

# Optimal Network Restoration Strategy

Application: Distribution



This module is designed to study the impact of single forced (e.g. fault on a line) or planned outages on the electrical distribution system. It finds the optimal switching plan to restore electrical power to customers. This module may be used for **off-line** application to pre-define strategies in case of outages or as **on-line** application to help the network operator to find quickly the correct strategy after a fault has occurred.

The following objective functions are implemented:

- Minimize network losses
- Minimize the number of overloaded elements
- Minimize the average loadings of the elements
- Maximize the average voltage

## Restoration Stages

- Four stages in the restoration strategy will be evaluated and may be stored in a fault history database:
  - Occurrence of the fault
  - Isolation of the fault -> NEPLAN shows the unsupplied customers
  - Re-Supply of customers which are affected by the fault -> NEPLAN shows which customer are re-supplied again
  - Normalization of the network after the repair of the fault
- All stages of the selected optimal restoration plan with the new switch positions will be graphically displayed on the single line diagram

## DMS On-Line Application

- Results with the new switch positions of all re-supply stages, including all objective functions are displayed as spreadsheet tables or can be accessed as text file for further evaluation (e.g. in DMS applications)
- All dialogs and restoration algorithms are available through a C++ API, the NPL - NEPLAN Programming Library. With NPL NEPLAN data and functions can be accessed with a user written C++ program. This allows building up customized restoration strategies for network operators.

More information and free DEMO at [www.neplan.ch](http://www.neplan.ch)