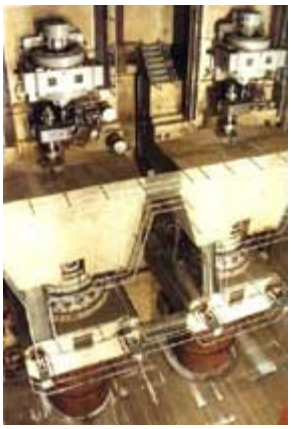
MICRO HYDRO TURBINES – AN OVERVIEW….



Hydro-electric power stations capture the energy in flowing water to produce electricity. Small hydro-electric generating systems provide clean, cheap electricity for local applications.

Small hydro power stations are comprised of turbine generators and the structures necessary to channel and regulate the flow of water to the turbines.

Water flows from high points to low points because of the force of gravity. There is energy embodied in the flow of water, and hydro-electric power systems capture some of the energy and convert it to electric power. The power available in a flow of water over a given interval depends on two factors: the vertical distance the water "falls" over the interval, measured in feet or meters, and the volume of the flow of water, measured in cubic feet or cubic meters per second.

If a dam is constructed to block the flow of water, a river or stream may be channeled through turbines connected to electric generators to produce power. The power produced by the hydro-electric system is the product of three parameters: the distance the water falls fall from the intake to the outlet, the volume of the flow of water, and the efficiency of the turbine/generator equipment.

The Hydro Power Equation:

For an estimate of the power available in a given stream or river, the following formula may be used: power = 10 x flow x fall x efficiency where "power" is measured in kilowatts, "flow" in cubic meters per second, and "fall" in meters.

Efficiency includes that of the turbines and the generators. Friction losses in the system are usually factored into the equation by decreasing the "fall" variable by an appropriate amount.

Potential:

The world's developing nations hold vast potential for hydropower development. The continents of Africa, Asia and South America have the potential for 1.4 million megawatts -- four times as much capacity as is found in North America.

Small hydropower, (up to 20 megawatts), with its multiple advantages as a decentralized, low-cost and reliable form of energy, is in the forefront of many countries' programs to achieve energy self-sufficiency. Small hydro allows for rural electrification, petroleum substitution, rural development of isolated areas, and a cleaner environment.

Small Hydro Applications:

- **Pumped Storage**

Pumped storage projects are a means of storing energy. Excess off-peak energy is used to pump water to an upper reservoir where it is stored as potential energy. The water is then released to produce peak-load power when necessary.

- **Run-of-the-River Power Plants**

Run-of-the-river hydroelectric plants use the power in river water as it passes through the plant without causing an appreciable change in the river flow. Normally such systems are built on small dams that impound little water. Many times a reservoir and a dam are not even required, so a run-of-river project may not cause the water quality changes such as higher temperature, low oxygen, decreased food production, siltation, increased phosphorus and nitrogen, or decomposition products associated with other hydroelectric systems.

Manufacturers of Small Hydro Turbines.

These manufactured turbines are as per the actual requirements of clients. Thus all make Kaplan, Semi Kaplan, Francis and Pelton wheel type turbines designed specifically to meet each client's requirements. Thus there is no system of buying readymade turbines off the shelf.

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