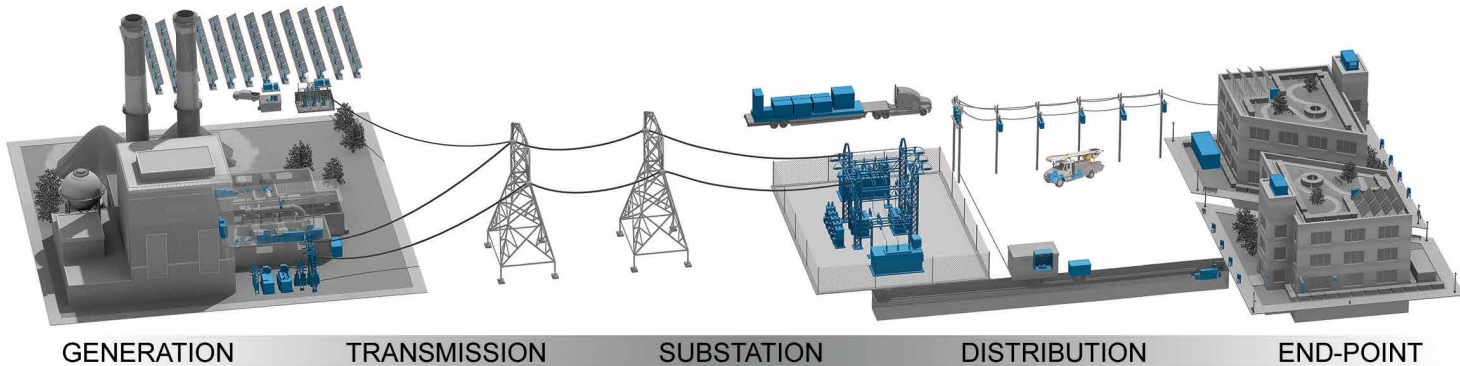


# CYME 8.0 New Features



## Power engineering analyses in sync with today's challenges and technologies

Eaton's CYME is proud to introduce the CYME 8 Series, which will invest in DER-related tools, look at emerging trends and continue to focus on network planning and operation topics. The CYME 8.0 introductory version brings forth a powerful framework which connects simplicity with efficiency, and features engineering analyses to address today's challenges.

CYME 8.0 leverages the expertise of our extensive customer base and the know-how of our team to bring forth features and analytical capabilities based on users' needs and trends of the industry.

Key features which help you tackle power system studies with ease include:

- Integration Capacity Analysis
- DER Impact Evaluation
- Techno-Economic Analysis
- Network Disturbance Assessment D-A-CH-CZ

Numerous enhancements have been brought to the Protective Device Analysis module and Arc Flash Hazards Assessment module. Analyses such as load flow, fault analyses, harmonics, dynamic motor start and transient stability also features several new functions. The Scripting Tool with Python® has been enhanced with new functionalities for further extend the capability of Python scripts.

CYME's equipment model, such as regulators and cables, continue to be improved to emulate the device's behavior as accurately as possible.

As it is important to maintain continuity between series, it is also essential to progress with today's technologies to allow greater user-friendliness which translates into a gain in productivity for CYME users. CYME 8.0 is equipped with a brand new user interface and with several enhancements to the controls and functions available via the Explorer Bar.

The combination of new analyses, user-driven functionalities and improvements makes CYME 8.0 an essential tool for all your power engineering studies.



*Powering Business Worldwide*

## Integration Capacity Analysis

The Integration Capacity Analysis addresses distributed energy resources (DER) and load interconnection issues by determining the maximum allowable capacity that can be added at any point of the network without violating a set of constraints. This new module allows to quickly assess the hosting capacity of the network and filter out interconnection requests that are non-compliant.

