controls	Capacitor Bank Controls send Equipment Status to Distribution Management System	The selected Capacitor Bank Controls send an Equipment Status to the Distribution Management System via SCADA.	Capacitor Bank Controls	Distribution Management System	Equipment Status		
1.8	Distribution Management System updates the System Equipment Status	Distribution Management System	Distribution Management System updates the System Equipment Status	The Distribution Management System updates the System Equipment Status.	Distribution Management System	Distribution Management System	System Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.9	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	Distribution Management System	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	The Distribution Management System Sends the Updated System Equipment Status to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	System Equipment Status	--END of the Cap Bank Steps--	
1.10	Distributed Energy Resource Automation Application sends Load Tap Changer Controls Operational Command to the Distribution Management System	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application sends Load Tap Changer Controls Operational Command to the Distribution Management System	The Distributed Energy Resource Automation Application sends Load Tap Changer Controls Operational Command for the selected Load Tap Changer Controls to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Load Tap Changer Controls Operational Command		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.10.1	Distribution Management System sends Load Tap Changer Controls Operational Command to Load Tap Changer Controls	Distribution Management System	Distribution Management System sends Load Tap Changer Controls Operational Command to Load Tap Changer Controls	The Distribution Management System sends Load Tap Changer Controls Operational Command for the selected Load Tap Changer Controls via SCADA.	Distribution Management System	Load Tap Changer Controls	Load Tap Changer Controls Operational Command		
1.10.2	Load Tap Changer Controls respond accordingly.	Load Tap Changer Controls	Load Tap Changer Controls respond accordingly.	The selected Load Tap Changer Controls respond accordingly.	Load Tap Changer Controls	Load Tap Changer Controls	Load Tap Changer Controls Operational Command		
1.11	Load Tap Changer Controls send Equipment Status to Distribution Management System	Load Tap Changer Controls	Load Tap Changer Controls send Equipment Status to Distribution Management System	The selected Load Tap Changer Controls send an Equipment Status to the Distribution Management System via SCADA.	Load Tap Changer Controls	Distribution Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.12	Distribution Management System updates the System Equipment Status	Distribution Management System	Distribution Management System updates the System Equipment Status	The Distribution Management System updates the System Equipment Status.	Distribution Management System	Distribution Management System	System Equipment Status		
1.13	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	Distribution Management System	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	The Distribution Management System Sends the Updated System Equipment Status to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	System Equipment Status	--END of Load Tap Changer Part--	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.14	Voltage Out of Range Event	AMI Net/Billing Meter	Voltage Out of Range Event	An AMI Net/Billing Meter (distribution node) detects a Voltage Out of Range Event Alert (voltage out of ANSI A standards) and sends the alert, jumping queue, to the AMI Network Management System via the AMI Infrastructure.	AMI Net/Billing Meter	AMI Network Management System	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	
1.14.1	Voltage Out of Range Event to the Meter Data Management System	AMI Network Management System	Voltage Out of Range Event to the Meter Data Management System	The AMI Network Management System sends the Voltage Out of Range Event Alert to the Meter Data Management System	AMI Network Management System	Meter Data Management System	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.14.2	Voltage Out of Range Event to the Distributed Energy Resource Automation Application	AMI Network Management System	Voltage Out of Range Event to the Distributed Energy Resource Automation Application	The AMI Network Management System sends the Voltage Out of Range Event Alert to the Distributed Energy Resource Automation Application.	AMI Network Management System	Distributed Energy Resource Automation Application	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	
1.14.3	Voltage Out of Range Event to the Distribution Management System	AMI Network Management System	Voltage Out of Range Event to the Distribution Management System	The AMI Network Management System sends the Voltage Out of Range Event Alert to the Distribution Management System.	AMI Network Management System	Distribution Management System	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.14.4	Voltage Out of Range Event acknowledged by the Distribution Operations	Distribution Operations	Voltage Out of Range Event acknowledged by the Distribution Operations	The Distribution Operations acknowledges the Voltage Out of Range Event Alert at the Distribution Management System.	Distribution Operations	Distribution Operations	Voltage Out of Range Event	Voltage Out of Range Event jumps queue and is reported back to the Distribution Management System via the AMI Infrastructure.	
1.15	Distributed Energy Resource Automation Application collects data	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application collects data	The Distributed Energy Resource Automation Application collects data from the Distribution Management System concerning affected equipment and area.	Distribution Management System	Distributed Energy Resource Automation Application	Affected Equipment and Affected Area		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.15.1	Distribution Management System updates system data and sends the System Condition Data to the Distribution Operations.	Distribution Management System	Distribution Management System updates system data and sends the System Condition Data to the Distribution Operations.	Distribution Management System updates system data and sends the System Condition Data to the Distribution Operations.	Distribution Management System	Distribution Operations	System Condition Data		
1.16	Distribution Operations determine a Demand Response Event is necessary.	Distribution Operations	Distribution Operations determine a Demand Response Event is necessary.	Distribution Operations review the system condition data and determine that a Demand Response Event is required for system reliability.	Distribution Operations	Distribution Operations	System Condition Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.17	Distribution Operations sends the Demand Response Event Notification to the Distributed Resource Availability and Control System.	Distribution Operations	Distribution Operations sends the Demand Response Event Notification to the Distributed Resource Availability and Control System.	Distribution Operations sends the Demand Response Event Notification to the Distributed Resource Availability and Control System.	Distribution Operations	Distributed Resource Availability and Control System	Demand Response Event Notification	The Demand Response Event Notification will include current system load, affected area and reduction amount.	
1.18	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System assembles the Demand Response Selected Customers Listing to meet the needs of the Demand Response Event Notification.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System	Demand Response Selected Customers Listing	This notification will only be sent out to the selected customers.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.19	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System sends the Demand Response Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System	AMI Network Management System	Demand Response Event Notification with the Selected Customers		
1.19.1	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System sends the Demand Response Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System	Customer Information System	Demand Response Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.1 9.2	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System sends the Demand Response Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System	Meter Data Management System	Demand Response Event Notification with the Selected Customers		
1.1 9.3	AMI Network Management System provides the Demand Response Event Notification with the Selected Customers to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System provides the Demand Response Event Notification with the Selected Customers to the AMI Premise Interface.	The AMI Network Management System sends Demand Response Event Notification with the Selected Customers out to the AMI Premise Interface via the AMI Infrastructure.	AMI Network Management System	AMI Premise Interface	Demand Response Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.1 9.4	AMI Premise Interface provides the Demand Response Event Notification with the Selected Customers to the Customer Energy Management System.	AMI Premise Interface	AMI Premise Interface provides the Demand Response Event Notification with the Selected Customers to the Customer Energy Management System.	The AMI Premise Interface delivers the Demand Response Event Notification with the Selected Customers to the selected customer's Customer Energy Management System.	AMI Premise Interface	Customer Energy Management System	Demand Response Event Notification with the Selected Customers		
1.1 9.5	AMI Premise Interface provides the Demand Response Event Notification with the Selected Customers to the Customer Display.	AMI Premise Interface	AMI Premise Interface provides the Demand Response Event Notification with the Selected Customers to the Customer Display.	The AMI Premise Interface delivers the Demand Response Event Notification with the Selected Customers to the selected customer's Customer Display.	AMI Premise Interface	Customer Display Device	Demand Response Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.19.5.1A.1	Customer chooses to Override	Customer	Customer chooses to Override	Customer chooses to Override by entering the correct code into the Customer Display.	Customer	Customer Display Device	Override	The "Override" steps are an alternate sub-set of steps in this scenario and are OPTIONAL. The Customer would use these steps if they chose to "Override" the Demand Response Event Notification. If the "Override" is not chosen please move on to Step # 1.19.5.1B.1.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.19.5.1A.2	Customer Display sends override signal to the Customer Energy Management System	Customer Display Device	Customer Display sends override signal to the Customer Energy Management System	Customer Display acknowledges correct code and sends override signal to the Customer Energy Management System.	Customer Display Device	Customer Energy Management System	Override	The "Override" steps are an alternate sub-set of steps in this scenario and are OPTIONAL. The Customer would use these steps if they chose to "Override" the Demand Response Event Notification. If the "Override" is not chosen please move on to Step # 1.19.5.1B.1.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.19.5.1A.3	Customer Energy Management System responds accordingly.	Customer Energy Management System	Customer Energy Management System responds accordingly.	Customer Energy Management System receives the override signal and responds accordingly.	Customer Energy Management System	Customer Energy Management System	Override	The "Override" steps are an alternate sub-set of steps in this scenario and are OPTIONAL. The Customer would use these steps if they chose to "Override" the Demand Response Event Notification. If the "Override" is not chosen please move on to Step # 1.19.5.1B.1.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.19.5.1B.1	Customer Energy Management System compares Demand Response Event Notification and responds accordingly.	Customer Energy Management System	Customer Energy Management System compares Demand Response Event Notification and responds accordingly.	The Customer Energy Management System compares the Demand Response Event Notification with the Selected Customer Predefined Profile and acts accordingly	Customer Energy Management System	Customer Energy Management System	Demand Response Event Notification with the Selected Customers	This is the "normal" set of steps for this sequence. Please move on to Step # 1.20.	
1.20	Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	Customer Energy Management System	Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	The Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	Customer Energy Management System	AMI Premise Interface	Customer Status Information		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.20.1	AMI Premise Interface sends Customer Status Information to the AMI Network Management System.	Customer Energy Management System	AMI Premise Interface sends Customer Status Information to the AMI Network Management System.	The AMI Premise Interface Delivers the Customer Status Information to the AMI Network Management System via the AMI Infrastructure.	Customer Energy Management System	AMI Network Management System	Customer Status Information		
1.20.2	AMI Network Management System sends Customer Status Information to the Distributed Resource Availability and Control System.	AMI Network Management System	AMI Network Management System sends Customer Status Information to the Distributed Resource Availability and Control System.	The AMI Network Management System delivers the Customer Status Information to the Distributed Resource Availability and Control System.	AMI Network Management System	Distributed Resource Availability and Control System	Customer Status Information		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.20.3	AMI Network Management System sends Customer Status Information to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Customer Status Information to the Meter Data Management System.	The AMI Network Management System delivers the Customer Status Information to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Customer Status Information		
1.21	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request.	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request to the AMI Network Management System.	Distributed Resource Availability and Control System	AMI Network Management System	AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2 1.1 A.1	AMI Network Management System sends a request to the AMI Net/Billing Meter for an AMI Meter read.	AMI Network Management System	AMI Network Management System sends a request to the AMI Net/Billing Meter for an AMI Meter read.	The AMI Network Management System sends the AMI Net/Billing Meter Read Request to the AMI Net/Billing Meter via the AMI Infrastructure.	AMI Network Management System	AMI Net/Billing Meter	AMI Net/Billing Meter Read Request		
1.2 1.1 B.1	AMI Network Management System sends a request to the AMI Renewable Energy Credit Meter for an AMI Meter read.	AMI Network Management System	AMI Network Management System sends a request to the AMI Renewable Energy Credit Meter for an AMI Meter read.	The AMI Network Management System sends the AMI Renewable Energy Credit Meter Read Request to the AMI Renewable Energy Credit Meter via the AMI Infrastructure.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2 1.1 A.2	AMI Net/Billing Meter delivers AMI Net/Billing Meter Data	AMI Net/Billing Meter	AMI Net/Billing Meter delivers AMI Net/Billing Meter Data	The AMI Net/Billing Meter delivers AMI Net/Billing Meter Data to the AMI Network Management System via the AMI Infrastructure.	AMI Net/Billing Meter	AMI Network Management System	AMI Net/Billing Meter Data		
1.2 1.1 B.2	AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data.	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data.	The AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data to the AMI Network Management System via the AMI Infrastructure.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2 1.2	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Resource Availability and Control System.	AMI Network Management System	Distributed Resource Availability and Control System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		
1.2 1.3	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2 1.4	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.22	Distribution Management System sends the AMI Net/Billing Meter and AMI Renewable Energy Credit Meter readings to the Distributed Energy Resource Automation Application.	Distribution Management System	Distribution Management System sends the AMI Net/Billing Meter and AMI Renewable Energy Credit Meter readings to the Distributed Energy Resource Automation Application.	The Distributed Energy Resource Automation Application Receives AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data from the Distribution Management System.	Distribution Management System	Distributed Energy Resource Automation Application	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		
1.23	Meter Data Management System performs a calculation to calculate the total load affected by the Demand Response Event.	Meter Data Management System	Meter Data Management System performs a calculation to calculate the total load affected by the Demand Response Event.	Meter Data Management System performs a calculation and verification to calculate the total load affected by the Demand Response Event.	Meter Data Management System	Meter Data Management System	Total Load Affected Calculation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.23.1	Meter Data Management System delivers the Total Load Affected by the Demand Response Event to the Distribution Operations.	Meter Data Management System	Meter Data Management System delivers the Total Load Affected by the Demand Response Event to the Distribution Operations.	Meter Data Management System delivers the Total Load Affected by the Demand Response Event to the Distribution Operations.	Meter Data Management System	Distribution Operations	Total Load Affected	--END of Distributed Resource Availability and Control System Steps--	
1.24	The Distributed Energy Resource Automation Application receives History Data from the Distribution Managemen t System.	Distribution Managemen t System	The Distributed Energy Resource Automation Application receives History Data from the Distribution Managemen t System.	The Distributed Energy Resource Automation Application Receives Voltage Out of Range Event Alert History Data from the Distribution Management System.	Distribution Management System	Distributed Energy Resource Automation Application	Voltage Out of Range Event Alert History Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
1.2 4.1	The Distributed Energy Resource Automation Application compiles History Data and sends to the Distribution Management System.	Distributed Energy Resource Automation Application	The Distributed Energy Resource Automation Application compiles History Data and sends to the Distribution Management System.	The Distributed Energy Resource Automation Application compiles all relevant Voltage Out of Range Event Alert History Data and sends it to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Relevant Voltage Out of Range Event Alert History Data		
1.2 4.2	Distribution Management System sends all relevant Voltage Out of Range Event Alert History Data To the Meter Data Management System.	Distribution Management System	Distribution Management System sends all relevant Voltage Out of Range Event Alert History Data To the Meter Data Management System.	The Distribution Management System sends all relevant Voltage Out of Range Event Alert History Data To the Meter Data Management System.	Distribution Management System	Meter Data Management System	Relevant Voltage Out of Range Event Alert History Data		

