

Matching PSSE Power flow with PSCAD manually without using any tool

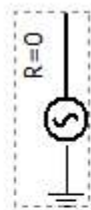
Assuming an original power circuit is available in PSSE and we have the load flow solution for the system the following steps may be taken to initialize the circuit in PSCAD.

Do the following in PSSE:

- 1- Identify the area that is required to do TOV or SOV studies. Identify the buses that connects the area with the rest of circuit (nearby buses).
- 2- Replace the nearby buses with voltage source and define the active power and voltage magnitude for them from the load flow obtained for original circuit.
- 3- Redo the load flow for the new circuit. In the new circuit the nearby sources are replaced by equivalent voltage sources that have same active power and voltage magnitude. When the load flow is done for the new circuit the reactive power and the angle can be calculated. Note that the reactive power range should be closed to the reactive power obtained from the original circuit.
- 4- So for the new circuit we know the active, reactive powers voltage magnitude and the phase angles (4 parameters).

Do the following in PSCAD:

- 1- Create the same circuit in PSCAD for the new circuit we have in PSSE.
- 2- Model the voltage sources as “ at the terminal” and put the values for the 4 parameters obtained from PSSE as the terminal conditions for each voltage sources.



Three Phase Voltage Source Model 2

Signal Parameters

General

Specified Parameters	At the Terminal
External Control of Voltage?	No
External Control of Frequency?	No
Magnitude (AC:L-L,RMS)	230.0 [kV]
Voltage ramp up time	0.05 [s]
Frequency	60.0 [Hz]
Phase Shift	0.0 [deg]

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Terminal Conditions

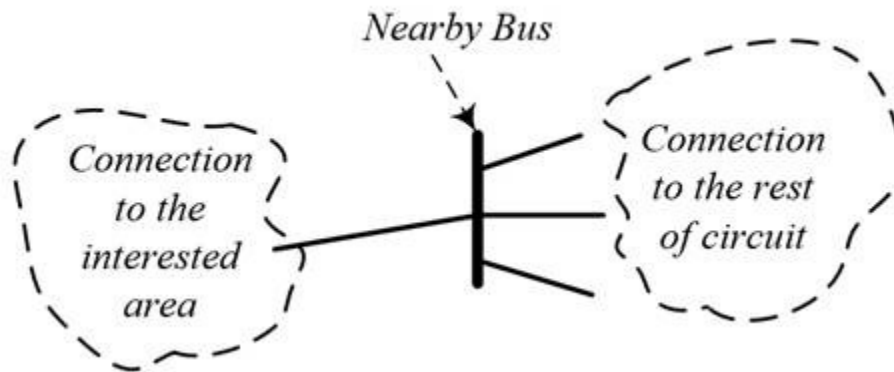
General

Base Voltage (L-L,RMS)	230.0 [kV]
Base MVA	100.0 [MVA]
Terminal voltage	1.0 [pu]
Phase angle	0.0 [deg]
Real power	0.0 [pu]
Reactive power	0.0 [pu]

The impedance of the equivalent sources can be identified by the following steps:

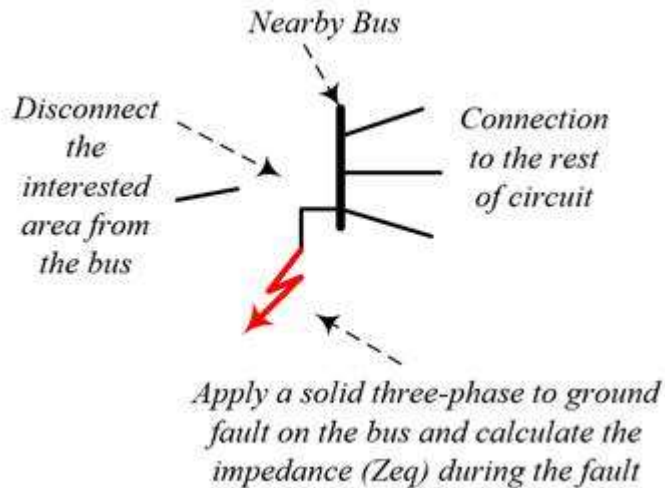
Do this in PSSE:

- 1- Identify the nearby buses



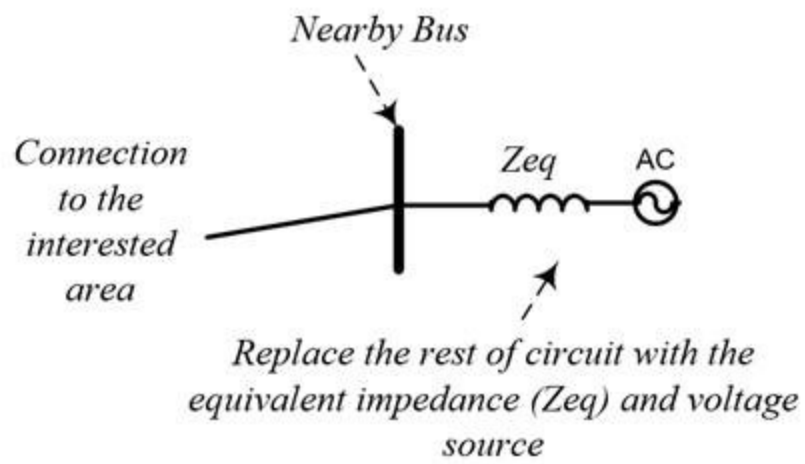
Disconnect the interested area that we want to do the TOV and SOV studies and apply a solid three-phase to ground fault.

Calculate the impedance of the bus during the fault (Z_{eq}) in PSSE.



Do this in PSCAD and PSSE (when making the equivalent circuit and replacing the rest of circuit by voltage sources):

Replace the rest of circuit by a voltage source and equivalent impedance that calculated from the above simulation in PSSE.



This is the way to initialize a circuit in PSCAD.