1   Descriptions of Function

All prior work (intellectual property of the company or individual) or proprietary (non-publicly available) work should be so noted.

1.1   Function Name

Last Gasp Message – Outage Notification

1.2   Function ID

Identification number of the function

1.3   Brief Description

Many AMI systems offer endpoints with a "last gasp" transmission capability to tell the utility that the endpoints have lost power. This last-gasp transmission serves as a surrogate for the customer's call, often allowing the problem to be fixed before the customer even becomes aware of the outage. AMI systems also work well in helping the OMS and dispatcher understand and efficiently respond to widespread outage conditions Restoration messages will follow a similar path.

1.4   Narrative

This Use Case is unique as it is initiated at the **NIC ESP** when it detects a zero voltage event lasting more than 45 seconds. The **NIC ESP** then issues a last gasp message that flows back to the enterprise without any request from an enterprise system The Last Gasp Message is routed through the AMI Network to the **AMI Head-End**. The **AMI Head-End** publishes the message where it is consumed by the **Meter Outage Processor (MOP)** and the **Operational Data Store (ODS)** who subscribes to the message.
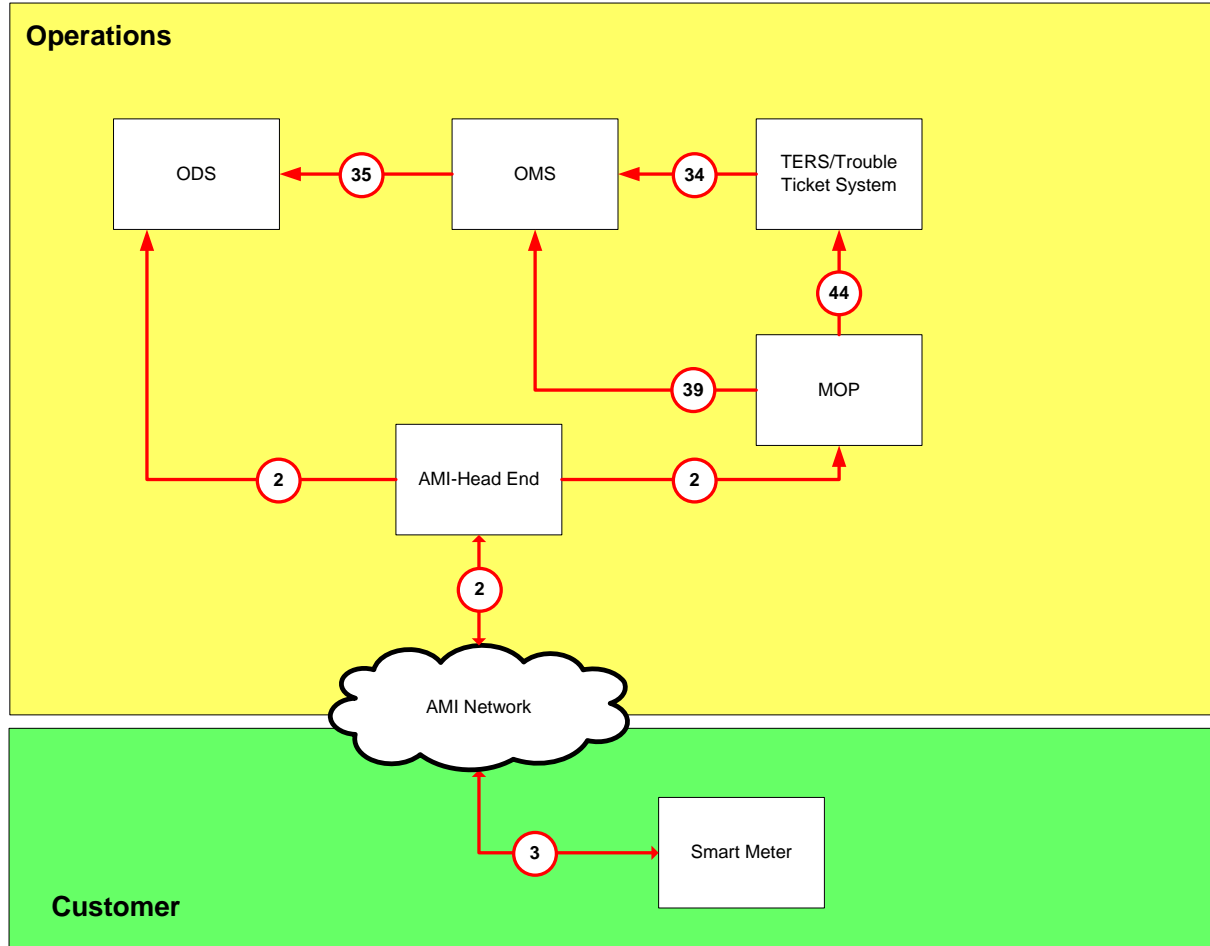
Figure 1-1
Context Diagram for Last Gasp Outage Notification