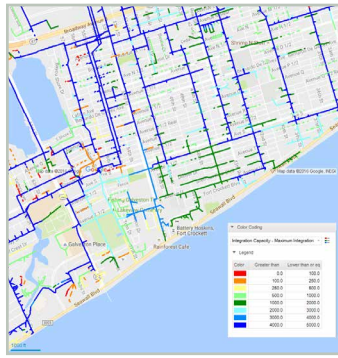
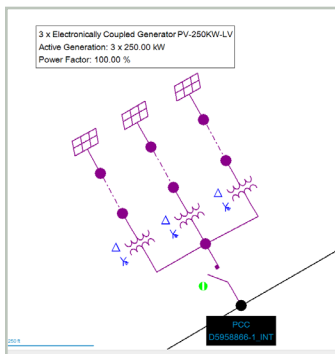
Features:

- Parameters such as maximum installation capacity, peak and minimum load conditions.
- Integration constraints from the California DRP Ruling of May 2016, such as thermal loading, reverse flow, abnormal voltages, voltage variations, protection reduction of reach and sympathetic tripping.

## DER Impact Evaluation

The DER Impact Evaluation module can assist engineers in their generation interconnection system impact studies. The analysis automates a series of time-consuming, repetitive and error-prone verifications and returns insightful results that clearly identify violations.

- Multiple loading conditions.
- Single or multiple DER installations, with the minimum and maximum DER contribution defined by the user.
- Steady-state voltage, voltage variations, thermal loading, reverse power flow on the network due to DER installations are monitored.
- Generation and power factor ramping.
- Voltage variation analysis
- Flicker analysis
- Harmonic analysis
- Take into account different types of installations such as motors, generators, DERs and loads.
- Use constraints as per the D-A-CH-CZ™ standard or user-defined.
- Display flicker limit-emission curve and harmonic load contribution curve.



## Network Disturbance Assessment D-A-CH-CZ

Based on the standard "Technical Rules for the Assessment of Network Disturbance" published by a German-Austrian-Swiss-Czech working group, the Network Disturbance Assessment D-A-CH-CZ module evaluates the power quality disturbances produced by an equipment on a power source's signal by determining if the equipment passes three different power quality tests as follows:

- Voltage variation analysis
- Flicker analysis
- Harmonic analysis

The module has the following capabilities:

- Take into account different types of installations such as motors, generators, DERs and loads.
- Use constraints as per the D-A-CH-CZ™ standard or user-defined.
- Display flicker limit-emission curve and harmonic load contribution curve.

## Techno-Economic Analysis

The Techno-Economic Analysis module helps electric utilities invest into their infrastructure by analyzing the technical impacts of modifications made to the network, and the cost they entail. To assist in the determination of the feasibility and the profitability of a project, this new module shows technical and economic data resulting from network modifications such as:

The module features:

- Cost associated to each network modification.
- Economic parameters such as asset cost, operation and maintenance cost.
- Technical and economic data output such as loss reduction, reliability improvement, net cash flow and capital budgeting.
- Budget management on multi-year time frame when used in conjunction with the CYME Advanced Project Manager module.

## Protective Device Analysis

The Protective Device Analysis module has been enhanced with new functionalities to further its user-friendliness and capabilities.

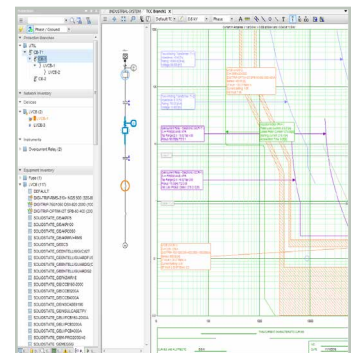
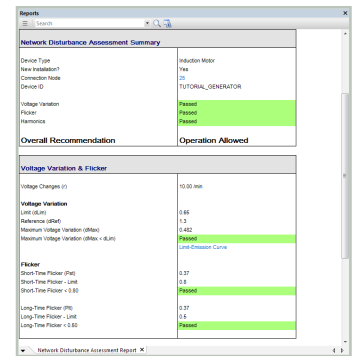
New Explorer Bar control for protective device coordination:

- Lists all protective branches in a comprehensive tree view.
- Provides an easy access to commands such as display curves and branch device coordination.

