

100% Stator Ground Fault Protection

by

Ferran Garcia and Ramon Alcantara

Generators have an important role in power systems since they are in charge of providing the power supply to the customer. Moreover, the cost of fixing them in case of damage is very high. Therefore, generators must be protected against all kind of situations that can damage them.

One type of these irregular situations that can damage the generator is the stator ground faults. These are accidental electrical connections between the non-rotating winding of the generator and other parts. All the stator of the generator must be protected against them since the generator could be burnt if these faults are not detected and cleared.

There are several methods currently being used to protect the stator of the generators but conventional protection schemes can not detect the faults that occur close to the neutral point of the generator. Therefore, other protection schemes are required in order to protect this part of the stator.

This master thesis presents the comparison between two protection methods that can detect stator ground faults close to the neutral of the generator. These methods are the subharmonic injection method and the third harmonic voltage method. Both can protect the stator close to the neutral. The first is shown to be more technically capable while the other has economical advantages.