

RTP – Market Operations Energy Services

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

RTP – Market Operations Energy Services

1.2 Function ID

IECSA identification number of the function

C-4

1.3 Brief Description

Describe briefly the scope, objectives, and rationale of the Function.

Market Operations Energy Services, for the purposes of this use case, collects bid and offers into the energy market from Energy Service Providers (EnergyServiceProvider) and other aggregators of distributed energy resources.

1.4 Narrative

A complete narrative of the Function from a Domain Expert's point of view, describing what occurs when, why, how, and under what conditions. This will be a separate document, but will act as the basis for identifying the Steps in Section 2.

For this use case, the EnergyServiceProvider or other aggregator submits bids and/or offers based upon bids and offers made by their customers. The aggregator may submit bids in several tiers to accommodate a range in quality and price of services.

Market Operations Energy Services, for the purposes of this use case, collects bid and offers into the energy market from Energy Service Providers (EnergyServiceProvider) and other aggregators of distributed energy resources. MarketOperationSystem evaluates

incoming bids against needs and accepts or rejects those offers. The detailed process for evaluating bids and offers is detailed in MarketOperationSystem cone, Day Ahead use cases.

Once the bids and offers are evaluated and accepted or declined, the results are posted on the marker interface server is used or transmitted to the EnergyServiceProvider for scheduling and action.

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.

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>MarketOperationSystem</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
BidEvaluationSystem	System	Evaluates bids and offers for energy services and accepts those that meet the criteria established by the market opertator.
MarketInterfaceServer	System	Provides access to market information to ESPs and other market participants.
MarketOperationSystem	Community	this

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Energy Service Providers</i>		<i>Provide Energy to end use customers</i>
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
EnergyService Provider Aggregation System	System	Combines and rates the incoming bids and aggregates them into a single or few large bids for submission to the Market Operation Energy and Ancillary Services Bid/Offer system.
EnergyService Provider	Community	this

Replicate this table for each logic group.

1.6 Information exchanged

Describe any information exchanged in this template.

<i>Information Object Name</i>	<i>Information Object Description</i>
Aggregate energy bids and offers	Bids and offers for energy resources offered through the EnergyServiceProvider aggregation system
Accepted energy bids and offers	Accepted offers and bids returned to the EnergyServiceProvider for action

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.

<i>Activity/Service Name</i>	<i>Activities/Services Provided</i>

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.

<i>Contract/Regulation</i>	<i>Impact of Contract/Regulation on Function</i>
Accepted Bid or Offer	Constitutes a contract to provide the bid service at the specified time

<i>Policy</i>	<i>From Actor</i>	<i>May</i>	<i>Shall Not</i>	<i>Shall</i>	<i>Description (verb)</i>	<i>To Actor</i>
Provide Service	EnergyServiceProvider			X	Provide accepted services as bid	MarketOperationSystem

<i>Constraint</i>	<i>Type</i>	<i>Description</i>	<i>Applies to</i>
Laws of physics	Environmental	Laws of physics for power system operations	All
Technology	Environmental	Technology constraints for providing real-time pricing information to all customers with RTP as part of their customer tariffs	All
Security	Environmental	Security policies and technologies must be established and used to address all security needs at the appropriate/contracted levels	All

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 (Preconditions and Assumptions, Steps normal sequence, and Steps alternate or exceptional sequence, Post conditions)

2.1 Steps to implement function

Name of this sequence.

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'.

<i>Actor/System/Information/Contract</i>	<i>Preconditions or Assumptions</i>
EnergyServiceProvider	Completed aggregation of energy services bids and offers.

2.1.2 Steps – Normal 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.

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. ¹	What other actors are primarily responsible for the Process/Activity? Actors are defined in section 1.5.	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 section 1.5.	What other actors are primarily responsible for Receiving the information? Actors are defined in section 1.5. (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.
1.1	EnergyServiceProvider aggregates bids and offers	EnergyServiceProvider Aggregation System		EnergyServiceProvider transmits energy bid/offer data to market operations	EnergyServiceProvider	MarketInterfaceServer	Aggregate energy bids and offers		RTOs / Market Participants
1.2	Completion of previous Step	BidEvaluationSystem		Bid evaluation system processes loads data from market interface server. Bids are processed and evaluated against needs for the period. Some or all of the bids maybe accepted or rejected.	MarketInterfaceServer	BidEvaluationSystem	Aggregate energy bids and offers		RTOs / Market Participants
1.3	Completion of previous Step	BidEvaluationSystem		Acceptance or rejections status is transferred to the market interface server	BidEvaluationSystem	MarketInterfaceServer	Accepted energy bids and offers		RTOs / Market Participants

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 Environments
1.4	Timer	EnergyServiceProvider		EnergyServiceProvider polls Market Server for bid status. Status is transferred to the EnergyServiceProvider Aggregation System,	MarketInterfaceServer	EnergyServiceProvider Aggregation System	Accepted energy bids and offers		RTOs / Market Participants

2.1.3 Steps – Alternative / Exception Sequences

Describe any alternative or exception sequences that may be required that deviate from the normal course of activities. Note instructions are found in previous table.

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments

2.1.4 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

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>
EnergyServiceProvider	Committed to providing accepted aggregated energy bids.

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>
MarketOperationSystem	Committed to honoring accepted Energy services bids and offers.

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..



Microsoft Excel
Worksheet

2.3 Diagram

For clarification, draw (by hand, by Power Point, by UML diagram) the interactions, identifying the Steps where possible.

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.

ID	Title or contact	Reference or contact information
[1]		
[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.

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
0.			