International Journal of Engineering Science Invention Research & Development; Vol. II Issue VI December 2015
www.ijesird.com e-ISSN: 2349-6185

IMPROVEMENT IN VOLTAGE STABILITY IN POWER SYSTEM BY USING STATCOM DEVICE

Bajan
bjan768@gmail.com

Abstract: In this paper the effects of static voltage stability will be studied. Reactive power handling capacity can be improved by using STATCOM device. We can reduce voltage instability by using STATCOM device. Increasing load demand is the main reason of voltage instability in power system. In this paper it is thoroughly studied how to maintain voltage stability in changing load positions by using STATCOM Device.

I. INTRODUCTION

The electric supply undertaking is undergoing a big transformation throughout world, Natural resources increasing demand of electricity are some of the factors responsible for this change.

Improvement of reactive power handling capacity through flexible AC Transmission System (Facts) devices is the solution for prevention of voltage instability.

Recently with the use of FACTS controllers at the specific location is the most appriate way for electrical users with utilities to improve the stability of the system. With the increase in voltage limits of electrical insolating devices there is voltage collapse when the system is loaded beyond its capacity. Voltage insatiability of the power system is increasing nowadays because of increasing demand and it is very important to analyze the power system with respective voltage suitability. A system faces a state of voltage instability when due to demand and change in system condition cause uncontrolled drop in voltage. Most important factor causing insatiability in the power system is the in ability of the power system to meet the demand for reactive power.

The FACTS is basically based on power electronic controllers which increase the value of transmission networks by increasing the use of their capacity. They work very fast without risking the stability of the system; they increase the safe operating limits of transmission system. A system enters state voltage instability when disturbances occur. The aim is only to increase of power flows in the high voltage side of network during both steady state and transient conditions. FACTS has money economical and technical benefits which make it the choose of electrical equipment manufactures and research organizations worldwide.

For very long high voltage transmission lines voltage drop is the limitation factor on the line load ability in these cases study state stability limit is far below the thermal limit to ensure reliability of lines are operated at loads less than their ratings.

The ability of transmission system to carry power becomes impaired by following study state and dynamic limitations.

1. Dynamic Stability
2. Thermal Limits

3. Voltage Magnitude
4. Transient stability

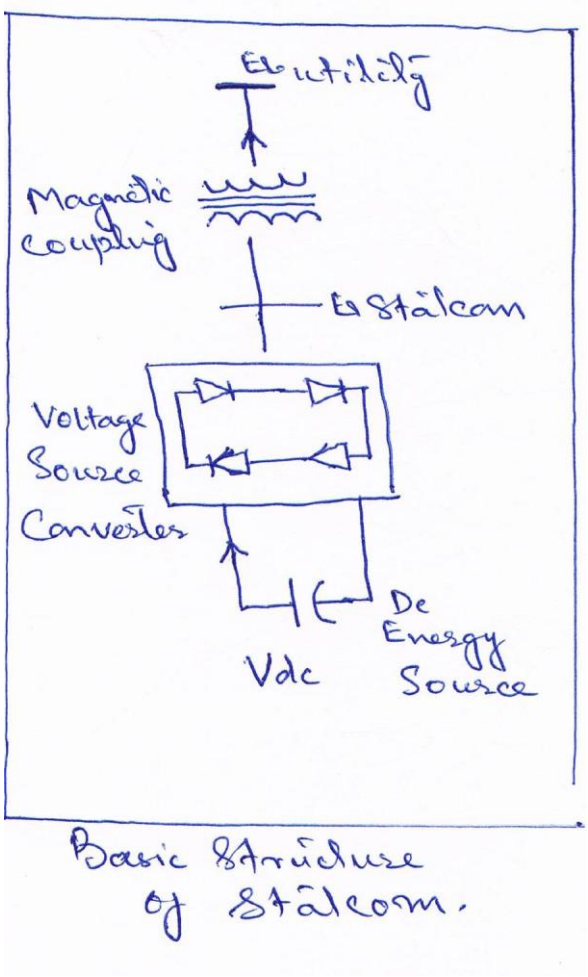
Types of facts controllers

A number of FACTS controllers have been developed and they are being used during both steady state and transient operation.

Some of the FACTS controllers are:-

1. Static compensation (STATECOM) this is a solid state synchronous condenser connected in shunt with the AC system.
2. Silid state series controller this controller is similar to the stat com but it is connected in series with the AC system.
3. High voltage direct current link this is a controller comprising a rectifiers station and an inverter station.
4. Static VAR compensator this is a shunt connected static source or sink or reactive power.
5. Thruster controlled series capacitor (TCR) this is a shunt connected thyristor controlled reactor.

6. STATCOM FACTS devices can be used to provide reactive power compensation there are many types of FACTS devices but statcom can give very much benefit in terms of voltage stability, statcom is basically static synchronous generator and works as shunt connector var generator its capacitive or inductive current can be controlled from the AC system . Statcom is either voltage source based or current source based. voltage source invertor which converts a DC input voltage into AC output voltage to compensate the active and the reactive power.



Basic Structure of Stalcom.

II. CONCLUSION

In this paper instability of the power system which occurs with increased demand nowadays is studied in length and breadth and affect of electronic devices/electronic power controllers like FACTS devices (STATCOM) is studied**.**

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