2.1.3 Post-conditions and Significant Results

Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.

Describe any significant results from the Function

Actor/Activity	*Post-conditions Description and Results*
The Utility	The Utility will be able to utilize communicating Distributed Generation inverter controllers (via 2-way communications) for the purpose of control and optimization of Distributed Generation, storage, Capacitor Bank Controls, Load Tap Changer Controls and Demand Response to optimize the system during a voltage event.

2.2 Steps to implement function - Scenario 2

Utility implements integrated management of Distributed Generation, storage and Demand Response. Peaking Resource.

2.2.1 Preconditions and Assumptions

Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities

Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place

Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.

Actor/System/Information/Contract	*Preconditions or Assumptions*
The Utility	PV inverters are set up to autonomously respond to ANSI A out-of-range voltage conditions.
The Utility	Utility PV can be at substation or anywhere on the feeder.
Customer	Customer PV can be at their residence which could be anywhere on the feeder.
Customer	All controllable Distributed Energy Resource are utility controlled within tariff agreements
The Utility	Assuming a full AMI system

Actor/System/Information/Contract	*Preconditions or Assumptions*
The Utility	IEEE 1547 and other standards have evolved to support advanced applications.
The Utility	SCADA Distribution Management System has the logic to determine priorities and control between volt or VAR control.
The Utility	Distribution Management System will block switching of capacitor control for VARs/Power Factor if control is already being used for voltage control.
Customer	The cause of the voltage being out-of-range is due to cloud transient and therefore requires a "system" control response vs. an individual Customer control (due to energy storage) resulting in low voltage.
The Utility	PV inverter is providing voltage regulation within its capabilities and VAR support.
The Utility	When PV and the inverter are combined with storage, the control is integrated together as one actor.
Customer	The Utility has control over the inverter.
Customer	During an emergency situation, grid stability, the Utility can isolate the customer's inverter from the grid. The Customer will not be able to override this situation with their Customer Energy Management System. This is only for emergency situations.
The Utility	Energy Management System continuously calculates system LAMBDA
Customer	Distributed Energy Resource >100 KW (per meter) shall be considered eligible for action by Distribution Management System.
The Utility	The Distributed Energy Resource Automation Application uses an algorithm to determine the optimum asset dispatch including storage, Distributed Generation, capacitor bank, Load Tap Changer and Demand Response.

2.2.2 Steps

Describe the normal sequence of events, focusing on steps that identify new types of information or new information exchanges or new interface issues to address. Should the sequence require detailed steps that are also used by other functions, consider creating a new "sub" function, then referring to that "subroutine" in this function. Remember that the focus should be less on the algorithms of the applications and more on the

interactions and information flows between "entities", e.g. people, systems, applications, data bases, etc. There should be a direct link between the narrative and these steps.

The numbering of the sequence steps conveys the order and concurrency and iteration of the steps occur. Using a Dewey Decimal scheme, each level of nested procedure call is separated by a dot '.'. Within a level, the sequence number comprises an optional letter and an integer number. The letter specifies a concurrent sequence within the next higher level; all letter sequences are concurrent with other letter sequences. The number specifies the sequencing of messages in a given letter sequence. The absence of a letter is treated as a default 'main sequence' in parallel with the lettered sequences.

