APPDCL **ANDHRA PRADESH**
POWER DEVELOPMENT COMPANY LIMITED

Hyderabad - 500 082

To
Dr P.L Ahujarai,
Director
Ministry of Environment & Forests, GOI
Paryavaran Bhavan, CGO Complex
Lodi Road, New Delhi – 110 003
☎: 011 – 24362434

Lr.No. APPDCL/SDSTPS/STG-II/F.ENV /D. No. 617/12, Dt.04-07-2012

Sir,

Sub: APPDCL – 1X 800 MW SDSTPS stg-II Supercritical Coal based Thermal Power plant at Krishnapatnam near Nellore Town – Form-1 & TOR submitted- Request Approval for TOR –Reg.

* * *

- Andhra Pradesh Power Development Company Limited (APPDCL) proposed to establish one unit of 800 MW super critical coal based Thermal Power plant (Stage-II) as expansion plant to the 2x800 MW Sri Damodaram Sanjeevaiah Thermal Power Station (SDSTPS stg-1), Krishnapatnam in SPSR Nellore District, Andhra Pradesh which is under erection. The fuel for the proposed station is also envisaged to be blended Coal (70% domestic washed coal + 30% imported coal) identical to Stage-I.
- It is proposed to carry out Environmental studies for the proposed expansion project to obtain Environmental clearances from statutory bodies. The Detailed Project Report (DPR) is prepared by the consultants M/s Desein Private Ltd., New Delhi.
- Form – 1, Terms of References (TOR) for preparation of EIA report along with Feasibility Report, Detailed Project Report and Project Implementation Status of 2x800MW SDSTPS stage-I are submitted here with.
- It is requested to communicate approval for TOR to proceed further with environmental studies for the project.

Encl: As above.

Yours faithfully,

Project Manager

Ground Floor, APGENCO Building, GTS Colony, Kalyan Nagar, Hyderabad - 500 045.
Andhra Pradesh, INDIA. Tel: +91 40 23840268/270/271, Tel Fax: +91 40 23840267

1 X 800 MW SRI DAMODARAM SANJEEVAIAH THERMAL POWER STATION (STAGE -II)

EXPANSION TO 2 X 800 MW (STAGE -I)
SUPER CRITICAL COAL BASED THERMAL POWER PLANT
AT
Nelaturu (Village), Muttukuru (Mandal)

SRI POTTI SRIRAMULU NELLORE DISTRICT, ANDHRA PRADESH

Submitted to:

MINISTRY OF ENVIRONMENT AND FORESTS

NEW DELHI

Submitted by:

ANDHRA PRADESH POWER DEVELOPMENT COMPANY LIMITED

(A subsidiary of APGENCO & Govt. of Andhra Pradesh Undertaking)

FORM-1

TERMS OF REFERENCE

PRE-FEASIBILITY REPORT

2X800MW STAGE-I PROJECT IMPLEMENTATION STATUS

&

DETAILED PROJECT REPORT

Environment Consultants:

VIMTA LABS
Determining Quality

Vimta Labs Ltd.
142, IDA, Phase-II, Cherlapally
Hyderabad–500 051
env@vimta.com, www.vimta.com
(QCI/NABL Accredited and ISO 17025 Certified Laboratory, Recognized by MoEF, New Delhi)

July 2012

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FORM-1

1 X 800 MW SRI DAMODARAM SANJEEVAIAH THERMAL POWER STATION (STAGE -II)

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July , 2012

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FORM-1

APPLICATION FOR PRIOR ENVIRONMENTAL CLEARANCE FOR "A" CATEGORY PROJECTS

(I) BASIC INFORMATION

Sr. No.	Item	Details
1.	Name of the project/s:	Sri Damodaram Sanjeevaiah Thermal Power Station (SDSTPS), Stage-II, Nelaturu (Village), Muttukuru (Mandal)
2.	S. No. in the schedule	Sr. No. 1 (d) under 'A' Category
3.	Proposed capacity/ area/ length/ tonnage to be handled/ command area/ lease area/ number of wells to be drilled	1X 800 MW Supercritical Coal based Thermal Power plant.
4.	New/Expansion/Modernization	Expansion
5.	Existing Capacity/ Area etc.	1600 MW (2 X800MW) Supercritical Coal Based Thermal Power Plant (ongoing)
6.	Category of Project i.e. 'A' or 'B'	Category A
7.	Does it attract the general condition? If yes, please specify.	No
8.	Does it attract the specific condition? If yes, please specify.	No
9.	Location:	14^{o} 20' 40"N Latitude 80^{0} 07' 35" E Longitude The location map and study area map (10 km radius) of the project site are enclosed in **Annexure-I**.
	Plot/ Survey/Khasra No.	Nelaturu (Village), Muttukuru (Mandal), Nellore Dist Sy. No. 32 to 35, 53/1, 56, 57, 70 to 115, 143 to 148, 152 to 177, 179 to 194, 196 to 218, 224 to 239, 285 to 302 Pynapuram village, Muttukuru (Mandal), Nellore Dist Sy. No. 118, 119, 125 to 136, 140 to 176, 179 to 213
	Village	Nelaturu
	Tehsil	Muttukuru (Mandal)
	District	Sri Potti Sriramulu Nellore District
	State	Andhra Pradesh
10.	Nearest railway station/ airport along with distance in kms	Nellore 19.6 km Venkatachalam RS (23 km) Nearest Airport is Chennai (170 km).
11.	Nearest town, city, district head quarters along with distance and direction in kms	Nellore 19.6 km Direction: North West District headquarters: Nellore 19.6 km
12.	Village panchayats, Zilla parishad, Municipal corporation, local body (complete postal addresses with telephone nos. to be given)	Nelaturu (Village), Muttukuru (Mandal) Nellore (Zilla parishad, Municipal corporation)

Sr. No.	Item	Details
13.	Name of the applicant	Andhra Pradesh Power Development Company Limited (APPDCL)
14.	Registered Address	APPDCL, Vidyut Soudha, Khairatabad, Hyderabad – 500 082 Andhra Pradesh
15.	Address for correspondence	APPDCL, APGENCO Building GTS Colony, Kalyan Nagar Hyderabad – 500 045 Andhra Pradesh
	Name	Ch. Vivekananda
	Designation (Owner/Partner/CEO)	Project Manager
	Address	APPDCL, APGENCO Building GTS Colony, Kalyan Nagar Hyderabad
	Pin Code	500 045
	E-mail	nandaappdcl@gmail.com
	Telephone No.	+91 40 23840268
	Fax No.	+91 40 23840267
16.	Details of Alternative Sites examined, if any. Location of these sites should be shown on a toposheet.	The proposed project is an expansion. Hence, no other alternate sites have been studied.
17.	Interlinked Projects	No
18.	Whether separate application of interlined project has been submitted	Not Applicable
19.	If yes, date of submission	
20.	If no, reason	Not Applicable
21.	Whether the proposal involves approval/clearance under: (a) The Forest (Conservation) Act, 1980 (b) The Wildlife (Protection) Act, 1972 (c) The C.R.Z Notification, 1991	 No No No
22.	Whether there is any Government Order/ Policy relevant/relating to the site	No
23.	Forest land involved (hectares)	Nil
24.	Whether there is any litigation pending against the project and/ or land in which the project is propose to be set up (a) Name of the Court (b) Case No. (c) Orders/ directions of the Court, if any and its relevance with the proposed project.	No

(II) Activity

1) Construction, operation or decommissioning of the project involving actions, which will cause physical changes in the locality (topography, land use, changes in water bodies, etc.)

Sl. No	Information/Checklist confirmation	Yes /No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
1.1	Permanent or temporary change in land use, land cover or topography including increase in intensity of land use (with respect to local land use plan)	-	The proposed 1 X 800 MW Supercritical Coal based Thermal Power plant is an extension to the ongoing 2x800 MW Supercritical Coal based Thermal Power Station. The requirement of land will be much less due to integration of facilities like coal handing, water systems with the ongoing stage-I of the plant. The area required for the proposed Stage-II is available in the existing plant boundary.
1.2	Clearance of existing land, vegetation and buildings?	No	-----
1.3	Creation of new land uses?	No	51 acres land available within the plant boundary will be used for main plant, equipment and water storage facilities. Existing Ash pond area will be used for proposed extension unit. Area available outside the Power plant boundary such as corridor for raw water pipe and coal conveyer system will be used for extension unit. Land acquired for Stage-I staff colony accommodates Stage-II staff quarters.
1.4	Pre-construction investigations e.g. bore holes, soil testing?	No	Geological investigations will be Carried out
1.5	Construction works?	Yes	Boiler, Turbine, Generator, Condenser, Cooling water system, Coal handling system, Ash handling system, Coal plant, ESPs, Switchyard and other civil, mechanical and electrical plant and equipment.
1.6	Demolition works?	No	The site is free from any structures
1.7	Temporary sites used for construction works or housing of construction workers?	No	Existing Temporary sites and construction workers housing of stage-I will be utilized. Also majority of labour will be hired from nearby areas.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations	Yes	As mentioned in the item 1.5
1.9	Underground works including mining or tunneling?	No	Not required
1.10	Reclamation works?	No	-----
1.11	Dredging?	No	-----

1.12	Offshore structures?	No	-----
1.13	Production and manufacturing processes?	Yes	Coal received from the mines at (-)100 mm size is crushed in the crusher house to (-)20 mm size, which is further powdered in the coal mills. The powdered coal is burnt in the furnace to generate steam in the boiler. The steam generated in the boiler is expanded in the HP & LP turbines and power is generated in the generator which will be transmitted to grid through switchyard. The steam after expansion in the turbine is condensed in the condenser and condensed steam is recycled back to the boiler. The hot gases from the furnace after losing heat in different areas goes through the Electrostatic Precipitators (ESP) where ash is trapped. The clean gas goes through the chimney. Detailed process and process flow diagram are shown in Annexure-II.
1.14	Facilities for storage of goods or materials?	Yes	Facilities created for Stage-I will be utilized.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	Effluent Treatment Plant will be provided for treatment of plant effluents from plant. 100% dry ash handling systems are proposed for disposal of fly ash (solid waste) in dry form. Hydrobins will be provided to utilize bottom ash (solid waste).
1.16	Facilities for long term housing of operational workers?	Yes	Colony with additional facilities proposed for Stage-I will be used for operational staff of expansion unit.
1.17	New road, rail or sea traffic during construction or operation?	Yes	No rail or additional sea facilities are required. Already roads are available to the proposed project. Additional internal roads required will be formed.
1.18	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	Yes	As mentioned in the item 1.17
1.19	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	No	-----

1.20	New or diverted transmission lines or pipelines?	No	2 nos. 400KV lines are envisaged for evacuation of 800MW power generated.
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	------
1.22	Stream crossings?	No	No additional stream crossings in the proposed expansion site
1.23	Abstraction or transfers of water from ground or surface waters?	Yes	Required water for the proposed unit will be met from Bay of Bengal.

1.24	Changes in water bodies or the land surface affecting drainage or run-off?	No	The envisaged project is an Expansion Project
1.25	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Transportation is required for labour from nearby villages and construction materials for the project.
1.26	Long-term dismantling or decommissioning or restoration works?	No	------
1.27	Ongoing activity during decommissioning which could have an impact on the environment?	No	Not envisaged
1.28	Influx of people to an area in either temporarily or permanently?	Yes	About 1000 labour during construction will be employed. 100 Nos. of permanent staff will work in the power plant during operation stage.
1.29	Introduction of alien species?	No	------
1.30	Loss of native species or genetic diversity?	No	------
1.31	Any other actions?	No	None

2) Use of Natural resources for construction or operation of the Project (such as land, water, materials or energy, especially any resources which are non-renewable or in short supply)

Sl. No	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
2.1	Land especially undeveloped or agricultural land (ha)	Yes	Existing vacant land will be used for the proposed project.
2.2	Water (expected source & competing users) unit: KLD	Yes	Water requirement is 157344 KLD and will be drawn from sea (east-coast of Bay of Bengal).
2.3	Minerals (MT)	Yes	Raw material is coal: 11112 TPD
2.4	Construction material – Cement, steel, stone, aggregates, sand/soil (expected source – MT)	Yes	Cement: 16,500 MT Structural Steel : 21,000 MT Reinforcement Steel : 4,950 MT Stone/Aggregate: 0.55 lakh cum (local) Sand : 0.33 lakh cum (local)
2.5	Forests and timber (Source – MT)	No	Not applicable
2.6	Energy including electricity & fuels (source, competing users) Unit: Fuel (MT) Energy (MW)		Electricity required will be met from the Stage-I.
2.7	Any other natural resources (use appropriate standard units)	Yes	Oil (1 ml/kwh) for start up and flame stabilization.

