

EDITORIAL

We are pleased to present to you the VIth edition of PDPU Journal of Energy and Management. The following are the highlights of the papers presented in the journal.

The first paper on 'Performance Analysis and Optimization of Plate Type Heat Exchanger in Dairy Industries' by Niyant P. Thakkar and Mithilesh Kumar is an experimental studies performed on a corrugated plate heat exchanger for single phase flow (water-to-water) configurations in an institute laboratory to determine the performance of plate type heat exchanger, i.e., overall heat transfer coefficient, heat transfer rate, effectiveness, cold side efficiency, and hot side efficiency. The temperatures of the heat exchanger at the inlet and outlet ports, the volumetric flow rates of the hot and cold fluids, and the pressure drops between the inlet and outlet ports are measured during the experiments. The research found that the complex corrugated surface design flow is highly turbulent which makes the design of plate heat exchanger to deviate from actual. Sometimes the flow medium cannot distribute uniformly which affects the performance of plate heat exchanger. The result of the study can be used to find the optimized condition to operate heat exchanger in dairy industries.

In the second paper, Mustafa Ahmed Abdulhussain studied the thermal effectiveness of plate heat exchanger exposing to uniform hot air flow by working with three Refrigerants (R134a, R290 and R513a). The three refrigerants are heat exchanged with cold water assuming constant flow rate, calculated via the AUTODESK CFD 2019 package using the standard K- ϵ turbulence model. The result shows that the PHE effectiveness decreased by (14%) for the R513a and by (17%) and (19%) for R134a and R290, respectively.

The third paper on 'Heliostat design for Low Wind Terrain' by Rakesh Singhai, Nitin Banker, and Harender studied the potential for generating electricity on a large scale for places with high DNI in concentrated solar thermal power tower plants. The researcher found that as this is capital intensive specifically on account of heliostats. As heliostats constitute 45-50% of the total cost of a PT plant, hence their design is highly influenced by wind loads. The analysis shows that significant cost reduction is possible by sizing and suitably redesigning the heliostats.

The fourth article on 'Energy Security & Sustainability: Role of Natural Gas in Indian Context' by Sambhaji Kadam and Sanjay Kumar Kar analysed the role of natural gas in energy security, sustainability & economic growth of country. In this paper, authors have developed a framework of energy security based on literature review and classroom discussion in Ph.D. course-work and added acceptability and sustainability to above mentioned aspects of energy security. In the proposed framework sustainability occupies the central position and acceptability has been added as a desirable dimension to energy security. The authors applied the proposed framework to assess the role of natural gas in sustainability and energy security of India. Further, authors analysed role of government in infrastructure development, policy reforms & recommend actionable measures to improve availability, accessibility, affordability and acceptability of natural gas to achieve energy security & sustainability goal.

Finally, the paper on 'Effect on Protection Scheme' by DG in ETAP by Preyansh Sharma, Kashyap Mehta, R. Venkata Rama Raju discusses about the analysis and coordination of protection equipment's in a power system when distributed generations are incorporated in it. The study has been conducted on IEEE 30 bus test system in Electrical Transient Analyzer Program (ETAP) simulation software. An IEEE 30 bus test system without any DG source is considered, and its protection analysis is carried out with Over-Current (OC), and Directional Over-Current (DOC) relays. Further, the DGs are then incorporated and the changes, as well as problems faced by the protection system are studied and the respective solution presented.

We wish you all the best.

*C. Gopalkrishnan, Director General
Chief Editor*