Additional enhancements include:

- The TCC Views can be saved within a study or a self-contained study file.
- A TCC Action Bar is displayed in TCC Views.
- A simplified coordination report containing only the devices of the selected branch for a branch device coordination.
- The coordination of parallel branches connected to a bus instead of assuming radial coordination is supported.
- The time current curves of synchronous machine short-time thermal capability, short-circuit decrement and rated full load current are supported.

- The motor starting time current curve can be displayed taking into account the data points as calculated by the actual motor starting method of the motor.
- The protection level and protection zone color-coding layers have been added Motor starting curves have been added to take into account the variation of the starting current over time. It is possible to enter a user-defined curve, or to export the curve from the Dynamic Motor Start analysis module. TCC settings for motors include the Starting Current and the Inrush Multiplier.



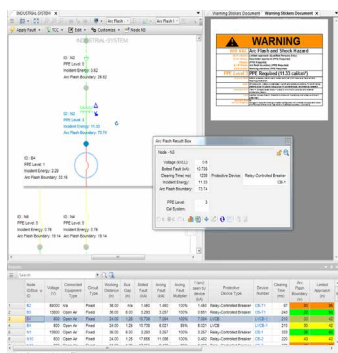
## Arc Flash Hazards Assessment

The Arc Flash Hazard Analysis module has been enhanced with new calculation methods while existing methods have been updated, as follows:

- IEEE 1584™ 2011 is now supported.
- The default clothing guide reflects the PPE recommended by the NFPA-70E© 2015 standard.
- New calculation method based on the Wilkins method is now available. The Lee method is now available for both Industrial and Distribution Analyses.
- A new method based on the 2013 OSHA tables has been added to calculate the cal system.
- The Minimum Approach Distance values have been updated according to the 2012 edition of the NESC© Standard.

Other enhancements include:

- The Multiple Contributions option calculates the total incident energy from different contributing energy sources connected to the analyzed node.
- A Backup Protection option allows selecting the fastest protective device according to the time-current curves of the devices available at a given simulation.
- The duration of the contributions from induction machines and inverter-based DGs can be specified.
- Additional calculations with LG current for methods in the industrial system analyses can be performed.
- New Arc Flash result box.
- New reports: Summary by Protective Device and a Summary by Network report.



## Load Flow Analysis

- Improvement to the performance of the Newton-Raphson-Unbalanced method.

## Fault Analysis

- Simultaneous Fault – A new diagram is available when creating an inter-circuit fault to illustrate the interconnection diagram with the respective fault type for each circuit to be simulated.
- Device monitoring in ANSI and IEC 60909© Short-Circuit analyses for first ring and remote contributions when faulting all buses and nodes is supported.
- ANSI test X/R ratios for low voltage protective devices are included the database library and are factored in the analysis for the calculation of the short circuit duty multiplying factors of those devices.
- Conventional short-circuit analysis device rating Report for the interrupting duty sizing of protective devices such as breakers and fuses has been added.
- Equipment Rating Verification – The summary report has been enhanced to include all monitored devices and to color-code each one based on its pass or fail status. A Bus Rating report detailing overloads and short-circuit rating has also been added.

## Harmonic Analysis

- Now supports the 2014 version of the IEEE© standard for Voltage Distortion Limits and Current Distortion Limits.

## Dynamic Motor Starting

- The acceleration torque calculated after running a Dynamic Motor Start analysis can be monitored and plotted.
- The motor starting time current curve data sets can be updated with the results of any starting assistance method supported in the analysis.

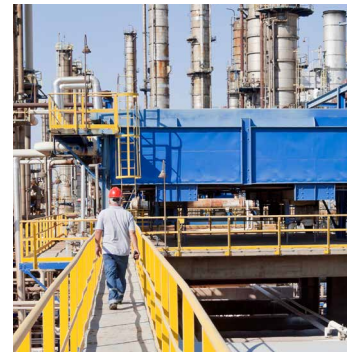
## Transient Stability Analysis

- A new feature has been added to report over-frequency, under-frequency and voltage dips.
- A new Alerts Report section, with alerts on synchronous generators and on system buses, is added to flag violations to any particular operating standards.

