



A REVIEW ON HYBRID AC-DC POWER SYSTEM RENEWABLE ENERGY SOURCES

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ABSTRACT: Renewable energy sources will be fulfilled by Future power system. The need for expert designers is increasing. Operators for such systems are also increasing. The concept of renewable type of energy sources have discussed by developing new platforms. These are for development, design, and integration of renewable energy sources. These are like wind and photovoltaic for research. The educational efforts are also going to be affected by this. This involves the implementation of energy source emulators. This related control issues. This research and education environment involves techniques. Some examples are ac-dc real time operation, power system design, analysis and control. It provides a state of the art platform for solving most challenges of original renewable sources in the modern power systems.

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[1] INTRODUCTION

Electricity is considered as normally generated at a power station. It is completed by electromechanical generators. It has primarily driven by heat engines. These are fuelled by combustion. Nuclear fission is also fuelled by it. Different energy sources involve solar geothermal power & photo voltaics. The process of generating electric power is named as Electricity generation. It is get from sources of primary energy. It is the first stage in delivery of electricity to users. This for electric utilities in electric power industry. After these stages like distribution, transmission, energy storage & recovery, it uses pumped-storage methods.

A major characteristic of electricity may be shown as it is not a primary energy. It is freely present in nature in known amounts. It must be produced. Production

is carried out in power plants. Electricity is oftenly generated at a power station. It is used by electromechanical generators. These are primarily driven by heat engines fuelled by combustion. It is for nuclear fission. It is also carried by other means like kinetic energy of flowing water & wind. Other energy sources involve solar photovoltaics & geothermal power.

1. Heat energy generated from: fossil natural gas. fuels coal. petroleum. solar thermal energy. geothermal energy. nuclear energy.
2. Energy from falling water in a hydroelectric facility.
3. Wind energy.
4. Solar electric from solar (photovoltaic) cells.
5. Chemical energy from: fuel cells. batteries.

[2] Wind Energy



Wind power is use of air flow through wind turbines. It is to mechanically power generators for electric power. Wind power is considered as alternative to burning fossil fuels. It is plentiful as well as renewable. It has been widely distributed. It is clean and produces no greenhouse gas emissions at the time of operation. It needs no water and it occupies little land. It has minimum effects on environment than those of non renewable power sources.



Fig 1 Wind Mill

Wind farms consist of many individual wind turbines which are connected to electric power transmission network. Onshore wind has been considered an inexpensive source of electric power. It competitive with or in many places cheaper than coal or gas plants. It is observed that Offshore wind has been steadies. It is stronger as compare to land. The offshore farms are having less visual impact. The construction and maintenance costs are getting higher. The Small onshore wind farms may feed some energy in grid. They could provide electric power. It is to isolated off-grid areas. Wind power is providing variable power. It is very consistent from year to year. But it has significant variation over shorter time scales. Thus it is has been used in conjunction with other electric power sources. It is to give a reliable supply. As the proportion of wind power in a region is getting increases there is requirement to upgrade grid. A lowered ability to supplant

conventional production might occur. The power management techniques are consisting of geographically distributed turbines. It is having excess capacity, dispatch able backing sources, exporting & importing power to neighbouring areas, sufficient hydroelectric power. It also consists of reducing demand when wind production is low. There could be many cases in order to overcome such issues. Weather forecasting is going to permit electric power network to be readied. It is done using sufficient hydroelectric power. It is for predictable variations in production.

[3]Hydroelectricity

Hydroelectricity would be traditional technique of generated electricity. Jack Caveman stuck some research leaves on a pole & put it in a moving stream. Water would turn pole that compressed speck to make their lovely low fat primitive bran muffins. People have used moving water to help them in their work throughout history, & modern people make great use of moving water to produce electricity. It has been found that the cost of hydroelectricity is small. It is making it a competitive source of renewable electricity.

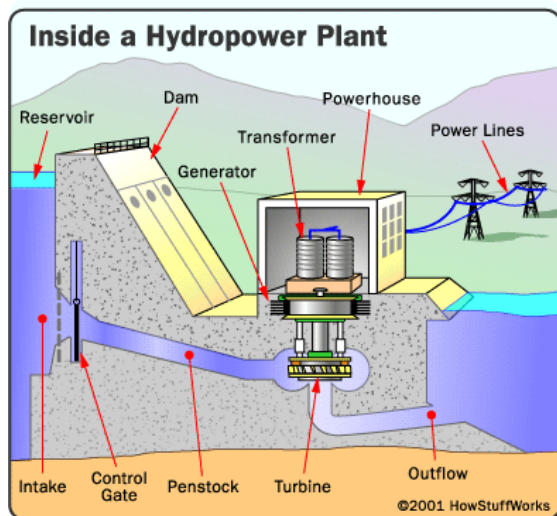


Fig 2 Hydropower Plant

Hydro station consumes no water, unlike coal or gas plants. Average cost of electricity from a hydro station larger than ten megawatts is three to five U.S. cents per kilowatt-hour. Within a stem & pool it is also a supple basis of power since cost produced by station could be changed up or down very rapidly to adapt to changing power demands. It has a considerably lower output level of greenhouse gases than fossil fuel powered energy plants.