3) Use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health

Sl. No	Information/ Checklist confirmation	Yes / No	Details thereof (with approximate Quantities/rates wherever possible) with source of information data
3.1	Use of substances or materials, which are hazardous (as per MSIHC rules) to human health or the environment (flora, fauna, and water supplies)	Yes	Furnace oil/HSD, Chlorine, Alum, Caustic soda, HCL etc will be used intermittently.
3.2	Changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)	No	------
3.3	Affect the welfare of people e.g. by changing living conditions?	Yes	Improve living conditions of local people
3.4	Vulnerable groups of people who could be affected by the project e.g. hospital patients, children, the elderly etc.,	No	The project is away from Hospitals and schools
3.5	Any other causes	No	None

4) Production of solid wastes during construction or operation or decommissioning (MT/month)

Sl. No	Information/ Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
4.1	Spoil, overburden or mine wastes	Yes	Excavated soil during grading of the soil
4.2	Ash/Municipal waste (domestic and or commercial wastes)	Yes	Ash generation: 3778 TPD (463 tph coal with 34% ash) Bottom Ash : 756 TPD Fly ash: 3022 TPD
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	To limited extent
4.4	Other industrial process wastes	No	------
4.5	Surplus product	No	------
4.6	Sewage sludge or other sludge from effluent treatment	Yes	Not significant.
4.7	Construction or demolition waste	Yes	During construction some amount of construction debris may be generated which will be segregated and whatever is re-saleable will be sold to buyers and rest of the waste will be used for filling up of

			low lying areas and development of internal roads and boundary walls
4.8	Redundant machinery or equipment	No	
4.9	Contaminated soils or other materials	No	None
4.10	Agricultural wastes	No	None
4.11	Other solid wastes	No	None

5) Release of pollutants or any hazardous, toxic or noxious substances to air (Kg / hr)

Sl. No	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources	Yes	Flue gas emission: **Main stack** SPM: 100 mg/Nm^3 SO2: 5556 kg/hr (for worst coal consumption of 463 tph and sulphur 0.6%) NOx: 1372 kg/hr (flue gas volume: 635 Nm3/sec, NOx conc: 600 mg/Nm3).
5.2	Emissions from production processes	Yes	As mentioned in the item 5.1
5.3	Emissions from materials handling including storage or transport	Yes	Fugitive emissions to limited extent
5.4	Emissions from construction activities including plant and equipment	Yes	Temporary in nature which may originate during construction of buildings or roads, which will be taken care by proper dust suppression by sprinkling of water
5.5	Dust or odors from handling of materials including construction materials, sewage and waste	Yes	Dust generated due to handling of construction material will be controlled by sprinkling of water.
5.6	Emissions from incineration of waste	No	No incineration is proposed
5.7	Emissions from burning of waste in open air (e.g. slash materials, construction debris)	No	No material will be openly burnt in air
5.8	Emissions from any other sources	No	No emission from any other sources.

6) Generation of noise and vibration and emissions of Light and Heat:

Sl. No	Information/Checklist confirmation	Yes/ No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
6.1	From operation of equipment e.g. engines, ventilation plant, crushers	Yes	Noise will be generated from Turbines, Generators. Expected noise level is 90 dBA, necessary PPEs (Ear Muffs, closed chambers) will be provided for the

			personnel working in those areas. ii) Most of the equipment structures are static. The vibration effect of these will be only local and the design of supports and foundations will nullify the intensity of vibration. iii) Light emissions are not envisaged in the project. iv) Heat emissions are not envisaged in the project.
6.2	From industrial or similar processes	No	As explained in 6.1
6.3	From construction or demolition	Yes	Excavation, drilling and welding which are temporary in nature
6.4	From blasting or piling	Yes	Limited to construction area
6.5	From construction or operational traffic	Yes	Limited
6.6	From lighting or cooling systems	Yes	Cooling Tower: 75 dBA
6.7	From any other sources	No	None

7) Risks of contamination of land or water from release of pollutants into the ground or into sewers, surface waters, ground water, coastal waters or the sea

Sl. No	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
7.1	From handling, storage, use or spillage of hazardous materials	No	Spillages are limited to dyke area
7.2	From discharge of sewage or other effluents to water or the land (expected mode and place of discharge)	No	Treated sewage water will be used for greenbelt
7.3	By deposition of pollutants emitted to air into the land or into water	No	The major emission from the proposed project are Particulate Matter (PM), SO_2 and NO_x. Adequate control systems like ESP and stack height meeting MOE&F guidelines will be provided to control the emissions. Hence there will not be any chance of significant contamination of land and water by deposition of pollutants emitted to air.
7.4	From any other sources	No	None
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	Yes	But within the prescribed limits by proper Environmental Management Plan

8) Risk of accidents during construction or operation of the project, which could affect human health or the environment

Sl. No	Information/Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous	No	Only minimum quantity of chemicals required will be stored with in the plant premises and safety precautions will be

	substances		taken while handling.
8.2	From any other sources	No	None
8.3	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, land slides, cloudburst etc.)?	No	The project site is situated in the earthquake zone-III as per IS 1893-2002 (Part IV) and earthquakes occurrence are remote possibility.

9) Factors which should be considered (such as consequential development) which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality

Sl. No	Information/ Checklist confirmation	Yes / No	Details thereof (with approximate quantities/rates wherever possible) with source of information data
9.1	Lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g ➢ Housing development ➢ Extractive industries ➢ Supply industries ➢ Others	No	Due to this project some positive development is envisaged, as the socio-economic conditions of the local population will improve. However, the impact on environment if any will be controlled by proper EMP.
9.2	Lead to after-use of the site, which could have an impact on the environment	No	None
9.3	Set a precedent for later developments	Yes	
9.4	Have cumulative effects due to proximity to other existing or planned projects with similar effects	No	Cumulative impact of proposed and existing units will be in the statutory limits.

(III) Environmental Sensitivity

Sl. No	Areas	Name/ Identity	Aerial distance (within 15 km.) Proposed project location boundary
1	Areas protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value	No	No areas of protected under international conventions, national or local legislation for their ecological, landscape, cultural or other related value are present with in 15 km radius.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	Yes	1) **Water Bodies;** 1) Buckingham Canal (0.4 km, E) 2) Bay of Bengal (2.6 km, E) 3) Upputeru River (6.0 km, SSW) **Forests:** 1) Ipuru RF (6.5 km, SSW)

			2) Tammenapatnam RF (9.7 km, S)
3	Areas used by protected, important or sensitive species of flora or fauna for breeding, nesting, foraging, resting, over wintering, migration	No	-----
4	Inland, coastal, marine or underground waters	No	-----
5	State, National boundaries	No	------
6	Routes or facilities used by the public for access to recreation or other tourist, pilgrim areas	No	NH-5 (18.0 km, NW)
7	Defence installations	No	None
8	Densely populated or built-up area	Yes	Nelaturu (0.1 km, N) Nellore (19.6 km, NW)
9	Areas occupied by sensitive man-made land uses *(hospitals, schools, places of worship, community facilities)*	Yes	
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	**Forests:** 1) Ipuru RF (6.5 km, SSW) 2) Tammenapatnam RF (9.7 km, S)
11	Areas already subjected to pollution or environmental damage. (those where existing legal environmental standards are exceeded)	No	------
12	Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding *or extreme or adverse climatic conditions)*	No	This is generally a plain area not prone for any of the natural disasters. The location is not prone to earthquake either since the area falls in Seismic Zone-III.

(IV) Proposed terms of reference for EIA studies

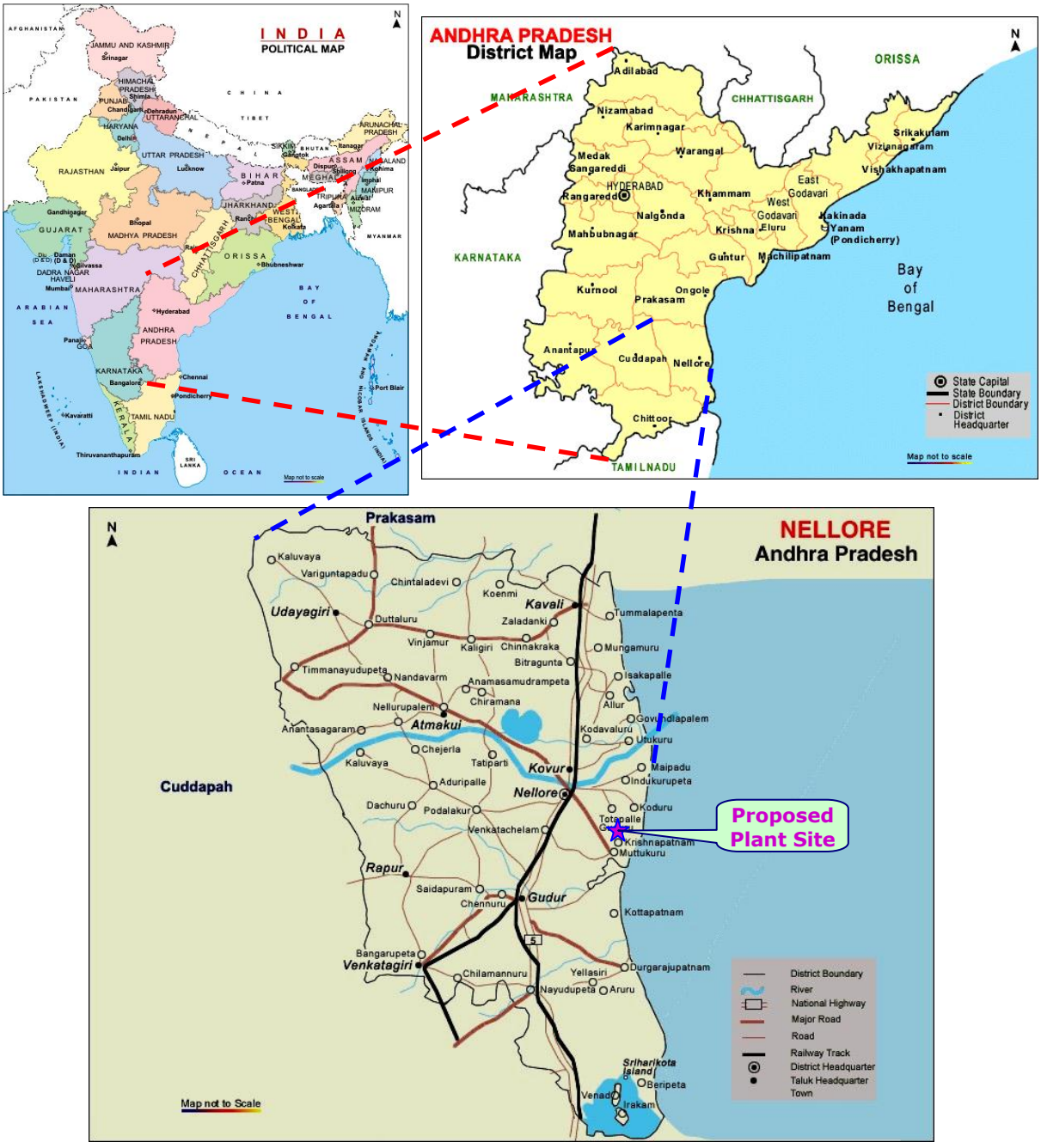
TOR is enclosed as Annexure-II

I hereby give an undertaking that the data and information given in the application and enclosures are true to the best of my knowledge and belief and I am aware that if any part of the data and information submitted is found to be false or misleading at any stage, the project be rejected and clearance given, if any, to the project will be revoked at our risk and cost:

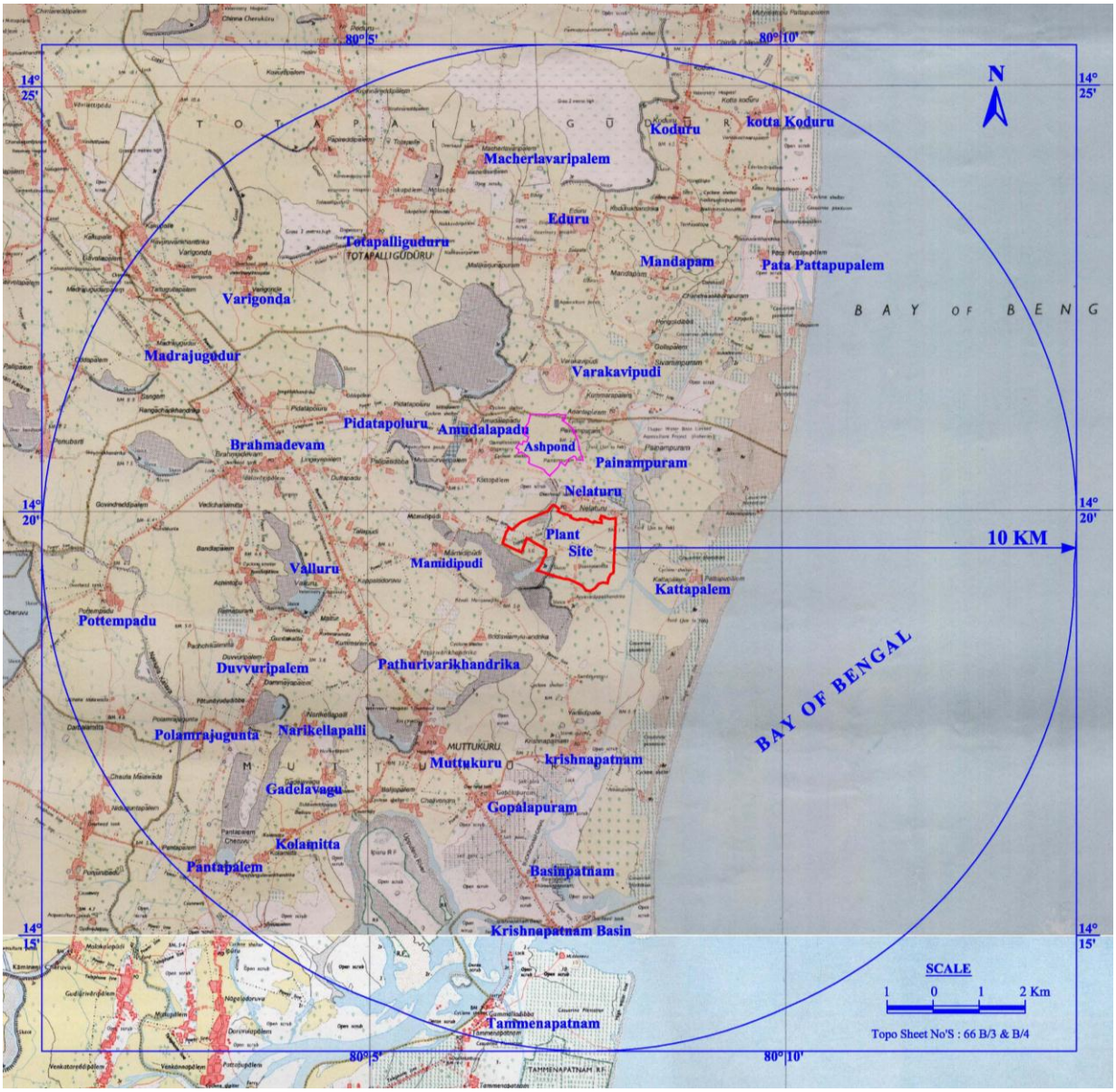
Date:04-07-2012
Place:HYD

PROJECT MANAGER

ANNEXURE-I
LOCATION MAP



ANNEXURE-I
STUDY AREA MAP



TERMS OF REFERENCE (TOR)

FOR

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PLAN

FOR

PROPOSED

SRI DAMODARAM SANJEEVAIAH THERMAL POWER STATION (SDSTPS) STAGE – II (1 X800 MW)

Nelaturu (Village), Muttukuru (Mandal)
Sri Potti Sriramulu Nellore District, Andhra Pradesh.

Submitted to

MINISTRY OF ENVIRONMENT AND FORESTS
GOVERNMENT OF INDIA

By

ANDHRA PRADESH POWER DEVELOPMENT COMPANY LTD (APPDCL)
Vidyut Soudha, Hyderabad – 500 082

July 2012

TERMS OF REFERENCE
FOR
CARRYING OUT ENVIRONMENTAL IMPACT ASSESSMENT (EIA) STUDY AND PREPARATION OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)
FOR OBTAINING ENVIRONMENTAL CLEARANCES (EC)
FROM REGULATORY AUTHORITIES
FOR
1X800 MW Supercritical Coal based Thermal Power Plant

Introduction

Andhra Pradesh Power Development Company Limited (APPDCL), a joint venture company of APGENCO (51% equity), AP Distribution Companies and Government of AP. The state of Andhra Pradesh has peaking shortage of 1663 MW i.e (-) 12.5% and energy shortage of 4283 MU i.e (-) 6.4 %. The peak load in Andhra Pradesh system at the end of 11^{th} plan is 14721 MW and it will be 21845 MW by the end of 12^{th} plan. To meet the demand, APPDCL proposed to install one expansion unit of 800 MW capacity under SDSTPS Stage – II.

Location of the project :

800 MW Supercritical Coal based Thermal Power plant is proposed under Stage-II near ongoing Sri Damodaram Sanjeevaiah Thermal Power Station (SDSTPS), Nelaturu (Village), Muttukuru (Mandal), SPSR Nellore District, Andhra Pradesh. The site is situated in Latitude 14^{o} 20' 40"N and Longitude 80^{0} 07' 35"E. The major habitation center near the site is at Nellore at a road distance of 19.6 km . Approach road: Nellore town is situated on National Highway NH-5 connecting Kolkata and Chennai.

Nearest Airport is Chennai at 170 km.

Nearest railway station : Venkatachalam located about 23 km from site on Vijayawada – Chennai main Broad Gauge line of Southern railway.

Nearest Sea port : Krishnapatnam

Components of the proposed project

The expansion unit of 800 MW would consist of super critical technology boiler with steam flow of 2600 TPH, steam pressure 256 Kg/cm2 and temperature 568^{0} C. Boiler will be of pulverized fuel. Coal with ash content 34% (Indigenous Washed coal) will be used. Cooling system is Natural Draft Cooling Towers with recirculation arrangement. The chimney height is 275 metres. ESP efficiency is 99.89% to limit out let dust concentration below 100 mg/Nm3. Water will be drawn from Bay of Bengal. 51 acres land available within existing plant boundary will be used for main plant, equipment and water storage facilities. Existing Ash pond area will be used for proposed extension unit. Existing area outside the Power plant boundary such as corridor for raw water pipe and coal conveyer system will be used for extension unit. Land acquired for Stage-I staff colony is sufficient to accommodate Stage-II staff quarters.

Details of the ongoing units and proposed unit

Stage	Capacity MW	Unit No	Date of Commissioning	Supplier	Fuel
I	800	1	ongoing	BHEL	coal
	800	2	ongoing	BHEL	coal
II	800	3	Proposed		coal

Objective of EIA study

The objective is to carry out the Environmental Impact Assessment (EIA) study to identify, predict and evaluate potential environmental, socio-economic effects which may result from the proposed "800 MW SUPERCRITICAL COAL BASED THERMAL POWER PLANT" and develop suitable Environmental Management Plan (EMP) to mitigate the undesirable effects. The EIA has been mandatory in the environmental clearance process of any developmental activities as per MOE&F, GOI Notification dated No. S.O.1533 dated 14-09-2006.

The study is aimed at:

a) Establishing the existing environmental conditions, identifying potential environmental impacts and identifying areas of significant environmental concerns due to the proposed project;
b) Prediction of impacts on environment, socio-economic conditions of the people etc. due to the proposed project;
c) Preparation of Environmental Management Plan (EMP);
d) Risk Assessment and Disaster Management Plan ; and
e) Development of post project environmental monitoring programme.

The EIA and EMP reports will be prepared for seeking necessary environmental clearances from the Ministry of Environment & Forests, Government of India and Andhra Pradesh Pollution Control Board according to the relevant EIA notifications and its subsequent amendments.

The EIA study will be conducted as per the applicable rules/guidelines of Ministry of Environment and Forests, Govt. of India /Andhra Pradesh Pollution Control Board (APPCB) including general/sectoral provisions

EIA Study

Terms of Reference (TOR) for EIA Study Report

EIA Study generally will include requirements of the MOE&F, GOI and APPCB. The EIA study will necessarily include but not get restricted to the following:

The TOR will include (a) literature review, (b) field studies (c) impact assessment and preparation of the EIA/EMP document covering the disciplines of Meteorology, Air quality, Noise, Water Quality, Land Use, Soils, Water Use, Demography and Socio-economics, Ecology, R&R etc.

Stage 'A'

- Establishing the relevant features of the project that are likely to have an impact on the environment during construction and operation phases. Collection of baseline data for weather conditions during post monsoon season ie; September 2012, October 2012 and November 2012. Establishing base line air, water, soil, noise, socio economic and ecological conditions during September 2012 to November 2012 (post monsoon).

Stage 'B'

- Assessment of likely emissions, effluent and solid waste quantities from the proposed expansion unit. Assessment of impacts using scientific tools to delineate post project scenario.

Stage 'C':

- Suggesting adequate pollution control measures to offset adverse impacts if any. Preparation of the EIA and EMP document. Defense of the study findings before the regulatory authorities.

Stages A, B & C may have concurrent activities.
An outline of the activities to be undertaken for each stage is given below:

Stage 'A':

Study Area

The study area will be up to 10 km radial distance from the proposed project with reference to air, water, soil, noise, Socio economic and ecological studies.

Baseline Conditions

The baseline environmental conditions will be established using Survey of India Topo maps, existing data already available through literature survey and field investigations. In addition to the above, information on the location of towns/cities, national parks, wildlife sanctuaries and ecologically sensitive areas like tropical forests, important lakes, bio-sphere reserves and sanctuaries within impact area will be furnished.

A review and analysis of the information available with various governmental, educational and other institutions will be carried out for each discipline. Based upon preliminary review of the available data, detailed field work will be planned to collect information on the parameters critical to characterize the environment of the area.

The baseline environmental studies will be undertaken in the following disciplines.

Disciplines

Meteorology, Air quality, Noise, Water Quality, Land Use, Soils, Water Use, Demography and Socio-economics, Ecology, R&R etc.

Various aspects to be covered under different disciplines are as follows:

(a) Meteorology

Following meteorological parameters of the area will be measured at the project site. In addition, data will be collected from the nearest IMD observatory also for reference.

1) Temperature (Dry & Wet)
2) Barometric pressure
3) Relative humidity
4) Wind speed and direction and
5) Rainfall

In addition, whether phenomena like hail, thunder storms, dust storms, fog/smog and cloud cover will be noted in terms of their intensity and duration using IMD data. From this data wind roses will be prepared.

(b) Air Quality

Ambient Air Quality will be monitored at 10 locations considering the prevailing meteorological conditions, topography, nearby villages etc. The parameters for monitoring will be PM10, PM2.5, SO_2, NOx, CO, Hg & O3. Details of monitoring parameters, frequency, locations etc. are given in Annexure-A.

(c) Noise

Noise monitoring survey will be carried out to characterize the noise environment in the study area. The noise level will be measured using high level precision sound level meter at 10

locations. Attenuation model will be developed to predict the noise level in the surrounding areas.

(d) Water

Surface water samples (5 locations) and Ground water samples (7 locations) will be collected and analysed for pH, Temperature, TDS, Turbidity, DO, Iron, Fluoride, Nitrates etc. The effluent water quality from the proposed project will be assessed and necessary treatment system proposed.

(e) Soil

Significant Physico-chemical parameters of soil will be determined at seven (7) locations in the study area with respect to pH, electrical conductivity, organic carbon, NPK contents etc., to establish agricultural potential and likely impact on soil due to proposed project is to be determined. An interpretation report on the results obtained will be presented.

(f) Land Use

The present land use pattern will be established using satellite imageries if available to the location, literature review and field studies with respect to irrigated and non-irrigated agricultural land, barren stretches, pasture land, plant, forest and human settlements. The land use pattern will be presented on maps. Current practice and locations of disposal of industrial and municipal solid wastes affecting the land use pattern, if any, will also be determined and depicted on the map. Important archaeological, historical, cultural and ecological sensitive areas like National Park/Sanctuary/Biosphere Reserve within impact area, if any, will be identified. The land requirement for the project including plant, township etc. will be spelt out. The classification of land used for main plant i.e agricultural/forest/waste land/ Government land/Private land etc., will also be described in detail.

(g) Demography and Socio-Economics

A study of the existing population in the study area will be conducted and its socio-economic characteristics and historical trends for the past decade will be determined through literature review. The study will include assessment and characterization of population with respect to male and female ratio, literacy, religion, family size, irrigation, source of livelihood, economical opportunities and financial position of the population.

The study will also include available infrastructure facilities related to health services, present status of health and disease pattern in the study area, water supply, road and transport system, communication, sanitary facilities, schools etc. Labour force characteristics will also be determined in terms of skilled and un-skilled workers available and the role of women in the labour force.

Collection of epidemiological data on prominent endemic diseases like malaria, fileria, gastro enteritis and respiratory diseases within the study area.

