

Market Operations – Medium and Short Term Planning

1 Descriptions of Functions – Medium and Short Term Planning for Market Operations

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

1.1 Function Name

Name of Function

Market Operations – Medium and Short Term Planning for 3 Western Regional Transmission Organizations (RTOs)

1.2 Function ID

IECSA identification number of the function

M-2, M-3

1.3 Brief Description

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

As the electricity industry is deregulated, and as FERC defines more clearly what the market operation tariffs will encompass, three possible Regional Transmission Organizations (RTOs) in the Western Interconnection are developing seamless interfaces for Market Participants to submit energy schedules and ancillary service bids across these 3 RTOs. The 3 RTOs are California ISO (existing ISO handling the electricity market in California), RTO West (potential RTO of many northwestern utilities), and WestConnect (potential RTO of many southwestern utilities). These 3 RTOs are developing the requirements for the Western RTO functions.

1.4 Narrative

The following is a list of Western RTO functions related to medium and short term planning for market operations. The four functions with asterisks are described in this document.

1. Medium/Short Term Planning
 - a. Load Forecast *
 - b. Outage Scheduling *
 - c. Congestion Management *
 - d. Long term Auction/sale of CRRs *
 - e. Bilateral Energy Market

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>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Area & Resource Operation Centers	Corporation	
AuditingPersonnel	Person	
DatabaseAdministrator	Person	
DisCos	Corporation	
DistributionSystem	System	

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Eligible Customer Metered Entity	Person	
Eligible Customers	Person	
GenCos	Corporation	
IntervalMeterDevice	Device	
LGROwner	Person	
LoadProfile	Database	
MarketParticipant	Person	
Metered Entities	Corporation	
WeatherService	Corporation	
NERC	Corporation	
Other 2 RTOs	Corporation	
RetailCos	Corporation	
RTOOperator	Person	
RTOProgrammerEngineerPersonnel	Person	
RTOScheduler	Person	

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
SC-FTROwner	Person	
SchedulingCoordinator	Person	
SettlementAdministrator	Person	
SettlementDataMgmtAgent	Corporation	
CustomerMeterDevice	Device	
Tag Authority	Corporation	
TimeLineManager	Timer	
TransmissionOwner	Person	
TransmissionSystem	Power System	
WSCC	Corporation	
PowerSystemModel	Database	
RTOPowerSystemModelPowerSystemModel	Database	
TransmissionOutageSchedule	Database	
LGRGenerationMaintenanceSchedule	Database	
EnergyScheduleDatabase	Database	

<i>Grouping (Community)'</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
AncillaryServiceSchedule	Database	
TransmissionRightOwnershipDatabase	Database	
FTR Requirements Matrix	Database	
TransmissionSystemCharacteristicsDatabase	Database	
Existing Transmission Contracts	Database	
OperatingPlan	Database	
Balancing Energy Stack	Database	
Available FTR		
CongestionManagementSystem		
Control (DAC) Subsystem		
Data Acquisition		
day Load Forecast		
FTR Market Clearing Price Auction Function		
HistoricLoadDatabase		

<i>Grouping (Community)</i>		<i>Group Description</i>
<i>Market Operations</i>		
<i>Actor Name</i>	<i>Actor Type (person, device, system etc.)</i>	<i>Actor Description</i>
Maintenance Outage Function		
OperationalTransmissionCapacity		
WMI Web Server		

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>

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>
Maintenance Outage Function	Analyzes maintenance outages

<i>Activity/Service Name</i>	<i>Activities/Services Provided</i>
7-Day Load Forecast Function	Determines the long term load forecast
CongestionManagementSystem	Determines if congestion could occur
Operations Transmission Capacity	Determines the Operations Transmission Capacity, based on energy schedules
Western Market Interface Web Server	Manages the interface between the RTOs and the MarketParticipants
Data Acquisition and Control Subsystem	Monitors and controls field devices
Available FTR	Manages FTRs
FTR Market Clearing Price Auction Function	Determines market clearing price of FTRs based on energy schedules
EnergyScheduleDatabase Analysis Function	Analyzes the energy schedules
Ancillary Services Procurement Analysis	Analyzes the needs for ancillary services
Tag Approval Service	Approves electronic tags