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

Actor Name	Actor Type (person, organization, device, system, or subsystem)	Actor Description
AMI Head-End	Sub-System	Operational Data Store is a sub-system of The Utility's data warehouse, which stores operational data i.e. all metering events and messages.
NIC - ESP	Device	AMI side of the network interface card within the smart meter.
ODS	Sub-System	Operational Data Store is a sub-system of The Utility's data warehouse, which stores operational data i.e. all metering events and messages.
TERS/Trouble Ticket System	System	Distribution Trouble ticket system.
MOP	Sub-System	Meter Outage Processor is a sub-system of the OMS - Meter event filter that determines whether the outages are spurious events or real outages.
OMS	System	Outage Management System

1.6 Information exchanged

Information Object Name	Information Object Description
Last Gasp Message	Message generated by the Smart Meter when the NIC - ESP indicates a zero voltage event for at least 45 seconds.

1.7 Activities/Services

Activity/Service Name	Activities/Services Provided

1.8 Contracts/Regulations

Contract/Regulation	Impact of Contract/Regulation on Function

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

Constraint	Type	Description	Applies to

2 Step by Step Analysis of Function

Describe steps that implement the function. If there is more than one set of steps that are relevant, make a copy of the following section grouping (Steps to implement function, Preconditions and Assumptions, Steps normal sequence, Post-conditions) and provide each copy with its own sequence name.

2.1 Steps to implement function – Name of Sequence

Name of this sequence.

2.1.1 Preconditions and Assumptions

Actor/System/Information/Contract	Preconditions or Assumptions
Smart Meter	A large amount of "Last Gasp" messages delivered from the Smart Meter may bog the communications down and limit the effectiveness of the message.
Access Point	The Access Point can handle 4 messages per second.
Access Point	There may be 5,000 Smart Meters per Access Point
NIC - ESP	Last Gasp is issued after 100msec outage.

2.1.2 Steps – Name of Sequence

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.

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environment
#	*Triggering event? Identify the name of the event.[1]*	*What other actors are primarily responsible for the Process/Activity? Actors are defined in section0.*	*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 section0.*	*What other actors are primarily responsible for Receiving the information? Actors are defined in section0.* *(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.*
1.1	Check: No voltage to NIC - ESP triggers an alarm	Assume meter in service and functioning as designed	Outage at Premise	NIC - ESP issues a Last Gasp message	NIC - ESP	NIC - ESP	Last Gasp Message		
1.2		NIC - ESP	NIC - ESP delivers Last Gasp Message	NIC - ESP delivers Last Gasp Message to the AMI Network	NIC - ESP	AMI Network	Last Gasp Message	Use AMI Network Use Case; Validates communication path from the Smart Meter to the AMI Head-End	
1.3		AMI Network	AMI Network delivers Last Gasp message	AMI Network delivers Last Gasp message to the AMI Head-End	AMI Network	AMI Head-End	Last Gasp Message		

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[1] Note – A triggering event is not necessary if the completion of the prior step – leads to the transition of the following step.

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environment
1.4		AMI Head-End	AMI Head-End delivers the Last Gasp message	AMI Head-End delivers the Last Gasp message to the MOP	AMI Network	MOP	Last Gasp Message		
1.5		MOP	The MOP filters/processes Last Gasp Message	The MOP filters/processes Last Gasp Message	MOP	MOP	Last Gasp Message		
1.6		MOP	MOP delivers Last Gasp Message	MOP delivers Last Gasp Message to TERS/Trouble Ticket System	MOP	TERS/Trouble Ticket System	Last Gasp Message		
1.7		TERS/Trouble Ticket System	TERS/Trouble Ticket System delivers the Last Gasp Message	TERS/Trouble Ticket System delivers the Last Gasp Message to the OMS	TERS/Trouble Ticket System	OMS	Last Gasp Message		
1.8		AMI	The AMI Head-End delivers the Last Gasp Message	The AMI Head-End delivers the Last Gasp Message to the ODS	AMI Head-End	ODS	Last Gasp Message		
1.9		OMS	OMS delivers event information to ODS	OMS delivers event information to ODS to facilitate Outage Analysis	OMS	ODS	Last Gasp Message		