[4]Solar Energy

Solar energy is energy that earth receives from sun. It is visible light as well as other forms of electromagnetic radiation. Solar portal provides idea of information on energy pedia that is related to solar energy. Solar control has been considered as exchange of power from sunshine into electricity. It is unlock by photovoltaic. It is indirectly using concentrated solar power.



Fig 3 Solar Energy

The expenses of a home photovoltaic system or solar electric have been determined by both capital as well as operating costs. Capital costs are considering early costs of designing. It also consider configuration a photovoltaic system. Operating costs are including costs that have been associated. It is required during maintaining as well as operating photovoltaic system over its useful life.

[5] EXISTING RESEARCHES

In this section we have discussed several research relevant to existing research.

A. Dastfan, F. Behrangi (2009) “Design & Simulation of a New DC Power Supply Based on Dual Bridge Matrix Converter”, Iranian Journal of Electrical & 58 Electronic Engineering, Vol. 5, No. 1, March 2009

A conventional high power DC power supply system’s is consisting of a three-phase diode rectifier. It is followed by a high frequency converter to supply loads at regulated DC voltage. These rectifiers draw significant harmonic currents from utility, resulting in poor input power factor. DC power supply based on dual-bridge matrix converter having minimized number of switches has been discussed in this paper. In circuit, three switches



convert low frequency AC input to a DC link. A single-phase bridge inverter converts DC-link to a high frequency AC output. Output of matrix converter is then processed. It is done via a high frequency isolation transformer. It is rectified to regulated DC voltage.

A simple voltage control loop confirms that output voltage is regulated against load modifications. Input supply variations in proposed topology. Current control loop is not used to correct input currents. Theory analysis & simulation are made to investigate performance of proposed circuit. Simulation result represents that input currents are of a high quality in changing load conditions & input voltage in power supply with 7 switches.

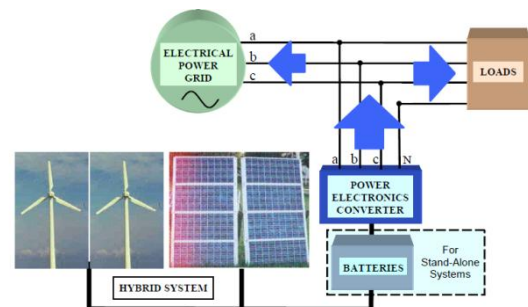
Design Specification	Values
Input line voltage (v_i)	380 V
Input frequency (f_i)	50 Hz
Switching freq. in rectifier mode	10 KHz
Switching freq. in inverter mode	25 KHz
Output DC Voltage (V_{dc})	48 V
Load power (P_o)	6 KW

Table1 Design Specification of proposed approach

Paulo Ferreira, Manuel Trindade, Júlio S. Martins & João L. Afonso (2010) "Interfaces for Renewable Energy Sources with Electric Power Systems", Environment 2010: Situation & Perspectives for European Union 6-10 May 2003. Porto, Portugal

This paper shows technological solutions. It focuses on contribution for efficient production of electric energy. It is done using renewable non-pollutant sources. It is to improvement of power quality in

electrical systems. It proposes development of power controllers having minimum cost with high efficiency. It optimizes energy extraction from hybrid systems. It is constituted by photovoltaic solar panels & wind power turbines in renewable energy power plants. It is considered that main innovations are utilization of a single microcontroller. It is for both sources' power control & development of an interface. It is between DC link & AC electrical system. This interface is using a control system. It is based in p-q theory that takes into account power quality issues. The paper is also representing a cost study. It is regarding products for renewable systems available in market.



Connection of hybrid system

Lijie Dinga, Yiqun Miao (2011) "Research of Control Strategy of STATCOM in AC/DC

Hybrid Power System", ICSGCE 2011: 27-30 September 2011, PP. 437 - 442

This paper has analyzed control strategy of dynamical reactive power. It is in AC/DC hybrid power grid, & presented limitation of control strategy. It is based on location bus voltage. It could improve transient stability under AC line faults but not DC block faults. Thus, it controls strategy of STATCOM. It is based on real-time wide-area signal. It was presented by introducing tie-line power flow of power grid. A nonlinear control mode in sections



is also proposed. It is to consider transient stability, dynamical stability & voltage stability at same time. Simulation results are representing that control strategy will raise transient stability. This would improve dynamical stability of AC/DC hybrid system. It would be done under AC line faults either DC block faults.

[6] SCOPE OF RESEARCH

It would provide reliability and consistency of electricity production. According to proposed model there is no need to depend only on single sources. Proposed model would be capable to produce electricity in absence of other electricity production system. This system would reduce consumption of fossil fuels and production of greenhouse gases. System is good for remote application: satellites, rural hospital equipment in developing counties, telecommunication equipments, etc. It would reduce the loss of electricity due to power line resistance because it can be sited where the electricity is used. System reduces water consumed in electrical generation processes by displacing electrical demand.

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