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>
Market Tariff	
Agreements between RTOs	

<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>

<i>Constraint</i>	<i>Type</i>	<i>Description</i>	<i>Applies to</i>

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 Load Forecasts (LF)

2.1.1 LF – 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>

2.1.2 LF – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
1.1a	Periodic or event driven	SchedulingCoordinator	Load estimates	Provides load MW estimates from Day Ahead schedules as an auxiliary source of LF data	SchedulingCoordinator	7-day Load Forecast	Load estimates		User Interface
1.1b	In parallel to step 1a	WeatherService	Forecast weather	Provides weather forecasts and updates for each region	WeatherService	7-day Load Forecast	Weather data		RTOs / Market Participants
1.1c	In parallel to step 1a	TransmissionOwner	Regional loads	Provides regional LF estimates as auxiliary source of LF data	TransmissionOwner	7-day Load Forecast	Load estimates		RTOs / Market Participants
1.1d	In parallel to step 1a	HistoricLoadDatabase	Historical forecasts	Provides historical input for forecast	HistoricLoadDatabase	7-day Load Forecast	Historical forecasts		RTOs / Market Participants
1.2	Upon completion of previous step	RTO Scheduler	Adjust forecasts	Adjusts load forecast	RTO Scheduler	7-day Load Forecast	Adjustments		User Interface
1.3	Upon completion of previous step	7-day Load Forecast	Issue load forecasts	Provides 7-day regional load forecasts	7-day Load Forecast	Market Participant	Load forecasts		RTOs / Market Participants

2.1.3 LF – 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 LF – 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>

2.1.5 LF – 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.

2.1.6 LF – Current Implementation Status

*Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above
Identify the key existing products, standards and technologies*

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

Current Implementations:

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	Load forecast is very mature application
Moderately mature	
Fairly new	
Future, no systems, no interactions	

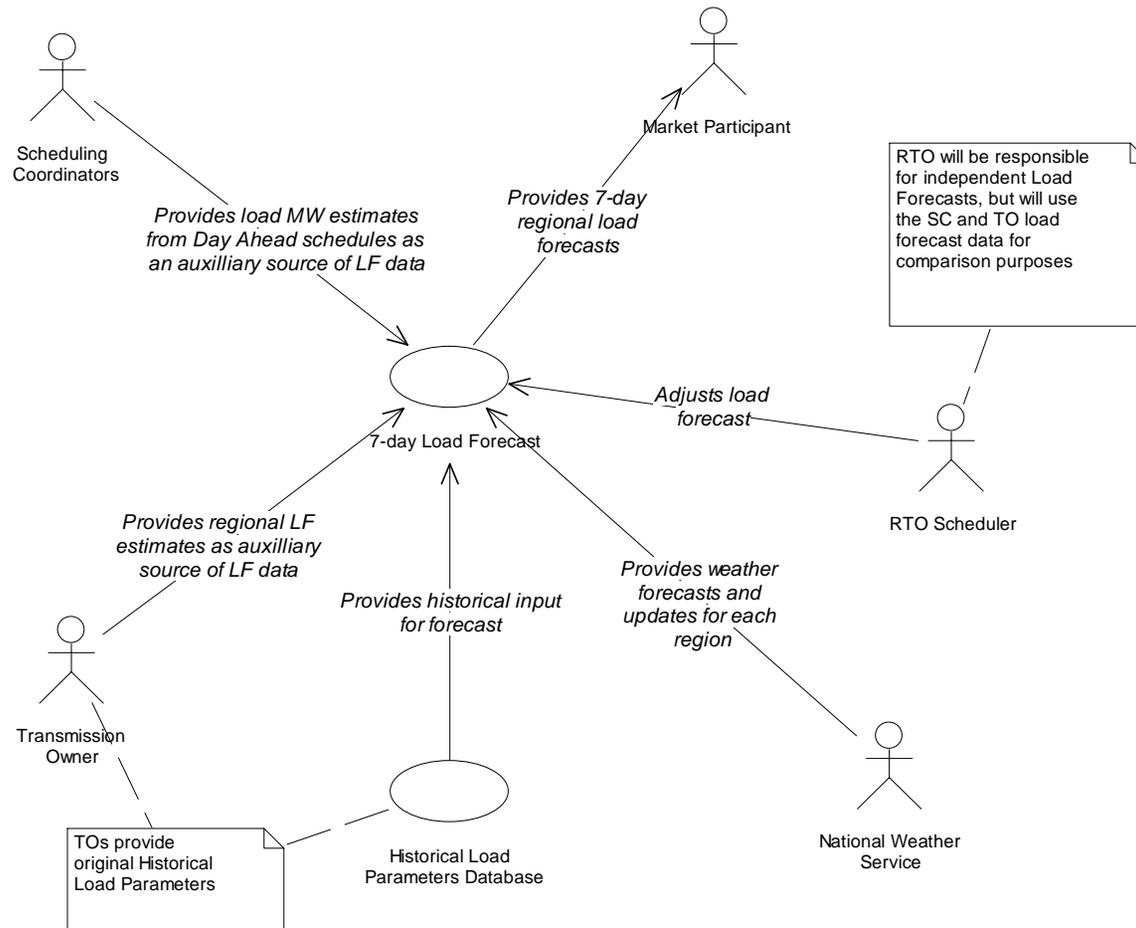
<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

