

Short-Circuit ANSI Comparison Case # 2

Comparison of ETAP Unbalanced Short-Circuit Calculations against a Published Example

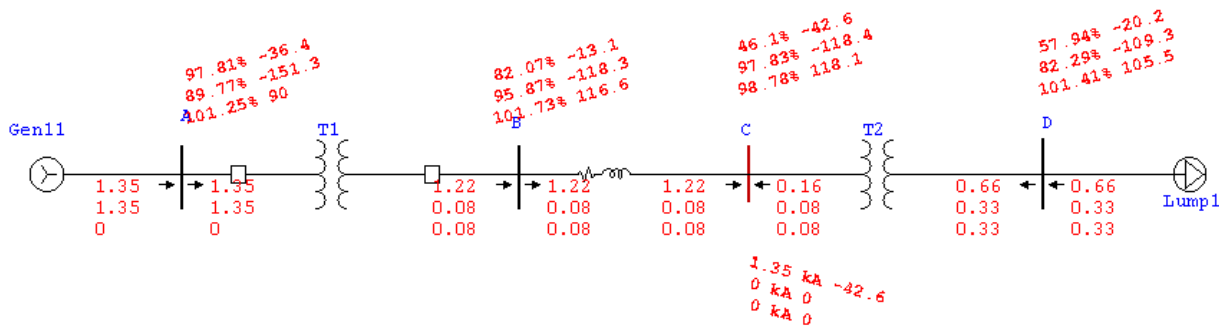
Excerpts from Validation Cases and Comparison Results (TCS-SC-105)

Highlights

- Comparison of ETAP unbalanced fault results against published results in “Faulted Power System Analysis” by Paul Anderson, 1973, page 38-40.
- Comparison of total fault current (I_A or $3 \cdot I_0$).
- Comparison of phase voltages (V_A , V_B and V_C).
- Comparison of sequence voltages (V_1 , V_2 , V_0).

System Description

This is a four-bus radial system that consists of a generator, transformer, transmission line, load transformer and load. The fault is located at Bus C. The generator is rated as 25MVA, 10 kV and its Subtransient Reactance is 12.5%.



Comparison of Results

The following tables of comparison show the differences between ETAP Results and those published in Paul Anderson’s book for an unbalanced LG fault. Please notice that the maximum deviation in the results is less than 0.5%.

	Example	ETAP	% Diff
Ia (3*I0) (kA)	1.35	1.35	0.0
Va (%)	46.02	46.1	-0.2
Vb (%)	98.08	97.83	0.3
Vc (%)	99.09	98.78	0.3
V1 (%)	77.42	77.53	-0.1
V2 (%)	25.61	25.5	0.4
V0 (%)	22.22	22.12	0.5

Table 6: Comparison of ETAP unbalanced fault results against textbook example

Reference

1. “Faulted Power System Analysis” by Paul Anderson, 1973, pages 38-40.
2. ETAP Short Circuit ANSI V&V Documents, Case Number TCS-SC-105.