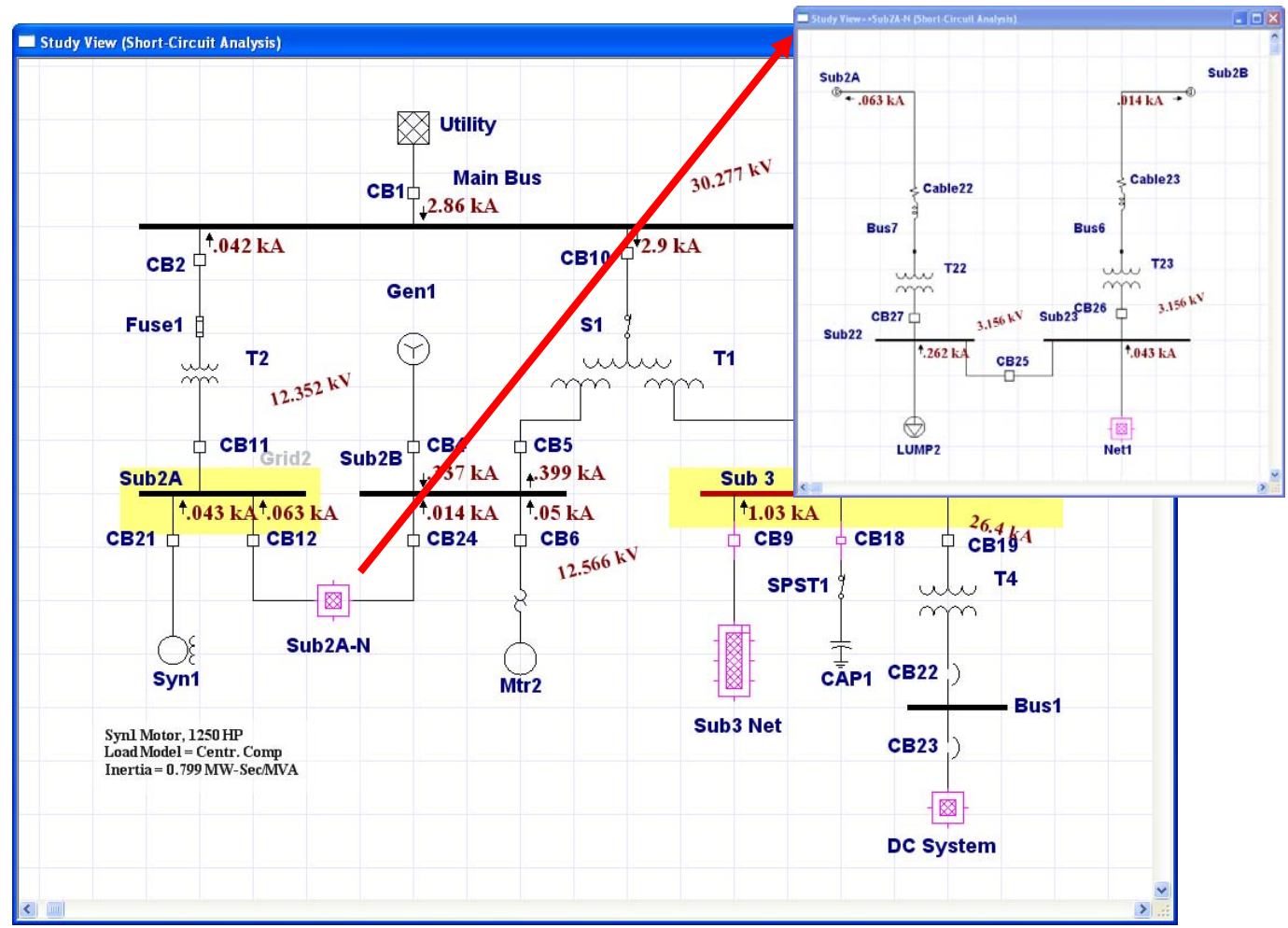


Running a Short Circuit Analysis

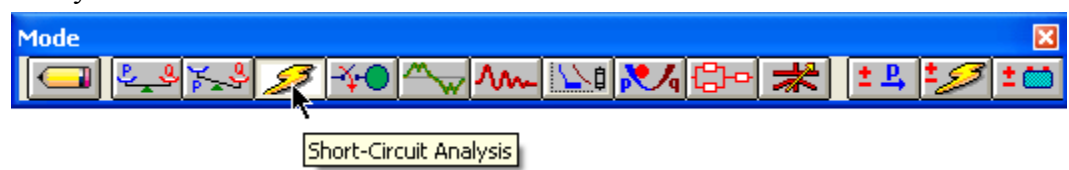
The purpose of this tutorial is to introduce the Short-Circuit Analysis module of ETAP, and provide instructions on how to run ANSI and IEC short-circuit calculations. In addition, there will be a brief look at study case editors and the Alert View function. For this section of the tutorial you should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