2.1.7 LF – Diagram

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

Mid Term and Short Term Load Forecast Process



2.2 Outage Scheduling (OS)

2.2.1 OS – 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>

2.2.2 Outage Scheduling (OS) – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
2.1a	As needed before a specific day and time when maintenance coordination is to be performed	Scheduling Coordinator	Send generation outages	(1a) Send Day Ahead Local Generation Resources (LGR) outages, limit and ramp rate changes, and notification of non-LGR units	Scheduling Coordinator	LGR Generation Maintenance Schedule	Generation outages		User Interface
2.1b	In parallel to step 1a	Transmission Owner	Send transmission outages	(1b) Request Day Ahead transmission maintenance outages	Transmission Owner	Transmission Outage Schedule	Transmission outages		RTOs / Market Participants
2.1c	In parallel to step 1a	Other 2 RTOs	Send other RTO transmission outages	(1c) Notify of relevant transmission outages	Other 2 RTOs	Transmission Outage Schedule	Transmission outages		RTOs / Market Participants
2.2a	On the specific day and time	LGR Generation Maintenance Schedule	Provide outage schedules	(2a) Provide proposed outage schedules	LGR Generation Maintenance Schedule	Maintenance Outage Function	Generation outages		HV Generation Plant
2.2b	In parallel to step 2a	Transmission Outage Schedule	Provide outage schedules	(2b) Provide proposed outage schedules	Transmission Outage Schedule	Maintenance Outage Function	Transmission outages		User Interface

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.3a	On the specific day and time	EnergyScheduleDatabase	Provide energy schedules	(3a) Provide proposed energy schedules	EnergyScheduleDatabase	Maintenance Outage Function	Energy schedules		RTOs / Market Participants
2.3b	In parallel to step 3a	7-day Load Forecast	Provide load forecast	(3b) Provide 7-day load forecasts for each region	7-day Load Forecast	Maintenance Outage Function	Load forecasts		RTOs / Market Participants
2.4	After previous step	Maintenance Outage Function	Review outages	(4) Reviews result of Maintenance Outages	Maintenance Outage Function	RTOScheduler	Generation outages Transmission outages		User Interface
2.5a	When RTOScheduler analyzes the impact of outages	RTOScheduler	Analysis of LGR outages	(5a) Approves or rejects LGR outage	RTOScheduler	LGRGenerationMaintenanceSchedule	Indication of approval and rejection of LGR maintenance schedules		User Interface
2.5b	In parallel to step 5a	RTOScheduler	Analysis of transmission outages	(5b) Approves or rejects transmission outage schedules	RTOScheduler	TransmissionOutageSchedule	Indication of approval and rejection of transmission outage schedules		User Interface
2.6a	After previous step	LGRGenerationMaintenanceSchedule	Notify LGR owners	(6a) Notify LGR Owner of approvals and rejections	LGRGenerationMaintenanceSchedule	SchedulingCoordinator	Indication of approval and rejection of LGR maintenance schedules		User Interface
2.6b	In parallel to step 6a	TransmissionOutageSchedule	Notify transmission owners	(6b) Notify TO of approvals and rejections	TransmissionOutageSchedule	TransmissionOwner	Indication of approval and rejection of transmission outage schedules		RTOs / Market Participants

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
2.6c	In parallel to step 6a	Transmission OutageSchedule	Warnings on contingencies	(6c) Warn of potential contingencies	TransmissionOutageSchedule	Other 2 RTOs	Contingency warnings		RTOs / Market Participants

2.2.3 OS – 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

2.2.4 OS – 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>

<i>Actor/Activity</i>	<i>Post-conditions Description and Results</i>

2.2.5 OS – 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. Double click on the embedded excel file – record the changes and save the excel file (this updates the embedded attachment).