Sequence 1:

```
1.1 - Do step 1
1.2A.1 - In parallel to activity 2 B do step 1
1.2A.2 - In parallel to activity 2 B do step 2
1.2B.1 - In parallel to activity 2 A do step 1
1.2B.2 - In parallel to activity 2 A do step 2
1.3 - Do step 3
1.3.1 - nested step 3.1
1.3.2 - nested step 3.2
```

Sequence 2:

```
2.1 - Do step 1
2.2 – Do step 2
```

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
#	*Triggering event? Identify the name of the event*	*What other actors are primarily responsible for the Process/Activity? Actors are defined in section1.5.*	*Label that would appear in a process diagram. Use action verbs when naming activity.*	*Describe the actions that take place in active and present tense. The step should be a descriptive noun/verb phrase that portrays an outline summary of the step. "If …Then…Else" scenarios can be captured as multiple Actions or as separate steps.*	*What other actors are primarily responsible for Producing the information? Actors are defined in section1.5.*	*What other actors are primarily responsible for Receiving the information? Actors are defined in section1.5.* *(Note – May leave blank if same as Primary Actor)*	*Name of the information object. Information objects are defined in section 1.6*	*Elaborate architectural issues using attached spreadsheet. Use this column to elaborate details that aren't captured in the spreadsheet.*	*Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.*

