**POWER QUALITY IMPROVEMENT WITH THE COMBINATION OF ACTIVE AND REACTIVE POWERS**

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**ABSTRACT:**

With the public opinion, economically weaker sections have drawn the attention by the power suppliers to supply the power to them economically. In this paper the different types of power systems in the name of “Distributed Generation systems” have been combined. Most of the countries will have the renewable usual collection and about 20-30% electrical supply has been generated through renewable energy sources only. Hence the electrical power sales within 20 years may be through renewably power generated only. Most of the requirements have been attended by the generating companies and added in their list essentially, wind energy and solar energy as the bulk power systems.

Distributed power systems concept is largely included through wind resources, run of river hydro power, such as hydro wave energy is made use of. In this concern major consideration is wind and solar energies. Most of the varieties of distribution generation have been shared with similar characteristics, since the variability is largely driven by weather or other natural phenomena tic features. Similar optimization and integration approaches are applied to these distribution generation resources. In fact the load is also influenced by weather conditions. Therefore the demand of distributed generation in optimization may come into existence.

Key Words: Distributed Generation System (Active, Reactive, Both Active and Reactive Powers), Photovoltaic System, Wind Energy, New Concept of power system

1. INTRODUCTION

The distributed generating System is the new and unique power generating systems of its own and economic type. In this system the small generators are used compared to conventional systems of power generations. They are distributed along with the power transmission and distribution lines closer to the load or load centers. In the normal conventional type generation the power is transmitted and distributed the transmission and distribution lines from a single generating plant, where many power quality issues incurred. While through distributed generating system the power quality is improved as per the expectation of consumers.

In this systems, most of the small generators are configured, the model represents as the centralized system of generation with economic way. This system of generation is located away from the city area or populated area as per the environmental reason and availability of fuel and water.

Hence this generating system has the following features:

* Small generators are installed near the load centers
* It has decentralized generation aspect
* It has embedded quality generation
* It disperse the generated power efficiently

## ADVANTAGES AND DIS-ADVANTAGES OF DG SYSTEMS

## ADVANTAGES: Renewable

## Energy Sources: Reduce fossil fuel consumption

## Increase the Efficiency of the working systems

## Reduction of T & D electrical losses

## Deferral investments in T & D systems (enhance network capacity)

## Network support and auxiliary services

## Continuity, Reliability and Security of supply system

## Improves competitiveness and Market opportunities

## Flexibility and locality (resources, business, employment

## DIS-ADVANTAGES:

## High level of dependence on imported fossil fuels

## Environmental impact of greenhouse gases and other pollutants

## Security of supply under threat

## Transmission losses

## Necessity for continuous upgrading and replacement of transmission and distribution facilities

## Load demand is continuously growing

## APPLICATIONS OF DG:

## In general, distributed generation system can use any type of electrical generator or static Converter/inverter which produces an alternating current which has the ability of parallel operation with the utility distribution system. It is designed to operate separately from the utility system and can feed the power to the load which can also be fed back by the utility electrical system also. A distributed generator can also be referred as only “generator”

## EQUIPMENTS FOR DISTRIBUTED GENERATING SYSTEM:

Reciprocating Engines, Gas Turbines, Micro turbines, Fuel Cells, Photovoltaic Systems, Wind Energy

Biomass, Hydro-electric resources, new network technologies

## PHOTOVOLTAIC (PV) SYSTEMS:

## The devices which are supplied from solar photo voltaic cells: Such as Night Lamps, car coolers, Toys etc. They consist of a small solar panel

## and motor, operated at the low voltage of 12 V D.C and current in the order of milli or micro amperes. The devices used in this system are different from the general system. They can be used to supply the power to house utilities, such as internet connection with utility offset to building energy consumption.

## Power Quality Improvement Using FACTS Controller D-STATCOM

USE OF D-CUSTOM POWER DEVICE TO IMPROVE POWER QUALITY: To overcome the problem of Power Quality issues in the conventional and Non conventional devices, the equipments are very sensitive to voltage sags and swell; they need the justifying devices to be very quick in action. So in order to overcome the power quality issues, new technology device called D-custom power device is used. This device is the newly designed of power electronics equipments for enhancing the power quality, such as reliability and flow of quality power with low distribution networks etc. In this paper, D-STATCOM is the proposed topology which can be used for compensating the current reactive power Compensation, power factor improvement and harmonic

Suppression in all the feeders of conventional and nonconventional DG power.

1. IMPACT OF DISTRIBUTED GENERATION ON DISTRIBUTION SYSTEMS:
2. General Concept of Power Systems. In the general concept, power is generated by conventional method using thermal or hydro power resources and transmitted to the substation then its step-down as power the requirements say 110/33KV. 33KV line is send the consumer’s area again step-down to 11KV then distributed through II/0.4KV systems.
3. New Concept of Power Systems: The new concept is presented in this paper. Where, the power is generated by Distributed generating concept with non conventional method using solar energy and wind power energy and sent the power to common grid which is installed near the load centre. Both the conventional generator power and non conventional generator power with improved power quality are connected to the consumer’s end with auto or manual control switch. Whichever is convenient will be supplied to the consumers in the economic way.
4. Impact of Distributed Generation on Power System Grids: In DG system of power generation nonconventional energy system is used, which generates high active power is an advantage; the same transferred to grid system then sent to consumers in economical charges.
5. Impact of Distributed Generation on Voltage Regulation: The voltage regulation of more acceptable compared to conventional generation and distribution.
6. Impact of Distributed Generation on Harmonics: Harmonically distorted wave form can be rectified as a purely sinusoidal wave form in these systems as an advantage to the A C operated devices.
7. POWER QUALITY RELATED ISSUES OF DISTRIBUTED GENERATORS: The major power quality issues may incurred on the distributed generating equipments connected to the grid system. Voltage Regulation, Grounding Issue, Harmonic Distortion, Flicker, Islanding, Sag and swell etc.
8. **CONCLUSION:** Distributed generation is the need to fulfill the requirements of Electrical supply in a present time, because of Continuity, Reliability and Security of supply. Improved competitiveness and Market opportunities, flexibility and locality (resources, business, and employment.) Distributed generation systems are smaller in size & can’t design of any required rating with low cost. Most of the Distributed systems are based on natural resources.

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