Running a Short Circuit Analysis

The purpose of this tutorial is to introduce the Short-Circuit Analysis module of ETAP, and provide instructions on how to run ANSI and IEC short-circuit calculations. In addition, there will be a brief look at study case editors and the Alert View function. For this section of the tutorial you should select “Example Project (ANSI)” option when starting ETAP Demo.

Results of the Short Circuit Analysis

Running Short Circuit Analysis

- From the Mode toolbar, select the short circuit mode by clicking on the Short-Circuit Analysis button.
toolbar you can select the name of the output report as one already defined or “Prompt.” If “Prompt” is selected then prior to running the Short Circuit Analysis you will be prompted to enter a report name.

From the Study Case toolbar, click the Edit Study Case button. This will open the Short Circuit Study Case editor, allowing you to change calculation criteria and options. From the Info page, choose a bus or multiple buses to be faulted. Click all buses except Sub 3 and select ~Fault>> to place them in the Don’t Fault category. Sub 3 should now appear alone in the Fault category. Click OK when finished.

Note: The faulted bus, Sub3, will be shown in dark red color on the one-line, indicating that it will be faulted.

Helpful Tips…
You can also assign a bus to fault by right-clicking on a bus on the one-line and selecting Fault or Don’t Fault.

You can now run a short circuit (duty) study by clicking on the Run 3-Phase Device Duty button on the ANSI Short Circuit toolbar. If Prompt was selected as the output report in the Study Case toolbar, you will be prompted to enter a name for your output report.

There are four other types of studies besides the 3-Phase ANSI that can be performed under the ANSI standard setting. In addition, three studies according to the IEC set of standards can be performed. The ANSI methods are the default for short circuit studies, but this can be changed in the Standard page of the Short Circuit Study Case editor.
Viewing the Results

The results of the Device Duty Short Circuit calculation are displayed on the one-line. Changing the settings in the short circuit Display Options can modify the results displayed and their format on the one-line.

Note that breaker CB9 and CB18 are now colored magenta. This flag means that the device capabilities have been exceeded in some way. Click the Alert View button on the ANSI Short Circuit toolbar to view the flagged devices (please note that the alert function is disabled in the Demo).

To view the output report click on Report Manager from the Short Circuit toolbar, and go to the Result page and select Short Circuit Report.
Modifying Alert View settings

To view or modify the Alert settings, open the Short Circuit Study Case editor to the Alert page. Check the Marginal box and change the limit to 70%. Also, click the Auto Display button and then click OK. When the Marginal box is checked, all devices that have been exceeded by this limit, but remain under 100% rating will appear in the Alert View in the Marginal category. Devices that have been exceeded by 100% of rating will always be flagged, and will appear in the Critical category of the Alert View.

Now run the same short circuit study again by following the procedure used above. Note that once the calculation has been completed, the Alert View window will automatically open, as per the change made to the Alert page in the Short Circuit Study Case editor. Notice that other protective device conditions appear in the Marginal Alert View. Note that the short circuit results do not change.

The Alert function of the Short Circuit and Load Flow modules of ETAP is a convenient way to size protective devices at your facility.