## Scripting Tool with Python®

The Python Scripting tool has been enhanced with new functionalities to further extend Python scripts capability to meet your analytical needs.

- An integrated help has been included in the CYME Python Editor for access to a full documentation page on all the objects/functions of the CYME Python interface in a single click. The Auto-Save functionality has been introduced in the Python Editor to avoid losing data.
- The CymPy library now provides complete access to the charts generated by any simulation in the CYME software.
- Customized charts can be created through the CymPy library.
- New features are added in the CYME Python Editor to allow the use of nested views and load models.



# CYME 8.0

## New Features

Power engineering analyses in sync with today's challenges and technologies

### Equipment Enhancements

- Regulator – Distinct by-phase bandwidths for both the forward settings and reverse settings have been added.
- Cable – An estimate function for the number of conductor strands has been added to the cable construction details.
- Equipment Import / Export – It is now possible to import and export one or more pieces of equipment using XML files.

### One-Line Diagram Navigation and Views

Several improvements have been made functions related to the One-Line Diagram navigation and views, such as:

- A new Circle Symbol function to circle individual devices.
- The Background Map Control, used by the Geographic Overlay module and the Online Maps Service, has been enhanced to enable the display of different map types simultaneously.
- The main line of a radial circuit can be defined by the user, color-coded on the one-line diagram and used to restrict the scope of some analyses.
- A color map, based on color grid aggregation methods, is now available.
- New network modeling mode facilitates addition of new devices on the one-line diagram.

### User Interface Improvements

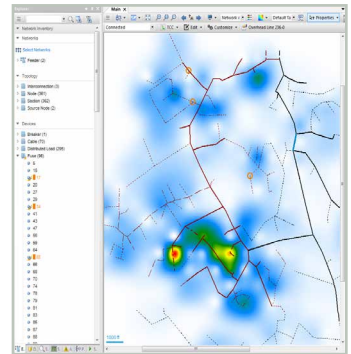
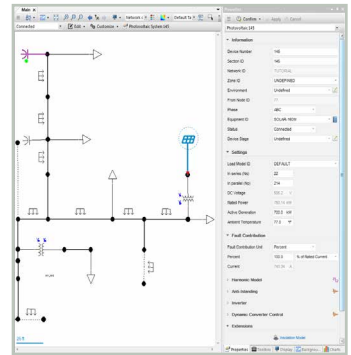
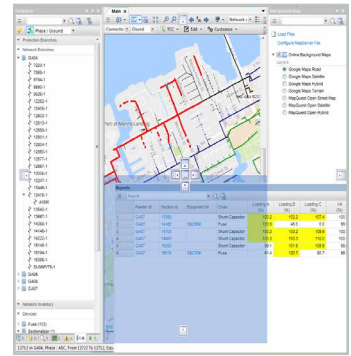
The user-interface is equipped with various enhancements to further its user-friendliness and intuitiveness. Among those:

- Windows and controls can be docked at any selected location within the framework.
- A new explorer bar control to edit the properties of the element selected on the one-line diagram.
- A new action bar provides a contextual layout of commands and options based on the active view.
- A new Customize Commands interface for the personalization of software commands available in menus and toolbars.
- New layout for the Customize Menu and Customize Toolbar dialog boxes to facilitate their use.
- A start-up page offers quick access to commands such as opening a study/tutorial and connecting to a database.

### Reports Enhancements

The spreadsheet reports have been greatly enhanced both esthetically and functionally as they are now equipped with many new tools to provide additional flexibility for customization and clarity in the information displayed.

- Sorting, decimals, grouping filtering, conditional formatting cell resizing and search have been enhanced.
- Multiple layouts can be saved for a given report. Hyperlinks to the one-line display elements have been added in reports.



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