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.1	The Utility decides, because of peaking concerns, to issue a Distributed Energy Resource Event Notification.	Energy Management System	Energy Management System uses day ahead planning system to determine peaking resource requirements and generate pricing signal.	Energy Management System uses day ahead planning system (algorithm) to determine peaking resource requirements for the following day and generate pricing signal accordingly.	Energy Management System	Energy Management System	Peaking Resource Requirements and Distributed Generation Pricing Signal		
2.1.1	Energy Management System sends Peaking Resource Requirements and Distributed Generation Pricing Signal to Distribution Management System	Energy Management System	Energy Management System sends Peaking Resource Requirements and Distributed Generation Pricing Signal to Distribution Management System	Energy Management System sends Peaking Resource Requirements and Distributed Generation Pricing Signal to Distribution Management System	Energy Management System	Distribution Management System	Peaking Resource Requirements and Distributed Generation Pricing Signal		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.1.2	Distribution Management System calculates optimal energy storage strategy using the Distributed Energy Resource Automation Application.	Distribution Management System	Distribution Management System calculates optimal energy storage strategy using the Distributed Energy Resource Automation Application.	Distribution Management System receives Peaking Resource Requirements and Distributed Generation Pricing Signal and calculates optimal energy storage strategy based upon pricing signals using the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	Peaking Resource Requirements and Distributed Generation Pricing Signal		
2.2	Distributed Energy Resource Automation Application outputs the resources.	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application outputs the resources.	Distributed Energy Resource Automation Application outputs the Equipment Resources Required for the Next Day.	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application	Equipment Resources Required for the Next Day		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.2.1	Distribution Operations confirms and schedules assets.	Distribution Operations	Distribution Operations confirms and schedules assets.	Distribution Operations confirms the Equipment Resources Required for the Next Day will be available and schedules them.	Distribution Operations	Distribution Operations	Confirmed Equipment Resources Required for the Next Day		
2.2.3	Distribution Operations confirms availability to Energy Management System.	Distribution Operations	Distribution Operations confirms availability to Energy Management System.	Distribution Operations confirms availability of Equipment Resources Required for the Next Day to Energy Management System.	Distribution Operations	Energy Management System	Confirmed Equipment Resources Required for the Next Day		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.1	Distribution Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Utility Storage Battery and Charging Systems		
2.3.1B.1	Distribution Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1C.1	Distribution Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Utility Owned Distributed Generation		
2.3.1D.1	Distribution Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Customer Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.2	AMI Network Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Utility Storage Battery and Charging Systems		
2.3.1B.2	AMI Network Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1C.2	AMI Network Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Utility Owned Distributed Generation		
2.3.1D.2	AMI Network Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Customer Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.3	AMI Premise Interface sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Inverter.	AMI Premise Interface sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Inverter.	AMI Premise Interface	Utility Inverter	Request for Scheduled Utility Storage Battery and Charging Systems		
2.3.1B.3	AMI Premise Interface sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Inverter.	AMI Premise Interface sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Inverter.	AMI Premise Interface	Customer Inverter	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1C.3	AMI Premise Interface sends Request for Scheduled Utility Owned Distributed Generation to the Utility Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Utility Owned Distributed Generation to the Utility Inverter.	AMI Premise Interface sends Request for Scheduled Utility Owned Distributed Generation to the Utility Inverter.	AMI Premise Interface	Utility Inverter	Request for Scheduled Utility Owned Distributed Generation		
2.3.1D.3	AMI Premise Interface sends Request for Scheduled Customer Owned Distributed Generation to the Customer Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Customer Owned Distributed Generation to the Customer Inverter.	AMI Premise Interface sends Request for Scheduled Customer Owned Distributed Generation to the Customer Inverter.	AMI Premise Interface	Customer Inverter	Request for Scheduled Customer Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.4	Utility Inverter sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Storage Battery and Charging Systems.	Utility Inverter	Utility Inverter sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Storage Battery and Charging Systems.	Utility Inverter sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Storage Battery and Charging Systems.	Utility Inverter	Utility Storage Battery and Charging Systems	Request for Scheduled Utility Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1B.4	Customer Inverter sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Storage Battery and Charging Systems.	Customer Inverter	Customer Inverter sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Storage Battery and Charging Systems.	Customer Inverter sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Storage Battery and Charging Systems.	Customer Inverter	Customer Inverter	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1C.4	Utility Inverter responds accordingly to the Request for Scheduled Utility Owned Distributed Generation to the Utility Owned Distributed Generation.	Utility Inverter	Utility Inverter responds accordingly to the Request for Scheduled Utility Owned Distributed Generation to the Utility Owned Distributed Generation.	Utility Inverter responds accordingly to the Request for Scheduled Utility Owned Distributed Generation to the Utility Owned Distributed Generation.	Utility Inverter	Utility Inverter	Request for Scheduled Utility Owned Distributed Generation		
2.3.1D.4	Customer Inverter responds accordingly to the Request for Scheduled Customer Owned Distributed Generation.	Customer Inverter	Customer Inverter responds accordingly to the Request for Scheduled Customer Owned Distributed Generation.	Customer Inverter responds accordingly to the Request for Scheduled Customer Owned Distributed Generation.	Customer Inverter	Customer Inverter	Request for Scheduled Customer Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.5	Utility Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Utility Storage Battery and Charging Systems.	Utility Storage Battery and Charging Systems	Utility Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Utility Storage Battery and Charging Systems.	Utility Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Utility Storage Battery and Charging Systems.	Utility Storage Battery and Charging Systems	Utility Storage Battery and Charging Systems	Request for Scheduled Utility Storage Battery and Charging Systems		
2.3.1B.5	Customer Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Customer Storage Battery and Charging Systems.	Customer Storage Battery and Charging Systems	Customer Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Customer Storage Battery and Charging Systems.	Customer Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Customer Storage Battery and Charging Systems.	Customer Storage Battery and Charging Systems	Customer Storage Battery and Charging Systems	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.6	Utility Storage Battery and Charging Systems sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging Systems	Utility Storage Battery and Charging Systems sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging Systems sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging Systems	Utility Inverter	Equipment Status		
2.3.1B.6	Customer Storage Battery and Charging Systems sends Equipment Status to the Customer Inverter.	Customer Storage Battery and Charging Systems	Customer Storage Battery and Charging Systems sends Equipment Status to the Customer Inverter.	Customer Storage Battery and Charging Systems sends Equipment Status to the Customer Inverter.	Customer Storage Battery and Charging Systems	Customer Inverter	Equipment Status		
2.3.1C.5	Utility Owned Distributed Generation sends Equipment Status to the Utility Inverter.	Utility Owned Distributed Generation	Utility Owned Distributed Generation sends Equipment Status to the Utility Inverter.	Utility Owned Distributed Generation sends Equipment Status to the Utility Inverter.	Utility Owned Distributed Generation	Utility Inverter	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1D.5	Customer Owned Distributed Generation sends Equipment Status to the Customer Inverter.	Customer Owned Distributed Generation	Customer Owned Distributed Generation sends Equipment Status to the Customer Inverter.	Customer Owned Distributed Generation sends Equipment Status to the Customer Inverter.	Customer Owned Distributed Generation	Customer Inverter	Equipment Status		
2.3.1A.7	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	AMI Premise Interface	Equipment Status		
2.3.1B.7	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	AMI Premise Interface	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1C.6	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	AMI Premise Interface	Equipment Status		
2.3.1D.6	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	AMI Premise Interface	Equipment Status		
2.3.1A.8	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1B.8	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		
2.3.1C.7	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		
2.3.1D.7	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1A.9	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
2.3.1B.9	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
2.3.1C.8	AMI Premise Interface sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Premise Interface sends Equipment Status to the Distribution Management System.	AMI Premise Interface sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1D.8	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
2.3.1A.10	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		
2.3.1B.10	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3.1C.9	AMI Premise Interface sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Premise Interface sends Equipment Status to the Meter Data Management System.	AMI Premise Interface sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		
2.3.1D.9	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1A.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1B.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1C.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1D.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1A.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1B.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1C.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1D.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1A.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1B.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1C.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1D.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1A.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1B.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1C.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1D.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1A.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1B.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1C.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.4.1D.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		
2.5	Distribution Management System determines insufficient energy storage resources.	Distribution Management System	Distribution Management System determines insufficient energy storage resources.	Distribution Management System determines that energy storage resource available was not sufficient.	Distribution Management System	Distribution Management System	Insufficient Resources		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.6	The Distribution Operations submits a request to the Wholesale Power Group.	Distribution Operations	The Distribution Operations submits a request to the Wholesale Power Group.	The Distribution Operations submits a request for a Demand Response Load Reduction Event to the Wholesale Power Group.	Distribution Operations	Wholesale Power Group	Request for a Demand Response Load Reduction Event		
2.6.1	Wholesale Power Group sends Demand Response Load Reduction Event Notification to the Distributed Resource Availability and Control System.	Wholesale Power Group	Wholesale Power Group sends Demand Response Load Reduction Event Notification to the Distributed Resource Availability and Control System.	Wholesale Power Group receives the request for a Demand Response Load Reduction Event Notification and submits the request for a Demand Response Load Reduction Event to the Distributed Resource Availability and Control System.	Wholesale Power Group	Distributed Resource Availability and Control System	Demand Response Load Reduction Event Notification	The Demand Response Load Reduction Event Notification will include current system load, affected area and reduction amount.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System assembles the Demand Response Selected Customers Listing to meet the needs of the Demand Response Load Reduction Event Notification.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System	Demand Response Selected Customers Listing	This notification will only be sent out to the selected Customers.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System	AMI Network Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.2	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System	Customer Information System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.3	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System	Meter Data Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.1	AMI Network Management System provides the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System provides the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Premise Interface.	The AMI Network Management System sends Demand Response Load Reduction Event Notification with the Selected Customers out to the AMI Premise Interface via the AMI Infrastructure.	AMI Network Management System	AMI Premise Interface	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.2	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Energy Management System.	AMI Premise Interface	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Energy Management System.	The AMI Premise Interface delivers the Demand Response Load Reduction Event Notification with the Selected Customers to the selected customer's Customer Energy Management System.	AMI Premise Interface	Customer Energy Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.3	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Display.	AMI Premise Interface	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Display.	The AMI Premise Interface delivers the Demand Response Load Reduction Event Notification with the Selected Customers to the selected customer's Customer Display.	AMI Premise Interface	Customer Display Device	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.3.1A.1	Customer chooses to override	Customer	Customer chooses to override	Customer chooses to override by entering the correct code into the Customer Display.	Customer	Customer Display Device	Override	The "Override" steps are an alternate sub-set of steps in this scenario and are OPTIONAL. The Customer would use these steps if they chose to "Override" the Demand Response Event Notification. If the "Override" is not chosen please move on to Step # 2.7.1.3.1B.1.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.3.1A.2	Customer Display sends override signal to the Customer Energy Management System	Customer Display Device	Customer Display sends override signal to the Customer Energy Management System	Customer Display acknowledges correct code and sends override signal to the Customer Energy Management System.	Customer Display Device	Customer Energy Management System	Override	The "Override" steps are an alternate sub-set of steps in this scenario and are OPTIONAL. The Customer would use these steps if they chose to "Override" the Demand Response Event Notification. If the "Override" is not chosen please move on to Step # 2.7.1.3.1B.1.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.3.1A.3	Customer Energy Management System responds accordingly.	Customer Energy Management System	Customer Energy Management System responds accordingly.	Customer Energy Management System receives the override signal and responds accordingly.	Customer Energy Management System	Customer Energy Management System	Override	The "Override" steps are an alternate sub-set of steps in this scenario and are OPTIONAL. The Customer would use these steps if they chose to "Override" the Demand Response Event Notification. If the "Override" is not chosen please move on to Step # 2.7.1.3.1B.1.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.3.1B.1	Customer Energy Management System compares Demand Response Load Reduction Event Notification and responds accordingly.	Customer Energy Management System	Customer Energy Management System compares Demand Response Load Reduction Event Notification and responds accordingly.	The Customer Energy Management System compares the Demand Response Load Reduction Event Notification with the Selected Customer Predefined Profile and acts accordingly	Customer Energy Management System	Customer Energy Management System	Demand Response Load Reduction Event Notification with the Selected Customers	This is the "normal" set of steps for this sequence. Please move on to Step # 2.7.1.5.	
2.7.1.5	Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	Customer Energy Management System	Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	The Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	Customer Energy Management System	AMI Premise Interface	Customer Status Information		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.6	AMI Premise Interface sends Customer Status Information to the AMI Network Management System.	Customer Energy Management System	AMI Premise Interface sends Customer Status Information to the AMI Network Management System.	The AMI Premise Interface Delivers the Customer Status Information to the AMI Network Management System via the AMI Infrastructure.	Customer Energy Management System	AMI Network Management System	Customer Status Information		
2.7.1.7	AMI Network Management System sends Customer Status Information to the Distributed Resource Availability and Control System.	AMI Network Management System	AMI Network Management System sends Customer Status Information to the Distributed Resource Availability and Control System.	The AMI Network Management System delivers the Customer Status Information to the Distributed Resource Availability and Control System.	AMI Network Management System	Distributed Resource Availability and Control System	Customer Status Information		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.7.1.8	AMI Network Management System sends Customer Status Information to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Customer Status Information to the Meter Data Management System.	The AMI Network Management System delivers the Customer Status Information to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Customer Status Information		
2.8	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request.	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request to the AMI Network Management System.	Distributed Resource Availability and Control System	AMI Network Management System	AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.8.1A.1	AMI Network Management System sends a request to the AMI Net/Billing Meter for an AMI Meter read.	AMI Network Management System	AMI Network Management System sends a request to the AMI Net/Billing Meter for an AMI Meter read.	The AMI Network Management System sends the AMI Net/Billing Meter Read Request to the AMI Net/Billing Meter via the AMI Infrastructure.	AMI Network Management System	AMI Net/Billing Meter	AMI Net/Billing Meter Read Request		
2.8.1B.1	AMI Network Management System sends a request to the AMI Renewable Energy Credit Meter for an AMI Meter read.	AMI Network Management System	AMI Network Management System sends a request to the AMI Renewable Energy Credit Meter for an AMI Meter read.	The AMI Network Management System sends the AMI Renewable Energy Credit Meter Read Request to the AMI Renewable Energy Credit Meter via the AMI Infrastructure.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.8.1A.2	AMI Net/Billing Meter delivers AMI Net/Billing Meter Data	AMI Net/Billing Meter	AMI Net/Billing Meter delivers AMI Net/Billing Meter Data	The AMI Net/Billing Meter delivers AMI Net/Billing Meter Data to the AMI Network Management System via the AMI Infrastructure.	AMI Net/Billing Meter	AMI Network Management System	AMI Net/Billing Meter Data		
2.8.1B.2	AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data.	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data.	The AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data to the AMI Network Management System via the AMI Infrastructure.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.8.2	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Resource Availability and Control System.	AMI Network Management System	Distributed Resource Availability and Control System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		
2.8.3	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.8.4	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		
2.9	The Distribution Management System sends AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Energy Resource Automation Application.	Distribution Management System	The Distribution Management System sends AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Energy Resource Automation Application.	The Distribution Management System sends AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.10	Meter Data Management System performs a calculation to calculate the total load affected by the Demand Response Event.	Meter Data Management System	Meter Data Management System performs a calculation to calculate the total load affected by the Demand Response Event.	Meter Data Management System performs a calculation and verification to calculate the total load affected by the Demand Response Load Reduction Event.	Meter Data Management System	Meter Data Management System	Total Load Affected Calculation		
2.10.1	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Wholesale Power Group.	Meter Data Management System	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Wholesale Power Group.	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Wholesale Power Group.	Meter Data Management System	Wholesale Power Group	Total Load Affected		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.10.2	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Distribution Management System.	Meter Data Management System	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Distribution Management System.	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Distribution Management System.	Meter Data Management System	Distribution Management System	Total Load Affected		
2.11	Distribution Management System reports Energy Resource Dispatch Status (storage and Demand Response) to the Energy Management System.	Distribution Management System	Distribution Management System reports Energy Resource Dispatch Status (storage and Demand Response) to the Energy Management System.	Distribution Management System reports Energy Resource Dispatch Status (storage and Demand Response) to the Energy Management System.	Distribution Management System	Energy Management System	Energy Resource Dispatch Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.12	The Distributed Energy Resource Automation Application receives History Data from the Distribution Management System.	Distribution Management System	The Distributed Energy Resource Automation Application receives History Data from the Distribution Management System.	The Distributed Energy Resource Automation Application receives Event History Data from the Distribution Management System.	Distribution Management System	Distributed Energy Resource Automation Application	Voltage Out of Range Event Alert History Data		
2.121	The Distributed Energy Resource Automation Application compiles History Data and sends to the Distribution Management System.	Distributed Energy Resource Automation Application	The Distributed Energy Resource Automation Application compiles History Data and sends to the Distribution Management System.	The Distributed Energy Resource Automation Application compiles all Relevant Voltage Out of Range Event Alert History Data and sends it to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Relevant Voltage Out of Range Event Alert History Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.1 2.2	The Distribution Management System sends all Relevant Voltage Out of Range Event Alert History Data to the Meter Data Management System.	Distribution Management System	The Distribution Management System sends all Relevant Voltage Out of Range Event Alert History Data to the Meter Data Management System.	The Distribution Management System sends all Relevant Voltage Out of Range Event Alert History Data to the Meter Data Management System.	Distribution Management System	Meter Data Management System	Relevant Voltage Out of Range Event Alert History Data		

2.2.3 Post-conditions and Significant Results

Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.