2.2.6 OS – Current Implementation Status

Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above Identify the key existing products, standards and technologies

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

Current Implementations:

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Fairly new	Fairly new
Future, no systems, no interactions	

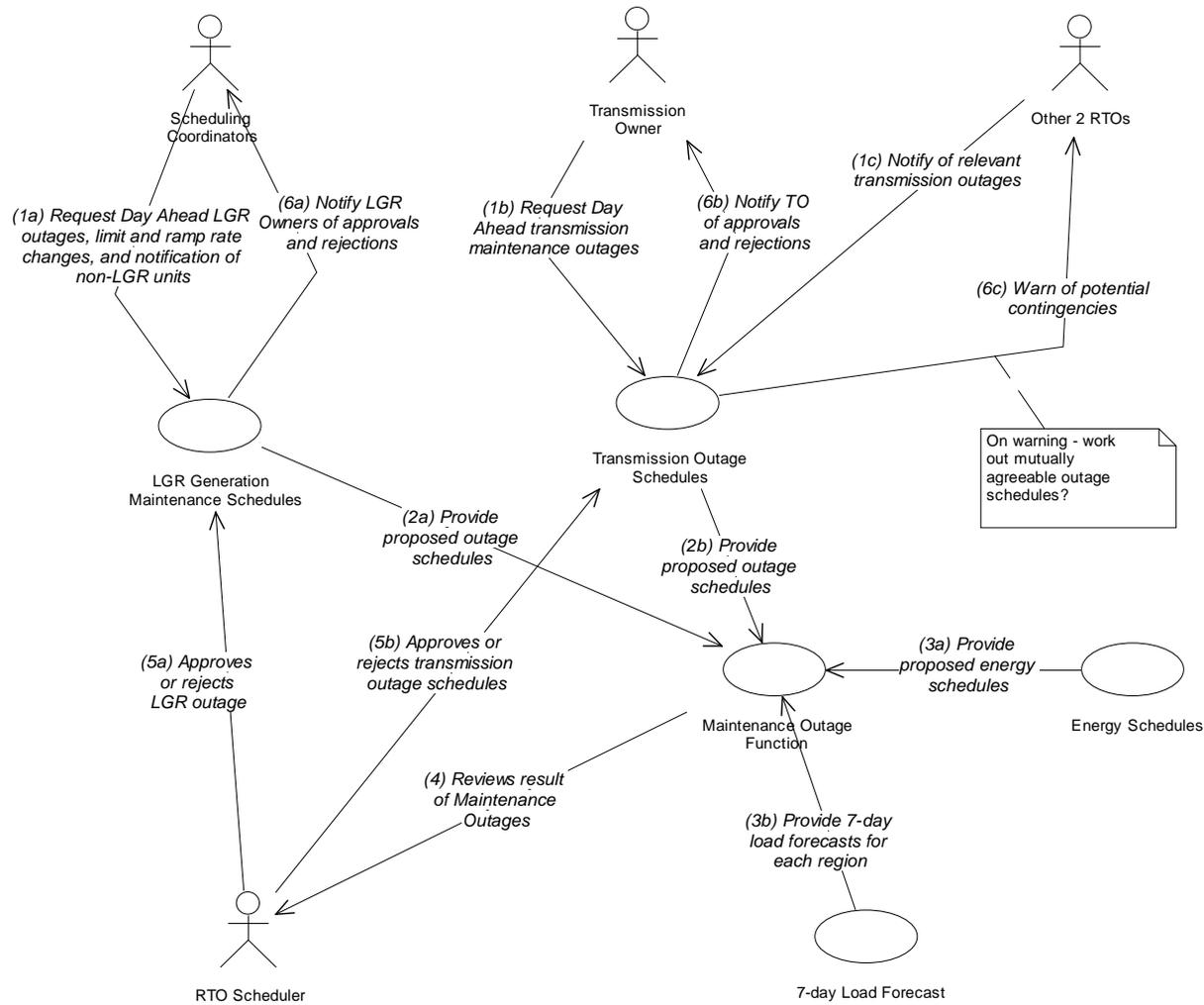
<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