(h) Ecology

Details of flora and fauna will be enumerated through secondary sources such as Forest Department. Species density, diversity, frequency, relative abundance etc., will be studied. In addition, relative abundance of wild animals and birds will be estimated. Path of migratory birds, if any will also be demarcated. A list of endangered species will be prepared. Presence of wet lands and other ecologically sensitive areas such as national parks/sanctuaries, if any, will be identified and indicated on a map.

(i) Rehabilitation and Resettlement

Rehabilitation and Resettlement issues if any will be studied as per state and Central Government policies**.**

Stage 'B'
Assessment of Environmental impacts of proposed project

With the knowledge of baseline conditions in the study area and proposed project activities, impact on the environment will be discussed in detail covering flue gas emissions, discharge of liquid effluents and particulates emission during construction, noise & solid waste generation etc. Detailed projections will be made to reflect influence of the project on different environmental components using appropriate scientific tools acceptable to MOE&F and APPCB. The projections will identify critical environmental conditions due to operation of the project. It will also to be established as to whether these critical conditions will be further degraded with the proposed project and what additional environmental conditions are likely to become critical.

Both short term and long term impacts on sensitive areas, if any, such as habitat of endangered species of wildlife or plants, sites, historical and cultural monuments will be determined. Important centers with concentrated population in the study area will be established. Assessment of potential damage to terrestrial and aquatic flora and fauna due to flue gas emissions, discharge of effluents, noise pollution, ash disposal, and change in land use pattern, habitat degradation and fragmentation, anthropogenic activities from the proposed project and delineation of guidelines to minimize adverse impacts is to be done.
Assessment of economic benefits arising out of the project will be done.

Stage 'C'
Environmental Management Plan

At this stage, it may become apparent that certain mitigative measures are necessary to offset the impacts of the proposed project. Environmental management plan and pollution control measures will be necessary to meet the requirements of the regulatory agencies.

Environmental Management Plan will consist of mitigation measures for item-wise activity to be undertaken for construction and operation of the plant for its entire life cycle to minimize adverse environmental impacts. It will also delineate the environmental monitoring plan for compliance of various environmental regulations. The EIA/EMP will also include disaster management plan for the anticipated hazards due to storage and handling of fuel oil, fire hazards etc.

The EMP will include at least the following aspects but not restricted to them:

1. Delineation of mitigation measures for all the identified significant impacts;
2. Effluent treatment plan;
3. Ash utilisation plan;
4. Green belt plan;
5. Water harvesting and conservation plan;
6. Disaster management plan;
7. EMP Implementation schedule with costs;
8. Budget support in the project cost;
9. Post project monitoring plan;
10. A Topo map indicating National Park, Sanctuary, Elephant Tiger Reserve (existing as well as proposed), migratory routes if any within 10 km of project site duly authenticated by the CWW;
11. Fuel analysis for Sulphur, Ash content, heavy metals including Pb, Cr, As & Hg;

12. Water balance diagram ;
13. R&R plan;
14. Flora & Fauna duly authenticated by DFO. In case of any scheduled fauna conservation plan;
15. Socio economic measures and its influence to the local community due to the proposed project in quantitative dimensions;
16. Map indicating heat radiation contours under different hazardous scenario.

Public Hearing

The APPCB conducts Public hearing at designated location. After the "Public Hearing" of the project, the project proponent will make appropriate changes in the draft EIA and EMP reports so as to prepare the final EIA and EMP report for submission. Alternatively, a supplementary report to the draft EIA/EMP may be prepared addressing all the concerns expressed during the Public Hearing as per the requirement of the regulatory authorities.

CORPORATE ENVIRONMENTAL RESPONSIBILITY:

S.No			
1.	Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report	Yes	Will be described in the EIA
2.	Does the Environment Policy prescribe for standard operating process/Procedures to bring into focus any infringement/deviation /violation of the environmental or forest norms/conditions? If so, it meay be detailed in the EIA.	Yes	Will be described in the EIA
3.	What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions? Details of this system may be given.	Yes	Will be described in the EIA
4.	Does the company have a system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stake holders at large? This reporting mechanism should be detailed in the EIA report.	Yes	Will be described in the EIA

PROJECT MANAGER

Annexure-A

TENTATIVE MONITORING SCHEDULE FOR EIA STUDY

Sl. No	Attribute	Parameters	No. of Locations	Frequency	Remarks
1	**Air**				
(a)	Meteorology	Temperature (Dry & Wet), Barometric pressure, Relative humidity, Wind speed & direction and Rainfall.	One	Hourly	-
(b)	Ambient air	PM10, PM2.5, SO_2, NO_x, CO, Hg, and O3	10	Twice a week, 24 hourly sampling	
(c)	Noise	Leq. Max, Min	10	Once in each season	
2	**Water**				
	Ground/Surface water	All the parameters specified under the IS:10500	7/5	Once in each season	
3	**Soil**	pH, electrical conductivity, organic carbon, NPK contents etc.	7	Once in each season	
4	**Land use**		10 KM radius		
5	**Socio-economic**		10 KM radius		
6	**Ecology**		10 KM radius		
7	**Other aspects**		As per MOE&F requirement		

PROJECT MANAGER

PRE-FEASIBILITY REPORT

1 X 800 MW SRI DAMODARAM SANJEEVAIAH THERMAL POWER STATION (STAGE -II)

EXPANSION TO 2 X 800 MW (STAGE -I)
SUPER CRITICAL COAL BASED THERMAL POWER PLANT
AT
Nelaturu (Village), Muttukuru (Mandal)

SRI POTTI SRIRAMULU NELLORE DISTRICT, ANDHRA PRADESH

Submitted to:

MINISTRY OF ENVIRONMENT AND FORESTS

NEW DELHI

Submitted by:

ANDHRA PRADESH POWER DEVELOPMENT COMPANY LIMITED

Environment Consultants:

VIMTA LABS
Determining Quality

Vimta Labs Ltd.
142, IDA, Phase-II, Cherlapally
Hyderabad–500 051
env@vimta.com, www.vimta.com

(QCI/NABL Accredited and ISO 17025 Certified Laboratory, Recognized by MoEF, New Delhi)

July , 2012

CONTENTS

1. **EXECUTIVE SUMMARY**

S .No	Description	Details
1.	Name of the Project	Sri Damodaram Sanjeevaiah Thermal Power Station, Stage-II, Unit # 3 (1 X 800 MW) Nelaturu (Village), Muttukuru (Mandal)
2.	Location of the Plant	The proposed project site is at Nelaturu (Village), Muttukuru (Mandal), Sri Potti Sriramulu Nellore District, Andhra Pradesh. The Latitude and Longitude of the site is : 1. $14^0$20'40" N $80^0$07'35" E
3.	Power plant Capacity	1X800 MW
4.	Total land requirement for the project	51 Acres
5.	Total Water requirement & Source	6556 m^3 / hour Sourced from Sea – Bay of Bengal
6.	Power Evacuation	440 kV system
7.	Working hours	3 shifts daily of 8 hr each [Effective 18 hrs a day] 330 days a year
8.	Rehabilitation and Resettlement	No R & R issue is involved.
9.	Manpower [Operation]	350 persons
10.	Estimated Cost of the Project	Rs. 4276 crores

2. INTRODUCTION OF THE PROJECT/ BACKGROUND INFORMATION

(i) Identification of Project and Project Proponent

The Government of AP approved the proposal of APGENCO to set up a Special Purpose Vehicle (SPV) named as Andhra Pradesh Power Development Company Limited (APPDCL), a Joint Venture Company of APGENCO (50% equity), AP Distribution Companies and Govt. of AP.

Andhra Pradesh Power Development Company Limited (APPDCL) is implementing the following two Mega Power Projects on fast track basis in the state to meet the Supply – Demand gap of energy in the XI and XII plans.

1. 2 x 800MW coal based Supercritical Thermal Power Station near Krishnapatnam in Nellore District, which is about 150 Kms North of Chennai.

2. 2100MW (3 modules of each 700 MW) Combined cycle Power Plant near Karimnagar, which is about 160 Kms north of Hyderabad.

APPDCL commenced its functions on 01.03.06 for the projects by site identification, land acquisition, statutory clearances, project report, environmental studies, availability of inputs, project consultancy services and selection of EPC contractor based on international competitive bidding and substantial progress has been achieved on both projects.

(ii) Brief description of Nature of the Project

- ***Need for the Project***

The peak load in Andhra Pradesh system at the end of 11th plan will be 14721 MW it will be 21845 MW by end of 12th plan, and 28216 MW by the end of 13th plan. Considering the utilization factor of 70%, AP system will require about 21030 MW by year 2011-12, 31207 MW by the year 2016-17 and 403089 MW by the end of 13th plan. During the above periods, Southern Region will require 57667 MW, 86332 MW and 114978 MW respectively. **Table-2.1** indicates the extent of shortfall in peaking requirement and peaking requirement in the state of Andhra Pradesh, Southern Region, Western Region and Northern Regions. Considering the power scenario of the State of Andhra Pradesh and the power deficit regions viz Northern and Western Region, the need for setting up of proposed 1x800 MW SDSTPS, Krishnapatnam, stage – II, the load centre Power Plant is fully justified.

TABLE-2.1
PEAK LOAD AND ENERGY REQUIREMENT AT STATION BUS BAR

Year	Western Region		Northern Region		Eastern Region	
	Peak Load (MW)	Energy Requirement (MKWH)	Peak Load (MW)	Energy Requirement (MKWH)	Peak Load (MW)	Energy Requirement (MKWH)
2009-10	38259	254465	39502	250274	15361	91911
2010-11	42699	273777	43495	271616	17105	101266
2011-12	47108	294860	48137	294841	19088	111802
2016-17	64349	409805	66583	411513	28401	168942
2021-22	84778	550022	89913	556768	42712	258216

(iii) Demand-Supply Gap

Table2.2 shows the details of peak load and energy requirement of State of Andhra Pradesh and Southern Region as per 17th Electric Power Survey, a publication of CEA, upto the year 2021-2022.

TABLE-2.2
PEAK LOAD AND ENERGY REQUIREMENT/ CONSUMPTION IN THE STATE OF ANDHRA PRADESH, SOUTHERN, WESTERN & NORTHERN REGION

Year	State of Andhra Pradesh		Southern Region		Western Region		Northern Region	
	Peak Load (MW)	Energy Requirement (MKWH)	Peak Load (MW)	Energy Requirement (MKWH)	Peak Load (MW)	Energy Requirement (MKWH)	Peak Load (MW)	Energy Requirement (MKWH)
2010-11	13429	81404	36527	232426	42699	27377	43495	271616
2011-12	14721	89032	40367	253443	47108	294860	48137	294841
2016-17	21845	132118	60433	380058	64349	409605	66583	411513
2021-22	28216	175560	80485	511659	84778	550022	89913	556768

(iv) Imports v/s Indigenous production

Domestic coal is proposed to be sourced from the Talcher mines of Mahanadi Coal Fields or any other source allocated by the coal linkage committee. Imported coal will be sourced from Indonesia or other available good quality imported coal.

(V) Employment Generation (Direct &Indirect) due to the Project

During construction period the requirement of man power will be about 3000. In the operation phase, 300 persons will get direct employment in various services. About150 persons will get indirect employment.

The plant management will be responsible for overall performance of the unit. The management will be supported by a team of highly skilled persons having varied expertise and experience, which will function individually as well as collectively for overall performance of the plant.

3. PROJECT DESCRIPTION

(i) Type of project including interlinked and interdependent projects, if any.
1X 800 MW Coal fired thermal power plant

Location

The proposed thermal power plant will be located with in the boundary of the on going 2 X 800 MW SDSTPS at Nelaturu (Village), Muttukuru (Mandal), Near Nellore Town, Andhra Pradesh. The project will span between $14^0$20'40" N and $80^0$07'35" E. The index map of the project site is shown in **Figure-1** and a map showing area 10 km around the project site is shown in **Figure-2**.

(ii) Details of alternate sites considered and the basis of selecting the proposed site, particularly the environmental considerations gone into should be highlighted.

The site is and extension unit with in the boundary of the on going 2 X 800 MW Sri Damodaram Sanjeevaiah Thermal Power Station at Nelaturu (Village), Muttukuru (Mandal). Hence, no alternate site were considered for the project.

(iii) Size or magnitude of operation.

1X 800 MW Coal fired thermal power plant.

(iv) Project description with process details

The Coal based thermal power plant to be set up near Krishnapatnam will use blended coal from Talcher mines of Mahanadi coal fields or any other coal source depending on the coal allocation and imported coal will be sourced from Indonesia or other available good quality imported coal.

Coal will be fired in a high pressure boiler to produce steam at about 247 kg/cm^2, 565^0C, which will be fed to steam turbine which will drive the generator connected rigidly to it. The power output from the generator through appropriate electrical system will be fed to the grid for distribution to consumer.

