



NETPLAN

Module for data manipulation, computational models and analysis of results

The following new data treatments were incorporated into the data manipulation, computational models and results module:

- Data aggregator for importing data in the Anarede format. Automatic mapping of Anarede bus (.PWF) in SDDP using data aggregator (DAGR)
- Option to export NetPlan data to the NPF (NetPlan File) format
- Filters by column were implemented in all screens. The syntax adopted was: <C#>text, where # corresponds to the column number and text corresponds to the search to be performed. If text is placed between "" the search will be exact
- Editing of tabular data: 3-winding transformers, series capacitors, flow controllers, DC buses, DC lines and AC-DC converters
- Included options for the treatment of flow controller information
- Added treatment of data from CSP generators
- Added Portuguese language
- Execution options for the linear execution method were enabled for selection in the PSR-Flow model
- Added the possibility of searching (Ctrl+F) for any element, for its location in the diagram
- Added parallel processing option in OptFlow module
- New OptVar reactive power expansion planning module
 - The Operational Analysis execution options inherit, on the first execution of the model, the execution options of the OptFlow module
 - Included parallel processing option

The corrections and improvements made are listed below:

- An error in the conversion of dates in the SDDP format to the NetPlan format, which occurred for weekly cases, was corrected

- An error in the importation of external databases was corrected, in the specific case that a certain date did not have an associated file
- An error was corrected when trying to open the files outpdec.csv/datprjc.csv case they were already open by Excel
- Error was corrected updating the information in the binary files when there is substitution of existing/planned agents by candidate agents that come into operation
- An error was corrected in the CC circuit editing screen when it was selected in the diagram
- The error in the load data import process, in the load editing screen, was corrected
- The electrical area filter was activated in the screen for editing monitored/contingency circuits

Module for transmission expansion planning (OptNet)

The following new developments were incorporated into the transmission expansion planning module:

- New execution option that allows direct redundancy analysis of a previously determined expansion plan
- Refactoring of the optimization module, leading to a reduction in the total time to solve the expansion problem
- Representation of CSP type generators

The corrections and improvements made are listed below:

- Validation of the status of the files in Excel format. It is verified that each of them is closed before starting to run the model
- Addition of project data reports within the convergence log
- Activation of the bus load shed output to enable visualization of the amount of load shedding, without penalization
- Identification of electrification outputs and flow controller for visualization of results in the network diagram
- Correction in the initialization of the binary file for phase shifter

Module for reactive power expansion planning (OptVar)

Addition of the reactive power expansion planning module, with the following characteristics and functionalities:

- Integration with the Optimal Power Flow module OptFlow
- Possibility to choose between two solution algorithms
 - *Direct Method*, which determines the convex hull of a solution set of shunt investments per year of expansion (included in the OptFlow module up to NetPlan 4.2 version)

- *Progressive Hedging* algorithm, whose purpose is to reduce the set of solutions by applying an iterative process of minimum deviation from the average solution for each candidate shunt
- Inclusion of execution options specific to the *Progressive Hedging* algorithm and also to the optimal power flow module OptFlow, which is called during the iterative process
- Production of specific reports and binary outputs for analysis

Module for optimal power flow analysis (OptFlow)

The following new developments were incorporated to the optimum power flow module:

- Direct integration with the OptVar module
- Parallelization of the solution process, both in its individual execution and in its integration with the OptVar module
- Representation of CSP type generators

The corrections and improvements made are listed below:

- Validation of the status of the writing files in Excel format. It is verified that each of them is effectively closed before starting to run the model
- Addition of project data reports in the printout of the convergence log
- Identification of electrification outputs and flow controller for visualization of results in the network diagram