

Use Case 1: Export Powerflow from Planning to Planning

1 Summary:

Export a solved powerflow case from one planning software program to another planning software program to transfer a planning base case for additional study by another party. This use case is for exchange of powerflow data only. Additional use cases must be prepared for exchange of short circuit and dynamic data.

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
Planning Engineer – Exporter	Person	Uses the Planning Software – Exporter to establish a solved powerflow case and export that case in a format that can be imported by the Importing Software
Planning Engineer – Importer	Person	Uses the Planning Software – Importer to import a solved powerflow case provided by the Planning Engineer – Exporter, and to perform further study operations on this case.
Planning Software – Exporter	System	Software for executing studies on powerflow data. This software exports a solved case in a format that can be read in by the Planning Software – Importer. (In general, Planning Software should operate as both Importer and Exporter as the situation demands). Generally based on a bus-branch model (no switches/breakers). Planning software includes powerflow, short-circuit, dynamics, etc. Planning Software – Exporter and Planning Software – Importer may be the same application.
Planning Software – Importer	System	The counterpart to Planning Software – Exporter, which reads in the powerflow data and uses this to perform further studies on the data.
CIM for Planning XML	Method	A protocol that establishes the content, naming, relationships, etc. of network data and the file format for a file exchange from one Planning Software to another such that sufficient data is exchanged to perform a similar powerflow solution on the Planning Software – Importer
Case	Network planning model	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). This Case may be a Base Case or a derivative of a Base Case. A Case should also include Solution Parameters. The Reference Case is a Case in a data format that can be read in by the Planning Software – Exporter.
Solution Parameters	Supplemental Data	Solution Parameters describe the options that were used in the Planning Software – Exporter to arrive at a solved powerflow case. These include, for example, solution technique, convergence tolerance, whether or not taps were enabled, etc. This information, when used by the Planning Software – Importer, increases the likelihood that the Planning Software – Importer will also be able to solve the powerflow.

3 Assumptions / Design Considerations:

Cases may be transferred from one Planning Software to another either within one organization, or between two separate organizations (i.e. RTO – utility). Because various Planning Software applications have different and proprietary methods for interpreting, cleaning and handling data, it is assumed that the powerflow solutions arrived at by different Planning Software tools will be similar but not identical to one another.

Solving a powerflow with two different sets of Solution Parameters may result in two different solutions, especially when comparing one case where automatic controls (i.e. tap switching) was enabled –vs- a solution with automatic controls disabled.

4 Pre-conditions:

The Reference Case exists and may be read into the the Planning Software – Exporter. Also, an adequate powerflow solution has been found for the Reference Case in that software.

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 Engineer - Importer	Planning Engineer – Importer Planning Engineer – Exporter Planning Software – Exporter	Planning Engineer – Importer must specify the type of case needed for their purposes and, if it is for a specified time, the time of the model needed. Should also specify desired file format. Planning Engineer – Exporter should solve the powerflow case and export the data in the specified format.	Planning Engineer – Exporter Planning Software - Exporter	Planning Engineer – Importer receives a file	The file can be in any number of forms depending on the tools available to the network planning engineer, but it is generally a data file for one of the more popular network planning software packages, or in IEEE format (2A) Alternatively the file can be: CIM for Planning XML file (2B)	Popular planning formats include: PSS TM E PSLF IEEE See alternate Steps 2A – 2B

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>	
2A	Planning data file received in a popular planning software format	Planning Engineer – Importer Planning Software - Importer	Generally a “Read,” “Open,” or “Import” activity in the receiving applications software; or, perhaps a custom data conversion software application	Application software or data conversion software	Planning Engineer - Importer	Case for Planning Engineer use	Process Complete
2B	Planning data file received in CIM for Planning XML	Planning Engineer – Importer Planning Software – Importer	Probably a “Read,” “Open,” or “Import” activity in the receiving applications software; or, perhaps a custom data conversion software application	Application software or converter software	Planning Engineer - Importer	Case for Planning Engineer use	Process Complete

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.

We need to consider whether the data exchange should include specifications for contingency cases, as well.

7 Post Conditions

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

Complete and error-free transfer with minimal effort.

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

11 Revision History:

No	Date	Author	Description
0	12/12/2006	Doug Welsh	Initial version

12 Use Case Diagram