2.2.7 OS – Diagram

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

Day Ahead Transmission Outage and LGR Outage Scheduling



2.3 Congestion Management (CM)

2.3.1 CM – 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>

2.3.2 CM – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
3.1a	Periodically and/or at specific times and dates	Transmission Owner	Update constraints	(1a) Update transmission path constraints for each future hour	Transmission Owner	Transmission System Characteristics Database	Future constraints		RTOs / Market Participants
3.1b	In parallel to step 1a	Data Acquisition and Control (DAC) Subsystem	Update constraints	(1b) Provide real-time data on transmission constraints and outages	Data Acquisition and Control (DAC) Subsystem	Transmission System Characteristics Database	Real-time constraints		RTOs / Market Participants
3.1c	In parallel to step 1a	Other 2 RTOs	Update constraints	(1c) Update relevant transmission path constraints for each future hour	Other 2 RTOs	Transmission System Characteristics Database	Future and real-time constraints		RTOs / Market Participants
3.2a	Periodically or upon request or upon event	Transmission Right Ownership Database	Provide FTRs	(2a) Provide list of Firm Transmission Rights (FTR) Interfaces and Scheduling Points	Transmission Right Ownership Database	Congestion Management System	FTRs		RTOs / Market Participants
3.2b	In parallel to step 2a	Transmission Outage Schedule	Provide transmission outages	(2b) Provide approved transmission outage schedules for the appropriate timeframes	Transmission Outage Schedule	Congestion Management System	Transmission outage schedules		User Interface

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
3.2c	In parallel to step 2a	LGR Generation Maintenance Schedule	Provide LGR outage schedules	(2c) Provide approved LGR outage schedules for the appropriate timeframes	LGR Generation Maintenance Schedule	Congestion Management System	LGR outage schedules		RTOs / Market Participants
3.2d	In parallel to step 2a	Transmission System Characteristics Database	Provide transmission conditions	(2d) Provide update of transmission conditions for the appropriate timeframes	Transmission System Characteristics Database	Congestion Management System	Transmission conditions		RTOs / Market Participants
3.3	Periodically	Congestion Management System	Calculate TTC, ATC, and OTC	(3) Calculate TTC, ATC, and OTC for each FTR Interface and Scheduling Point	Congestion Management System	Operational Transmission Capacity	TTC, ATC, & OTC		RTOs / Market Participants
3.4	Upon request	Operational Transmission Capacity	Review OTC	(4) Review OTC data	Operational Transmission Capacity	RTOS Scheduler	OTC		User Interface
3.5	By specific date and time	RTOS Scheduler	Approve OTC	(5) Approve OTC data	RTOS Scheduler	Operational Transmission Capacity	OTC approvals		User Interface
3.6a	By specific data and time	Operational Transmission Capacity	Updated OTC	(6a) Provide updated TTC, ATC, and OTC data	Operational Transmission Capacity	WMI Web Server	TTC, ATC, & OTC		RTOs / Market Participants
3.6b	In parallel to step 6a	FTR Requirements Matrix	Calculate FDF	(6b) Provide updated Flow Distribution Factors (FDF)	FTR Requirements Matrix	WMI Web Server	FDF		RTOs / Market Participants
3.6c	In parallel to step 6a	Operational Transmission Capacity	Updated OTC	(6c) Provide updated TTC, ATC, and OTC data	Operational Transmission Capacity	Other 2 RTOs	TTC, ATC, & OTC		RTOs / Market Participants

#	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	At specific date and time	WMI Web Server	Provide TTC, ATC, and OTC	(7) Provide TTC, ATC, OTC, and FDF data to MarketParticipants	WMI Web Server	MarketParticipant	TTC, ATC, & OTC		RTOs / Market Participants

2.3.3 CM – 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

2.3.4 CM – 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>

2.3.5 CM – 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. Double click on the embedded excel file – record the changes and save the excel file (this updates the embedded attachment).

