



SREE VENKATESWARA COLLEGE OF ENGINEERING

NAAC 'A' Grade Accredited Institution

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(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
2021-22	26.12.2021	2018 BATCH IV B.TECH-I SEM	Srisailam Power House (Right Bank)	Srisailam, Kurnool, A.P	52

REPORT ON INDUSTRIAL VISIT

TO

SRISAILAM POWER HOUSE

(RIGHT BANK)

On 26th December, 2021



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1.ACKNOWLEDGEMENT

We are indebted to the principal Dr. P. Kumar Babu Sir, for giving us permission to go for such an Industrial visit.

We are also indebted to the chief engineer of APGENCO for giving permission for the industrial visit at srisailem hydro power plant.

Our sincere gratitude to Head of Department Dr.V. Anil Kumar Sir, without his guidance and corporation tour would not been possible.

We also express our gratitude to Mrs.S.Narmadha madam,Mr.N.Sudarshan Rao sir who has taken a lot of efforts for getting success at each and every step and coming along with us.

2.INFORMATION



Srisailem hydro power plant

The **Srisailem Dam** is constructed across the Krishna River in Nagarkurnool district, Telangana and Kurnool district, Andhra Pradesh near Srisailem temple town and is the 2nd largest capacity working hydroelectric station in the country.

The dam was constructed in a deep gorge in the Nallamala Hills in between Kurnool and Nagarkurnool districts, 300 m (980 ft) above sea level. It is 512 m (1,680 ft) long, 145 metres (476 ft) maximum height and has 12 radial crest gates. It has a reservoir of 616 square kilometers (238 sq mi). Project has an estimated live capacity to hold 178.74 TMC ft at its full reservoir level of 885 feet (270 m) MSL. The minimum draw down level (MDDL) of the reservoir is at 705 feet (215 m) MSL from its river sluice gates and corresponding dead storage is 3.42 TMC ft. The left bank underground power station houses 6 × 150 megawatts (200,000 hp) reversible Francis-pump turbines for pumped-storage operation (each Turbine can pump 200 cumecs) and the right bank semi underground power station houses 7 × 110 megawatts (150,000 hp) Francis-turbine generators.

Tail pond dam/weir located 14 km downstream of Srisailem dam is under advanced stage of construction to hold the water released by the hydro turbines and later pump back into the Srisailem reservoir by operating the turbines in pump mode. The weir portion got breached in November 2015 unable to withstand the normal water release from the hydro power stations. Tail pond weir was completed during the year 2017 and pumping mode operation is being done even the downstream Nagarjuna Sagar reservoir water level is below 531.5 feet (162 m) MSL. The tail pond has nearly 1 TMC ft live storage capacity.

Srisailem Dam, Officially called The Neelam Sanjeeva Reddy Project. This Srisailem project consists of two banks. They are right bank and left bank power station.

History

The Srisailem project began in 1960, Initially only as a power project. After several delays, the main dam was finally completed twenty years later in 1980 July 26. In the meantime the project was converted into a multipurpose facility with a generating capacity of 770 megawatts (1,030,000 hp) by its second stage which was completed in 1987. The dam is to provide water for an estimated 2,000 square kilometres (770 sq mi). Under the right bank branch canal 790 square

kilometres (310 sq mi) in Kurnool and Kadapa districts will have assured irrigation. From the initial modest estimate of ₹384.7 million for a power project the total cost of the multipurpose project was estimated to cross ₹10 billion in its enlarged form. The dam has alone cost ₹4.04 billion together with the installation of four generating sets of 110 MW each. The right bank branch canal is estimated to cost ₹4.49 billion and the initial investment of ₹1.4 billion has been provided by the World Bank. The projected cost-benefit ratio of the project has been worked out at 1:1.91 at 10% interest on capital outlay. In 1998 a coffer dam was over topped by flooding. The power house required repairs and did not generate power for a year. On 2 October 2009, Srisailem dam experienced a record inflow which threatened the dam.

Installed Capacity:

S.No	Unit No.	Installed capacity (MW)	Commissioned Date	Status
1	Unit No.1	110	30-08-1982	running
2	Unit No.2	110	04-12-1982	running
3	Unit No.3	110	19-11-1983	running
4	Unit No.4	110	27-08-1984	running
5	Unit No.5	110	31-03-1986	running
6	Unit No.6	110	30-10-1986	running
7	Unit No.7	110	15-03-1987	running



Irrigation

Srisailem right main canal (SRMC) is constructed with 44,000 cusecs capacity at Srisailem reservoir level of 269.22 metres (883 ft) MSL to feed Veligodu reservoir (16.95 TMC ft), Brahmamsagar Reservoir (17.74 TMC ft), Alaganoor reservoir (2.97 TMC ft), Gorakallu reservoir (12.44 TMC ft), Owk reservoir (4.15 TMC ft), Gandikota Reservoir (26.86 TMC ft), Mylavaram reservoir (9.98 TMCft), Somasila reservoir (78 TMC ft) and Kandeleru reservoir (68 TMC ft) with nearly 235 TMC ft total storage capacity. This canal also supplies water to Telugu Ganga project which supplies Krishna river water to Chennai city for its drinking purpose. This main canal

by feeding water to K. C. Canal, Srisailem right bank canal, Telugu Ganga canal and Galeru Nagari canal irrigates vast area in Kurnool, Kadapa, Chittoor and Nellore districts.