Results of the Short Circuit Analysis

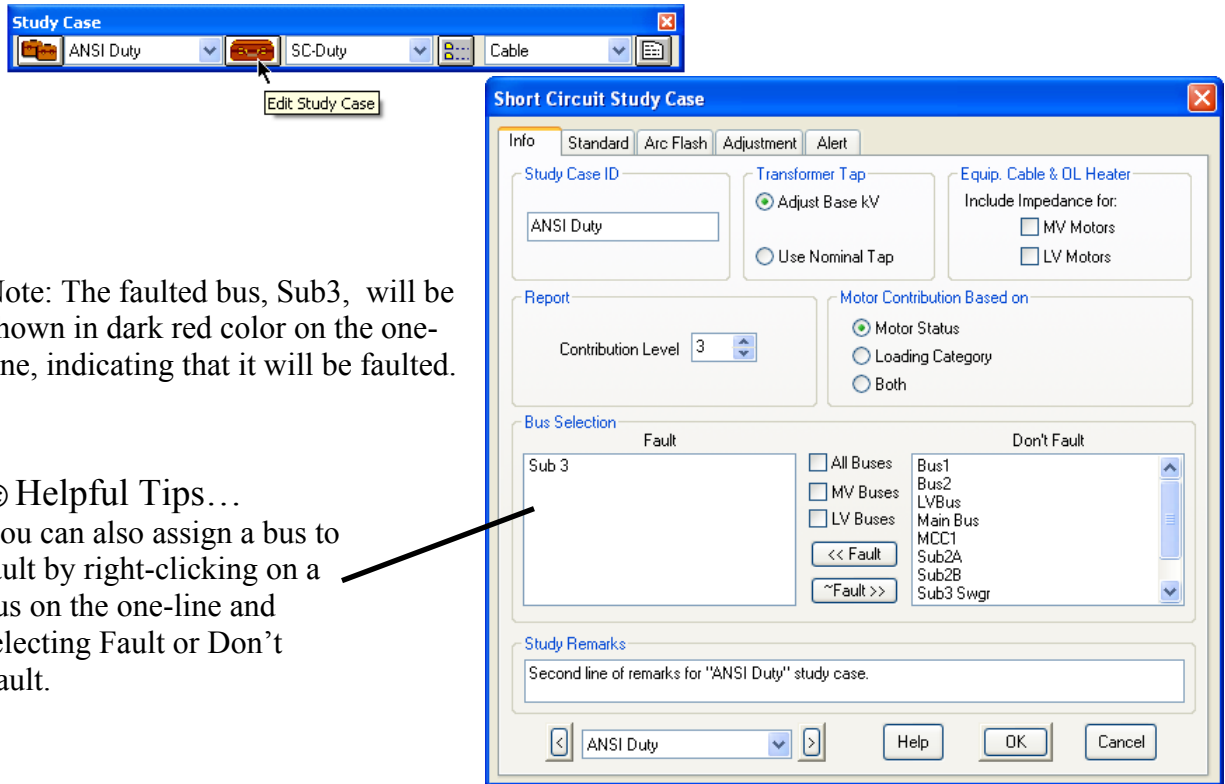
Running Short Circuit Analysis

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.



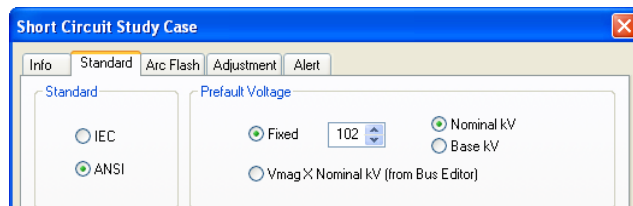
Note: The faulted bus, Sub3, will be shown in dark red color on the one-line, indicating that it will be faulted.

☺ 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).

Run 3-Phase Device Duty (ANSI C37)

Run 3-Phase (30 Cycle)

Run 3-Phase, LG, LL, LLG (1/2 Cycle)

Run 3-Phase, LG, LL, LLG (1.5 - 4 Cycle)

Run 3-Phase, LG, LL, LLG (30 Cycle)

Run Arc-Flash (IEEE 1584/NFPA70E)

Display Options

Alert View

Report Manager

Short Circuit Analysis Alert View - Output Report: SC-Duty					
Study Case:	ANSI Duty	Data Revision:	Base		
Configuration:	Normal	Date:	02-13-2007		
Critical					
Device ID	Type	Condition	Rating/Limit	Operating	% Operating
Marginal					
Device ID	Type	Condition	Rating/Limit	Operating	% Operating
CB18	HV CB	Interrupting	33.462 kA	31.191	93.2
CB9	HV CB	Interrupting	33.462 kA	31.191	93.2

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.