2.1.3 Post-conditions and Significant Results

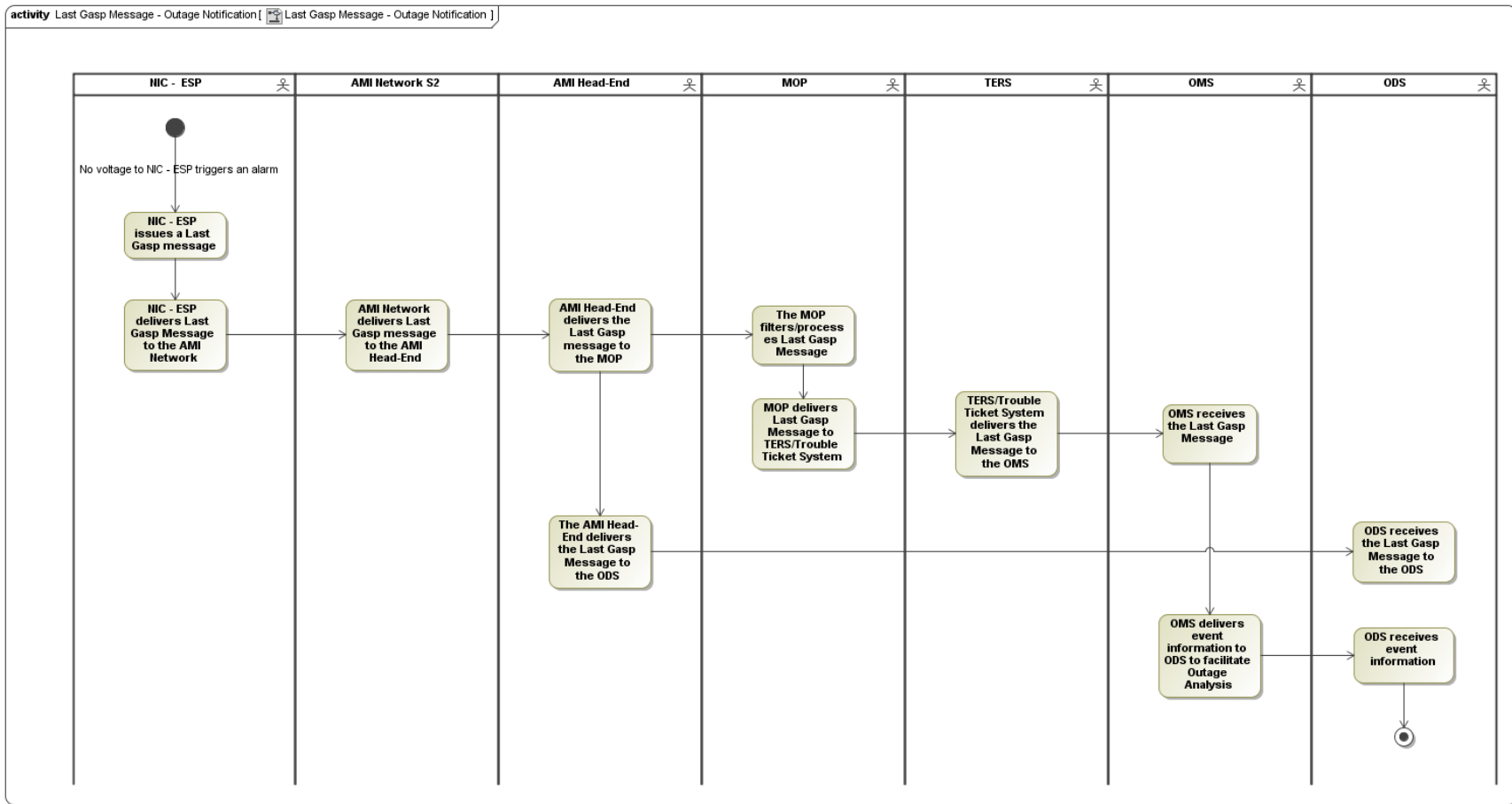| Actor/Activity	Post-conditions Description and Results

2.2 Architectural Issues in Interactions

Elaborate on all architectural issues in each of the steps outlined in each of the sequences above. Reference the Step by number.