Handri-Neeva lift canal by drawing water from the Srisailem reservoir, supplies drinking water in all the districts of Rayalaseema. Veligonda reservoir receives water by gravity through tunnels to irrigate lands in Nellore, Kadapa and Prakasam districts. Kalwakurthy lift irrigation scheme by drawing water from the Srisailem reservoir, supplies irrigation water in Mahbubnagar and Nalgonda districts.

Srisailem left bank canal will receive water by gravity through tunnels to irrigate lands in Nalgonda district. Tunnel work is not complete and the required water has been provided to most of the project area by lifting water from the downstream Nagarjuna Sagar reservoir.

Catchment area:

The area behind the dam, which collects the rain water, drains in to a stream (or) river is called "Catchment Area". The catchment area of the srisailem hydro electric power plant is **206,040 km² (79,550 sq mi)**.

Reservoir:

The place in which the water is stored in a dam is called Reservoir. A reservoir may be natural. A natural reservoir is a lake in a high mountains and artificial reservoir is made by constructing a dam across the river. The total capacity of srisailem reservoir is 216 Tmcft (Thousand million cubic feet). The total surface area is 616 kmsq.

FULL RESERVOIR LEVEL	: EL+269.75 M (885 Ft.)
Max. WATER LEVEL	: EL+271.88 M (892 Ft.)
GROSS STORAGE CAPACITY	: 8.722 MCM (215 TMC)
LIVE STORAGE CAPACITY	: 5.975 MCM (190 TMC)
WATER SPREAD AREA AT FRL	: 616.42 Sq. Km (238 Sq. Miles)

Dam Maintenance and Safety

A dam is a structure of masonry or some other material build at a suitable location across a river . The following functions are:

1. To provide the Head Of Water
2. To create storage

The type of srisailam dam is earth fill and gravity. The following are the measurements of srisailam dam :-

1. Top of Dam : EL 275.54 M (904 ft)
2. Height above deepest foundation : 145.10 M (470 ft)
3. Length at top : 512 M (1680 ft)
4. Crest Level : 253 M (830 ft)



Systematic Neglect and absence of diversion of funds is evident in maintenance of the dam and lack of any modernization attempts of the Powerhouse. The officers report a shortage of maintenance staff. Safety concerns to the 2nd largest Hydroelectric project in the country have been raised over the years and have been assessed false subsequently. In 2009, the dam, designed for a maximum flood of 19 lakh cusecs, endured a flood of 25.5 lakh cusecs. According to a survey conducted in summer of 2018, the scouring resulted in the formation of a huge pit in the apron downstream the dam. And a structure protecting the 'toe' and foundation of the main dam has weakened. Efforts are not yet made to repair and maintain the dam.

Penstock:

The following are the measurements of srisailam dam power tunnel (Penstock) :-

1. Diameter : 15 M (50 ft)
2. Length : 740 M (2428 ft)
3. Height of Trash Rack : 38 M
4. Width at Bell mouth entrance : 18.45 M
5. Discharge (Max.) : 1000 comes (35000 cusecs)
6. Invert level at entrance : EL + 219 M (718.54 ft)
7. No. of penstocks : 7 of 6.10 M dia (20 ft dia) each
8. Diameter of surge shaft : 28 M (92 ft)



Transformers:

A **transformer** is a static electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. A varying current in one coil of the transformer produces a varying magnetic field, which in turn induces a varying electromotive force (emf) or "voltage" in a second coil. IN srissailam Hydro power plant there are 21 no. of single phase transformers are used each transformer rating is 42.5 MVA .

Battery room:

A **battery room** is a room in a facility used to house batteries for backup or uninterruptible power systems. There is 220V DC battery system of capacity 440AH. Model: PLANTE-YKP-33, there are 110 no. cells and date of commissioning is 10/05/2010.



Control Room:

There is generator of 11 KV which are connected to bus bars and there are 220V stuck off transformer connected.

In this synchronizing takes place i.e., voltage, frequency, phases are same. This can be tested by 2 lamp method. If an ON machine is tripped it takes half an hour time to start synchroscope method.

