RECENT ADVANCEMENT IN POWER SYSTEM ENGINEERING

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Power flow Control of Grid Integrated Solar PV/Wind Hybrid System

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Non-conventional sources of energy are available in plenty, free of cost and pollution free as compared to conventional sources. Solar and wind has good advantages than other than any other Non-conventional energy sources. Both the energy sources have greater availability in all areas. Photovoltaic (PV) technology involves converting solar energy directly into electrical energy by means of a solar cell, whereas Wind turbines convert kinetic energy in the wind into mechanical power that can be converted into electrical energy with a generator. Hybrid renewable energy system (HRES) is the combination of two or more energy sources for giving power to grid. It has good reliability, efficiency, less emission, and lower cost. This chapter presents the performance of a Solar/ Wind renewable energy resources based hybrid power generation system. ANN base control scheme for inverter integration to the grid is incorporated. Modeling simulation and integration with Grid for complete system is done in MATLAB/SIMULINK environment and results are presented.

Presently almost all the electricity generation takes place at central power station which utilizes coal, oil, gas, water or fissile nuclear

Energy Pilfering Detection by Use of Smart Meter

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Electricity theft is costing many governments, particularly those in poor countries, a lot of money. Fraud (meter hacking), theft (illegal connections), billing discrepancies, and unpaid bills are all examples of electricity theft. Electricity theft costs the government a lot of money. As a result of the monetary loss, governments are unable to invest in expanding current power capacity, and as a result, governments are unable to meet the ever-increasing demand for electricity. Traditional electro-mechanical and electronic energy meters have limitations when it comes to detecting power theft. We created an electrical power stealing detection system (smart meter) to identify unlawful tapping on distribution lines, and we employed a wireless data transfer mechanism to notify the service provider firm about the power theft. Power theft may be effectively controlled using a smart metering system. The entire adoption of a smart metering system in India will considerably minimise power theft, resulting in a significant increase in revenue collection.

An electricity meter, also known as an energy meter, is an equipment that monitors the amount of electric energy utilized by a home, a business, or a machine that runs on electricity. Customers' electric meters were installed by the electric service provider company to

Mathematical Modelling and Control System Design of Actuator Used in Aerospace Vehicle

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This chapter involves survey of different types of actuators, study of different topologies of electro-mechanical actuators, different configuration of electric drives, BLDC motor and their control, effect of nozzle and the design of filter to achieve the desired response from the aerospace vehicle. To design the filter, first, the mathematical modeling of BLDC motor based electro-mechanical actuator is carried out by including the detailed modeling of BLDC motor, transmission mechanism and dynamics of feedback element. Furthermore, the robustness analysis is performed by varying the input signal in control system hardware as per the specified specification. The undesired phenomena i.e. chattering produced by the nozzle effect is compensated by properly designing the filter so that the aerospace vehicle (missile) can reach the desired target. As the resistance is very important from control system point of view as it is one of the parameter which affects the damping of the system. Analysis is also carried out with 4 different values of resistances by varying resistance from 0.125 to 0.425 ohms.

A missile is aerodynamically controlled for pitch, yaw and roll by four rear mounted control surfaces operated by four individually controlled

Solar Energy Utilization and Enhancement using Load Schedular

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As the need for electricity grows by the day, it is our responsibility to make it accessible as needed. Many power plants rely on non-renewable resources as their major source of energy. Main power supply controller to continuous read to the battery voltage. The main power supply controller first checks the panel output voltage. If the solar panel output power is sufficient to fully charge the battery, it does not connect the A.C. main power supply. If the solar power is insufficient to fully charge the battery, the main supply controller allows the main power supply to charge the battery. It must be the system does not overcharge the battery. It does not deep discharge battery voltage and also it makes maximum uses of the solar energy in over charging condition of the battery level. Therefore we reduce main power supply, maximum uses on when the overcharging of the battery by through solar power main power supply controller. The main supply controller is an intelligent solar controller that can operate the load and charge the battery at the same time. The primary supply controller is programmed to prioritise solar power and only use grid power when solar power or battery charge is inadequate to fulfil the load requirement.This

Transmission Expansion Planning in Electrical Power System

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Transmission expansion planning (TEP) is currently an important power system optimization challenge since modern electric power networks are made up of large-scale and extremely complicated linked transmission lines. In a deregulated context, evolutionary programming is employed for transmission network design, and a risk-based approach is used for transmission expansion planning. Both systems make use of a six-bus bar network. Ten distinct types of transmission cables are employed in transmission network planning utilizing evolutionary programming. 1 to 10 numbers were utilized to denote various line kinds. The Newton Raphson technique was used to calculate the load flow. The main goal of the load flow computation is to determine the MVA flow in lines. The suggested approaches produced solutions that were accurate, had consistent convergence characteristics, were easy to implement, and took a reasonable amount of time to compute. The calculations were carried out in the MATLAB programming environment for transmission expansion planning utilizing evolutionary programming and a risk-based methodology.

Since the mid-1980s, the electrical power supply business has gone through a period of fast and essential change in terms of how energy is

Arduino Based Irrigation System Using IoT

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India is an agriculture based country. Carrying on with outdated methods of irrigation is no more sufficient to uplift the economy. Some artificial automatic irrigation methods need to be incorporated for proper agricultural yield. The system should also be capable of being operated remotely for the sake of farmer's benefit thereby result in better crop production. The project uses Arduino micro controller to control the process.

Manual irrigation is one method used to water the field. This method represents massive losses since the amount of water given is in excess of the plants needs. Available resources of water are used excessively.The proposed system will allow farmers to continuously monitor the moisture level in the field, controlling the supply of water remotely through internet. When moisture goes below a certain level, sprinklers would be turned on automatically, thus achieving optimal irrigation using Internet of Things. One of the advantages of Automatic IrrigationControl is that it prevents Disease and Weeds. Irrigation of plants is usually a very time-consuming activity and proposed system as another advantage provides free time to farmer that could be given to family. Further one can avail video capturing facility about the crop status.

Standalone Solar Photovoltaic Energy System

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India is fractious to light the electric power demands of a fast expanding economy. Restructuring and deregulation of the power industry has only increased several challenges for the power system engineers. In this thesis, an optimized model of photovoltaic system connected at residential load is developed and analysed. The proposed vision of introducing Photovoltaic model with backup at various levels in the Indian domestic stand-alone systems has endorsed for improved and enhanced power quality. It also reviews the progress made in stand-alone PV technology since its commencement. Attempts are made to highlight the current and future issues involved for the development for future demands in Indian perspective. For utilities, the model proposed can provide an insight on the price of electricity that should be paid for green PV energy. From a customer's perspective, the proposed model can provide the customer with a more accurate estimate of the PV payback time since the model takes into account the variability in PV as well as the fact that not all PV. Finally, the model presented in the study can be adapted to fit any region in the world taking into account two major factors, the electricity market price in the area and the capacity of solar radiation at that place.