Describe any significant results from the Function

Actor/Activity	*Post-conditions Description and Results*
The Utility	The Utility will be able to utilize communicating Distributed Generation inverter controllers (via 2-way communications) for the purpose of control and optimization of Distributed Generation, storage, Capacitor Bank Controls, Load Tap Changer Controls and Demand Response to optimize the system during a peaking scenario.

2.3 Steps to implement function - Scenario 3

2.3.1 Preconditions and Assumptions

Describe conditions that must exist prior to the initiation of the Function, such as prior state of the actors and activities

Identify any assumptions, such as what systems already exist, what contractual relations exist, and what configurations of systems are probably in place

Identify any initial states of information exchanged in the steps in the next section. For example, if a purchase order is exchanged in an activity, its precondition to the activity might be 'filled in but unapproved'.

Actor/System/Information/Contract	*Preconditions or Assumptions*
Customer	PV inverters are set up to autonomously respond to ANSI A out-of-range voltage conditions.
The Utility	Utility PV can be at substation or anywhere on the feeder.
Customer	Customer PV can be at their residence which could be anywhere on the feeder.
Customer	All controllable Distributed Energy Resource are utility controlled within tariff agreements
The Utility	Assuming a full AMI system
The Utility	IEEE 1547 and other standards have evolved to support advanced applications.
The Utility	SCADA Distribution Management System has the logic to determine priorities and control between volt or VAR control.
The Utility	Distribution Management System will block switching of capacitor control for VARs/Power Factor if control is already being used for voltage control.
The Utility	The cause of the voltage being out-of-range is due to cloud transient and therefore requires a "system" control response vs. an individual Customer control (due to energy storage) resulting in low voltage.
Customer	PV inverter is providing voltage regulation within its capabilities and VAR support.
The Utility	When PV and the inverter are combined with storage, the control is integrated together as one actor.

Actor/System/Information/Contract	*Preconditions or Assumptions*
Customer	The Utility has control over the inverter.
Customer	During an emergency situation, grid stability, the Utility can isolate the customer's inverter from the grid. The Customer will not be able to override this situation with their Customer Energy Management System. This is only for emergency situations.
The Utility	Customers will not have the option to override the Demand Response Event Notification in this scenario.
The Utility	The Distributed Energy Resource Automation Application uses a smart algorithm to determine the optimum asset dispatch including storage, Distributed Generation, capacitor bank, Load Tap Changer and Demand Response.

2.3.2 Steps

Describe the normal sequence of events, focusing on steps that identify new types of information or new information exchanges or new interface issues to address. Should the sequence require detailed steps that are also used by other functions, consider creating a new "sub" function, then referring to that "subroutine" in this function. Remember that the focus should be less on the algorithms of the applications and more on the interactions and information flows between "entities", e.g. people, systems, applications, data bases, etc. There should be a direct link between the narrative and these steps.

The numbering of the sequence steps conveys the order and concurrency and iteration of the steps occur. Using a Dewey Decimal scheme, each level of nested procedure call is separated by a dot '.'. Within a level, the sequence number comprises an optional letter and an integer number. The letter specifies a concurrent sequence within the next higher level; all letter sequences are concurrent with other letter sequences. The number specifies the sequencing of messages in a given letter sequence. The absence of a letter is treated as a default 'main sequence' in parallel with the lettered sequences.

Sequence 1:

```
1.1 - Do step 1
1.2A.1 - In parallel to activity 2 B do step 1
1.2A.2 - In parallel to activity 2 B do step 2
1.2B.1 - In parallel to activity 2 A do step 1
1.2B.2 - In parallel to activity 2 A do step 2
1.3 - Do step 3
1.3.1 - nested step 3.1
1.3.2 - nested step 3.2
```

