TITLE: Modeling and Simulation of 12 Machine 18-bus system (including tie-bus system) using OpenModelica and Open IPSL.

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ABSTRACT

The power system model designed shall be used to evaluate the system behavior and response at variable load conditions, the effect on the loads connected during fault or abnormal situations, working of protection and control equipment during those conditions.

The model consists of 12 generators with 12 transformers, 18 buses, 7 constant loads and two variable loads, 18 transmission lines. The system is on a 100MVA, 50Hz base.

The system also includes tie-bus system with 3 generators. It is included to observe the behavior of the system under this condition.

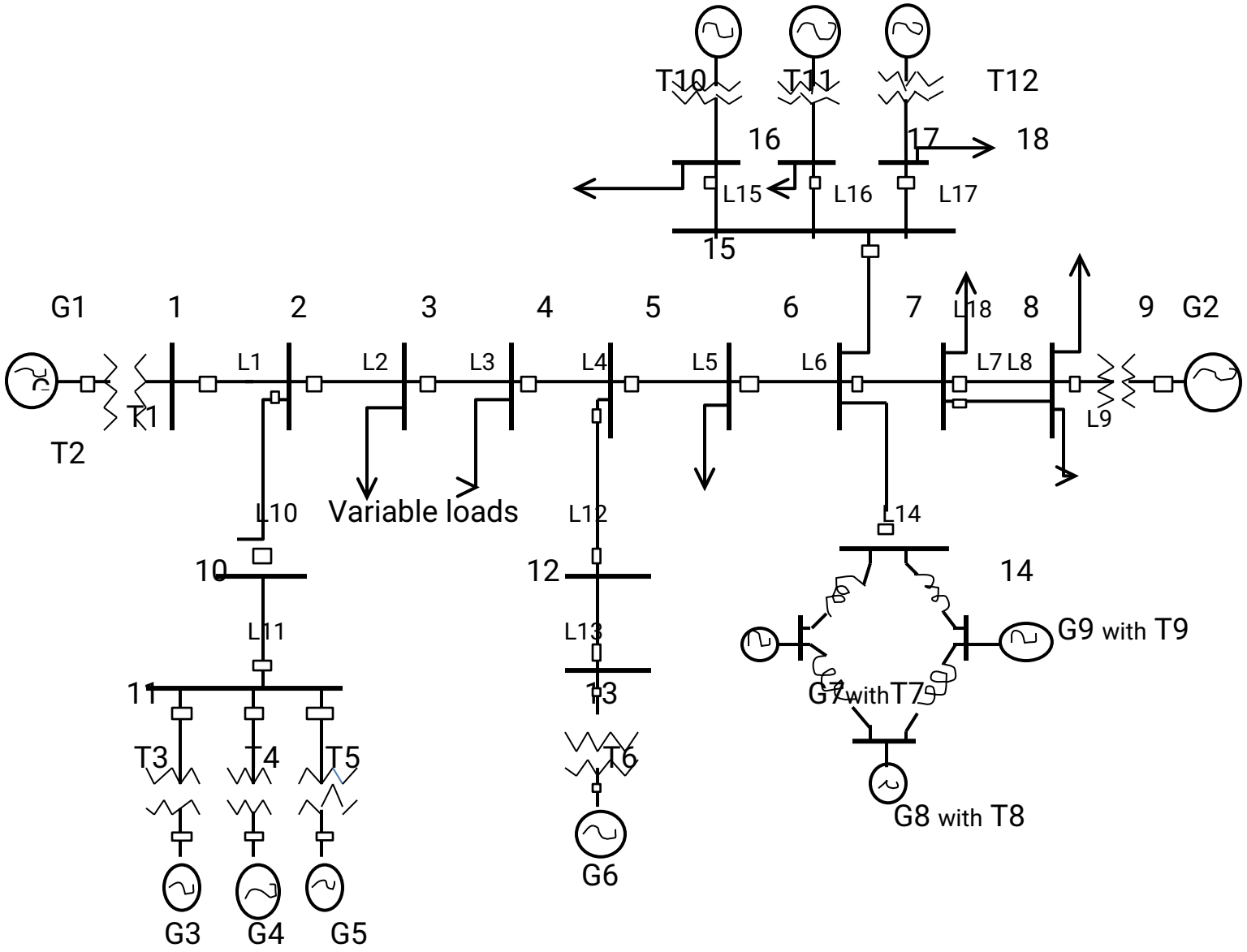
The single line diagram of the above mentioned system is shown below.

The aim of the model is to simulate different scenarios under different operating conditions.

The submitted model, implemented in Modelica language and simulated using OpenIPSL library components provides the clear view of the system's response under variable load conditions and also under symmetrical and unsymmetrical fault conditions at one of the buses.

The circuit breakers are provided to check the tripping time when fault occurs. The fault is simulated for 0.5 sec.

The result obtained from the simulation shows the voltage profile at different loading conditions and also under pre-fault and post-fault conditions.



SINGLE LINE DIAGRAM OF 12 MACHINE 18 BUS SYSTEM

G - generator.
L - transmission line.
T - transformer.
Numbers represent buses.
Arrows represent loads.

BASE:
100 MVA, 50Hz