A REPORT ON INDUSTRIAL VISIT TO
PULICHINTALA HYDRO ELECTRIC PROJECT

This is a study report on industrial visit to pulichintala hydroelectric project which is located in Nalgonda district of Telangana state. We started in our campus on 19.03.2015 at 4:30 AM. We, 80 students of II EEE and 25 students of II MECH along with our faculty members visited Hydroelectric Project which is in under construction.

This is one of the project, which is in under construction. So that, we have a chance to observe clearly examine what’s going on there…..,especially building of draft tubes, penstocks, a huge turbines, pumping system beneath the dam, Alternator (a huge power generating machine) with 48 poles, etc..

Pulichintala multipurpose irrigation project serves irrigation needs, hydro power generation and also to control flood. It was opened on 7 December 2013 by Chief Minister of Andhra Pradesh. 120 MW hydro electric power station (4 units of 30 MW each) owned by “TSGENCO “ Initial cost of any hydral project is high. Like that, assumed cost of this project is approximately Rs.400 crores….., but the cost of the project has exceeded Rs.1850 crores.

We had a very good experience and we gained knowledge practically by seeing all those equipment and working procedure.

One of the Civil Engineer gave an idea about surface area of plant, construction of dam based on height from sea level and water entering to the turbines and leaving the turbine were explained clearly. We feel practical knowledge is more useful to become a skilled engineer. This visit helped a lot and helped us to gain knowledge other than in our books.

It is very good place for dam as it is between hill and observe the curve that is taken by krishna river at this area.

INSIDE THE PLANT:

Fig a: Overall view inside hydro plant
Electrical Equipment:

We observe a 3 PHASE ac alternator which generates power of 120MW, which is in under designing process. This 120MW power is divided as 4 units each generates 30MW. Consulted electrical engineer explained about an Alternator working process and parts such as Stator, Rotor and electromagnetism phenomena.

An alternator is an electrical generator that converts mechanical energy to electrical energy in the form of alternating current. A conductor moving relative to a magnetic field develops an electromotive force (EMF) in it, (Faraday's Law). The output frequency of an alternator depends on the number of poles and the rotational speed.

Depending upon the particular frequency and rotational speed 48 poles were designed in this 120MW alternator.

MECHANICAL EQUIPMENT:

We visited mechanical dept., which includes PENSTOCKS: A penstock is a gate or intake structure that controls water flow, or an enclosed pipe that delivers water to hydro turbines. We observe that diameter of this penstocks is large in size. Penstock is a pipe with large diameter which connects water from reservoir to turbine. The turbine used in this plant is a Kaplan propeller type which has blades welded to turbine one side of shaft. The Kaplan turbine is an inward flow reaction turbine.

We observe this turbine has 6 blades. In this plant total 4 Kaplan turbines were placed each generates 30 MW of power. Kaplan turbines are widely used throughout the world for electrical power production. They cover the lowest head hydro sites and are especially suited for high flow conditions.

The Draft tube gives an advantage of placing the turbine above the tail race so that any required inspections can be made easily. Moreover, it also converts the wasteful kinetic energy at the exit of the runner into the useful pressure energy.
ABOUT DAM

It has 30 tmcft live storage capacity to impound the Krishna river flood waters generated from the catchment area located downstream of Nagarjunasagar Dam.

This dam has a height of nearly 42.23m, Length of 2922m, Width of 31m. It gives irrigation facility to 13 lakh acres. It has 24 gates in all with balancing reservoir with a capacity of 46 tmcft.

Construction process is almost comes to an end. After a few months power is ready to generate. Switch yard construction is not at all started in this plant. Constructing such type of plants has so many advantages..., especially in terms of pollution, also providing irrigation facilities to nearly 4 districts.

Actually, reservoir is built at certain height from sea level, through this penstocks are built to carry water from dam to power house. When water impinges on turbine with a velocity propeller blades were ready to rotate. Turbine one end is mechanically coupled to a 3 phase alternator (simply generator) to obtain power.

Power generating company which initializes is APGENCO, along with BHEL but now it comes under TGGENCO.
Fig 3: Kaplan turbine

Fig 4: Construction of draft tube

II EEE : 2013 BATCH