Sequence 2:

```
2.1 - Do step 1
2.2 – Do step 2
```

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
#	*Triggering event? Identify the name of the event*	*What other actors are primarily responsible for the Process/Activity? Actors are defined in section1.5.*	*Label that would appear in a process diagram. Use action verbs when naming activity.*	*Describe the actions that take place in active and present tense. The step should be a descriptive noun/verb phrase that portrays an outline summary of the step. "If …Then…Else" scenarios can be captured as multiple Actions or as separate steps.*	*What other actors are primarily responsible for Producing the information? Actors are defined in section1.5.*	*What other actors are primarily responsible for Receiving the information? Actors are defined in section1.5.* *(Note – May leave blank if same as Primary Actor)*	*Name of the information object. Information objects are defined in section 1.6*	*Elaborate architectural issues using attached spreadsheet. Use this column to elaborate details that aren't captured in the spreadsheet.*	*Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.*
3.1	Energy Management System performs grid security analysis and determines a transmission constraint scenario.	Energy Management System	Energy Management System performs grid security analysis and determines a transmission constraint scenario.	Energy Management System performs grid security analysis and determines a Transmission Constraint Scenario.	Energy Management System	Energy Management System	Transmission Constraint Scenario		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.1.1	Energy Management System sends Distributed Energy Resource Transmission Report to Distribution Management System.	Energy Management System	Energy Management System sends Distributed Energy Resource Transmission Report to Distribution Management System.	Energy Management System sends Distributed Energy Resource Transmission Report to Distribution Management System.	Energy Management System	Distribution Management System	Distributed Energy Resource Transmission Report	The Distributed Energy Resource Transmission Report will include current system load, affected area and reduction amount.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.2	Distribution Management System, using Distributed Energy Resource Automation Application, calculates Available Distributed Resource Strategy based upon Distributed Energy Resource signals and locations.	Distribution Management System	Distribution Management System, using Distributed Energy Resource Automation Application, calculates Available Distributed Resource Strategy based upon Distributed Energy Resource signals and locations.	Distribution Management System receives Distributed Energy Resource Transmission Report and, using Distributed Energy Resource Automation Application, calculates Available Distributed Energy Resource Strategy based upon Distributed Energy Resource signals and locations.	Distribution Management System	Distribution Management System	Available Distributed Energy Resource Strategy		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3..2.1	Distributed Energy Resource Automation Application outputs the resources to the Distribution Management System.	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application outputs the resources to the Distribution Management System.	Distributed Energy Resource Automation Application outputs the Available Distributed Energy Resources to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Available Distributed Energy Resources		
3.2.2	Distribution Management System checks Available Distributed Energy Resources for dispatch	Distribution Management System	Distribution Management System checks Available Distributed Energy Resources for dispatch	Distribution Management System checks Available Distributed Energy Resources for dispatch	Distribution Management System	Distribution Management System	Available Distributed Energy Resources		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.2.3	Distribution Management System confirms the Confirmed Distributed Energy Resources to Energy Management System.	Distribution Operations	Distribution Management System confirms the Confirmed Distributed Energy Resources to Energy Management System.	Distribution Management System confirms the Confirmed Distributed Energy Resources to Energy Management System.	Distribution Operations	Energy Management System	Confirmed Distributed Energy Resources		
3.3.1A.1	Distribution Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Utility Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1B.1	Distribution Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Customer Storage Battery and Charging Systems		
3.3.1C.1	Distribution Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Utility Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1D.1	Distribution Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	Distribution Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Distribution Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Distribution Management System	AMI Network Management System	Request for Scheduled Customer Owned Distributed Generation		
3.3.1A.2	AMI Network Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Utility Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Utility Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1B.2	AMI Network Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Customer Storage Battery and Charging Systems to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Customer Storage Battery and Charging Systems		
3.3.1C.2	AMI Network Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Utility Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Utility Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1D.2	AMI Network Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System sends Request for Scheduled Customer Owned Distributed Generation to the AMI Premise Interface.	AMI Network Management System	AMI Premise Interface	Request for Scheduled Customer Owned Distributed Generation		
3.3.1A.3	AMI Premise Interface sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Inverter.	AMI Premise Interface sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Inverter.	AMI Premise Interface	Utility Inverter	Request for Scheduled Utility Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1B.3	AMI Premise Interface sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Inverter.	AMI Premise Interface sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Inverter.	AMI Premise Interface	Customer Inverter	Request for Scheduled Customer Storage Battery and Charging Systems		
3.3.1C.3	AMI Premise Interface sends Request for Scheduled Utility Owned Distributed Generation to the Utility Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Utility Owned Distributed Generation to the Utility Inverter.	AMI Premise Interface sends Request for Scheduled Utility Owned Distributed Generation to the Utility Inverter.	AMI Premise Interface	Utility Inverter	Request for Scheduled Utility Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1D.3	AMI Premise Interface sends Request for Scheduled Customer Owned Distributed Generation to the Customer Inverter.	AMI Premise Interface	AMI Premise Interface sends Request for Scheduled Customer Owned Distributed Generation to the Customer Inverter.	AMI Premise Interface sends Request for Scheduled Customer Owned Distributed Generation to the Customer Inverter.	AMI Premise Interface	Customer Inverter	Request for Scheduled Customer Owned Distributed Generation		
3.3.1A.4	Utility Inverter sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Storage Battery and Charging Systems.	Utility Inverter	Utility Inverter sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Storage Battery and Charging Systems.	Utility Inverter sends Request for Scheduled Utility Storage Battery and Charging Systems to the Utility Storage Battery and Charging Systems.	Utility Inverter	Utility Storage Battery and Charging Systems	Request for Scheduled Utility Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1B.4	Customer Inverter sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Storage Battery and Charging Systems.	Customer Inverter	Customer Inverter sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Storage Battery and Charging Systems.	Customer Inverter sends Request for Scheduled Customer Storage Battery and Charging Systems to the Customer Storage Battery and Charging Systems.	Customer Inverter	Customer Inverter	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1C.4	Utility Inverter responds accordingly to the Request for Scheduled Utility Owned Distributed Generation to the Utility Owned Distributed Generation.	Utility Inverter	Utility Inverter responds accordingly to the Request for Scheduled Utility Owned Distributed Generation to the Utility Owned Distributed Generation.	Utility Inverter responds accordingly to the Request for Scheduled Utility Owned Distributed Generation to the Utility Owned Distributed Generation.	Utility Inverter	Utility Inverter	Request for Scheduled Utility Owned Distributed Generation		
3.3.1D.4	Customer Inverter responds accordingly to the Request for Scheduled Customer Owned Distributed Generation.	Customer Inverter	Customer Inverter responds accordingly to the Request for Scheduled Customer Owned Distributed Generation.	Customer Inverter responds accordingly to the Request for Scheduled Customer Owned Distributed Generation.	Customer Inverter	Customer Inverter	Request for Scheduled Customer Owned Distributed Generation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1A.5	Utility Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Utility Storage Battery and Charging Systems.	Utility Storage Battery and Charging Systems	Utility Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Utility Storage Battery and Charging Systems.	Utility Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Utility Storage Battery and Charging Systems.	Utility Storage Battery and Charging Systems	Utility Storage Battery and Charging Systems	Request for Scheduled Utility Storage Battery and Charging Systems		
3.3.1B.5	Customer Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Customer Storage Battery and Charging Systems.	Customer Storage Battery and Charging Systems	Customer Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Customer Storage Battery and Charging Systems.	Customer Storage Battery and Charging Systems responds accordingly to the Request for Scheduled Customer Storage Battery and Charging Systems.	Customer Storage Battery and Charging Systems	Customer Storage Battery and Charging Systems	Request for Scheduled Customer Storage Battery and Charging Systems		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1A.6	Utility Storage Battery and Charging Systems sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging Systems	Utility Storage Battery and Charging Systems sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging Systems sends Equipment Status to the Utility Inverter.	Utility Storage Battery and Charging Systems	Utility Inverter	Equipment Status		
3.3.1B.6	Customer Storage Battery and Charging Systems sends Equipment Status to the Customer Inverter.	Customer Storage Battery and Charging Systems	Customer Storage Battery and Charging Systems sends Equipment Status to the Customer Inverter.	Customer Storage Battery and Charging Systems sends Equipment Status to the Customer Inverter.	Customer Storage Battery and Charging Systems	Customer Inverter	Equipment Status		
3.3.1C.5	Utility Owned Distributed Generation sends Equipment Status to the Utility Inverter.	Utility Owned Distributed Generation	Utility Owned Distributed Generation sends Equipment Status to the Utility Inverter.	Utility Owned Distributed Generation sends Equipment Status to the Utility Inverter.	Utility Owned Distributed Generation	Utility Inverter	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1D.5	Customer Owned Distributed Generation sends Equipment Status to the Customer Inverter.	Customer Owned Distributed Generation	Customer Owned Distributed Generation sends Equipment Status to the Customer Inverter.	Customer Owned Distributed Generation sends Equipment Status to the Customer Inverter.	Customer Owned Distributed Generation	Customer Inverter	Equipment Status		
3.3.1A.7	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	AMI Premise Interface	Equipment Status		
3.3.1B.7	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	AMI Premise Interface	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1C.6	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter sends Equipment Status to the AMI Premise Interface.	Utility Inverter	AMI Premise Interface	Equipment Status		
3.3.1D.6	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter sends Equipment Status to the AMI Premise Interface.	Customer Inverter	AMI Premise Interface	Equipment Status		
3.3.1A.8	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1B.8	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		
3.3.1C.7	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		
3.3.1D.7	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface sends Equipment Status to the AMI Network Management System.	AMI Premise Interface	AMI Network Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1A.9	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
3.3.1B.9	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
3.3.1C.8	AMI Premise Interface sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Premise Interface sends Equipment Status to the Distribution Management System.	AMI Premise Interface sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1D.8	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System sends Equipment Status to the Distribution Management System.	AMI Network Management System	Distribution Management System	Equipment Status		
3.3.1A.10	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		
3.3.1B.10	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.3.1C.9	AMI Premise Interface sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Premise Interface sends Equipment Status to the Meter Data Management System.	AMI Premise Interface sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		
3.3.1D.9	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System sends Equipment Status to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1A.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1B.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1C.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1D.1	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	The Meter Data Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	Meter Data Management System	AMI Network Management System	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1A.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Utility Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1B.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the scheduled Customer Storage Battery and Charging Systems to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1C.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Utility Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1D.2	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	The AMI Network Management System sends an AMI Renewable Energy Credit Meter Read Request of the Scheduled Customer Owned Distributed Generation to the AMI Renewable Energy Credit Meter.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1A.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1B.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1C.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1D.3	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	The AMI Renewable Energy Credit Meter sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the AMI Network Management System.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1A.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1B.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1C.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1D.4	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Distribution Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1A.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Utility Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1B.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the scheduled Customer Storage Battery and Charging Systems to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1C.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Utility Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.4.1D.5	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Meter Data Management System.	The AMI Network Management System sends AMI Renewable Energy Credit Meter Data of the Scheduled Customer Owned Distributed Generation to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Renewable Energy Credit Meter Data		
3.5	Distribution Management System determines insufficient energy storage resources.	Distribution Management System	Distribution Management System determines insufficient energy storage resources.	Distribution Management System determines that energy storage resource available were not sufficient.	Distribution Management System	Distribution Management System	Insufficient Resources		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.6	Distribution Management System blocks VAR Based Capacitor Switching	Distribution Management System	Distribution Management System blocks VAR Based Capacitor Switching	Distribution Management System blocks VAR based capacitor switching decision logic when ANSI A voltage is out-of-range	Distribution Management System	Capacitor Bank Controls	Block VAR Based Capacitor Switching		
3.6.1	Distributed Energy Resource Automation Application sends Capacitor Bank Controls Operational Commands to The Distribution Management System	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application sends Capacitor Bank Controls Operational Commands to The Distribution Management System	The Distributed Energy Resource Automation Application sends Capacitor Bank Controls Operational Command for the selected Capacitor Bank Controls to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Capacitor Bank Controls Operational Command		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.6.2	Distribution Management System sends Capacitor Bank Controls Operational Commands to Capacitor Bank Controls	Distribution Management System	Distribution Management System sends Capacitor Bank Controls Operational Commands to Capacitor Bank Controls	The Distribution Management System sends Capacitor Bank Controls Operational Command for the selected Capacitor Bank Controls via SCADA.	Distribution Management System	Capacitor Bank Controls	Capacitor Bank Controls Operational Command		
3.6.3	Capacitor Bank Controls respond accordingly.	Capacitor Bank Controls	Capacitor Bank Controls respond accordingly.	The selected Capacitor Bank Controls respond accordingly.	Capacitor Bank Controls	Capacitor Bank Controls	Capacitor Bank Controls Operational Command		
3.6.4	Capacitor Bank Controls send Equipment Status to Distribution Management System	Capacitor Bank Controls	Capacitor Bank Controls send Equipment Status to Distribution Management System	The selected Capacitor Bank Controls send an Equipment Status to the Distribution Management System via SCADA.	Capacitor Bank Controls	Distribution Management System	Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.6.5	Distribution Management System updates the System Equipment Status	Distribution Management System	Distribution Management System updates the System Equipment Status	The Distribution Management System updates the System Equipment Status.	Distribution Management System	Distribution Management System	System Equipment Status		
3.6.6	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	Distribution Management System	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	The Distribution Management System Sends the Updated System Equipment Status to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	System Equipment Status	--END of the Cap Bank Steps--	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.7	Distributed Energy Resource Automation Application sends Load Tap Changer Controls Operational Command to the Distribution Management System	Distributed Energy Resource Automation Application	Distributed Energy Resource Automation Application sends Load Tap Changer Controls Operational Command to the Distribution Management System	The Distributed Energy Resource Automation Application sends Load Tap Changer Controls Operational Command for the selected Load Tap Changer Controls to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Load Tap Changer Controls Operational Command		
3.7.1	Distribution Management System sends Load Tap Changer Controls Operational Command to Load Tap Changer Controls	Distribution Management System	Distribution Management System sends Load Tap Changer Controls Operational Command to Load Tap Changer Controls	The Distribution Management System sends Load Tap Changer Controls Operational Command for the selected Load Tap Changer Controls via SCADA.	Distribution Management System	Load Tap Changer Controls	Load Tap Changer Controls Operational Command		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.7.2	Load Tap Changer Controls respond accordingly.	Load Tap Changer Controls	Load Tap Changer Controls respond accordingly.	The selected Load Tap Changer Controls respond accordingly.	Load Tap Changer Controls	Load Tap Changer Controls	Load Tap Changer Controls Operational Command		
3.7.3	Load Tap Changer Controls send Equipment Status to Distribution Management System	Load Tap Changer Controls	Load Tap Changer Controls send Equipment Status to Distribution Management System	The selected Load Tap Changer Controls send an Equipment Status to the Distribution Management System via SCADA.	Load Tap Changer Controls	Distribution Management System	Equipment Status		
3.7.4	Distribution Management System updates the System Equipment Status	Distribution Management System	Distribution Management System updates the System Equipment Status	The Distribution Management System updates the System Equipment Status.	Distribution Management System	Distribution Management System	System Equipment Status		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.7.5	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	Distribution Management System	Distribution Management System sends System Equipment Status to the Distributed Energy Resource Automation Application	The Distribution Management System Sends the Updated System Equipment Status to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	System Equipment Status	--END of Load Tap Changer Part--	
3.8	The Distribution Operations submits a request to the Wholesale Power Group.	Distribution Operations	The Distribution Operations submits a request to the Wholesale Power Group.	The Distribution Operations submits a request for a Demand Response Load Reduction Event to the Wholesale Power Group.	Distribution Operations	Wholesale Power Group	Request for a Demand Response Load Reduction Event		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.8.1	Wholesale Power Group sends Demand Response Load Reduction Event Notification to the Distributed Resource Availability and Control System.	Wholesale Power Group	Wholesale Power Group sends Demand Response Load Reduction Event Notification to the Distributed Resource Availability and Control System.	Wholesale Power Group receives the request for a Demand Response Load Reduction Event Notification and submits the request for a Demand Response Load Reduction Event to the Distributed Resource Availability and Control System.	Wholesale Power Group	Distributed Resource Availability and Control System	Demand Response Load Reduction Event Notification	The Demand Response Load Reduction Event Notification will include current system load, affected area and reduction amount.	
3.9	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System assembles Demand Response Selected Customers Listing to meet the event needs.	Distributed Resource Availability and Control System assembles the Demand Response Selected Customers Listing to meet the needs of the Demand Response Load Reduction Event Notification.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System	Demand Response Selected Customers Listing	This notification will only be sent out to the selected Customers.	

