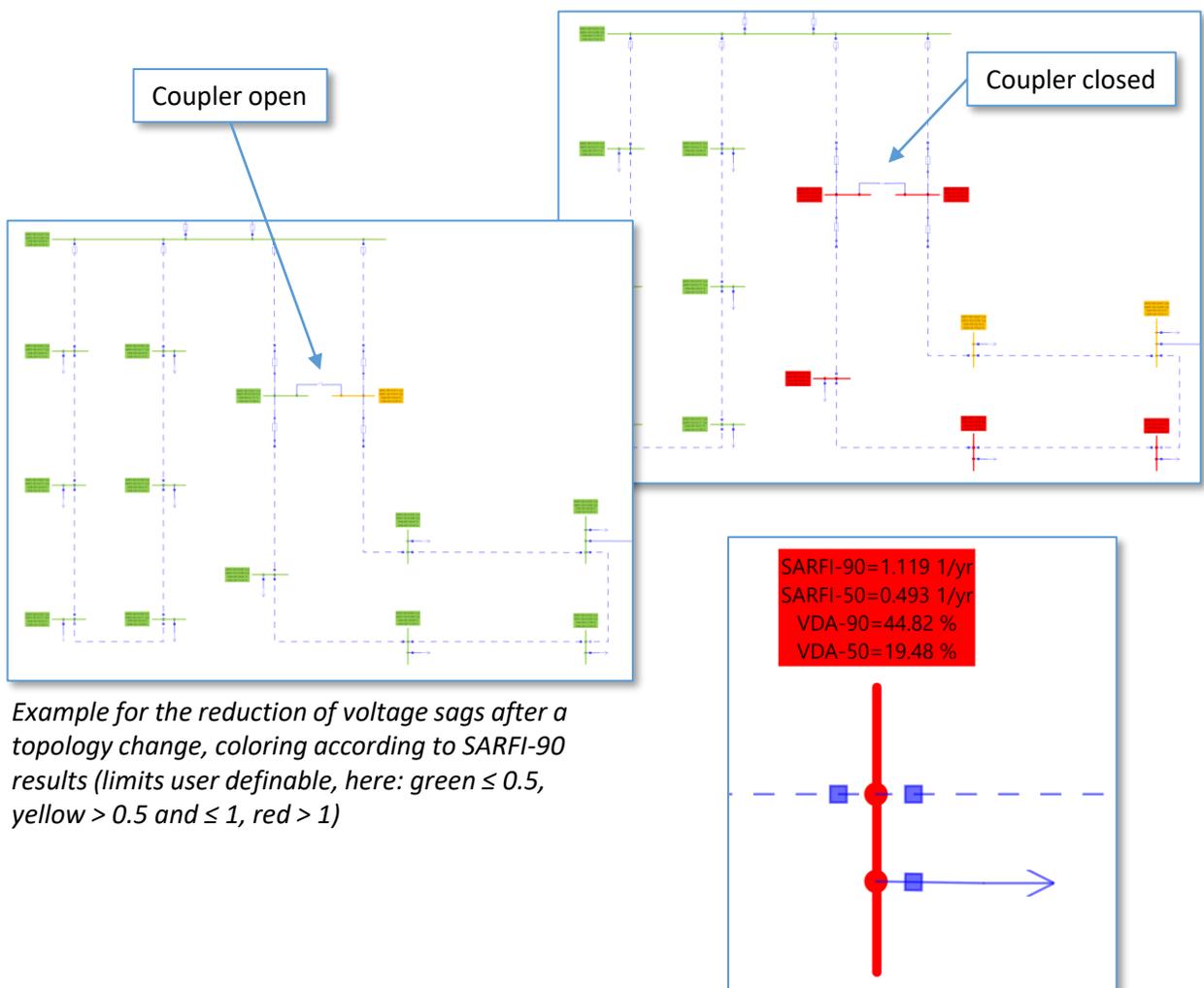


Voltage Sag Analysis

The module Voltage Sag Analysis calculates the frequency of critical voltage sags (voltage dips) due to short circuits in the network. Faults are simulated at numerous points of the network, calculating the remaining (retained) voltage of all busbars. This method is known as the method of fault positions.

SARFI-X and VDA

The results SARFI-90, SARFI-70, SARFI-50 and SARFI-10 are calculated for each node. The SARFI-X values are defined by the *IEEE Std 1564-2014 IEEE Guide for Voltage Sag Indices*. They indicate how often the voltage falls below a certain limit (X). The unit of SARFI-X is 1/yr. E.g. SARFI-50 indicates how often the voltage falls below 50% of the nominal voltage per year. For each index SARFI-X, the associated value VDA (Voltage Dip Amplitude) is also calculated. VDA is the expected value of the residual voltage during the short circuit and is given as a percentage of the nominal voltage.



Example for the reduction of voltage sags after a topology change, coloring according to SARFI-90 results (limits user definable, here: green ≤ 0.5 , yellow > 0.5 and ≤ 1 , red > 1)

Features

- Failure rates of the network elements can be defined in a simplified way in the calculation parameters or in detail for the individual network elements (see also the reliability calculation module)
- Definition of the circuit breakers graphically or by standard settings
- Fault types: 3-phase faults, 2-phase to ground faults, 2-phase faults, 1-phase to ground faults
- Percentages of the different fault types can be set
- Faults on lines can be defined using the number of faults per line or using the fault location distance (e.g. 200 m)