CYME
Power Engineering Software and Solutions

Predictive and Historical Reliability Assessment

Assess the reliability of electric distribution networks

The Predictive and Historical Reliability Assessment module of the CYME power engineering software computes reliability indices for the overall system and their corresponding protection zones, as well as customer point indices. The predictive model can be calibrated based on historical data. The module is fully integrated in the CYME software and provides a high degree of flexibility for analyzing distribution system configurations.

This add-on module is designed to aid distribution engineers in assessing the reliability of electric distribution networks. The program computes a set of predictive reliability indices for the overall system and their corresponding protection zones such as MAIFI, SAIFI, SAIDI, CAIDI, ASAI, ENS (Energy Not Supplied), AENS and LEI. It also computes customer point indices such as the frequency of interruption, the duration, etc., for each customer. The module can calibrate the predictive model based on historical data. This functionality is very handy to adjust the failure rates and repair time for the overhead lines and cables in order to match the simulated model with historical indices.

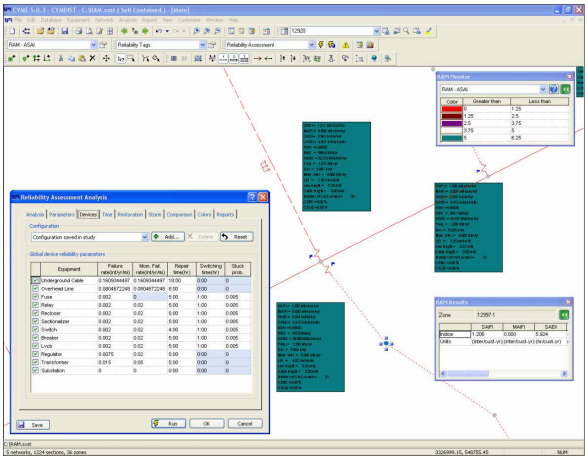
With it you can also display all historical failure data on the diagram and color code it based on the number of outages, the causes, the type of failures, etc.

Reliability System Data

In addition to the equipment data already modeled in the CYME software (ratings, impedances), the outage data for the different components are to be specified as follows:

- Failure rate (sustained and momentary)
- Repair time
- Switching / isolation time
- Stuck probability (on protective and switching devices)

The outage data can be computed and calibrated (adjusted) using historical data and can be furthermore modified graphically in various ways to reflect (for example) the impact of a tree trimming campaign by defining environmental factors that affect failure rates, and repair times at specific locations.



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Calculation of the Reliability Indices

Using either historical data or user-defined failure data the program can compute the different system and load point indices taking into consideration the re-closing scheme (fuse saving or fuse clearing) and the re-closer settings (single-phase trip, three-phase trip, individual phase lock-out, all phases lock-out, etc.).

Restoration may be enabled by using the pre-contingency load flow. The automation of some switching devices will impact the restoration time.

Indices are automatically calculated at the feeder level, zone level (start of a protected zone) and customer level.

The network one line diagram can be color coded based on any of the computed indices as a reference.

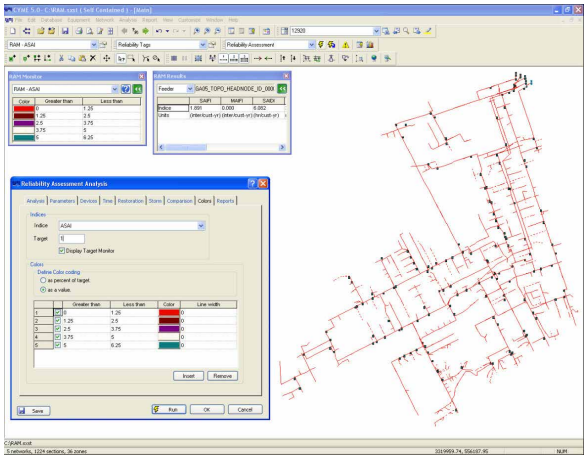
This allows the visual identification of areas where the number of interruptions or the outage time exceeds the predefined standard limits.

It also features a mode to compare the results of two studies and present the differences graphically. This allows the user to evaluate the improvement in reliability due to the installation or relocation of equipment, effect of tree trimming, etc. as compared to the base case.

What-If Scenarios

The module provides a high degree of flexibility for analyzing various distribution system configurations ("what-if" scenarios). The effects of network modifications can be analyzed to measure the improvement in reliability indices. The reports include numerous graphics showing the reliability indices by color as well as customizable tabular reports.

Reliability assessment has become more important for utility planners in recent years. Improved service reliability might be motivated by government regulation or by market competition, but providing superior service at an attractive price is in the interest of both the utility and the customer.



Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

CYME International T&D
1485 Roberval, Suite 104
St.Bruno, QC, Canada J3V 3P8
P: 450.461.3655 F: 450.461.0966
P: 800.361.3627 (Canada/USA)
CymeInfo@eaton.com
www.eaton.com/cyme

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