rapid DVR response; two transient undershoots are observed as in fig.18 when the DVR comes in and out of operation.

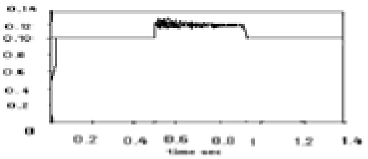

Figure 17: Voltage rms at load pt. without DVR.

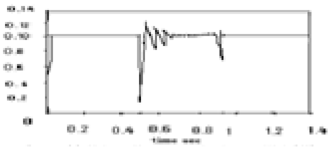

Figure 18: Voltage rms at load pt. with DVR

The first simulation contains no DVR and three phase fault is applied at point A. via a fault resistance of 0.001Ω doing the period 450-850 ms. The voltage at the load point is 10% with respect to the reference voltage. The second simulation is carried out using the same scenario as above but now with the DVR in operation. The total simulation period is 1350 ms. When the DVR is in operation the voltage sag is mitigated almost completely, and the rms voltage at the sensitive load point is maintained at 97%

4. Conclusion

This paper has presented the power quality problems such as voltage dips, swells and interruption consequences and mitigation techniques by custom power electronic devices DVR and D-STATCOM. This design and applications of DVR and D-STATCOM for voltage sags, interruptions, swells and comprehensive results are presented. A new PWM based control scheme has been implemented to control the electronic valves in the two levels VSC used in the D-STATCOM and DVR. As opposed to fundamental frequency switching schemes already available in the MATI AB/SIMULINK this PWM control scheme only requires voltage measurement. This characteristic makes it ideally suitable for low voltage custom power applications. The simulations carried out showed that the DVR provides relatively better voltage regulation capabilities. It was observed that the capacity for power compensation and voltage regulation of DVR and D-STATCOM depends on the rating of the dc storage device.

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