2.3.6 CM – Current Implementation Status

Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above

Identify the key existing products, standards and technologies

<i>Product/Standard/Technology</i>	<i>Ref - Usage</i>
Eg. DNP 3	2.1.2.1[1] - Exchange of SCADA information

Current Implementations:

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new
Future, no systems, no interactions	

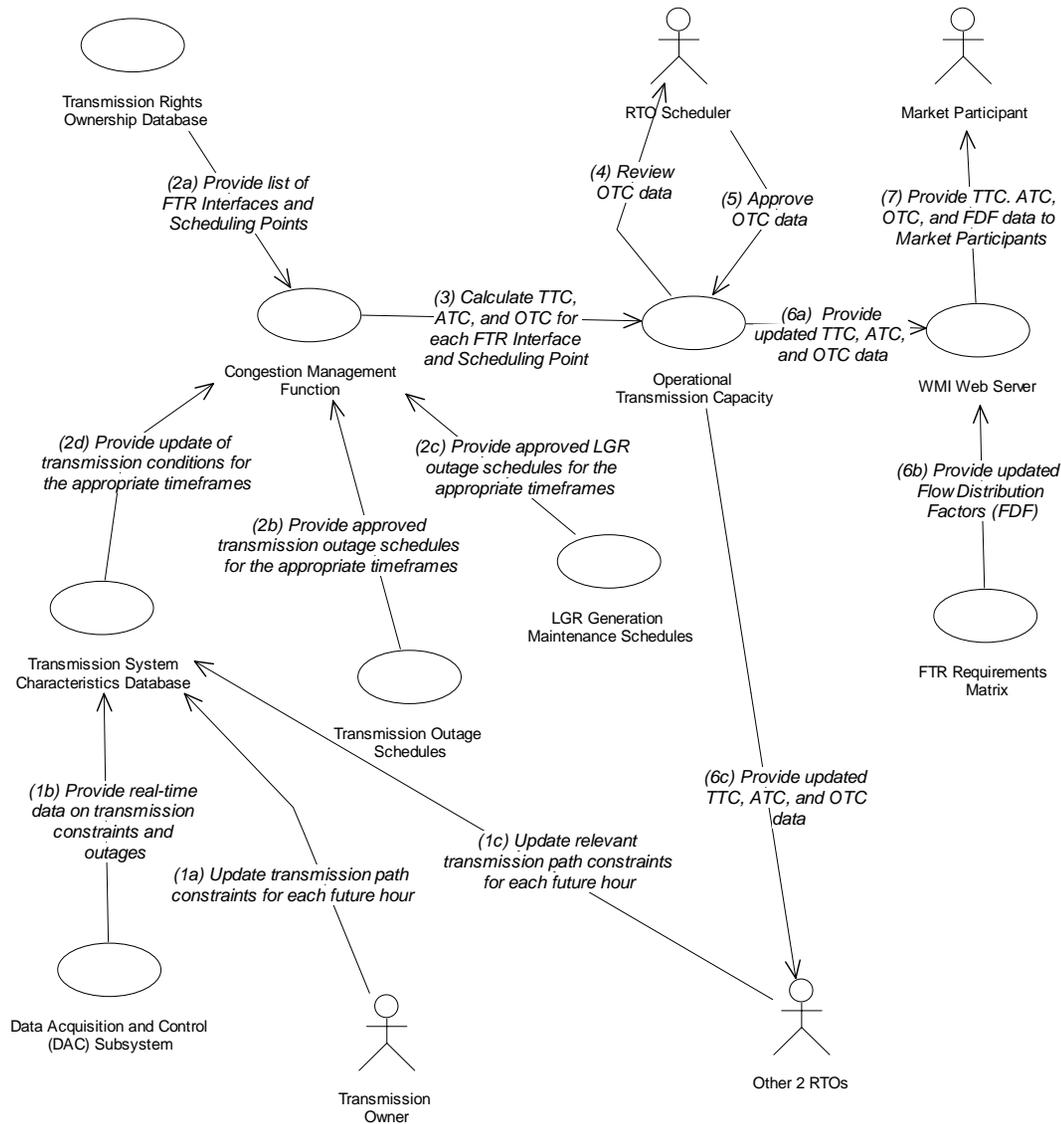
<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