Exhaust steam from the turbine will be cooled in the water cooled surface condenser and the condensate water will be recycled in the power cycle involving boiler, turbine and condenser as mentioned. Water for cooling purposes is required in the condenser, heat exchanger of auxiliary systems of boiler, turbine and generator etc. In addition water is required for bottom ash handling system, dust suppression system of coal handling, fire fighting systems, drinking (in plant and colony), make up for the power cycle etc. Hot water outlet of condenser and other heat exchangers will be cooled in suitable cooling tower and reused in the system. Similarly water used in other systems mentioned above will be recycled to the extent possible after suitable treatment. However, make-up will be required to be added for replenishing the loss due to evaporation, blow down and other consumptive use. To minimize the make up, effluent water from different process in the power station will be chemically treated so as to make it suitable for use in the development of green belt, sanitation, dust suppression etc.

About 6556 m3/hr of water will be required for 800 MW power plant planned at the location.

Fly Ash produced after burning coal in the boiler will be collected in ESP and conveyed pneumatically to storage silo located within the plant premises. Total ash generated in the power plant will be collected in dry form and sent for further utilisation. In case of disposal to ash pond/dyke, it will be High Concentrated Slurry Disposal (HCSD).

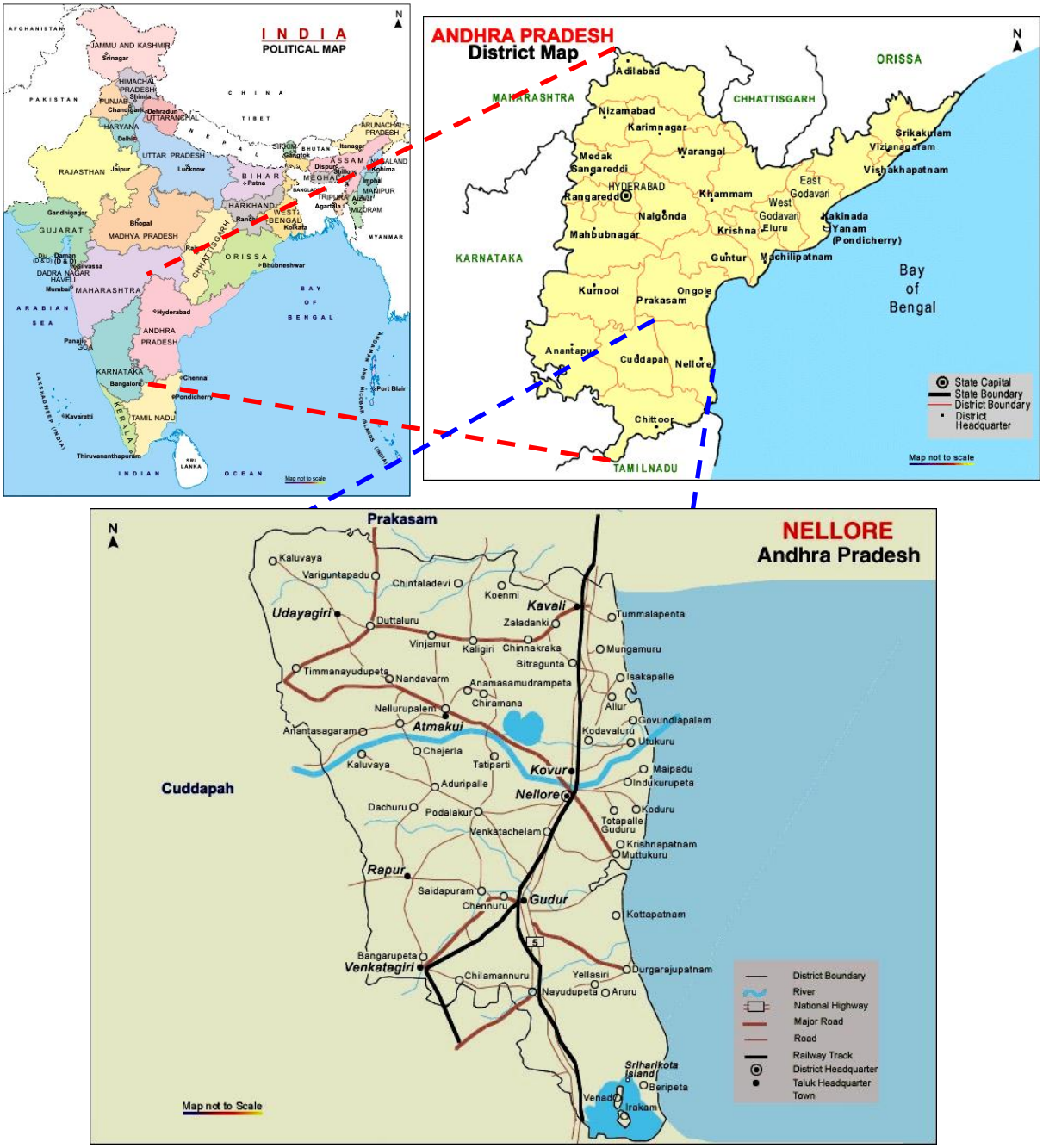


FIGURE-1
INDEX MAP SHOWING THE PROJECT SITE

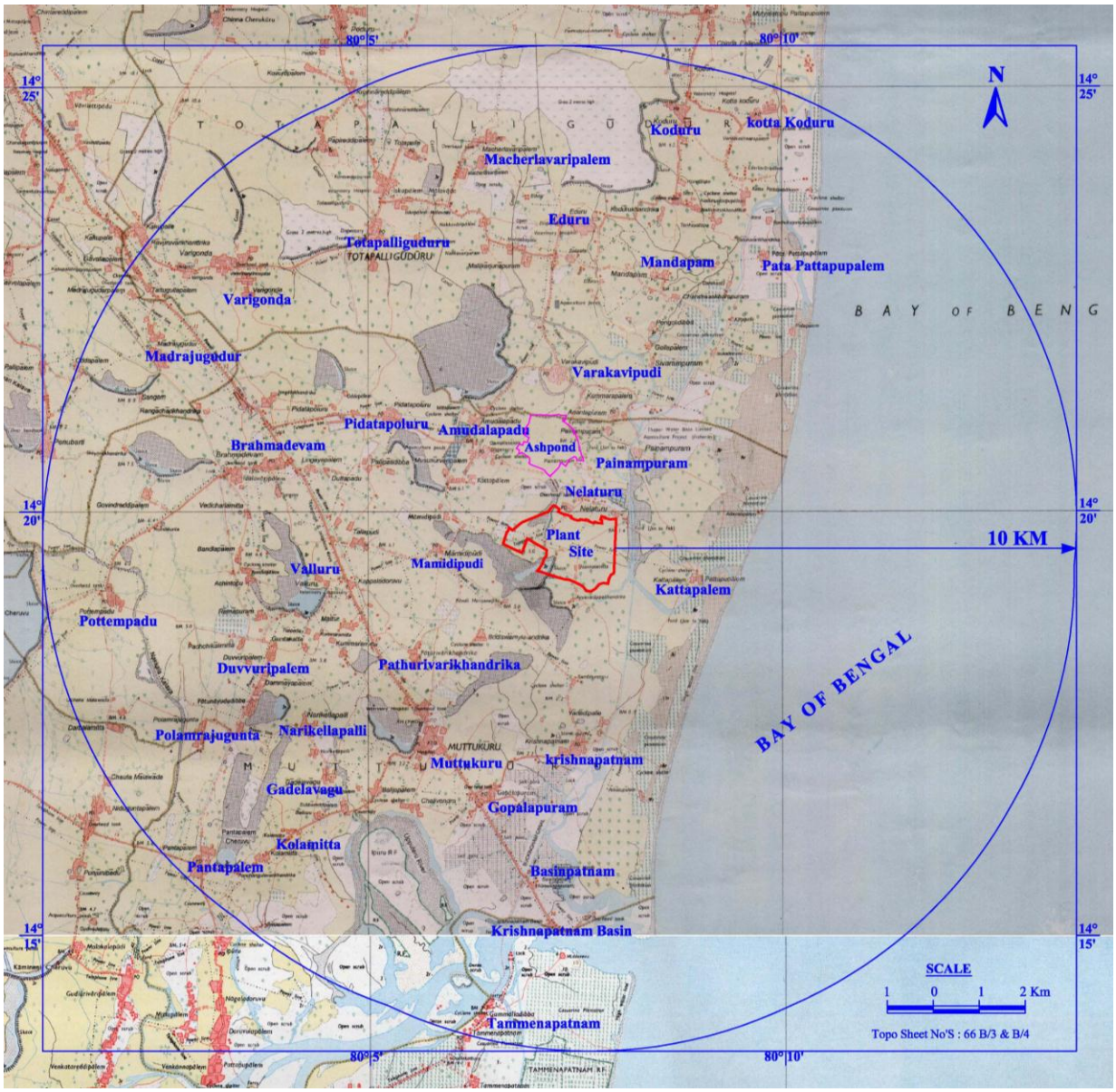


FIGURE-2
MAP OF THE AREA 10 KM AROUND THE PROJECT SITE

SELECTION OF PROCESS

The 800 MW power would be generated by a configuration of 1 x 800 MW units, with one boiler and one steam turbine for the unit.

Main Plant

Steam Generator & Auxiliaries

The steam generator will be supercritical, technology designed for firing coal as primary fuel, balanced draft furnace suitable for semi-outdoor installation. Boiler including auxiliaries will be designed for blend ratio of 30:70 (or higher) imported GCV coal : indigenous coal. The steam generator will be capable of operating on sliding parameter. The load charge for sliding parameter will be from 40% SGMCR to 100% TGMCR. However, it will be possible to operate the steam generator with modified pressure sliding mode with constant pressure mode operating between 90% TGMCR to 100% SGMCR. Steam generator will be designed to meet the Indian Boiler Regulation (IBR) requirement. Wherever IBR is not specific, ASME or equivalent reputed international code will be used.

Steam and water system will essentially comprise of steam separator, separator storage tanks evaporator down comers, water walls, superheater, reheater, desuperheater, economizer, valves, fittings, piping, insulation, supporting hanger' s instrumentation etc. The furnace will be designed to withstand pressure regimes without permanent deformations and will be made of gas tight welded membrane walls design required for openings of wall blowers, observation ports, access doors and instruments. The furnace walls will either be spiral wound and vertical tubes or vertical rifle tubes as per the manufacturer' s design. The furnace will have hopper bottom with stainless steel seal plates suitable for connection to an ash hopper. A suitable sealing arrangement shall be provided for connecting to water impounded wet type bottom ash hopper. The water / steam separators will be arranged at the evaporator outlet and will be so sized to ensure adequate steam separation. The water / steam mixture will be fed into the separators by connecting pipe work which will enter around the circumference at an inclined angle to ensure mixture moving spirally downwards and the water / steam separation is done by means of applied centrifugal force. The water will be led downwards to the collecting vessel and the steam escapes centrally upwards to the connections towards the first superheater stage. The water received in the separators will be re-circulated to the economizer inlet via 1x100% startup water re-circulation pump. At higher loads the re-circulation pump will not be in operation and the entire flow from the evaporator is directed to the superheater. It will also be possible to start the steam generator without the re-circulation pump. The superheater and reheater will be designed to maintain superheat and reheat steam temperatures at superheater and reheater outlet over the entire steam temperature control range.

The attemperators are to be of spray type fitted with an inner removable lining. RH temperature control is by means of burner tilt & damper control of the flue gases or gas recirculation. Feed flow measurement to the boiler will be achieved by flow measuring devices located on the BFP discharge header. The economizer will be of non-steaming and bare tube type. The tube banks will be of inline arrangement.

Steam Turbine and Auxiliaries

The turbine component and its auxiliaries will be designed and selected to meet the stringent requirements in respect of superior thermal performance, excellent product reliability & operational flexibility.

The turbine will be designed based on modular design approach that divides the turbine into three main parts:

- High-pressure (HP) section
- Intermediate-pressure (IP) section and
- Low-pressure (LP) section

The turbine will have one single flow HP, one single flow IP and two double flow LP cylinders exhausting downwards into condensers. All components will be selected based on long-proven records and standardized modules. The turbines will be of the tandem compound design. The individual shafts of the cylinders and the generator rotor shaft will be coupled rigidly together.

All auxiliaries like turbine oil purification system, generator seal oil system etc. as well as necessary protective and supervisory system will be provided to ensure trouble-free, safe and efficient operation of the turbo-generator.

Electrostatic Precipitator

High Efficiency Electrostatic Precipitators would be installed to control the emission of ash particles. The Precipitators would be designed to limit the particulate emission to 50 mg/Nm3 under all design conditions. The ESP would have an efficiency of around 99.9%.

