SREE VENKATESWARA COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi and Affiliated to JNTU,Anantapur)
Northrajupalem (Vi), Kodavaluru(M) , S.P.S.R Nellore (Dt)-524316

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LIST OF INDUSTRIAL VISITS

Academic Year	Date	Year & Batch	Name of The Company	Location	No. Of Students Attended
2019-20	28.09.2019	2018 BATCH II BTECH -I SEM	Balaji Energy Private Ltd (10 MW Hydro Power Plant)	Somasila, Nellore, A.P	56
	28.09.2019	2017 BATCH III BTECH -I SEM	10MW Amaravathi Solar Power Plant	Atmakur, Nellore, A.P	40

INDUSTRIAL VISIT DOCUMENTATION

REPORT ON SOMASILA HYDRO ELECTRIC PROJECT

INTRODUCTION:

Balaji Energy to setup 10 MW somasilahydro electric project in Somasila in Atmakur Taluka in Nellore(Dt) of Andhra Pradesh. The project involves setting up of two units of vertical Kaplan adjustable blade type turbines of capacity 5 MW each to harness the hydro potential available at Somasila reservoir. The project had been commissioned in 2007.

Objective:

The objective of the project was to meet the increasing demand for electric power (particularly during peak hours) in AP by constructing a pumped-up power plant in AP that would utilize the SomasilaReservoir as its upper reservoir and as its lower reservoir, effectively utilizing the river flow rate, and thereby contribute to the industrial promotion and improvement of the residents' lives by electrification in AP.

Somasila Reservoir is constructed across River Pennariver near Somasila, village of Ananthasagaram Mandal in Nellore District of Andhra Pradesh.The Project envisages storage of 78.00TMC of water at F.R.L. +100.58M. The contemplated ayacut under the project is 5, 84,500 acres in SPSR Nellore and Prakasam Districts. Out of which stabilization of wet ayacut under Pennar Delta Kanupur canal system and existing tanks in up lands is 4,05,500acres and new I.D.is1, 79,000 acres. Out of the above ayacut an extent of 82,500 acres stabilization and 1,35,000 new I.D is under Somasila Project canals viz., GKNC Canal (North Feeder Channel), south feeder channel and Kavalicanal.The allocation of water for the above ayacut is 60.892 TMC. It also envisages to transmit 30.00 TMCof water to Kandaleru Reservoir under Telugu Ganga Project for irrigating 3, 00,000 Acres of I.D. ayacut in Nellore and Chittoor Districts besides 15.00 TMCof Krishna water to Chennai city for drinking water purposes. In addition to the above 2.40 TMC of water was allocated to Nellore, Kavali, Gudur and Tirupathi towns for drinking water needs. The Andhra Pradesh State Electricity Board has sanctioned 2 x 5 M.W. Mini HydelScheme for Power Generation at Somasila Dam, Nellore District for captive utilization in G.O. M.S.No.180, dated 29.12.1994 in favor of M/s.Balaji Power Corporation Private Limited. Further the Government in G.O.Ms.No.100 I&CAD. TGP-I(2) Department, dated 9.7.1999 have issued no objection certificate to hand over the scheme to the said firm for implementing the Power Project. Accordingly the firm has executed the Mini Hydel Project including civil, electrical and mechanical works and water is being supplied to power house and project is commissioned in the year during December 2005and it is enhanced to 2 X 6 MW i.e. 12 MW. Approval accorded for an additional capacity of 11 MW and will come into operation in due course.

Location of Head works	:
Village	: Somasila
Mandal	: Ananthasagaram
District	: Nellore (Foreshore area in Kadapa Dist.)
River/Tributary	: Pennar River
Nearest City/ Town (including KMs.)	: Nellore 90 KMs
Name of the upper stream projects	: Mylavaram Dam, Cheyyeru Project and Lower Sagileru.Project (Complete).
Village benefited	: 101 Nos
Mandals benefited	: 15 Nos
Catchments area	: 48,645 Sq.km
Maximum Flood discharge (observed)	: 6,26,274 Cusecs, 2001year
Designed Discharge at F.R.L	: 6,95,000 Cusecs
Designed Discharge at M.W.L	: 7,90,000 Cusecs
Gross Capacity at FRL in TMC	: 77.988 TMC
Water spread area at FRL (Sq.Km.)	: 212.285 Sq.km
Water allocation	: 60.892 TMC
Average Monsoon rainfall	: 1031.76 mm
FRL/MWL	: +100.58M/+101.80M
Gross storage	: 77.988 TMC.
Dead Storage	: 7.567 TMC
Live storage between MDDL&FRL	: 70.421 TMC
Budget for the Year 2015-16	: Plan â€“ 124.9800Crs.

Irrigation Potential: :

The total ayacut contemplated under the Project is .4,05,500 acres wet (stabilization) and 1, 79,000 acres (New I.D) ayacut.

Component Works	:
a) Earth Dam	:
i) Type of dam	: Zoned Earth Dam
ii)Total Length	: 352 Meters
iii)Top width	: 18 Meters
b) Non Over Flow Dam	:
i) Type of dam	: Masonry Gravity
ii) Total length	: 172.53 Meters
iii) Top level	: 105.15Meters
c) Spill Way	:
i) Type of Spill way	: Ogee Type
ii) Total Length	: 236.21 Meters
iii)Crest level	: 86.87 Meters
d) No.of Gates	: 12 Nos.
Size of the radial gates	: 15.24 x 14.17 meters
e)Maximum Designed Discharge	: 6, 95,000 C/s at F.R.L.100.58 meters. 7, 90,000 C/s at M.W.L.101.80 meters

Irrigation Potential:

The total ayacut contemplated under the Project is .4,05,500 acres wet (stabilization) and 1, 79,000 acres (New I.D) ayacut.

