Use Case Task 1-4: Load Forecast Data between EMS & Planning

1 Summary:

Export Load Forecast data from the EMS or another application for use by the planning application(s). This would allow correct conversion between the models used by operations and transmission planning as well as generation planning.

2 Actor(s):

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

Actor Name	Actor Type (person, system, device, etc.)	Role description for this use case
Network Planning Engineer	Person	Develop a base planning model to examine an operations event or to establish a new planning base case for future planning.
EMS Operator	Person	Attends the EMS and is familiar with its capabilities to export network models
EMS System	System	System for monitoring/controlling the real-time system and includes a bus-breaker network operations model for real-time network calculations and includes switches/breakers in the model (bus-breaker model). Includes a State Estimator and usually a load flow solution package.
External System	System	System or database that contains information on load forecast data between EMS and Planning, mapping of equipment ID if they are different in EMS and Planning. Additionally, it will store load description information used to build the load model.
Planning Software	System	Software for detailed study of network performance, usually representing a larger geographical territory than the network model in the EMS. Generally based on a bus-branch model (no switches/breakers). Planning software includes power flow, short-circuit, dynamics, etc.
CIM XML	Method	A protocol defined by a NERC profile that establishes the content, naming, relationships, etc. of network data and the file format for a file exchange from one EMS to another such that sufficient data is exchanged to perform a similar load flow solution on the receiving EMS system
Model Converter & Topology Processor	Analysis	A software analysis used to remove switches/breakers from an operations model (bus-breaker model) to a planning model (bus-branch model). Uses the switch positions (open/closed) in the operations model to connect/disconnect equipment terminals together in the planning model. Load equivalents and network extension with a reference to a dictionary (the external system). The bus-breaker model can be developed from base EMS data or from an actual operations mode.
Base Case	Network planning model from which network alternatives are studied	A data set that represents the network at a specific point in time either as a past point in time or a significant point in time in the future (e.g. 2008 Summer heavy case). The Network Planning Engineer builds alternatives on this case for transmission expansion scenarios or “what-ifs” if the case is a case representing a historical operating point.

3 Assumptions / Design Considerations:

Load Modeling is based the understanding that the EMS model and Planning model may differ on their level of detail and time period of the forecasted load. The EMS or planning model may contain details down to the distribution network or use an "equivalent" load at a higher voltage level to represent the distribuition load. The Planning model may identify multiple owner loads at a single bus.

The source of the load forecast data may be different for the EMS model and the Planning model. Load forecasts may originate from off-line forecasting tools such as EPRI's AANNSTLF program, internal company load serving groups or external load serving entities within a companies area.

4 Pre-conditions:

There must be a concensus on what time period or system snapshot the actual load is to represent. Also, since voltage dependency of loads is represented by a mixture of constant impedance, constant current and constant power components, the type of load model must be known.

5 Normal Sequence:

Use Case Step	Event/ Input to this step	Actor activity and tools used	Description Of Processing	Information Producer	Information Receiver	Output Information to be Exchanged	Notes or Comments
#	*Event that triggers this step and/or inputs*	*Name of actor(s), activity description, and tools/ applications used*	*Describe the processing that takes place in this step.*	*Actors/tools responsible for producing information.*	*Actors responsible for receiving information*	*Description of information produced in this step to be exchanged with Information Receiver*	
1	Request from planning for an EMS model	Network Planning Engineer notifies target EMS system or external system of the need for an EMS model.	Network Planning Engineer specifies what model is being used and/or corresponding load level	EMS system	A file	The file is a CIM XML file	File consists of a network model with a particular timestamp, as specified by planning engineer
2	CIM XML file	Network Planning Engineer - Data model converter	Extends network model using load equivalents and load type identifiers	Manually by the Network Planning Engineer or automatic using a software application related to a topology processor	Network Planning Engineer	A model suitable for use in the target planning model	
3	An EMS model matching the planning	Network Planning Engineer	Open EMS model in the planning application	Network Planning Engineer	Planning Application	Network Study of EMS model and/or use EMS model as	**Process Complete**

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	model					starting point for future base case.	

6 Exceptions / Alternate Sequences:

Describe any alternative actions that may be required that deviate from the normal course of activities. Should the alternate sequence require detailed descriptions, consider creating a new Use Case.

None

7 Post Conditions

Describe conditions that must exist at the conclusion of the use case.

8 Activity Diagrams

Typically an activity diagram with swim lanes for each participating system or actor to graphically describe the step-by-step interactions between actors/systems and the messages exchanged between them. Additionally, sequence diagrams may be developed to help describe complex event flows.

9 References:

Use Cases referenced by this use case, or other documentation that clarifies the requirements or activities described. Also any prior work (intellectual property of companies or individuals) used in the preparation of this use case.

10 Issues:

List of outstanding issues that must be addressed to complete the use case.

ID	Description	Status
1	A set of rules required in the load model	Not started

11 Revision History:

No	Date	Author	Description
0	02/5/07	JUseldinger	Initial version

12 Use Case Diagram