Chimney

To facilitate wider dispersion of emission, single flue chimney of 275 m height is envisaged. It would be provided with access to personnel for regular monitoring of the stack emissions.

Cooling Towers

It is proposed to have cooling water pump house for 1x800 MW plant with six (6) nos. of pumps. Out of which four (4) Nos. (3w+1s) pumps each of capacity of 33% have been installed for the cooling water requirements for the condenser and auxiliary cooling. The cooling water requirements for auxiliary cooling systems shall be tapped from the CW pipe at the upstream of the condenser and the return water shall be led to CW discharge header after the condenser. The cold water from the cooling tower shall be led to the CW pump house through cold water channel by gravity. Three (3) Nos. of ACW booster pumps each of (3x50%) capacity has been installed for this purpose. The CW system blow-down shall be drawn by two (2) Nos. of CW blow-down pumps and shall be discharged to the sea. It has been considered that the cooling water requirements for the condenser is 88000 m^3/hr and the water requirements for auxiliary cooling water system as 4000 m^3/hr. A tapping from the main discharge header (2200 NB) with a flow of 760 m^3/hr shall be provided for the sea water sump Stage-II with electro chlorination plant supply pumps (2x100%) each of 60 m^3/hr and the Desalination Supply Pumps (2x100%) each of 700 m^3/hr. The sea water sump shall have the capacity of 10 hrs storage. The treated sea water shall be used to meet the other requirements of the plant like the potable water, firefighting, service water, dust suppression, wash water requirements for MB, CPU regeneration etc including boiler make up .

As the TDS & TSS is high in the sea water it is envisaged to design the system with 1.4 cycles of concentration (COC). The make up sea water shall be brought to the plant area by off shore intake structure, pump house and buried piping. For supply of the make-up water from the sea to the plant five (5) Nos. of pumps with 3 Nos. (2w+1s) of existing pumps of 7000 m^3/hr and for the present requirements the 2 Nos. (1w+1s) pumps each of 7000 m^3/hr has been envisaged in the intake structure. A main pipe line of 2200 NB shall cater the requirements of sea water. The makeup water requirement for the CT stage-II shall be 5796 m^3/hr and for process needs it shall be 760 m^3/hr.

Coal Handling System

The coal handling system for the proposed 1 x 800 MW thermal power plant covers proposed facilities for receipt of coal by sea, railway wagons, coal unloading system, stacking near the plant area, reclaiming from stockpile, crushing and conveying of coal up to the steam generator bunkers

(vi) Raw material required along with estimated quantity likely source, marketing area of final products, mode of transport of raw material and finished product.

Coal has been considered as the primary fuel for this. Fuel Oil will be secondary fuel during start-up and during light load operation. Since Indian mines are located well away from the site and obtaining full Coal linkage for complete requirement of the plant will be difficult, it is proposed to import coal. Accordingly, an application shall be submitted for long term coal linkage from Indigenous sources, simultaneously arranging for supply of coal from Indonesian mines where coal is available in abundance. However, to take care of the shortages, it is also proposed to adopt blending of coal by mixing imported coal with indigenous coal. The coal requirement for the capacity of 800 MW at 85% PLF operation would be of the order of 2.88 MTPA with calorific value of 4800 Kcal/Kg based on the heat rate of 2317 Kcal/KWh.

(vi) Availability of water its source, Energy/power requirement and source should be given.

- **Water Supply & Sewerage**

As Water requirement will be drawn from the sea. The makeup sea water shall be brought to the plant area by off shore intake structure, pump house and buried piping. Cooling water requirement for the condenser is 88000 m3/hr and the auxiliary cooling water system requirement is 4000 m3/hr

- **Power Evacuation**

The power from the plant will be evacuated at 400 kV voltage level through existing double circuit transmission lines to APTRANSCO system.

Quantity of Wastes to be generated and Scheme for their Management/Disposal

All efforts will be made to utilize fly ash for use in various applications/uses. Unused flyash and bottom ash will be disposed off safely in the ash disposal area. After the ash pond is abandoned, it would be reclaimed by providing earth cover and there after undertaking tree plantation. A detailed water balance scheme is provided in **Annexure-I.**

4. SITE ANALYSIS

Infrastructure

For establishment and successful operation of coal thermal power plant, it is imperative to ensure availability of the following infrastructure**:**

- Away from CRZ area
- No structure of archaeological importance.
- Availability of railway line nearby.
- No populated city in vicinity. Nearest town is Nellore
- Not an agricultural land
- No reserve forest nearby
- No R&R issues.
- As per records of government the site is low laying land
- Adjacent to existing power plant to share the common infrastructure facilities.

(i) Connectivity

Venkatachalam station southern railway is 23 km. For the on going project the site is being connected to National Highway (NH-5) connecting Kolkata & Chennai and thus accessible by road net works.

(ii) Land details

Land requirement of 51 acres for the Stage-II is part land acquired for the Stage-I. For the proposed 1x800 MW extension unit, main plant, equipments and water facilities will be accommodated in plant boundary. Emergency Ash pond area is sufficient for extension unit. This area is considered adequate for stage-II also as per MOEF norms. Ash utilization will be implemented to optimize the land requirement for Ash dump. Existing facilities such as corridor for Raw water pipe and Coal conveyor system is used for extension unit also, hence requirement for land outside the power plant boundary to accommodate stage-II does not arise.

(ii) Land details

Topographically the study area is plain with local undulations. The topography of the site is fairly flat and requires minimum filling. No filling material from outside is envisaged for the plant construction.

(iv) Existing land use pattern, shortest distances from the periphery of the project to periphery of the forests, water bodies.

The entire project land is private. There is no water body in the project area. Information on forests and water bodies nearer to the proposed project site is given below:

Water Bodies:

There are three water bodies, namely, Buckingham Canal, Bay of Bengal and Upputeru River in the 10-km radius from the project boundary.

Forests:

The Ipuru RF and Tammanepatnam RF are the only forest blocks with in 10-km radius from the project boundary.

There are no sanctuaries, biosphere reserves or national parks, tiger or elephant reserves or within 10 km radius from the proposed plant boundary.

(v) Soil classification

The area being located on the coast is comprised of a top cover of recently formed alluvium. The alluvium in the area is made of clay, silt and sand. The interior plain lands are covered by soils made of sandy loam.

(vi) Climatic data from secondary source

The meteorological data of the site is given in the **Table-4.1.**

TABLE-4.1
METEOROLOGICAL DATA

Annual mean ambient temperature	Max: 42.20^0c Min: 18.3^0c
Highest temperature in a day	33^0C
Lowest temperature in a day	24^0c
Relative humidity	Max: 84% Min: 46%

Wind speed	50 m/sec
Sea water temp	33^0c
Rainfall	Avg: 1032 mm Max: 100mm/hr

5. PLANNING BRIEF

(i) Planning concept (type of industries, facilities transportation etc). Town and country planning/development authority classification

There are few proposed Thermal power plants coming up in the 10-km radius of the project. The project area falls with in the region which is well connected by road and rail to the district head quarters – Nellore which is at about 19.0 km in NW direction.

(ii) Population Projection: The distribution of population in 10 km around the project site is shown

The study area falls under Muttukuru mandal of Nellore district. The study area comprises of 14 large and 11 small villages. The total population as per 2001 census for the 11 main villages is 42,977 in which male population is 21,915 and female population is 21,062 as presented in the **Table-5.1.**

TABLE-5.1
TABLE SHOWING VILLAGES AND POPULATION DETAILS

Sr. No:	Muttukuru Mandal	Population (As per 2001 Census)	Male	Female
1	Brahmadevam	5839	3371	2468
2	Krishnapatnam	4817	2371	2446
3	Mamidipudi	1444	708	736
4	Muttukuru	9712	4590	5122
5	Nelaturu	2301	1154	1147
6	Valluruvarikhandrika	294	157	137
7	Valluru	3190	1562	1628
8	Pidatapolur	5449	3063	2386
9	Survepalle – Bit I	1949	983	966
10	Narikellapalle	3261	1606	1655
11	Epuru Bit – I	4721	2350	2371
Total		42977	21915	21062

Literacy Levels

The area experiences a very moderate literacy rate of 67.5 %.

Occupational Structure

In the study area, the proportion of households belongs to different occupation groups, it was observed that Agricultural labourers are more in numbers in the total households and it constitutes about 66.5 percent and workers in household industries constitutes about 2.1 percent, 'service' constitutes about 1.2 percent, 1.00 percent for 'trade & business' and 1.2 percent were engaged in other activities.

With regard to the different subsidiary occupation groups, majority of the households (83.24 percent) were found to be engaged in fishing & dairying, about 2.10 percent in poultry and about 20 percent in salt preparation activity by using sea water.

(ii) Land use Planning

Total requirement of land for the project is 51 acres which is part of the existing plant. 33% of the project area is for raising plantation including peripheral green belt development using native plant species in consultation with the local Forest officials. A tentative break-up of land is given below in **Table-5.2.** The plant layout is given in **Annexure-II.**

TABLE-5.2
PROJECT AREA BREAK-UP

Sr. No.	Description	Area (in Acres) (1x 800 MW)	Remarks
1	Main Power block & Auxillaries	28	Required land available in existing plant boundary
2	Water Storage & Facilites	23	Required land available in existing plant boundary
2	Coal Storage & Handling facilites	-	Existing stock piles used
4	Ash dump are	-	Existing ash dyke use
5	Staff colony	-	Land acquired for colony of Stage-I,is sufficient to accommodate Stage-II
6	Green belt	-	
	Total	51	

(iii) Assessment of infrastructure demand (physical & social)

(i) Amenities/Facilities.

Facilities will be created at the project site for –

- Routine maintenance of all equipment.
- Incidental minor repair / replacement of sub-assemblies and components of CHP equipment and accessories, water pumps and pumping installations.
- Day-to-day repair and maintenance of plant and machinery.
- Inspection and scheduling of major repairs from outside agencies.

Service Buildings

Office buildings, sub-station, statutory buildings such as first aid centre, rest shelter, canteen etc. of appropriate size will be provided.

Residential Buildings

The Bachelor's accommodation and staff quarters will be located in the project area at a suitable place.

Roads

Approach road to project site will be provided.

6. PROPOSED INFRASTRUCTURE

(i) Industrial area (processing area)

- Power Block
- Switchyard
- Sea water in-take and discharge pipe corridor
- Cooling tower, pump house and piping
- Water storage and treatment facilities
- Coal conveyor corridor from port to plant
- Coal stock piles (crushed and uncrushed)
- Other BoP facilities (CHP, AHP, Compressors, DG set, Effluent, etc.)
- Pipe / cable corridors, inter building clearances, pathways, etc.
- Roads and Drains
- Equipment lay down and open storage area
- Non-plant buildings
- Access road
- Emergency Ash Pond

(ii) Residential Area

Bachelor's accommodation and staff quarters will be located in the project area.

(iii) Green belt

33% of the total project area will be used for Plantation and Greenery development.

(iv) Social infrastructure

Canteen, Rest shelter / room, Recreation Room will be provided.

(v) Connectivity

The site is nearest from Nellore town. The nearest broad gauge railway station Venkatachalam is located about 23 km from plant site. Nearest airport at Chennai is at a distance of 170 km.

(vi) Drinking Water Management (Source & Supply of water)

The colony & Plant potable water requirement shall be 55 m^3/hr. The plant potable water shall be stored in plant potable water tank of capacity 20 m^3..

(vii) Sewerage System

Domestic sewage will be treated and disposed of through Septic Tanks & Soak Pits.

(vii) Industrial Waste Management

a) Industrial Effluent

The plant effluent after treatment will be reused to maximum possible extent. All treated effluents will be brought to the guard pond for dilution and will be used for horticulture and green belt development.

b) Domestic Effluent

Septic Tanks & Soak Pits will be provided. Sludge after digestion will be used as manure.

(viii) Solid Waste Management

a. Total ash

Dust generation in ash pond will be controlled by maintaining the area in wet conditions.

b. Municipal waste

The municipal waste which will be generated, will be composted and used as manure.

(ix) Power Requirement & Supply/Source

Total power requirement will be sourced from existing Stage-I TPP.

7. REHABILITATION AND RESETTLEMENT (R & R) PLAN

There is no human settlement or structures at the project site. Thus no R & R issue is involved.

8. PROJECT SCHEDULE & COST ESTIMATES

(i) Likely date of Start of Construction and likely date of Completion

It is planned to award EPC contract within 2 months of issuance of "Environmental Clearance" and 'Consent to Establish" and complete the project in 50 months period.

(ii) Estimated project cost along with analysis in terms of economic viability of the project.