2.3   Diagrams
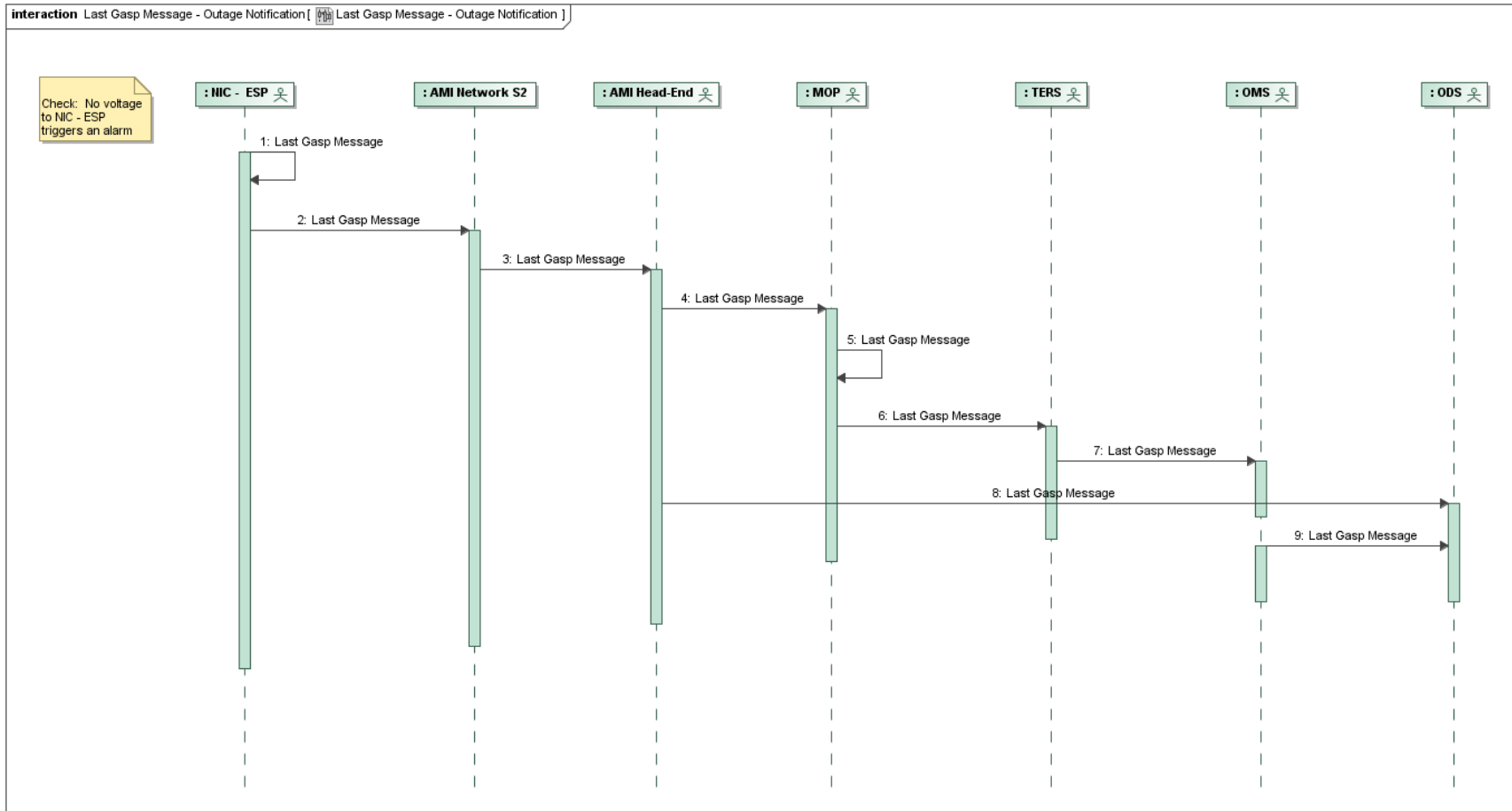
Last Gasp Message – Outage Notification Sequence Diagram

NIC - ESP | **AMI Network S2** | **AMI Head-End** | **MOP** | **TERS** | **OMS** | **ODS**

No voltage to NIC - ESP triggers an alarm

NIC - ESP issues a Last Gasp message

NIC - ESP delivers Last Gasp Message to the AMI Network

AMI Network delivers Last Gasp message to the AMI Head-End

AMI Head-End delivers the Last Gasp message to the MOP

The MOP filters/processes Last Gasp Message

MOP delivers Last Gasp Message to TERS/Trouble Ticket System

TERS/Trouble Ticket System delivers the Last Gasp Message to the OMS

OMS receives the Last Gasp Message

The AMI Head-End delivers the Last Gasp Message to the ODS

ODS receives the Last Gasp Message to the ODS

OMS delivers event information to ODS to facilitate Outage Analysis

ODS receives event information

Last Gasp Message – Outage Notification Activity Diagram

3   Auxiliary Issues

3.1   References and contacts

ID	Title or contact	Reference or contact information
[1]		

3.2   Action Item List

ID	Description	Status
[1]		

3.3   Revision History

No	Date	Author	Description
2.0	4/10/2010	Simmins	Fill in step by step, actor list, etc.
3.0	5/13/2010	Brian D. Green	Revisions and add diagrams