ANSI 3-Phase SC Report Manager

Complete Input **Result** Summary

Short-Circuit Report

Viewer PDF MS Word Rich Text Format MS Excel Set As Default

Output Report Name: SC-Duty

Path: C:\ETAP 555 Demo\Example-ANSI

Help OK Cancel

TAP Report - SC-Duty / Short-Circuit Report

View Help

Contract: OTI12345678 SN: ETAP-OTI

Designer: Operation Technology, Inc. Study Case: ANSI Duty Revision: Base

Name: EXAMPLE Config.: Normal

As info is printed on every output report, 1st remark line. (120 characters)

1st remark line of remarks for "ANSI Duty" study case.

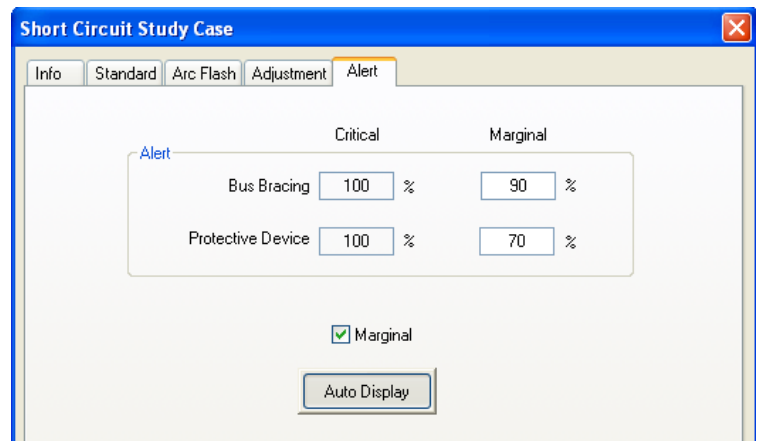
3-phase fault at bus: Sub 3

Prefault voltage = 4.243 = 102.00 % of nominal bus kV (4.160 kV)
= 102.00 % of base (4.160 kV)

From Bus ID	To Bus ID	1/2 Cycle			1.5 to 4 Cycle						
		% V	kA	kA	% V	kA	kA				
Sub 3	Total	0.00	0.779	-26.155	33.6	26.167	0.00	0.713	-25.802	36.2	25.812
Sub3 Swgr	Sub 3	0.31	0.149	-0.765	5.1	0.779	0.18	0.085	-0.436	5.1	0.444
Bus1	Sub 3	0.00	0.000	0.000	999.9	0.000	0.000	0.000	999.9	0.000	0.000
#T1-	Sub 3	86.62	0.630	-25.390	40.3	25.390	86.54	0.629	-25.367	40.3	25.375
LVBw	Sub3 Swgr	10.67	0.044	-0.183	4.2	0.188	5.94	0.022	-0.102	4.7	0.105
MCC1	Sub3 Swgr	12.09	0.031	-0.231	7.4	0.233	5.23	0.014	-0.099	7.0	0.100
Pump 1	Sub3 Swgr	106.08	0.073	-0.350	4.8	0.358	106.08	0.049	-0.234	4.8	0.239
Bus2	Bus1	0.00	0.000	0.000	999.9	0.000	0.000	0.000	999.9	0.000	0.000
#Mch Bus	T1-	87.70	0.071	-2.901	41.1	2.902	87.70	0.071	-2.904	41.0	2.905
#Sub2B	T1-	91.11	0.005	-0.161	29.9	0.161	90.86	0.005	-0.155	31.2	0.155

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.

Critical						
Device ID	Type	Condition	Rating/Limit	Operating	% Operating	
Marginal						
Device ID	Type	Condition	Rating/Limit	Operating	% Operating	
CB18	HV CB	C&L rms	58 kA	43.037	74.2	
CB18	HV CB	C&L Crest	97.2 kA	71.173	73.2	
CB18	HV CB	Interrupting	33.462 kA	31.191	93.2	
CB9	HV CB	C&L rms	58 kA	43.037	74.2	
CB9	HV CB	C&L Crest	97 kA	71.173	73.4	
CB9	HV CB	Interrupting	33.462 kA	31.191	93.2	

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