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.1	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Network Management System.	Distributed Resource Availability and Control System	AMI Network Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.2	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Information System.	Distributed Resource Availability and Control System	Customer Information System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.3	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System sends the Demand Response Load Reduction Event Notification with the Selected Customers to the Meter Data Management System.	Distributed Resource Availability and Control System	Meter Data Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.1.1	AMI Network Management System provides the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Premise Interface.	AMI Network Management System	AMI Network Management System provides the Demand Response Load Reduction Event Notification with the Selected Customers to the AMI Premise Interface.	The AMI Network Management System sends Demand Response Load Reduction Event Notification with the Selected Customers out to the AMI Premise Interface via the AMI Infrastructure.	AMI Network Management System	AMI Premise Interface	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.1.2	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Energy Management System.	AMI Premise Interface	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Energy Management System.	The AMI Premise Interface delivers the Demand Response Load Reduction Event Notification with the Selected Customers to the selected customer's Customer Energy Management System.	AMI Premise Interface	Customer Energy Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.1.3	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Display.	AMI Premise Interface	AMI Premise Interface provides the Demand Response Load Reduction Event Notification with the Selected Customers to the Customer Display.	The AMI Premise Interface delivers the Demand Response Load Reduction Event Notification with the Selected Customers to the selected customer's Customer Display.	AMI Premise Interface	Customer Display Device	Demand Response Load Reduction Event Notification with the Selected Customers	No "Override" would be permitted in this situation because this is dealing with a Transmission Constraint.	
3.9.1.4	Customer Energy Management System compares Demand Response Load Reduction Event Notification and responds accordingly.	Customer Energy Management System	Customer Energy Management System compares Demand Response Load Reduction Event Notification and responds accordingly.	The Customer Energy Management System compares the Demand Response Load Reduction Event Notification with the Selected Customer Predefined Profile and acts accordingly	Customer Energy Management System	Customer Energy Management System	Demand Response Load Reduction Event Notification with the Selected Customers		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.1.5	Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	Customer Energy Management System	Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	The Customer Energy Management System sends Customer Status Information to the AMI Premise Interface.	Customer Energy Management System	AMI Premise Interface	Customer Status Information		
3.9.1.6	AMI Premise Interface sends Customer Status Information to the AMI Network Management System.	Customer Energy Management System	AMI Premise Interface sends Customer Status Information to the AMI Network Management System.	The AMI Premise Interface Delivers the Customer Status Information to the AMI Network Management System via the AMI Infrastructure.	Customer Energy Management System	AMI Network Management System	Customer Status Information		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.9.1.7	AMI Network Management System sends Customer Status Information to the Distributed Resource Availability and Control System.	AMI Network Management System	AMI Network Management System sends Customer Status Information to the Distributed Resource Availability and Control System.	The AMI Network Management System delivers the Customer Status Information to the Distributed Resource Availability and Control System.	AMI Network Management System	Distributed Resource Availability and Control System	Customer Status Information		
3.9.1.8	AMI Network Management System sends Customer Status Information to the Meter Data Management System.	AMI Network Management System	AMI Network Management System sends Customer Status Information to the Meter Data Management System.	The AMI Network Management System delivers the Customer Status Information to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	Customer Status Information		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.10	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request.	Distributed Resource Availability and Control System	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request.	Distributed Resource Availability and Control System sends an AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request to the AMI Network Management System.	Distributed Resource Availability and Control System	AMI Network Management System	AMI Net/Billing Meter Read Request and an AMI Renewable Energy Credit Meter Read Request		
3.10.1 A.1	AMI Network Management System sends a request to the AMI Net/Billing Meter for an AMI Meter read.	AMI Network Management System	AMI Network Management System sends a request to the AMI Net/Billing Meter for an AMI Meter read.	The AMI Network Management System sends the AMI Net/Billing Meter Read Request to the AMI Net/Billing Meter via the AMI Infrastructure.	AMI Network Management System	AMI Net/Billing Meter	AMI Net/Billing Meter Read Request		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.10.1B.1	AMI Network Management System sends a request to the AMI Renewable Energy Credit Meter for an AMI Meter read.	AMI Network Management System	AMI Network Management System sends a request to the AMI Renewable Energy Credit Meter for an AMI Meter read.	The AMI Network Management System sends the AMI Renewable Energy Credit Meter Read Request to the AMI Renewable Energy Credit Meter via the AMI Infrastructure.	AMI Network Management System	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter Read Request		
3.10.1A.2	AMI Net/Billing Meter delivers AMI Net/Billing Meter Data	AMI Net/Billing Meter	AMI Net/Billing Meter delivers AMI Net/Billing Meter Data	The AMI Net/Billing Meter delivers AMI Net/Billing Meter Data to the AMI Network Management System via the AMI Infrastructure.	AMI Net/Billing Meter	AMI Network Management System	AMI Net/Billing Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.10.1B.2	AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data.	AMI Renewable Energy Credit Meter	AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data.	The AMI Renewable Energy Credit Meter delivers AMI Renewable Energy Credit Meter Data to the AMI Network Management System via the AMI Infrastructure.	AMI Renewable Energy Credit Meter	AMI Network Management System	AMI Renewable Energy Credit Meter Data		
3.10.2	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Resource Availability and Control System.	AMI Network Management System	Distributed Resource Availability and Control System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.10.3	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Meter Data Management System.	AMI Network Management System	Meter Data Management System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		
3.10.4	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	AMI Network Management System	AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data.	The AMI Network Management System sends the AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distribution Management System.	AMI Network Management System	Distribution Management System	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.12	The Distribution Management System sends AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Energy Resource Automation Application.	Distribution Management System	The Distribution Management System sends AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Energy Resource Automation Application.	The Distribution Management System sends AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data to the Distributed Energy Resource Automation Application.	Distribution Management System	Distributed Energy Resource Automation Application	AMI Net/Billing Meter Data and AMI Renewable Energy Credit Meter Data		
3.13	Meter Data Management System performs a calculation to calculate the total load affected by the Demand Response Event.	Meter Data Management System	Meter Data Management System performs a calculation to calculate the total load affected by the Demand Response Event.	Meter Data Management System performs a calculation and verification to calculate the total load affected by the Demand Response Load Reduction Event.	Meter Data Management System	Meter Data Management System	Total Load Affected Calculation		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.13.1	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Wholesale Power Group.	Meter Data Management System	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Wholesale Power Group.	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Wholesale Power Group.	Meter Data Management System	Wholesale Power Group	Total Load Affected		
3.13.2	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Distribution Management System.	Meter Data Management System	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Distribution Management System.	Meter Data Management System delivers the total load affected by the Demand Response Load Reduction Event to the Distribution Management System.	Meter Data Management System	Distribution Management System	Total Load Affected		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.14	Distribution Management System reports Energy Resource Dispatch Status (storage and Demand Response) to the Energy Management System.	Distribution Management System	Distribution Management System reports Energy Resource Dispatch Status (storage and Demand Response) to the Energy Management System.	Distribution Management System reports Energy Resource Dispatch Status (storage and Demand Response) to the Energy Management System.	Distribution Management System	Energy Management System	Energy Resource Dispatch Status		
3.15	The Distributed Energy Resource Automation Application receives Event History Data from the Distribution Management System.	Distribution Management System	The Distributed Energy Resource Automation Application receives Event History Data from the Distribution Management System.	The Distributed Energy Resource Automation Application receives Event History Data from the Distribution Management System.	Distribution Management System	Distributed Energy Resource Automation Application	Event History Data		

