

## Use Case Task 1-?: Convert Low Side Load Rollover from EMS application to Multi-Section Line Model used by the Planning application(s)

### 1 Summary:

Convert the contingency low side load rollover used in the EMS application(s) to the contingency load rollover used in the planning application(s). This would allow coordination between the contingencies 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 as well as a contingency analysis engine that uses either automatic or user-specified contingencies to check system security
External System	System	System or database that contains information on contingency conditions studied in the operations, generation planning, and/or transmission planning activities.
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
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. 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 Low Side Load Rollover: Operations vs Planning

Load rollover is implemented differently between the operational and planning model(s). The operational model includes the tap from the transmission line to the substation, the substation transformer(s), and the distribution feeders connected to the low side of the transformer(s). The planning model does not model the tap section to the substation, it does not model the substation transformer(s), and it combines the individual feeder loads into the load served by each transformer and connects these loads at the transmission level by adding the transformer losses to the total load fed by each transformer. Modelling this correctly in the planning cases is important since several hundred megawatts will roll under some contingencies.

### 4 Pre-conditions:

Contingency low side load rollover exists in the EMS and planning model(s). EMS low side load rollover contingencies will need to be converted to work in the planning application(s).

### 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
#	<i>Event that triggers this step and/or inputs</i>	<i>Name of actor(s), activity description, and tools/ applications used</i>	<i>Describe the processing that takes place in this step.</i>	<i>Actors/tools responsible for producing information.</i>	<i>Actors responsible for receiving information</i>	<i>Description of information produced in this step to be exchanged with Information Receiver</i>	
1	Request from planning for one or more contingency definitions	Network Planning Engineer notifies target EMS system or External System of the need for a contingency list.	Network Planning Engineer specifies what model is being used and/or what contingency data is needed – base data, future planning model, past model, etc.	EMS system or External System	A file	The file is a CIM XML file	File consists of some relationship to the model to which the contingencies apply and a list of contingencies
2	CIM XML file	Network Planning Engineer - Data model translator	Contingencies may be specified in reference to a different type of model (eg. Bus-breaker operations model) versus the bus-branch planning model. This processing	Manually by the Network Planning Engineer or automatic using a software application related to a topology processor	Network Planning Engineer	A list of contingencies suitable for use in the target planning model	

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
#	<i>Event that triggers this step and/or inputs</i>	<i>Name of actor(s), activity description, and tools/ applications used</i>	<i>Describe the processing that takes place in this step.</i>	<i>Actors/tools responsible for producing information.</i>	<i>Actors responsible for receiving information</i>	<i>Description of information produced in this step to be exchanged with Information Receiver</i>	
			would convert the contingencies to terms of the bus-branch model				
3	List of contingencies matching the planning model	Network Planning Engineer	Enter contingency specifications into the planning application	Network Planning Engineer	Planning Application	Network Study under contingency conditions	<b>Process Complete</b>

## 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.*

List of contingencies for use in planning studies.

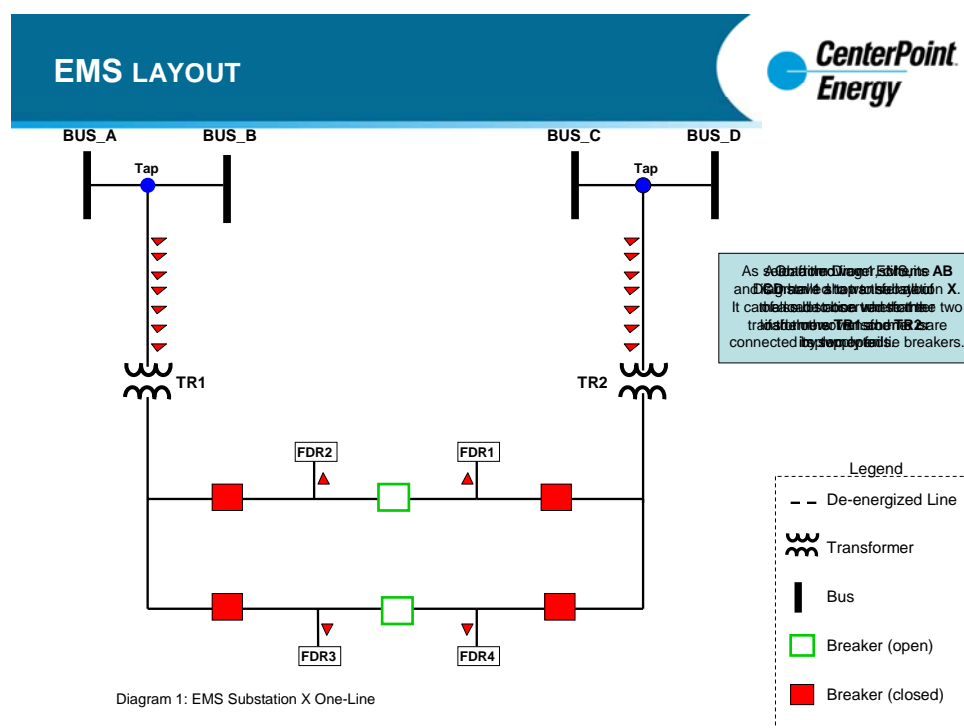
## 8 Activity Diagrams

*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.*

**Double Click** on presentation below for details on load rollover in EMS and Planning.



**10 Issues:**

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

ID	Description	Status

## 11 Revision History:

[illegible]

## 12 Use Case Diagram

