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PDPU JOURNAL OF **ENERGY AND MANAGEMENT**

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DESIGN PARAMETERS OF SHUNT ACTIVE FILTER FOR HARMONICS CURRENT MITIGATION

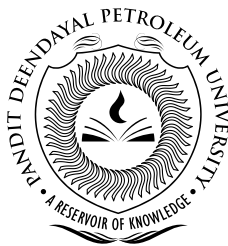
A.H. Budhrani, K.J. Bhayani, A.R. Pathak



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EDITORIAL

We are very happy to present to you this edition of Journal of Energy and Management. The following are the highlights of the papers presented in the journal.

“Electricity Generation Potential of Rooftop Photovoltaics in Punjab” by R.K. Pal discusses the potential of Solar Energy in Punjab. This study estimates the potential of solar electricity generation in the state by installing rooftop photovoltaics on residential houses. It was estimated that around 2475 GWh/year can be generated from rooftop solar photovoltaics installed on 90% of the residential houses in Punjab, which, it is estimated could meet the demand to the extent of 25 per cent of the requirements in the state today. Money savings are also realizable in case of rooftop photovoltaics. The total money savings for rooftop photovoltaics will be about Rs. 14850 Million/year. Reduction in greenhouse gases emission is also possible by using rooftop photovoltaics. The reduction in emission of greenhouse gases like carbon dioxide, methane and nitrous oxide would be about 806.67 kT/year, 92.9 kT/year and 13.51 kT/year respectively.

The second paper by Devang Parmer and Chirag Vibhakar reports findings of their study “Power Converter Topology of Brushless DC Motor for Improvement of Power Quality.” This study examines different control schemes and design related power factor improvement techniques used for brushless DC motor drives. It also provides a base for a range of a suitable power factor correction topology for the specified application. Several AC-DC Buck, Boost, Cuk converters based power factor correction typologies are designed, modeled and analyzed. Portions of the bi-directional extension converter and unipolar inverter typologies are likewise surveyed to give a total evaluation of the power factor controller topologies for BLDC drives. The proposed power factor correction converter topologies indicate modification to worldwide power quality measures with an enhanced implementation of BLDC drives. It also conforms to international power quality standards with improved performance of BLDCM drive, such as reduction of AC mains current harmonics, near unity power factor, and reduction of speed and torque ripples. Simulation environment with PSIM version 9.0.3.400 software has also been attempted in the study.

The third paper, “Design Parameters of Shunt Active Filter for Harmonics Current Mitigation” by A.H. Budhrani, K.J. Bhayani, A.R. Pathak, discusses design parameters of three phase shunt active filter based on PQ theory for mitigation of harmonics current.

A Framework for Development of Risk Severity through the Application of Fuzzy Expected Value Method (FEVM) for Infrastructure Transportation Project by Manvinder Singh, Debasis Sarkar examines risks and risk assessment aspects and finally risk mitigation measures based on the analysis of mega Infrastructure transportation projects using Fuzzy Expected Value Method (FEVM). Fuzzy logic is incorporated within conventional Expected Value Method (EVM) to map the interrelationship between probability of occurrence and impact generated for a particular activity. Based upon fuzzy risk severity values, it has been concluded that erection of pre-cast segments, detailed project report and feasibility, land handing over, traffic diversion and piling activities are having very high fuzzy risk severity values and came under first five ranks with respect to risk involved and associated with them. The developed fuzzy risk severity values would enable the project authorities to identify the activities with high risk severity and to take the mitigation measures accordingly.

The last paper of the journal is about fault detection and diagnosis methods in power generation plants specifically from the Indian power generation sector perspective by Himanshukumar R. Patel and Vipul A. Shah. The paper discusses about different faults related to nuclear power plants, thermal power plants, and solar power plants and their performance monitoring, instrumentation or sensor calibration, system dynamics, system faults, sensor faults, equipment monitoring, reactor and furnace monitoring, and transient monitoring. The authors suggested for a model-based and model-free FDD methods and examined the FDD methods. The paper explained about the popularity of FDD applications as safety and reliability are significant requirements for different power generation sector. The paper also discussed the model based and model-free FDD methods in nuclear power plants, thermal power plants, and solar power plant types of power generation plants.

We would like to receive feedback from our readers and authors, which, we hope, will help us to improve our journal.