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.15.1	The Distributed Energy Resource Automation Application compiles all Relevant Event History Data and sends it to the Distribution Management System.	Distributed Energy Resource Automation Application	The Distributed Energy Resource Automation Application compiles all Relevant Event History Data and sends it to the Distribution Management System.	The Distributed Energy Resource Automation Application compiles all Relevant Event History Data and sends it to the Distribution Management System.	Distributed Energy Resource Automation Application	Distribution Management System	Relevant Event History Data		
3.15.2	The Distribution Management System sends all Relevant Event History Data to the Meter Data Management System.	Distribution Management System	The Distribution Management System sends all Relevant Event History Data to the Meter Data Management System.	The Distribution Management System sends all Relevant Event History Data to the Meter Data Management System.	Distribution Management System	Meter Data Management System	Relevant Event History Data		

2.3.3 Post-conditions and Significant Results

Describe conditions that must exist at the conclusion of the Function. Identify significant items similar to that in the preconditions section.

Describe any significant results from the Function

Actor/Activity	*Post-conditions Description and Results*
The Utility	The Utility will be able to utilize communicating Distributed Generation inverter controllers (via 2-way communications) for the purpose of control and optimization of Distributed Generation, storage, Capacitor Bank Controls, Load Tap Changer Controls and Demand Response to optimize the system during a transmission constraint.

3 Auxiliary Issues

3.1 References and contacts

Documents and individuals or organizations used as background to the function described; other functions referenced by this function, or acting as "sub" functions; or other documentation that clarifies the requirements or activities described. All prior work (intellectual property of the company or individual) or proprietary (non-publicly available) work must be so noted.

FUTURE USE

ID	Title or contact	Reference or contact information
[1]	ANSI C84.1-1995 Electrical Power Systems and Equipment – Voltage Ratings (60HZ)	ANSI A and ANSI B Voltage Requirements
[2]		

3.2 Action Item List

As the function is developed, identify issues that still need clarification, resolution, or other notice taken of them. This can act as an Action Item list.

FUTURE USE

ID	Description	Status
[1]		
[2]		

3.3 Revision History

For reference and tracking purposes, indicate who worked on describing this function, and what aspect they undertook.

No	Date	Author	Description
1.1	8-11-09	Brian D. Green	Draft for Review
1.2	8-13-09	Brian D. Green	Update Equipment Interfaces
1.3	9-14-09	Brian D. Green	Change to new template
1.4	9-23-09	Brian D. Green	Update Information Exchanges
1.5	9-30-09	Brian D. Green	Update Step Sequences
1.6	10-01-09	Brian D. Green	Update Information Producer
1.7	10-01-09	Ronald J. Pasquarelli	Cleanup for import into IKB

No	Date	Author	Description
1.8	10-2-09	Ronald J. Pasquarelli	Cleanup- add actor the Utility, remove policy
1.9	10-2-09	Ronald J. Pasquarelli	Removed "." From some actor names.
1.10	10-5-09	Brian D. Green	Removed actors with an "and/or" in them.
1.11	10-06-09	Brian D. Green	Cleanup - Actors
1.12	10-06-09	Brian D. Green	Cleanup – Information Exchanges
1.13	12-15-09	Brian D. Green	Make the document generic and ready for posting on EPRI's Smart Grid Use Case Repository.

3.4 Common Terms and Definitions

As the function is developed, identify issues that still need clarification, resolution, or other notice taken of them. This can act as an Action Item list.

ID	Term	Definition
[1]	**Feeder Penetration**	PV penetration is the rated capacity (KW) of the aggregated generation, including the proposed Generating Facility compared to the annual peak load (KW) as most recently measured at the substation or calculated for that portion of a public utility's electric system connected to a Customer bounded by automatic sectionalizing devices or the end of the distribution line. Units are % of peak on the feeder or portion of a public utility's electric system In Manuel's discussions with the state, "DG will be viewed by

		the rating of devices at point of common coupling."
[2]	**Advanced Metering Infrastructure (AMI)**	"AMI" for the Utility for this project- refers to systems that measure, collect and analyze energy usage, and send information to the Customer through advanced electricity meters, via various communication media on request or on a pre-defined schedule. This infrastructure includes advanced electrical meters, communications, and meter (MDM) software. The communication between the end use energy consumer and the utility is two way communications. The AMI infrastructure and communications for the purposes of this project ends at the meter, which provides a Premise Interface to the Inverter or possibly the Home Area Network.
[3]	**AMI Premise Interface**	The Premise Interface is one of the communications radios "under glass" of the AMI Meter. (There are two radios built in to the AMI Meter. One is for the AMI System and is a longer range radio. The other is for the Premise Interface and it has a smaller range.) This interfaces to the Customer Inverter and the Home Area Network (if available).
[4]	**Home Area Network**	Any Customer side automation that can make use of utility signals to affect energy usage within the premises will be considered as the Home Area Network for this project. Home Area Network can affect DER, lighting, security, etc. The Utility will not own Home Area Network.
[5]	**Smart Grid**	The Utility's perspective is that the "smart grid" is a grid that integrates the electrical grid with communications/ automation with a fully integrated IT infrastructure to enhance reliability, involve the consumer, and integrate Distributed Energy Resources. It is the seamless integration of the electric network, a communications network, and all the necessary software and hardware to monitor, control and manage the creation, distribution, storage and consumption of energy by

		any Customer type. The smart grid of the future needs to be interactive, distributed, and extended to any consuming device.
[6]	**Real Time Pricing (RTP) Model**	An electricity pricing methodology that enables automatic Customer load response based on a pre-defined price matrix in response to a utility signal for hourly pricing.
[7]	**Distributed Generation (DG) and Distributed Energy Resource (DER)**	For this project Distributed Generation (DG) will be defined as utility or Customer provided photovoltaic generation or storage connected at the distribution voltage level (12.47kV) or service voltage level. Distributed Energy Resources (DER) on the other hand will include all DG and demand response capability through the Home Area Network.
[8]	**Electrical Storage**	The definition for storage for this project will be considered electrical storage (providing a way to add electrons to the grid). Alternate Scenario (and UC-3 – Demand Response): The definition for storage for this project will be electrical storage along with thermal storage (building envelop/thermal storage) and demand response techniques aligned with commercial and residential cooling and refrigeration systems in addition to innovative approaches to demand response aligned with data center energy consumption.