



Scienxt Journal of Electrical Power System  
Volume-2 || Issue-1 || Jan-Apr || Year-2024 || pp. 6-14

## *Smart grid power quality improvement using modified upqc*

**\*<sup>1</sup>Abhishek Dubey, <sup>2</sup>Balmukund Kumar, <sup>3</sup>Abhishek Mishra**

<sup>1</sup>Assistant Professor, Bhopal Institute of Technology and Science,  
Bhojpur Road, Bhopal, 462045 M.P. India

<sup>2, 3</sup>Student, Bhopal Institute of Technology and Science,  
Bhojpur Road Bhopal, 462045 M.P. India

*\*Corresponding Author: Abhishek Dubey  
Email: advidisha402@gmail.com*

**Abstract:**

The Smart Grid system typically deals with different issues involving security and Power Quality improvement. With frequent usage of power electronic devices and nonlinear load, harmonics are inserted into the system. The well-known Flexible AC Transmission System devices like Unified Power Quality Conditioners are usually employed to resolve the issues related to voltage sag, swell, flicker, PQ, and neutral current reduction of distribution systems. An UPQC itself inserts harmonics into the system that affects the system stability for sensitive loads. This paper describes proposed controller for harmonics elimination techniques for modified UPQC connected with SG. Lower order harmonics are eliminated by proper selection of switching angles and at the same time the higher order harmonics are suppressed by injecting same order harmonics with equal magnitude but opposite in phase from the other converter. The excitation of Modified UPQC converters are obtained from PV panel. The firing angles of series-shunt converter are obtained in real-time from the already stored angles in the microcontroller memory.

**Keywords:**

Smart Grid system, Transmission System, power electronic devices, series-shunt converter, PV panel