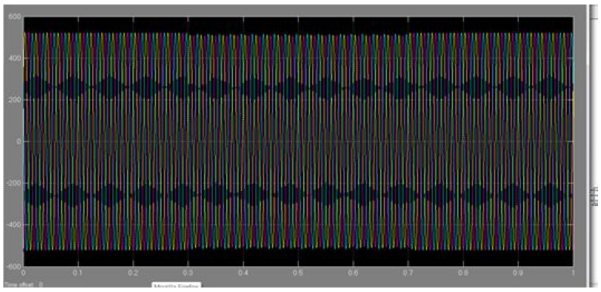

Figure 5b: Compensated voltage with DVR

- Voltage swell

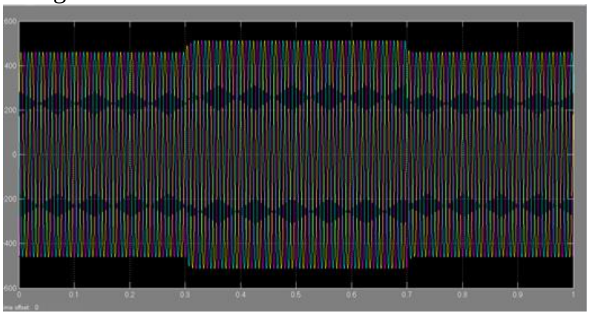

Figure 6a: Load terminal voltage without DVR - Swell

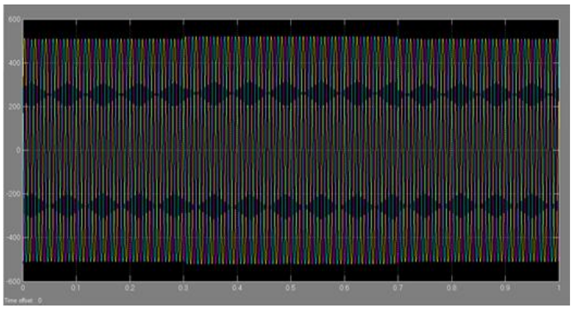

Figure 6b: Compensated voltage with DVR

- During fault

A fault is given for a period of 0.3-0.35s. At 0.4s the circuit breaker gets opened and closes on 0.36s. Without using DVR, from it is clear that, when a fault is applied voltage gets reduced. With DVR when the circuit breaker gets opened, DVR is automatically connected and injects appropriate voltage in proportion to the reduction in voltage and hence get compensated.

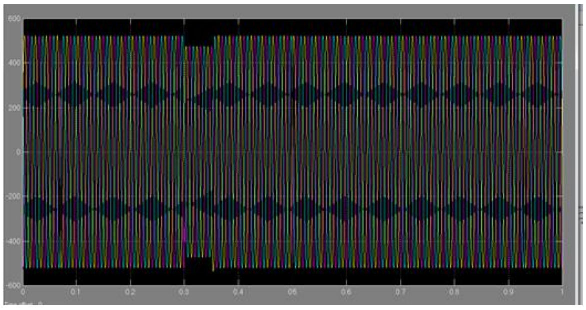

Figure 7a: During fault

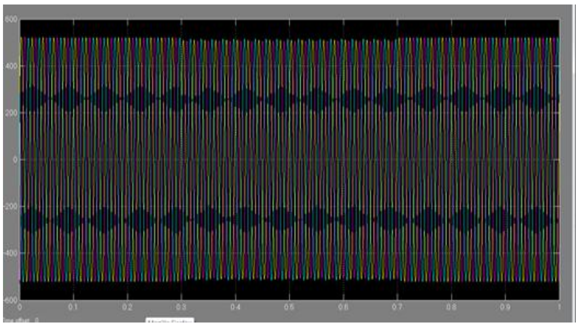

Figure7b: Fault cleared with DVR

4. Conclusion

This paper represents simulation of DVR in MATLAB. In order to show the performance of DVR in mitigation of voltage sags, s simple distribution network is simulated using MATLAB. A DVR is connected to a system through a series transformer with a capability to insert a maximum voltage of 50% of phase to ground system voltage. In-phase compensation method is used. DVR injects the appropriate voltage component to correct rapidly any deviation in the supply voltage to keep the load voltage constant at the nominal value and handles both balanced and unbalanced situations without any difficulties. The main advantages of the proposed DVR are simple control, fast response and low cost. The proposed PWM control scheme using PI controller is efficient in providing the voltage sag compensation. As opposed to fundamental frequency switching schemes already available in the MATLAB/SIMULINK, this PWM control scheme only requires voltage measurements. This characteristic makes it ideally suitable for low-voltage custom power applications. The main shortcoming of the DVR, being a series device, is its inability to mitigate complete interruptions.

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