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Voltage Sag Mitigation in an Indian Distribution System Using Dynamic Voltage Restorer

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Abstract:
Now a day's most power quality problems in distribution systems are related to voltage sags. Hence, diverse solutions have been tried to compensate these voltage sags to circumvent financial losses due to voltage sag at industries. Dynamic voltage restorers (DVRs) are now becoming more recognized in industries to diminish the impact of voltage sags to sensitive loads. The DVR, which is placed in series with a sensitive load, must be able to react speedily to a voltage sag if end users of sensitive equipment are to experience no voltage sags. This paper discusses the use of series reactive injection as a voltage regulator. The proposed approach is to develop analytical aspects and to illustrate these by an example of a real Indian distribution system. Voltage sag can be eliminated by continuously injecting very small voltage profile to the system. The scheme combines the method of instantaneous symmetrical components and complex Fourier transform relations. The proposed technique, based on half-cycle averaging, can mitigate voltage sag at desired locations in distribution systems. The proposed methodology is applied in a 4 bus system and a real Indian distribution system.

Keywords:
Distribution systemDVRHarmonicsPhase angle regulatorPower qualityVoltage sag

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