

# School of Electrical, Electronics and Communication Engineering

Course Code : MPSE2502

Course Name: Power System Dynamics and Stability



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Name of the Faculty: Dr. Shagufta Khan

Program Name: M.Tech

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## Introduction to Automatic generation control.

In an electric power system, automatic generation control (AGC) is a system for adjusting the power output of multiple generators at different power plants, in response to changes in the load.

Since a power grid requires that generation and load closely balance moment by moment, frequent adjustments to the output of generators are necessary. The balance can be judged by measuring the system frequency; if it is increasing, more power is being generated than used, which causes all the machines in the system to accelerate.

If the system frequency is decreasing, more load is on the system than the instantaneous generation can provide, which causes all generators to slow down.

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## The need of Automatic Generation Control .

As our development has increased, there has been a higher demand of electrical power loads both on industrial and domestic scale.

As the number increases, it is also imperative to manage load properly since a failure to do so results in frequency fluctuation and voltage drops. An effective regulatory strategy is available in the form of

- Automatic Voltage Regulator Systems (AVR) and
- Automatic Load Frequency Control (ALFC)

The main function of ALFC system is to assess and rectify the power and frequency while that of AVR system is to regulate voltage and reactive power.

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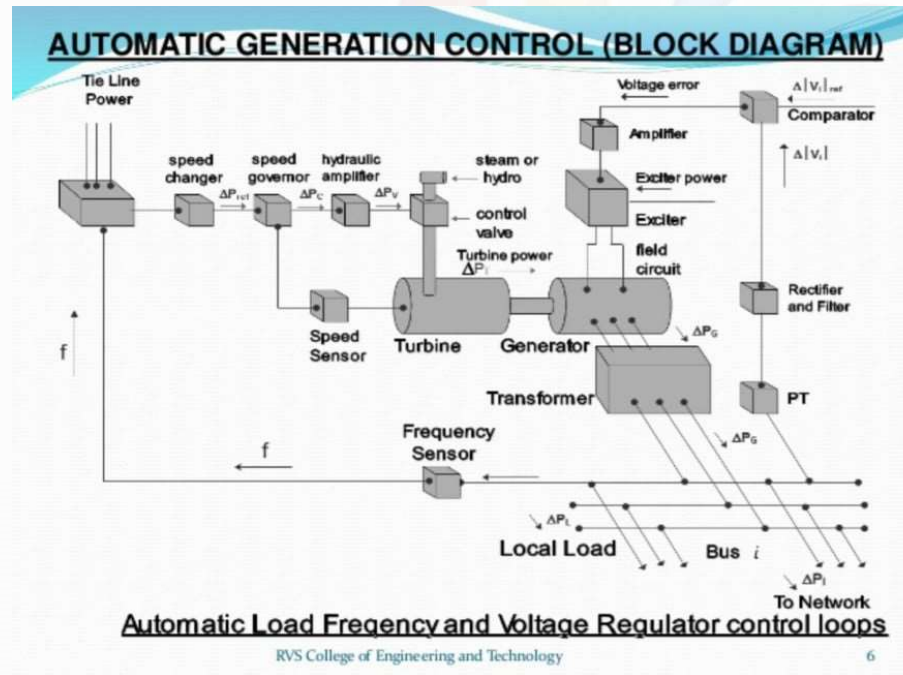
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## Block Diagram for Automatic Generation Control.



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## Types of AGC.

Turbine-governor control (TGC)

Load-frequency control (LFC)

Economic dispatch

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## Turbine-governor control (TGC)

Generators in a power system have stored kinetic energy in their large rotating masses.

The kinetic energy stored in a power system in such rotating masses is a part of the grid inertia. When system load increases, this inertia is initially used to supply the load.

The purpose of the turbine-governor control is to maintain the system frequency by adjusting the mechanical power output of the turbine.

## Load-frequency control (LFC)

Load-frequency control is employed to allow an area to first meet its own load demands, then to assist in returning the steady-state frequency of the system,  $\Delta f$ , to zero.

Load-frequency control operates with a response time of a few seconds to keep system frequency stable.

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## References

- Power System Stability by Kimbark Vol. I&II, III – 1968, Dover Publication Inc, New York 1968.
- Power System Dynamics Stability and Control by K.R.Padiyar, Second edition B.S.Publications 2002.
- Computer Applications to Power Systems–Glenn.W.Stagg & Ahmed. H.El.Abiad
- Power Systems Analysis & Stability – S.S.Vadhera Khanna Publishers.
- Power System Analysis by “Hadi Saadat” – Tata McGraw Hill Publications
- Power System Analysis by John J.Graniger William D.Stevenson. JR. – Tata McGraw Hill Publications.

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