

Tutorial -2 (Electrical Energy Management)

- 1) The maximum demand on a power station is 100 MW. If the annual load factor is 40%, calculate the total energy generated in a year.
- 2) A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being 61.5×10^6 per annum. Calculate (i) the demand factor and (ii) load factor.
- 3) A 100 MW power station delivers 100 MW for 2 hours, 50 MW for 6 hours and is shut down for the rest of each day. It is also shut down for maintenance for 45 days each year. Calculate its annual load factor.
- 4) A generating station has a maximum demand of 25MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72%. Find (i) the reserve capacity of the plant (ii) the daily energy produced and (iii) maximum energy that could be produced daily if the plant while running as per schedule, were fully loaded.
- 5) A base load station having a capacity of 18 MW and a standby station having a capacity of 20 MW share a common load. Find the annual load factors and plant capacity factors of two power stations from the following data :
Annual standby station output = 7.35×10^6 kWh
Annual base load station output = 101.35×10^6 kWh
Peak load on standby station = 12 MW
Hours of use by standby station/year = 2190 hours
- 6) The load duration curve for a typical heavy load being served by a combined hydro-steam system may be approximated by a straight line; maximum and minimum loads being 60,000 kW and 20,000 kW respectively. The hydro power available at the time of minimum regulated flow is just sufficient to take a peak load of 50,000 kWh per day. It is observed that it will be economical to pump water from tail race to the reservoir by utilising the steam power plant during the off-peak periods and thus running the station at 100% load factor. Determine the maximum capacity of each type of plant. Assume the efficiency of steam conversion to be 60%.
- 7) The annual load duration curve for a typical heavy load being served by a steam station, a run-of-river station and a reservoir hydro-electric station is as shown in Fig. given below. The ratio of number of units supplied by these stations is as follows:

Steam : Run-of-river : Reservoir : : 7 : 4 : 1

The run-of-river station is capable of generating power continuously and works as a base load station. The reservoir station works as a peak load station. Determine (i) the maximum demand of each station and (ii) load factor of each station.

