



ANALYSIS AND IMPROVEMENT IN PERFORMANCE CHARACTERISTICS OF FRANCIS TURBINE

S. Hari Narayanan^[1], Sri Saila Mallikarjunan K V^[2]

¹ Student, Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, India
Email: 90hari@gmail.com Ph: 91-9840577699

² Student, Department of Mechanical Engineering, Thiagarajar College of Engineering, Madurai, India
Email: kuttuvaarjun@gmail.com Ph: 9944282974

ABSTRACT

In Francis Turbine water flow is radial into the turbine and exits the Turbine axially. Water pressure decreases as it passes through the turbine imparting reaction on the turbine blades making the turbine rotate. The design parameters such as, radius of the runner, curvature of channel, angle of vanes and the size of the turbine as whole depend on the available head and type of application altogether. Water with high pressure enters the turbine through the spiral casing surrounding the guide vanes. If the turbine is operating at the design conditions, the water leaves the runner in axial direction. Turbine Efficiency is highly affected by various losses that occur in the Francis Turbine. The following paper aims at solving some of the commonly known problems. Also, the turbine efficiency would increase if the entering water has a whirl and for this purpose, a spiral case is provided. This paper also aims at the calculation of the design parameters of the spiral case. Hence by designing the number of cases required, we can weld the spiral case to the base structure.

Keywords – Francis Turbine, Spiral Casing, Turbine Efficiency, Runner, Vanes