

SECTION - A

Introduction of Distributed Vs Central Station, Generation, Source of energy such as micro turbine, Internal combustion engines.

Introduction of Distributed generation :-

Distributed generation (DG) is the implementation of various power generating resources, near the site of need, either for reducing reliance on or for feeding power directly into grid. Distributed generation may also be used to increase transmission and distribution system reliability.

The distributed generation consists of small medium power plants (typically - renewable sources, mainly wind and (PV) spread in random ways. The energy generated by these plants is usually consumed locally, by the user himself for own consumption, by the other's close user.

Technology for Distributed energy system &

• Gas Technology

→ ~~Combustion~~ Combustion Gas Turbine

→ Micro Turbine

→ Fuel Cell

Renewable Energy Technology

→ Biomass power

→ Small wind Turbine

→ Photovoltaic Arrays.

Benefits of Distributed Generation :-

→ Environmental friendly and Modular electric generation.

- Increased Reliability
- Fuel flexibility
- Cost Saving.
- On Site Generation
- Standby Generation.
- Peak Saving.

Generation (Centralized Form) &

The Centralized Generation is the classic standard power management model for the very big power plant connected to the power system.

Historically these plants are the thermoelectric one, nuclear, gas and so on, but also hydroelectric, which can provide continuously for 24 hours and they are located in specific points directly connected to transmission power system.

The new centralized generation considering renewable power plants, brings also some additional challenges for the grid operator. Indeed

these plants are located in specific geographical places where the primary resources is enough to justify the investment. So the plants can be realized in the area where solar radiation is high to obtain maximum possible production.

→ Centralized generation has also lower flexibility to failures.

→ During occurring of faults, a big portion of

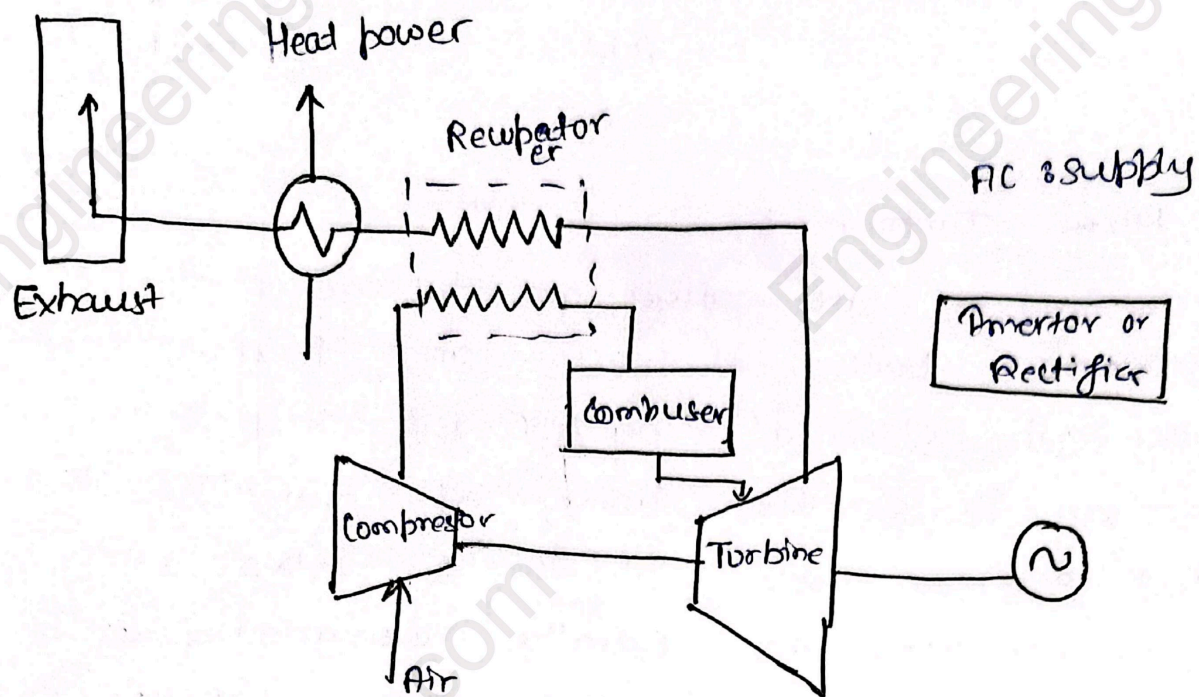
generation power could be turned off with possible power interruption for several final user.

Micro Turbine &

Micro turbine are tiny gas turbine that can generate both electricity and heat. They vary in electrical output from around 25 kw to 250 kw units of b/w 250 kw and 250 kw are sometimes called mini turbine. They are usually designed as distributed generator since they supply their power at distribution level of grid.

A micro turbine that cause the flow of gases to convert thermal energy into mechanical energy. The technology used in the micro turbine is derived from diesel engine, turbo charger, aircraft auxiliary power system and automotive design. MT consist of compressor, combustor, turbine and generator. The combustible usually gas is mixed in combustion chamber with air which is pumped by compressor. This product makes turbine rotate which at the same time impulse the generator and compressor. The turbine and compressor are mounted above the same shaft.

Schematic Diagram of Micro - turbine :-



Most of design are single shaft use a high speed permanent magnet generator for producing variable frequency and variable voltage AC power.

Most of units are designed currently for continuous duty operation to obtain higher electrical efficiencies.

Internal Combustion Engine :-

This is a type of heat engine which convert the heat energy during combustion of fuel into mechanical work. As the combustion take place within engine cylinder, it is named as internal combustion engine. This type of engine make use of liquid and gaseous fuel for combustion. Most of



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