The Mandals covered are Alluru, Bogolu, Buchi, Dagadarthi, Indukurpet, Kovur, Kodavalur,Muthukur, Nellore, Sangam, ThotapalliGudur, Venkatachalam, Vidavalur, Podalakur, Nellore Rural, Manubolu, Jaladanki, Kaligiri, Kavali, Kaluvoy, Chejerla, Podalakur, Ananthasagaram, Atmakur, Marripadu and A.S.Peta.

Type & Category:

According to the Appendix B to the simplified modalities and procedures for small-scale CDM project activities the proposed project activity fall under the following type and category.

Project Type: Type I – Renewable Energy Projects

Category I.D: Renewable Electricity Generation for a grid

The project activity utilizes renewable hydro potential for power generation and exports the generated power to the grid. Since, the capacity of the CDM project is 10 MW, which is less than the qualifying capacity of 15 MW, the project activity is regarded as small-scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied.

Technical details of the project activity:

The project activity envisages generation of hydel power utilizing the head created at the existing Somasila irrigation dam. It is proposed to have a separate water conductor system for drawing the required quantum of water from Somasila Reservoir through an approach channel followed by a tunnel to the intake dam and release of water after power generation into the Pennar River. The project comprises of two synchronous generators of capacity 5 MW each coupled to two units of Vertical Kaplan adjustable blade type turbines. Power is evacuated through 33/11 KV sub-stations at Somasila and Anantasagaram. Power evacuation is taking place from two sub-stations as the individual substation does not have the required load. The project installed capacity and data is as follows:

Brief technical details of the project design:

Hydrology

Design Discharge : 69.61 m3 /sec
Average Gross head : 21.55 m
Net Design head : 17 m

Energy:

Gross energy generation : 31.00 GWh
Annual export to the grid : 30.69 GWh

Plant Equipment:

Type of turbine : Vertical Full Kaplan Type
Type of generator : Brushless Synchronous

No. of generating units : 2 Nos.
Capacity of each generating Unit : 5 MW
Generation voltage : 11 kV Grid
interfacing voltage : 33 kV
Frequency : 50 Hz

LOCATION:

Somasila hydro Power Station is located at somasila in Andhra Pradesh. The power plant is one of the hydro peak power plants of APGENCO.

Fig : Map showing the Project Location in Nellore District in Andhra Pradesh

Main Parts of Somasila Hydro Powerplant:

1. DAM
2. SPILLWAYS
3. PENSTOCKS
4. TUNNELS
5. SURGE TANK
6. TURBINE
7. GENERATOR

DAM:

Dams are structures built over rivers to stop the water flow and form a reservoir. The reservoir stores the water flowing down the river. This water is diverted to turbines in power stations. The dams collect water during the rainy season and stores it, thus allowing for a steady flow through the turbines throughout the year. Dams are also used for controlling floods and irrigation. The dams should be

water-tight and should be able to withstand the pressure exerted by the water on it. There are different types of dams such as arch dams, gravity dams and buttress dams. The height of water in the dam is called head race.

SPILLWAYS:

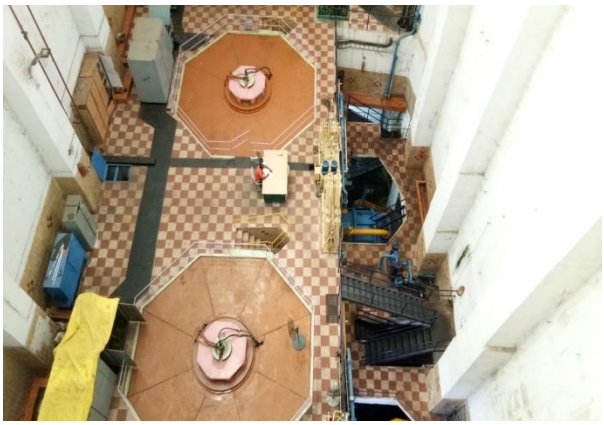
A spillway as the name suggests could be called as a way for spilling of water from dams. It is used to provide for the release of flood water from adam. It is used to prevent over toping of the dams which couldresult indamage or failure of dams. Spillways could be controlled type or uncontrolledtype. The uncontrolled types start releasing water upon water rising above aparticular level. But in case of the controlled type, regulation of flow is possible.

PENSTOCKS:

Penstocks are pipes which carry water from the reservoir to the turbines inside power station. They are usually made of steel and are equipped with gate systems. Water under high pressure flows through the penstock. A tunnel serves the same purpose as a penstock. It is used when an obstruction is present between the dam and power station such as a mountain.

POWER STATION:

Power station contains a turbine coupled to a generator. The water brought to the power station rotates the vanes of the turbine producing torque and rotation of turbine shaft. This rotational torque is transferred to the generator and is converted into electricity. The used water is released through the tail race. The difference between head race and tail race is called gross head and by subtracting the frictional losses we get the net head available to the turbine for generation of electricity.



PHOTOS:-