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Development of the Industry Based Curriculum for Manufacturing Technology to meet the Human Resource Needs of the Chennai Industrial Hub

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Abstract

The growth of manufacturing companies depends on many factors. One of the factors is the availability of competent technicians in various production processes. A joint evaluation by the industrial representatives and the faculty of the existing diploma programme offered by the polytechnic colleges in Tamil Nadu revealed deficiency in many areas of manufacturing competencies. Based on the in-depth needs analysis of the manufacturing industries located in the industrial corridors around Chennai, a draft curriculum has been developed and evaluated by a joint committee consisted of faculty members of the polytechnic colleges, professors from technical universities, employers representatives, and specialists in curriculum development. To implement this curriculum a network model has proposed which consisted of a lead polytechnic and networked polytechnics in four districts around Chennai industrial corridor. This model offers many advantages to implement the curriculum through a cooperative approach. It also provides win-win approach to all the stakeholders.

Optimal Siting and Sizing of Distributed Generation in Deregulated Electricity Market for Voltage Sensitive Loads Including Voltage Rise Issue

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Abstract

Connecting green power sources to the grid are gradually becoming popular. As the penetration of DG is increasing in the distribution network, it is no more passive in nature and behaving as an active transmission network. Therefore, it is relevant to consider the pricing mechanism other than traditionally used flat pricing mechanism in distribution The nodal pricing and locational charges are such pricing mechanism that are popular in transmission. The paper presents a mythology for optimally allocating distributed generation in terms of location and size for minimizing the average of locational charges for per unit active power at buses including voltage rise phenomenon. The system loads are not controlled which depend on the voltage and frequency of the systems. This paper addresses the impact of voltage sensitive loads on allocation of DG by incorporating appropriate load models. Simulation studies have been conducted on standard test systems to verify outcome of the method.

Keywords: Genetic Algorithms (GA), Distributed Generation (DG), Locational Charges, Distribution Network, Optimal Location, Optimal Size.

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Automatic Peak Power Tracker for Solar Photo Voltaic Modules

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Abstract

The present work describes the maximum power point tracker (MPPT) for the solar photo voltaic (SPV) module connected to a resistive load. A Personal Computer (PC) is used for the control of the MPPT algorithm. The power tracker is designed and tested successfully in the laboratory. The simulation studies are carried out in MATLAB /SIMULINK. The measured parameters such as panel voltage, current and power are displayed on the monitor of the personal computer.

Key words: MPPT, SPV system, Perturb and Observe algorithm, dc/dc converter.

Application of Artificial Neural Networks (MLP and RBF) in Determining Transfer Capabilities in Multi-Area Power System

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Abstract

In this study, the use of artificial neural network (ANN)-based models, multi-layer perceptron (MLP) and radial basis function (RBF) networks to compute the transfer capabilities in a multi-area power system was explored. The input for the ANN is load status and the outputs are the transfer capability among the system areas, voltage magnitudes and voltage angles at the concerned buses. The repeated power flow (RPF) method is used in this paper for transfer capability calculation necessary for the generation of input-output patterns for training the proposed ANN models. Preliminary investigations on a three area 30-bus system reveal that the proposed models are computationally faster than the conventional RPF method. Also the results strongly indicated that the RBF network model performs better than the MLP network model.

Index Terms: Power transfer capability, Repeated power flow, Multi-layer perceptron neural network, Radial basis function neural network.

Equivalent Circuit Modelling and Design of Atmospheric Barrier Discharge Reactor for Surface Processing

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Abstract

Presently, diverse scientific and technological areas such as electronics, textile and biomedical are using low pressure glow discharge plasmas for surface processing. But, low pressure glow discharge processing is very costly due to the requirement of vacuum system. The use of vacuum process increases the cost of the system and decreases the productivity and is therefore a burden for the textile industry. Therefore the surface treatments using eco-friendly atmospheric pressure plasma are getting recognition and are currently under investigation for various surface processing applications. Among various atmospheric plasmas, Dielectric Barrier Discharge (DBD) technology plays a pivotal role in surface treatment. In this paper, a DBD reactor for surface processing has been presented. Moreover, process parameters and major components of DBD reactor have been discussed. Further, an electrical model of DBD cell and mathematical analysis of discharge excitation parameters have been presented.

Key words: Surface Processing, DBD reactor, plasma.