EXPERIMENT: 7

OBJETIVE:

Plot V-I characteristic of a three-phase line with and without fault using Simulink.

SOFTWARE:

MATLAB 2008a

APPARATUS REQUIRED:

S.No	Parameter	Range
1	Voltage	440V
2	Inductor	100e-6 H
3	Resistor	10 Ω
4	Frequency	50 Hz
5	Capacitor	100e-6 F

THEORY:

In an electric power system, a fault is any abnormal electric current. For example, a short circuit is a fault in which current bypasses the normal load. An open-circuit fault occurs if a circuit is interrupted by some failure. In three-phase systems, a fault may involve one or more phases and ground, or may occur only between phases. In a "ground fault" or "earth fault", charge flows into the earth. The prospective short circuit current of a fault can be calculated for power systems. In power systems, protective devices detect fault conditions and operate circuit breakers and other devices to limit the loss of service due to a failure.

Symmetric fault

A symmetric or balanced fault affects each of the three phases equally. In transmission line faults, roughly 5% are symmetric. This is in contrast to an asymmetrical fault, where the three phases are not affected equally.

Asymmetric fault

An asymmetric or unbalanced fault does not affect each of the three phases equally. Common types of asymmetric faults, and their causes:

line-to-line - a short circuit between lines, caused by ionization of air, or when lines come into physical contact, for example due to a broken insulator.

line-to-ground - a short circuit between one line and ground, very often caused by physical contact, for example due to lightning or other storm damage

double line-to-ground - two lines come into contact with the ground (and each other), also commonly due to storm damage.

CIRCUIT DIAGRAM:

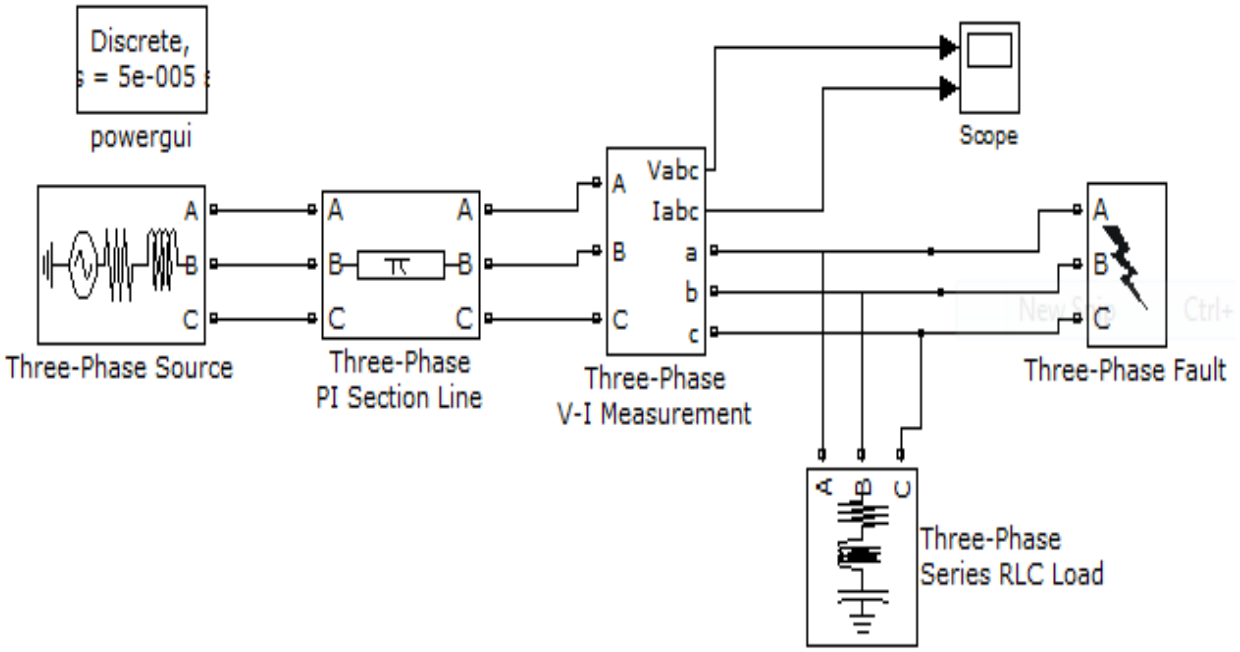

Fig.1. With Fault

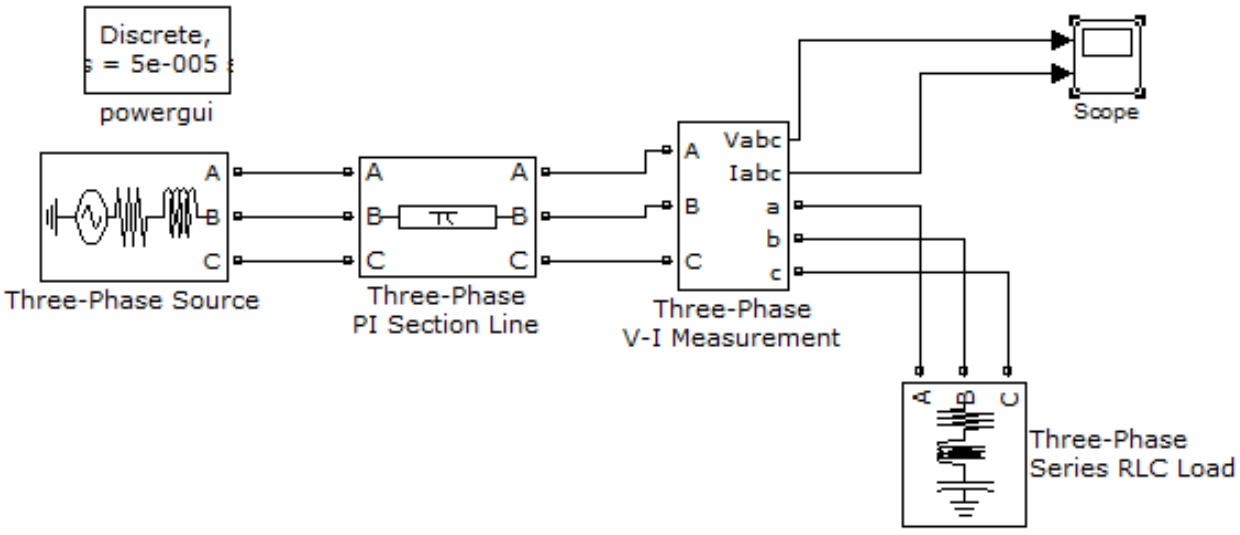

Fig.2. Without Fault

OUTPUT WAVEFORM:

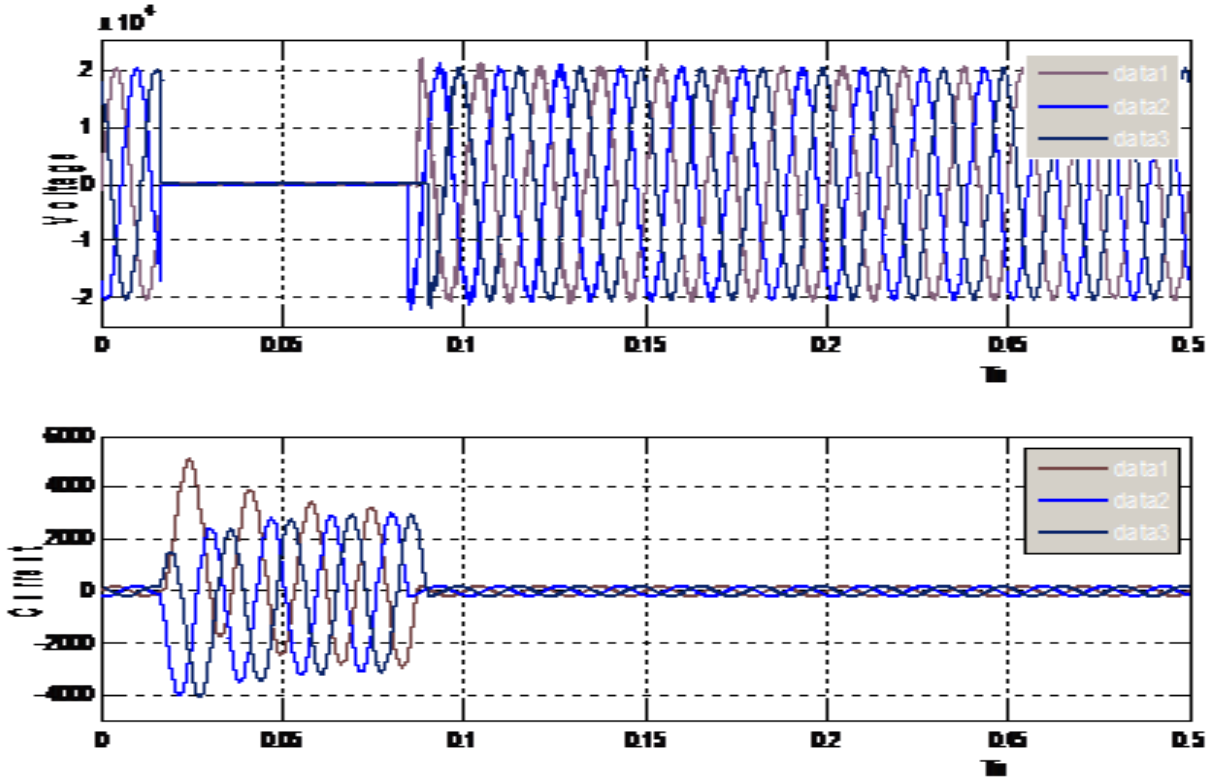

Fig.3. With fault

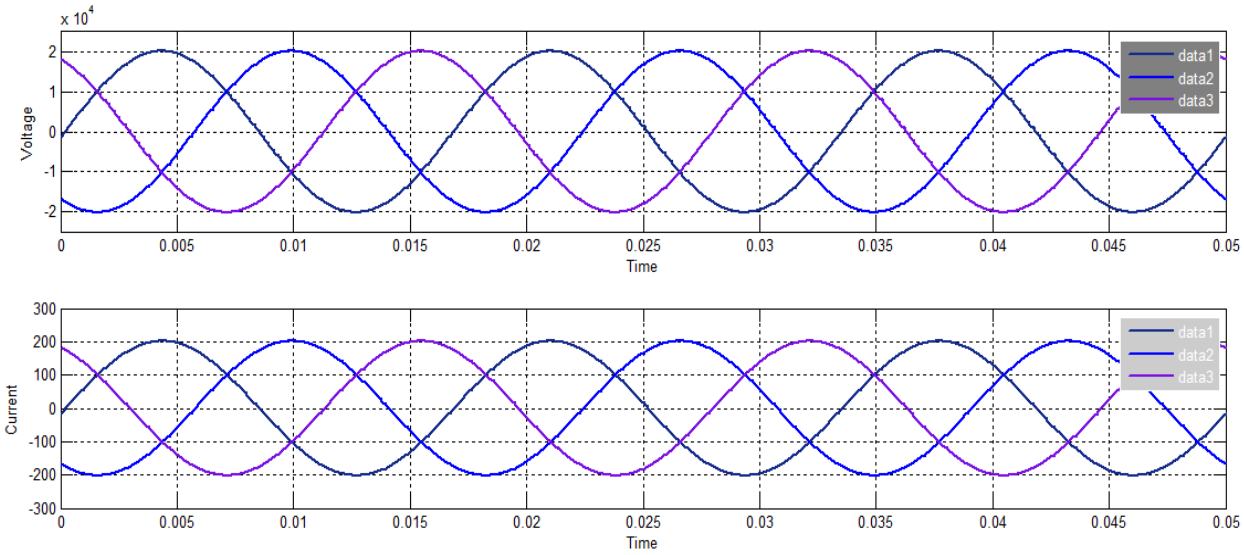

Fig.4. Without fault

RESULT:

V-I characteristic of three-phase line with and without fault was plotted using Simulink