











THERMAL POWER STATION –1 EXPANSION

(i) Unit Profile:

Thermal Power Station –I Expansion of Neyveli Lignite Corporation consists of two units of 2x210MW capacity. The units are commissioned in the year 2002 and 2003 respectively and are in operation.

The main equipments are

-  **Steam Generator**
-  **Turbine**
-  **Generator**
-  **Switch yard**
-  **Fuel Handling System**
-  **Water Chemical Treatment plant**
-  **Ash handling system**
-  **Cooling Tower**
-  **Chimney**
-  **Control Instrumentation**

STEAM GENERATOR:

The boilers are natural circulation system, single drum, non-steaming economizer, and membrane water wall with super-heaters and re-heaters, pulverized lignite firing with tangential firing system, balanced draft with cold-gas re-circulation system, tower type with dry bottom furnace having non-explosive slag conveyor at the bottom. The steaming capacity of the steam generator is 690 tonnes/hour. e. Super-heated steam at 150Ksc and 540°C flows to HP turbine via single main steam line. Exhaust steam from HP turbine is taken through single cold reheat pipeline. It is re-superheated in re heater in two stages with attemperation in between the stages. Re-heated steam at 31.2 Ksc and 540°C then flows through single hot reheat pipeline to IP turbine.

STEAM TURBINE:

The turbine used in the TPS-I (Expn) is Single re-heat, Tandem compound type with Dual casing i.e., Separate HP and combined IP-LP section

GENERATOR:

The two-pole hydrogen cooled generators of the THRL type (ANSALDO Design) with static excitation and directly coupled to the steam turbine.

SWITCHYARD:

The rated terminal voltage of the Generator is 15.75KV. 250 MVA Generator Transformer steps 15.75KV to 400KV and connected to National grid. The power is evacuated through 2 Nos 400 KV lines.

FUEL HANDLING SYSTEM:

Main source of fuel is from its own opencast mechanized lignite mines. Mine-I supplies lignite to TPS-I Expansion units by two series of conveying system. L.D.O and H.F.O are used during start up and shut down and also when the unit is in service at low load.

WATER CHEMICAL TREATMENT PLANT:

Required De-mineralized water to boiler is prepared by using Ion Exchange process.

ASH HANDLING SYSTEM:

Most modern fly ash collection system for 100% utilization of fly ash for cement industries have been installed with due consideration of environmental aspects.

CONTROL INSTRUMENTATION:

Fully automated plant controlled by Distributed Digital Controls and monitoring Information System and PLCs with SMART field devices.

(ii) Energy consumption:

Energy consumption of coal oil:

Year	2004-05	2005-06	2006-07
Total Thermal Energy consumption per year In Million Kcal	9210508.89	8534118.07	8982105.6

Specific energy consumption: -

Specific Consumption	Year	2004-05	2005-06	2006-07
Sp.Lignite.Con	Kg/Kwhr	1.06	1.02	1.01
Sp.Oil.Con	ml/Kwhr	1.57	1.38	1.07
Auxilliary consumption in %	Percentage%	9.05	9.08	8.47
Sp.DM water.Con	L/Kwhr	0.07	0.07	0.08

(iii) Energy policy and organizational set up:

Energy policy:

Energy policy has been formulated on 22-10-2005. The policy mainly focuses conservation of precious natural resource and environment.

1. Effective and Efficient Management of Energy Resource with due attention to Environment issues.
2. Create awareness of the needs and modes of Energy Conservation among Employees with inputs from within and outside the organization.
3. Reorganizing Employees' Energy Conservation practices
4. Conduct periodical review of Energy Conservation procedures and strive for continual improvement with state-of-the-art technology.

(V) Energy Conservation plans & Targets:

- ❖ *Laying new pipeline from discharge line of service water Booster pump to suction point of water lance pump. By doing so sufficient pressure will be developed by water lance pump and starting of another Bore well pump may not be required.*
- ❖ Providing timers in lighting system of Boiler, Turbine, ESP and AHU areas to avoid continuous burning of lights
- ❖ Conservation of electrical energy by way of switching off one out of two heaters in Heating, Ventilation and air conditioning system

(VI) Environment and safety:

TPS-I Expansion of NLC is an ISO certified Unit for the achievement of excellence in performance in quality and environment Management system. It fact the latest up gradation of EMS 14001:2004 version has been obtained by this unit.

The process of Power generation is well designed in such a way that a high level of environment friendly process is ensured. Future inn order to closely monitor the level of air pollution in exit flue gas an on line monitor system to indicate the level of SPM, NOX, CO is available. The boiler is designed in such a way that level of NOX at the flue gas in the furnace is well contained to the acceptable level by way of installation of latest type PF burners. On similar lines the effluent from the plant is suitably treated so that the effluent goes out of plant premises meet the statutory requirement.

Though at most care is being taken at all levels to ensure high level of standard on safety aspect, to add feather to cap it is now proposed top obtain certification on safety is Occupational Health Safety Assessment System (OHSAS)