2.3.7 CM – Diagram

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

Annual, Monthly, Daily, and Hourly Congestion Management Process to Determine TTC, ATC, and OTC



2.4 Long Term Auction of Transmission Rights (LTATR)

2.4.1 LTATR – 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>

2.4.2 LTATR – Steps – Normal Sequence

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
									<i>Reference the applicable IECSA Environment containing this data exchange. Only one environment per step.</i>
4.0	As needed	RTOProgrammerEngineerPersonnel	Input schedules	(As needed) Input schedules for legal existing contractual agreements	RTOProgrammerEngineerPersonnel	Existing Transmission Contracts	Transmission contracts		RTOs / Market Participants
4.1	Periodically or at specific time and date	Existing Transmission Contracts	Provide OTC	(1) Provide capacity needed for existing contracts	Existing Transmission Contracts	OperationalTransmissionCapacity	Transmission contracts		RTOs / Market Participants
4.2	After previous step	OperationalTransmissionCapacity	Calculate FTR	(2) Calculate conservative FTR from OTC minus previously auctioned FTRs, minus existing contracts	OperationalTransmissionCapacity	Available FTR	OTC		RTOs / Market Participants
4.3	At specific time and date	TimeLineManager	Trigger posting of FTR	(3) Trigger posting of FTRs	TimeLineManager	Available FTR	Trigger		RTOs / Market Participants
4.4	At specific time and date	Available FTR	Post FTR	(4) Post available FTRs, transmission outage schedules, & generation maintenance schedules	Available FTR	WMI Web Server	FTR		RTOs / Market Participants
4.5a	On-going	SchedulingCoordinator	Enter bids	(5a) Enter bids for FTRs	SchedulingCoordinator	WMI Web Server	Bids for FTR		User Interface

#	Event	Primary Actor	Name of Process/Activity	Description of Process/Activity	Information Producer	Information Receiver	Name of Info Exchanged	Additional Notes	IECSA Environments
4.5b	In parallel to step 5a	Eligible Customers	Enter bids	(5b) Enter bids for FTRs	Eligible Customers	WMI Web Server	Bids for FTR		User Interface
4.6	Before auction time	WMI Web Server	Receive bids	(6) Receive FTR bids during auction	WMI Web Server	FTR Market Clearing Price Auction Function	Bids for FTR		RTOs / Market Participants
4.7	At auction time	TimeLineManager	Trigger auction	(7) Trigger auction function	TimeLineManager	FTR Market Clearing Price Auction Function	Trigger		RTOs / Market Participants
4.8a	After previous step	FTR Market Clearing Price Auction Function	Post FTR winners	(8a) Post winners of FTR auction after auction close	FTR Market Clearing Price Auction Function	WMI Web Server	FTR winners		RTOs / Market Participants
4.8b	In parallel to step 8a	FTR Market Clearing Price Auction Function	Store FTRs	(8b) Store ownership of FTRs	FTR Market Clearing Price Auction Function	TransmissionRightOwnership Database	FTR owners		RTOs / Market Participants
4.9a	After previous step	WMI Web Server	Notify winners	(9a) Notify winners (and losers) of FTR	WMI Web Server	SchedulingCoordinator	FTR winners		User Interface
4.9b	In parallel to step 9a	WMI Web Server	Notify winners	(9b) Notify winners (and losers) of FTR	WMI Web Server	Eligible Customers	FTR winners		User Interface
4.9c	In parallel to step 9a	WMI Web Server	Provide FTR information	(9c) Provide FTR information to RTOs	WMI Web Server	Other 2 RTOs	FTR winners		RTOs / Market Participants

2.4.3 LTATR – 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

2.4.4 LTATR – 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>

2.4.5 LTATR – 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. Double click on the embedded excel file – record the changes and save the excel file (this updates the embedded attachment).

