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| **Title:** | Voltage stability augmentation of hybrid power system using robust reactive power control strategy of PV plant | | |
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| **Published Journal Name:** | International Journal of Renewable Energy Research-IJRER | | |
| **Type of Publication:** | Journal | | |
| **Volume:** | 11 | Issue | 3 |
| **Publisher:** | Gazi University, Turkey | | |
| **Publication Date:** | Sept. 30, 2021 | | |
| **ISSN:** | 1309-0127 | | |
| **DOI:** | https://doi.org/10.20508/ijrer.v11i3.12245.g8289 | | |
| **URL:** | https://www.ijrer.org/ijrer/index.php/ijrer/article/view/12245 | | |
| **Other Related Info.:** | Page 1441-1447 | | |
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| **Abstract:** |  |
| The involvement of large-scale grid-tied photovoltaic (PV) systems is growing speedily, and enormous effort is given to design the robust control mechanism of PV systems to augment the performance of the PV system in both transient and steady-state states. The terminal voltage may fluctuate at steady-state conditions due to the alternating nature of solar irradiance and affect the LVRT aptitude at the transient period. Therefore, in this paper, a cascaded grid-side AC-DC inverter control strategy is developed by modifying the inverter input signal to control the terminal voltage. The proposed dead-band-based inverter controller maintains the terminal voltage at rated value during steady-state and augments LVRT aptitude at transient conditions by injecting an efficient quantity of reactive power. The overall scenario, including PV system, conventional power plant, and load, has been designed and examined using the “PSCAD/EMTDC” platform. The traditional control system is taken into comparison with the proposed control system to verify the effectiveness of this innovative control technique. | |