Table-8.1 depicts the project cost and analysis

TABLE-8.1
COST OF GENERATION

Plant Capacity	1 X 800 MW
Auxiliary Energy Consumption	6%
Station Heat Rate	2317
Depreciation	For first 12 years – 5.25 % & for balance 13 years – 2.06%
O&M	2.45% escalated @ 4% every
Loan period	12 years (10 + 2)
Loan repayment	40 equal quarterly installment with 2 year moratorium
GCV of coal (Design)	4800 kcal/kg
Present day coal price	Rs. 3500/ tone on delivered basis with 5% annual escalation
GCV of support fuel	10,000 kcal/kg
Support fuel present day price	Rs. 45,000 tonnes for HFO/LDO
PLF	85%
Return on capital employed	13.65%
Completion schedule	50 months
Economic life of plant	25 years

9. ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

Financial and Social Benefits

The project will improve the socio-economic status of the society in the region by generating direct and indirect employment opportunities. The project will contribute additional revenue to the State & Central exchequers in the form of taxes, cess, etc.

The anticipated impacts of the project are explained below:

Human settlement is expected to increase after this project gets operational.

In the long term, the project will have impact on the population growth due to migration of people from outside area. Indirect employment opportunities will also add to this.

The literacy level of the project area is likely to increase as there will be influx of many educated people taking up jobs in the project, which is likely to result in establishment of better educational facilities.

The impact of the project on the civic amenities will be minimal. Health care facilities will be developed for the employees of the proposed project. These medical facilities will be extended to surrounding villages.

The project related construction activities will benefit the local populace in a number of ways such as supply of construction labourers – skilled, semi-skilled and un-skilled,

tertiary sector employment and provision of goods and services for daily needs including transport. The proposed project will provide employment to the skilled as well as un-skilled persons. The local population will be given preference depending upon their suitability to the job requirement. Besides direct employment, indirect employment opportunities will also open up. The project will have positive impact in the region. Quality of life of the people will improve, which in-turn will improve the socio-economic conditions of the area.

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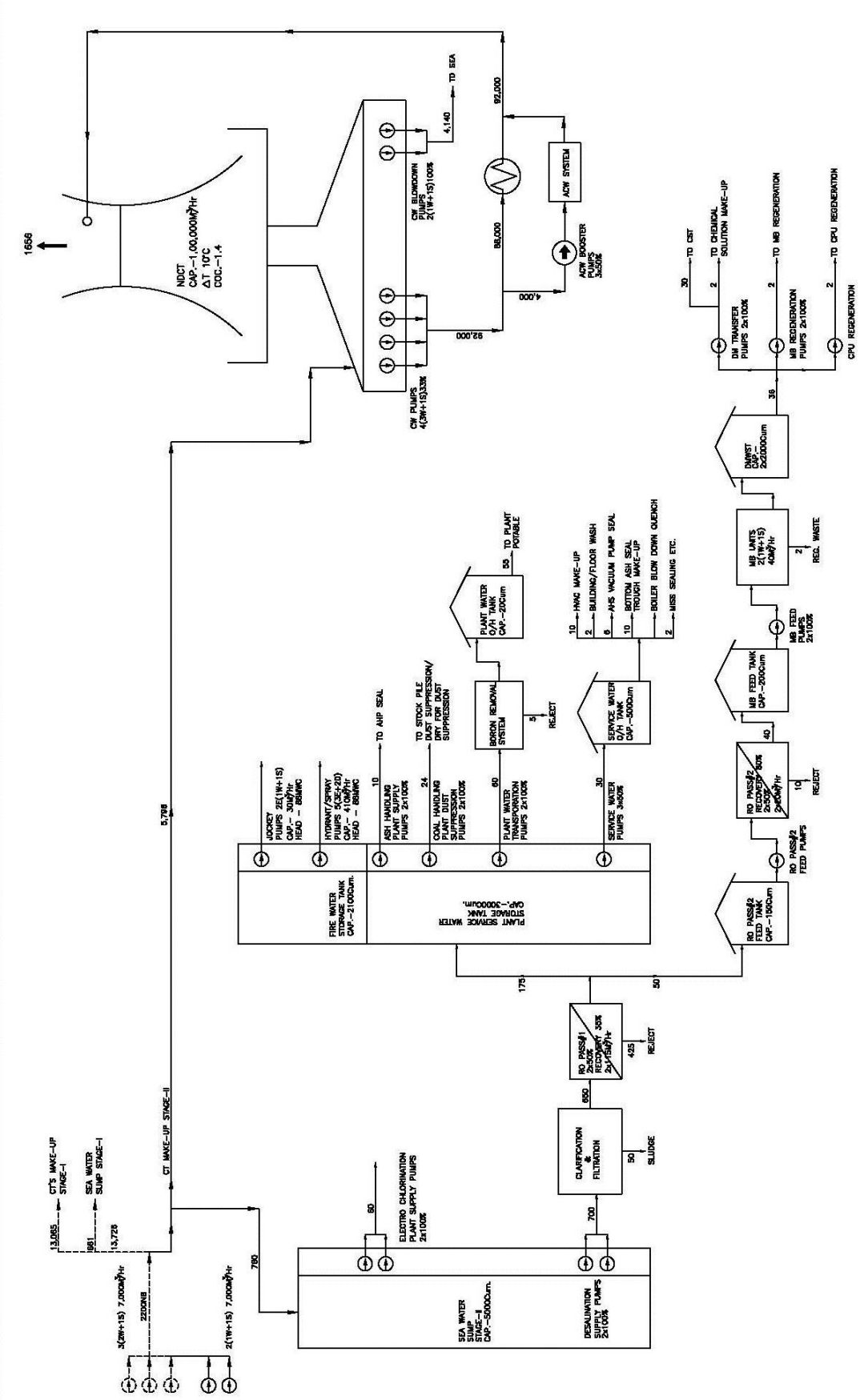
ANNEXURE-I: WATER BALANCE DIAGRAM



ANNEXURE-II: PLANT LAYOUT

PROJECT IMPLEMENTATION STATUS

SRI DAMODARAM SANJEEVAIAH THERMAL POWER STATION

2x800MW STAGE-I

ANDHRAPRADESH POWER DEVELOPMENT COMPANY LIMITED
SRI DAMODARAM SANJEEVAIAH THERMAL POWER STATION (2 X 800 MW)
PROJECT IMPLEMENTATION STATUS

Enivironmental Clearance Letter No. J-13011/20/2007 – I.A-II(T) DT:17-07-2007

1. All statutory clearances / approvals have been obtained
2. Financial tie-up is made with M/s PFC and M/s KFW, Germany.
3. M/s Desein Pvt Ltd, New Delhi are appointed as Project Consultants

4. **Placement of Orders**:

   i) On M/s BHEL for supply, erection, testing and Commissioning of Steam Generator and Auxiliaries
   ii) On M/s L&T Limited for supply, erection,testing and Commissioning of Turbine, Generator and their Auxiliaries
   iii) On M/s Tata Projects Limited (TPL) for Balance of plant including Civil works
   iv) External Coal Conveying System – The contract for External Coal Conveying System was finalized and LOA was issued to M/s.Techpro Systems Ltd., for a total value of Rs.119.70 Crores. The kick off meeting with M/s.Techpro Systems was held on 16.06.2012 and agreement entered on 29-06-2012.
   v) Sea Water Intake and Outfall System – The contract for Sea Water Intake and Outfall System was finalized and LOA was issued to M/s.Navayuga Engg., Co. Ltd., for a total value of Rs.268 Crores. The kick off meeting with M/s.Navayuga Engg., Co. Ltd., was held on 06.06.2012 and the contract agreement is likely to be entered.

5. Advance payments were released against the above three contracts and the Zero date and Completion periods for the above three contracts are as follows
   vi) BHEL : Zero date – 29.08.2008 ; Completion period : 47/53 Months
   vii) L&T : Zero date - 23.09.2008 ; Completion period : 47/53 Months
   viii) TPL: : Zero date – 27.02.2009 ; Completion period : 36/39 Months

6. The Unit # 1 is scheduled to be commissioned by 30.09.2013 and Unit # 2 by 31.12.2013.

I) Civil Works:

a. Foundations

1. Boiler foundations of both the units are completed.
2. ESPs foundations of both the units are completed.
3. BFP foundations of unit#1 completed.Unit#2 are in progress.
4. Bunker bay foundations of both the units are completed.
5. 3 out of 6 mill foundations of unit-1 are completed.
6. All foundations of PA,FD&ID fans of both the units are completed.
7. All the equipment and tower foundations are completed in the Switch yard.
8. Generator transformer, Unit transformer and Station transformer foundations are completed. UAT& IPBD structure foundations are in progress.
9. NDCT piling work of both the units are completed, Pile cap work of NDCT-1 is in progress.
10. Chimneys RCC shell casting and external plat forms completed. External shell painting completed. Flue can fabrication in progress, total 826MTout of 954 MT fabricated &221 MT erected.
11. Water treatment plant foundations are completed.

12. All Junction Towers and 9 conveyors trestle foundations completed.
13. BAH foundation and buffer hopper foundation piling work completed.
14. Overflow sump wall and coarse ash tank completed.
15. Mixer tank foundation completed.
16. HCSD Pump House – Pedestal completed, transformer foundations completed.
17. AHP Compressor cum vacuum pump Foundation in progress.
18. T.G Deck for unit 1 is ready and for unit 2 T.G. Strand Jack foundation completed.
19. C.W Fore bay Base raft & Top slab completed. Retaining wall RCC in progress. CW Pump house work in progress.

b. Buildings

1. Office building, Fire station building and canteen buildings are completed.
2. TG and central control building 18,730 MT of structure erected out of 19,850 MT
3. Bunker building 7,410 MT of structure erected out of 12,000 MT
4. WTP switch gear buildings, Switch yard control building, ESP control room building, fire water pump house building, CW pump house buildings, Sea water pump house building, CHP switch gear building, HCSD pump house building, AHP compressor cum vacuum pump house buildings, service buildings, Storage yard buildings both Type A & Type B,CHP switch gear building , crusher house F.O. Pump House and work shop buildings are in progress.
5. Fly ash Silo1 & Silo 2 work in progress.

c. Roads & Drainages

Patrol roads, internal roads and drainage works are under progress.

II) E&M WORKS:

a)Mechanical Activities

Weighbridge : Weigh Bridge Commissioned. .

Water Treatment Plant

DM Storage Tank, RO-II feed tank, CST tanksA&B and MBfeed tank fabrication, Erection& Hydro test, sand blasting and painting completed.

Piping : GRP piping fabrication 15346 RM completed out of 15835 RM.13868 MT erected out of 14526 inch mtr

EOT CRANES

1)T G building AB bay 100/20T: Crane commissioned.
2) 2No 60T crane erected and load tested.
3) 1No. 30T EOT crane received at site.

FUEL OIL SYSTEM

HFO Tank 1&2: Erection completed. Water draining under progress.
LDO tank erection completed. Water fill test completed.
Dyke wall-RCC except partly on west side completed.

FIRE PROTECTION SYSTEM: Piping in various areas under progress.5017 RM erected out of 12931RM

CW Pumps: For all 8 pumps Draft tube formwork fixing,liner holder ring,discharge divergent pipe,volute radius ring. Volute wooden frame work, volute tongue and cover ring with mock-up tool fixingcompleted.

CW Piping

PU Coating Works: 206 Pipes coating completed out of 222 pipes
: Bends& manholescoating done.Erection joint coating partly done.
Erection : Erection, welding& UT of pipe for unit1&2 supply & return line under progress. total 0.89/1.8 Km erected.
Sea water piping: Intake & outfall in front of switchyard control building completed. Total 0.24/1 Km Erected

Coal Handling System
Stacker cum Reclaimer I&II foundationscompleted. All equipment parts along with suspension and Rail fixing completed. Operator's cabin is fitted. Hydraulic Power Pack is placed.

Structural works(Qty. in M.T)

Activity	**Total Qty**	During the month	Qty erected
Fabrication	4800	157	4208
Sand blasting	4800	195	3440
Erection	4800	130	3276

Ash Handling System:Structural fabrication of 25 MT completed out of 485 MT.

b) Electrical Activities

- Client Office Building : Electrical work for Lighting and AC System completed.
- Fire Station Building : All the Electrical work completed for Lighting System.
- Canteen Building : All the Electrical works completed for Lighting and AC System.
- Gate Complex : Electrical work is completed.
- Erection and Testing of 100 MVA Station Transformers – 1&2 completed.
- Erection of Metallic Expansion Joints for GT-1, UAT 1A & 1B completed.

Earthing works
MS rod laying 13,810 RM out of 15500 RM completed. Auxiliary earth mat, GI flat earthling, earth electrodes erection in progress
Boiler Area I&II, ESP Area I&II, Chimney, Bunker Area I &II are completed,TG Floors,ESP control room-I&II,WTP, Work shop building & transformer yard area in progress.