2.4.6 LTATR – Current Implementation Status

Describe briefly the current implementation status of the function and/or parts of it, referring to Steps above

Identify the key existing products, standards and technologies

<i>Product/Standard/Technology</i> Eg. DNP 3	<i>Ref - Usage</i> 2.1.2.1[1] - Exchange of SCADA information

Current Implementations:

<i>Relative maturity of function across industry:</i>	<i>Ref - Status Discussion</i>
Very mature and widely implemented	
Moderately mature	
Fairly new	Fairly new
Future, no systems, no interactions	

<i>Existence of legacy systems involved in function:</i>	<i>Ref - Status Discussion</i>
Many legacy systems	
Some legacy systems	

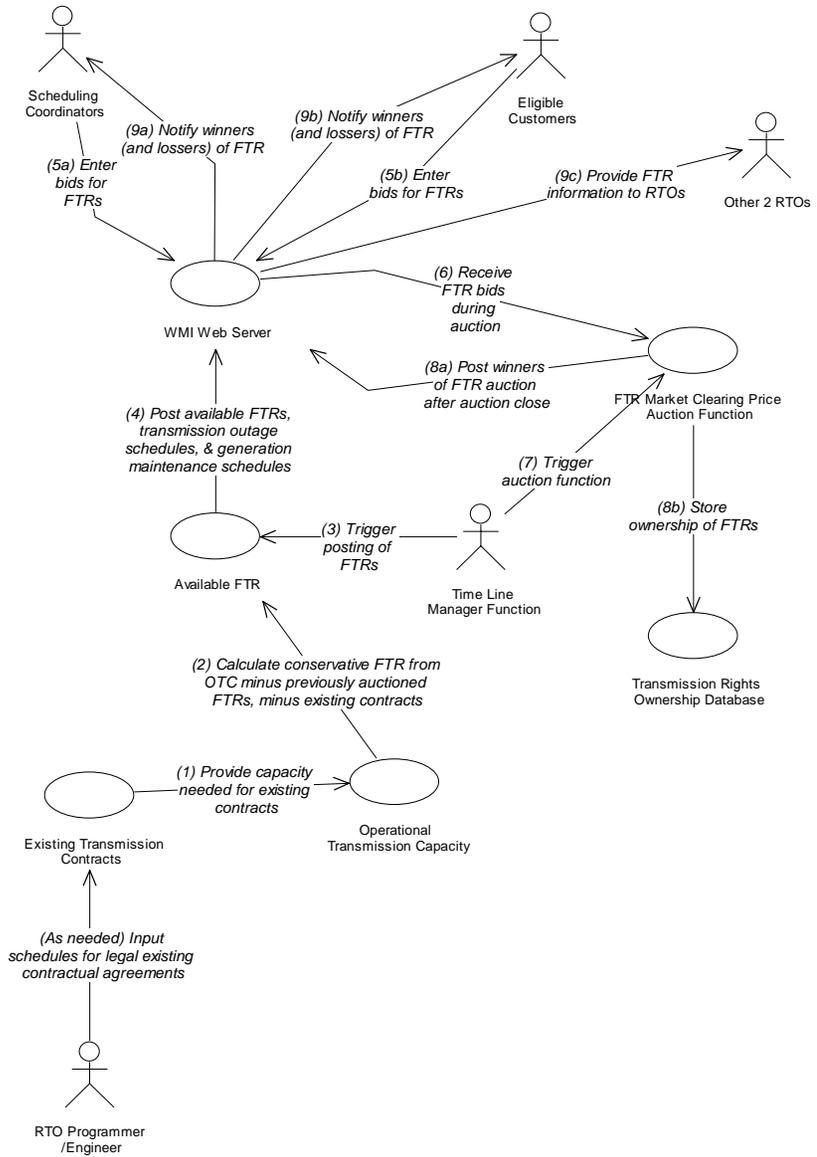
Few legacy systems	Very few legacy systems
No legacy systems	
Extensive changes will be needed for full functionality	
Moderate changes will be needed	
Few changes will be needed	
No changes will be needed	

<i>Implementation Concerns</i>	<i>Ref - Status Discussion</i>
Data availability and accuracy	
Known and unknown market pressures	Could have market pressures changing functionality
Known and unknown technology opportunities	
Validation of capabilities of function	
Cost vs. benefit	

2.4.7 LTATR – Diagram

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

Annual, Monthly, and 2-day Ahead Auctioning of FTRs Processes



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.	February 27, 2004	Frances Cleveland	