Abstract

Power quality is a problem that leads to financial issues. Many surveys have been shown that poor power quality causes large economic losses to industrial sectors and large amount of power is wasted due to power quality problems like sags, swells, harmonics, flickers etc. The present work considers, the modeling and simulation of a dynamic voltage restorer (DVR), which is achieved using MATLAB/Simulink. Faults are created with the proposed systems, and the disturbances are initiated at a duration of 0.8 sec till 0.95 sec. Comparison of the performances of the Fuzzy neural and Fuzzy logic based DVR are presented. Results are showed that Fuzzy logic controller is able to restore the load voltage to the nominal value in both linear and non linear loads quickly and efficiently. But when the 2nd and 3rd harmonics are superimposed on the voltage sag and voltage swell by the application of 3-ph programmable source, the fuzzy logic controller fails to restore and reduce the harmonic content to an acceptable values which is according to IEEE standard 3% for the individual voltage and 5% for the three phase voltage. While the Fuzzy neural controller has been very powerful and efficient to restore the load voltage to the pre-sag value and make it smooth under different cases of
faults and nonlinear load conditions and keep the harmonics within the permissible limits in all cases.

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Index Terms

Computer Science  Distributed Systems

Keywords

Non-Linear Controller, Fuzzy Neural, Power Quality Improvement, Sags, Swells, DVR