In this control panel:

1. BCW & TRF C.W are there
2. VALVE
3. STATOR cooling water valve

4. Annunciation panel-inductor panel
5. Manufactured by ABB-ASEA BROWN BOVER
6. shows water level-c-shaft
7. Reservoir level-833.20
8. Its capacity is 52.8918 TMC (Thousand Million Cubic's)

3. PURPOSE OF VISIT

Industrial visits are important for the following reasons:

1. To gain a practical knowledge of the actual working of the power plant.
2. To get the practical knowledge of the working of the various Equipments.
3. To adopt the criteria about the management.
4. To study co-ordination between different departments.
5. How to control various circumstances.

In order to achieve the above mentioned Objectives we had Organized an industrial visit at SRISAILAM POWER PLANT, Srisailam for 7th Sem, EEE Students.

4. WHAT WE LEARNT?

Pumped storage hydro power potential

Srisailam reservoir, serving as lower level reservoir, has potential to install nearly 77,000 MW high head pumped storage hydroelectric plants on its right side.

Preamble

The Srisailam Dam is constructed across the Krishna River on the border of Mahabubnagar District, Telangana and Kurnool district, Andhra Pradesh near Srisailam temple town and is the 2nd largest capacity working hydroelectric station in the country.

The dam was constructed in a deep gorge in the Nallamala Hills in between Mahabubnagar and Kurnool districts, 300 m (980 ft) above sea level. It is 512 m (1,680 ft) long, 145 metres (476 ft) maximum height and has 12 radial crest gates. It has a reservoir of 616 square kilometres (238 sq mi). Project has an estimated live capacity to hold 178.74 TMCft at its full reservoir level of 885 feet (270 m) MSL. The left bank underground power station houses 6 x 150 megawatts (200,000 hp) reversible Francis-pump turbines for pumped-storage operation and the right bank semi underground power station houses 7 x 110 megawatts (150,000 hp) Francis-turbine generators.

Salient Features

LOCATION:

State	: Andhra Pradesh
District	: Border between Kurnool(AP) & Mahaboob Nagar(Telangana)
Latitude	: 16-5' N

Longitude : 78-54' E

HYDROLOGY

Catchment Area : 2.06,030 sq km (79,530 sq. miles)

Mean Annual Rainfall Maximum : 1016 mm (40 inches)

Mean Annual Rainfall Minimum : 635 mm (25 inches)

Design Flood : 53770 cumecs(19 lakh cusecs) moderated to 38,365 Cumecs(13,55,680 cusecs)

Deep Bed level of River : EL 152.4 m (EL 500 ft)

Minimum Tail Water Level : EL 163.00 m(EL 535.00 ft)

Maximum Flood Level Observed at Dam site : EL 187.25 m (EL 614.35 ft)

DAM:

Type : Gravity Dam

Top elevation : EL 275.54 M (EL.904.0 ft)

Height above the deepest : 143.26 M (470 ft)

Foundation level - Total Length at Top : 512 M (1680 ft)

SPILL WAY:

Maximum discharging capacity : 37,356 cumecs (13,20,00Cuses)

Discharging capacity of River Sluices at M.W.L : 1009 cumecs (35,680 cusecs)

Total Discharging capacity at M.W.L : 38,365 cumecs (13,55,680 cusecs)

Crest Level of Spill way : EL. 252.98 m (EL.830.00 ft)

Gross Length of Spill way (between) : 266.39 m (874 ft.)

Faces of training walls

Spill way gates Number : 12 Nos.

Size : 18.3 m x 16.7 m (60'x55')

River Sluices Number : 2 Nos.

Size : 3.65m x 9.14 m (12 ft x 30 ft)

RESERVOIR:

Maximum water level : 271.88 m (EL. 892 ft)

Full Reservoir Level : EL. 269.75 m (EL.885 ft.)

Gross storage Capacity at F.R.L : (215.8070 TMC)

Water spread area at F.R.L : 541.90 sq. km.(209 sq. Miles)

MDDL (for IRR) : 854.00 (260.30 M)

Storage capacity : 89.29 TMC (2528.396 Cums)

MDDL (for Power) : 834.00 (254.20 m)

Storage capacity : 53.851 TMC(1524.871 cums)

Crest level : 830.00 (252.98 M)

Storage capacity : 49.49. TMC(1401.387 cums)

Dead Storage	: 214.875 Mt (EL 705 ft)
Capacity at Dead storage	: 3.4160 TMC
POWER HOUSES	
Right Side Capacity	: 7 X 110 MW
Left Side Capacity	: 6 X 150 MW

5. PHOTO GALLERY





6. CONCLUSION

The experience of this tour was really fantastic and unforgettable. It was reverberating experience which cherished all of us. Students got valuable information from this industrial tour and we got to learn a lot many things from this tour.