

STUDY THE EFFECTS OF DIFFERENT TYPES OF FAULTS ON THE PERFORMANCE OF A SYNCHRONOUS CONDENSER CONNECTED TO A INFINITE BUS

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ABSTRACT

Voltage sag are the event of voltage reduction while voltage swell are the event of voltage increment, after a short duration, it will be restored to the normal condition. Nowadays, power quality has become an important issue in the industrial area, as the industrial equipment becoming more and more sensitive to the minor voltage variation. Minor voltage sag/swell could lead to continuous process industry to trip, which cause costly shutdown.

In this paper, different types of fault that affect the performance of a synchronous generator of the power distribution system will be analyzed and discussed. At the same time, it introduced the modeling of Dynamic Voltage Restorer (DVR) control to a synchronous machine by using MATLAB Simulink software. This paper will comprise the background review of synchronous machines and dynamic voltage restorer (DVR). It will also cover the simulated result by using MATLAB Simulink to show how to maintain the voltage at fault scenarios. The proposed DVR control will compensate the voltage to 1 p.u., at the same time the performance of synchronous condenser will be improved. Lastly, discussion of the obtained result from the simulation will provide a good understanding of how synchronous generator reacts to the different types of fault.

After the DVR installed into the system, the performance of synchronous generator is affected. The recovery state is decreased by 0.25p.u. for symmetrical fault, as 0.15p.u for unsymmetrical fault. The synchronous machines experience no voltage swell after the DVR is installed in the system. Before the DVR is installed, the synchronous machine experience voltages swell.

Keywords: Voltage Sag/Swell, Effect of Fault, DVR, Simulink