

CYME

Power Engineering Software and Solutions

Optimal Recloser Placement

Improve network reliability by placing reclosers at optimal location

One of the major concerns for distribution planning is to achieve and improve system reliability while meeting different constraints. A common practice is to install reclosers. Engineers can use reliability indices to decide where to install the additional protective devices, but such evaluation may not yield the most beneficial outcome. The Optimal Recloser Placement Analysis module offers a comprehensive assessment and proposes solutions that correspond to your criteria.

Improving reliability – a challenging decision

System reliability is an integral part of distribution system planning and operation. Growing energy demands, aging infrastructure and network expansion are among the factors that influence system reliability.

Outages cannot be prevented, and the amount of failures has a direct impact on end-customer satisfaction and the cost of electricity. Hence, it is imperative to maintain a good level of network stability.

A popular reliability improvement strategy involves the addition of protective devices, particularly the addition of reclosers. With proper analytical tools, engineers can obtain reliability indices that would give them an idea of the locations at which an improvement is needed.

However, engineers are often bounded by limited capital spending. It then becomes important to make sure the investment yields the most beneficial return. Placing the reclosers at optimal locations is considered a challenging and yet a vital decision in distribution planning.

Optimal Recloser Placement

The Optimal Recloser Placement analysis module was designed to help engineers handle the complexity of the system reliability improvement issue.

The analysis is built upon the robust CYME Reliability Assessment module (required). It takes into account different objectives and criteria, studies the reliability indices, evaluates the expected improvement and finds the best solution.

EATON

Powering Business Worldwide

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Comprehensive Analysis

The Optimal Recloser Placement analysis offers a weighted-objective optimization technique which improves:

- SAIDI (System Average Interruption Duration Index)
- SAIFI (System Average Interruption Frequency Index)
- User-defined criteria based on CYME keyword expressions

The analysis also provides two optimization methods:

- Sequential Search
- Iterative Search

Features

The analysis is designed to take into consideration a wide-range of user-defined criteria:

- Define the number of reclosers
- Specify a searching distance for the possibility of adding a recloser
- Evaluate locations downstream to feeders, specific sections or specific nodes
- Choose the recloser to be used from the equipment library
- Choose operation mode and define reclose settings
- Include user-defined constraints (ex: loading limits, distance between reclosers, etc.)
- Ignore specific locations

Meaningful Results

As all other CYME analyses, the Optimal Recloser Placement analysis generates results in report formats.

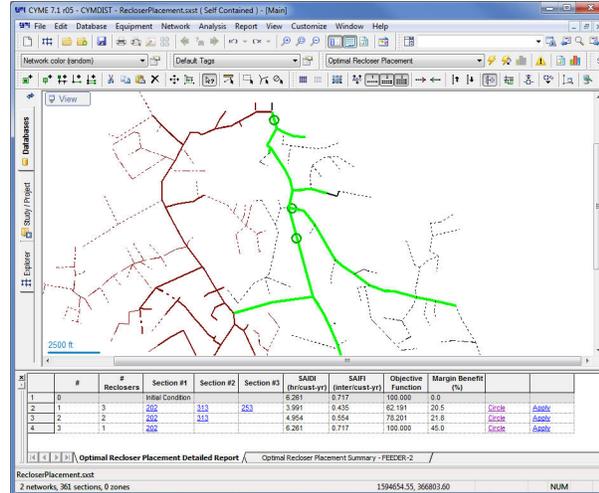
Reports include:

- Summary report which summarizes the reliability indices of the initial network compared to the optimal solution network
- Detailed report which gives details on each recloser to be added
- Reliability assessment reports

Options are also available to customize these reports.

Another mean to help users visualize the results is their display on the one-line diagram.

Users can choose to highlight the evaluated sections via color-coding. Suggested reclosers can be applied to the network via buttons in the report.



Optimal Recloser Placement Summary - FEEDER-2

Optimal Recloser Placement Summary Network: FEEDER-2

Study Parameters	
Study Name	RecloserPlacement.sxst
Date	Mon Dec 22 2014
Time	13h32m35s
Project Name	New
Search Method	Sequential Search
Improve SAIDI	Yes
Improve SAIFI	Yes
Improve Keyword Expression	No
Ignore Existing Reclosers	Yes

Optimal Solution	
Section #1	202
Section #2	313
Section #3	253

Keyword	Initial	Final	
SAIFI	0.71705	0.43476	(inter/cust-yr)
SAIDI	6.26537	0.35599	(hr/cust-yr)
SAIDI	6.26110	3.99149	(hr/cust-yr)
Csdi	8.73132	9.18048	(hr/cust-inter)

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