Lighting Mast : Erection and Fixing of Lighting Mast completed.

Switchyard Control Room: 220V battery placement at G Floor completed, Cable tray erectioncompleted, alignment under progress.
Switch Yard: Erection of various equipment completed.

SUMMARY

Sl.No.	**Sub-packages of BOP**	**Percentage(%) Physical Progress**			
		Civil works	**Supply**	**Mechanical Erection works**	**Electrical Works**
1	DM Plant	89%	90%	64%	1%
2	Raw Water System/ WT Plant	85%	95%	20%	0%
3	Fuel Oil System	70%	82%	50%	0%
4	Chimney	75%	93%	40%	0%
5	CW system	74%	98%	16%	0%

6	Cooling Tower	27%	25%	0%	0%
7	Switchyard	96%	100%	80%	20%
8	Ash Handling Plant	45%	75%	0%	0%
9	Coal Handling Plant	70%	83%	64%	0%

8) M/S BHEL:(S.G.Package)

The Engineering of various equipment is almost completed.

(A) Material receipt:

Unit-1

Boiler : 27752 MT out of 31000 MT
Piping 1341 MT out of 2512 MT
ESP 7790 MT out of 8711 MT

Unit-2

Boiler : 22348 MT out of 31000 MT
Piping 1268 MT out of 2512 MT
ESP 7512 MT out of 8711 MT

(B) Erection status:

ESP-1:5761 MT erected out of 8711MT(66.13%)

ESP-2:5011 MT erected out of 8711 MT.(57.52%)

Boiler Unit No. 1: Erection commenced on 20.02.2011 and 11865 MT Erected out of 31000 MT (38.27%)

Boiler Unit No. 2**:** Erection commenced on 24.04.2011 and 7599 MT Erected out of 31000 MT (24.51%)

Unit 1 Pressure part erection in progress.
Unit 2 Ceiling girders A,B,C,D,E,F erected

Storage facilities :

2 semi closed sheds and 2 closed sheds arecompleted.

T & P Deployment:

2 nos. 100 MT cranes, 2 No 250 MT Crane and 1no. 600MT Cranes are working at site.

9) M/s L&T:(STG Package)

1) The Engineering of various equipment is completed and the Procurement of materials are in progress.

2) Under STG package, the progress is as follows:

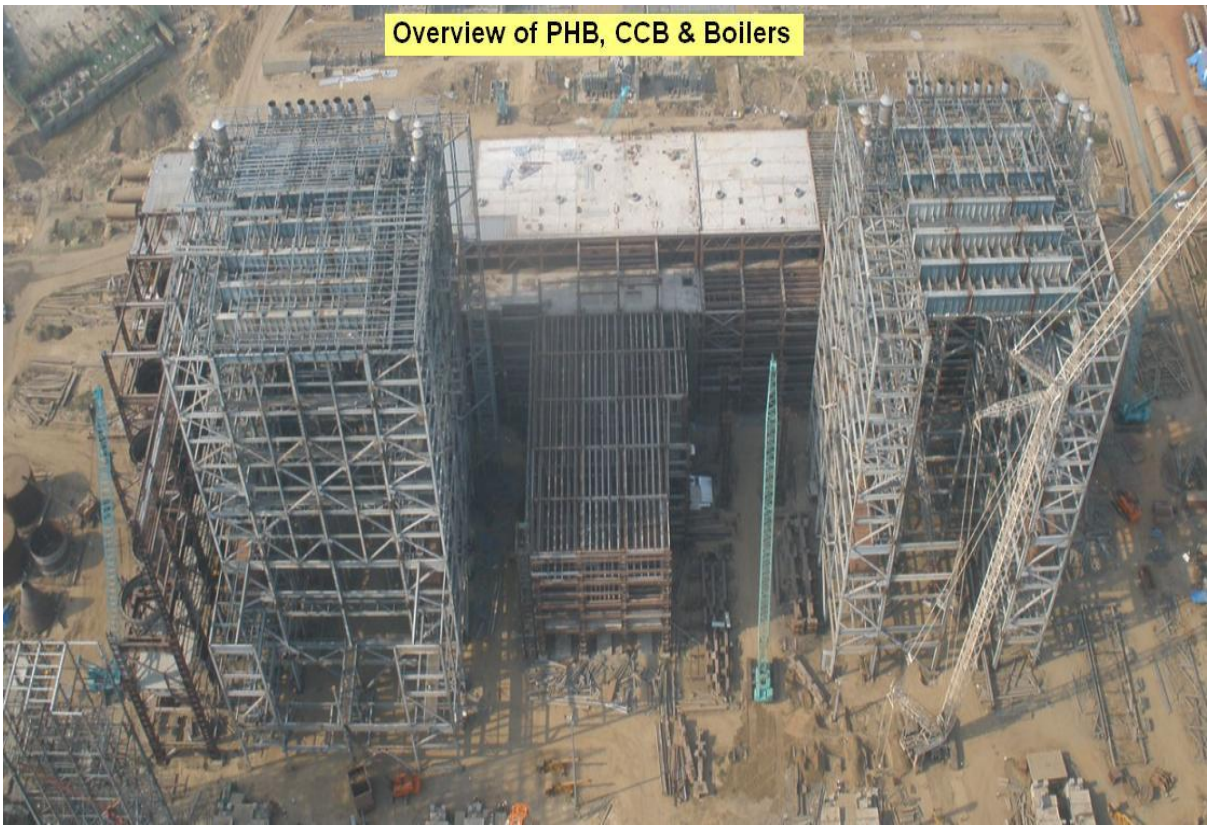
	Overall	**Engg.**	**Procurement**	**Const.&Comm**
Unit I	82.52%	98.14%	93.34%	18.00%
Unit II	79.91%	97.11%	91.92%	8.39%

Lifting & Erection of Generator stator of Unit-1 completed on 09.01.2012. LP-1& LP-2 condensersplaced in position. Deaerators I&II shifted to 31 mtr floor of TG building. Unit 1 LP2 outer lower casing erection completed.

Generator Stator of Unit#2 is placed on TG Deck on 24-06-2012

PHOTOGRAPHS
OF
STAGE-1 CONSTRUCTION

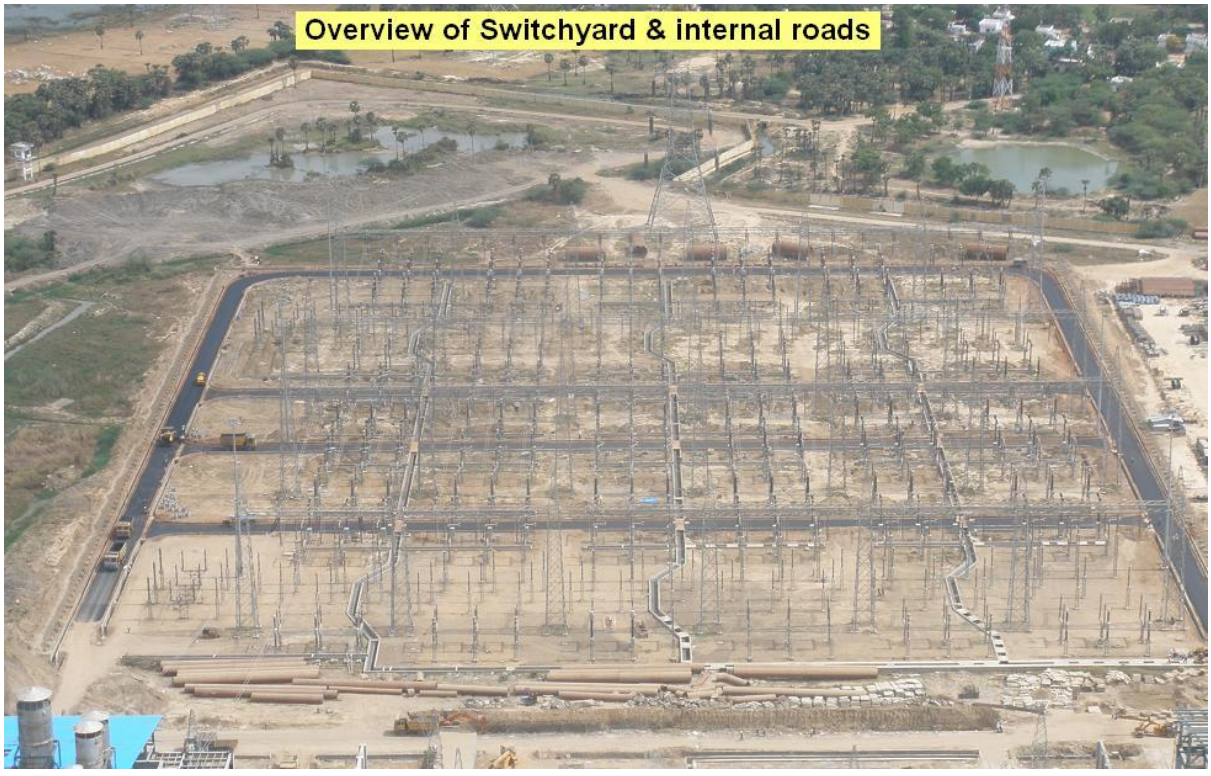

Plant overview

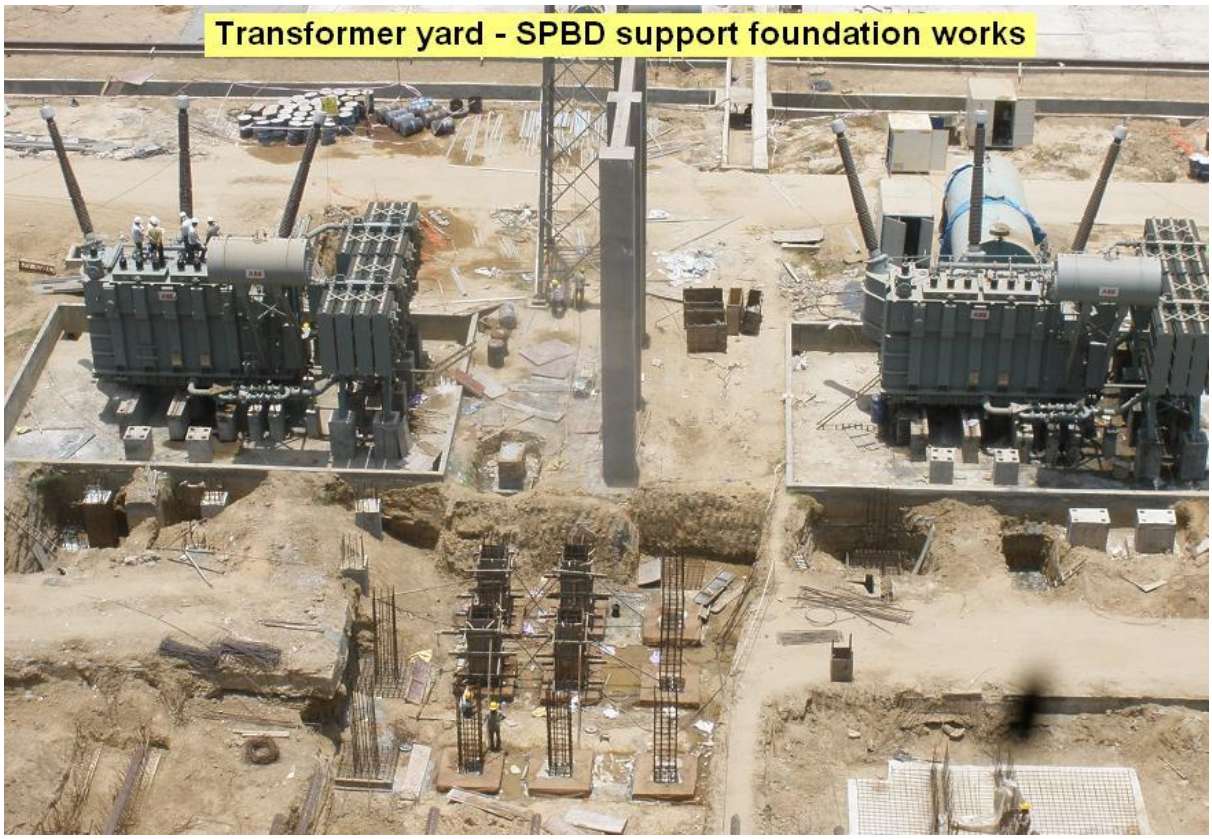

Overview of PHB, CCB & Boilers


NDCT 1 - Ring beam bottom shuttering in progress


Overview of CW pump house works


Overview of Water Treatment Plant


Overview of Switchyard & internal roads



Transformer yard - SPBD support foundation works

Switchyard control room - Illumination system charged.
Panel cable terminations & looping in progress