

FORM – 1 AND TOR

FOR

Dr. NARLA TATA RAO THERMAL POWER
STATION (Dr. NTPPS) STAGE –V (1X800 MW)

Submitted by

ANDHRA PRADESH POWER GENERATION CORPORATION LTD
(APGENCO)

Vidyut Soudha, Hyderabad – 500 082

ANDHRA PRADESH POWER GENERATION CORPORATION LIMITED

(A Government of Andhra Pradesh Undertaking)



Vidyut Soudha

Hyderabad - 500 082

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Smt. V.SURYA LAKSHMI

Chief Engineer/Civil/General Services

To

Dr P.L Ahujarai,

Director

Ministry of Environment & Forests, GOI

Paryavaran Bhavan, CGO Complex

Lodi Road, New Delhi - 110 003

Ph. No. 011 - 24362434

Lr.No.CE/C/GS/EE/C/Env/AEE(Env)/D.No. _____/12, dt. -07-2012

Sir,

Sub: APGENCO - Proposal for establishing one unit of 800 MW Supercritical Coal based Expansion unit namely Dr. Narla Tata Rao Thermal Power Station (Dr. NTTPS) Stage-V, (1 x 800 MW) at Ibrahimpatnam , Krishna District, Andhra Pradesh - Form-1 & TOR submitted -Reg.

* * *

Andhra Pradesh Power Generation Corporation Limited (APGENCO) proposed to establish one unit of 800 MW super critical coal based Thermal Power plant (Stage-V) as expansion plant adjacent to existing Dr. Narla Tata Rao Thermal Power Station at Ibrahimpatnam in Krishna District, Andhra Pradesh. The boilers will be Super Critical technology. The project report is prepared by M/s Desein Private Ltd. It is proposed to carry out Environmental studies for the proposed expansion project to obtain Environmental clearances from statutory bodies.

Form - 1, Terms of Reference (TOR) for preparation of EIA report are herewith furnished along with Detailed Project Report.

It is requested to communicate approval for TOR to proceed for environmental studies for the project.

Encl: As above.

Yours faithfully,

Chief Engineer/Civil/General Services

FORM-1

**APPLICATION FOR PRIOR ENVIRONMENTAL CLEARANCE FOR
"A" CATEGORY PROJECTS**

(I) BASIC INFORMATION

Sr. No.	Item	Details
1	Name of the project/s:	Dr. Narla Tata Rao Thermal Power Station (Dr. NTTPS) Stage -V
2	S. No. in the schedule	1 (d)-Thermal Power Plant
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.	1760 MW Coal Based Thermal Power Plant
6	Category of Project i.e. 'A' or 'B'	Category A (≥ 500 MW (Coal/Lignite/Naphtha & Gas based)
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:	16° 35' 33" N Latitude 80° 32' 03" E Longitude The location map and 10 Km radius Topographical Map of the proposed expansion project are enclosed as Annexure-I .
	Plot/Survey/Khasra No.	Sy. No. Main Plant (Gudurupadu Village): 51 to 53, 64, 65, 67 & 68; Ash pond (Trilochanapuram Village): 21 to 25, 30 to 43, 49 to 53, 82, 83, 85 to 95, 106, 107, 109 to 112; Colony (Kondapalli Village): 383, 410, 411; Ibrahimpatnam Village: 74 & 75; Greenbelt (Guntupalli Village): 368, 370, 375 to 377, Gollapudi Village: 54, 56, 57, 58, 61, 62, 64, 65, 66, 67, 69; Ibrahimpatnam Village: 53 to 56;
	Village	Ibrahimpatnam (M)
	Tehsil	-
	District	Krishna District
	State	Andhra Pradesh
10	Nearest railway station/ airport along with distance in kms	Kondapalli ~3 Km (NNW); Nearest Airport is Gannavaram ~32 Km (SE).
11	Nearest town, city, district head quarters along with distance and direction in kms	Vijayawada city ~16 km (SE) District headquarters: Machilipatnam ~78Km (SE)
12	Village panchayats, Zilla parishad, Municipal corporation, local body (complete postal addresses with telephone nos. to be given)	Ibrahimpatnam (Village & Mandal) , Kondapally (panchayat), Vijayawada (MC), Krishna Dist - 521 456. Ph No : 0866-2882203, 0866-2882425, Fax No: 0866-2882365
13	Name of the applicant	Andhra Pradesh Power Generation Corporation Limited.

Sr. No.	Item	Details
14	Registered Address	Chief Engineer/ Civil/General Services Room No.107, 'A' Block, APGENCO, Vidyut Soudha, Hyderabad - 500 082 Ph. No. 040 - 23499413/ 23499453 Fax: 040 - 23302883 E-mail: environment_apgenco@yahoo.co.in
15	Address for correspondence	Chief Engineer/ Civil/General Services Room No.107, 'A' Block, APGENCO, Vidyut Soudha, Hyderabad - 500 082 Ph. No. 040 - 23499413/ 23499453 Fax: 040 - 23302883 E-mail: environment_apgenco@yahoo.co.in
	Name	Smt. V. Surya Lakshmi
	Designation (Owner/Partner/CEO)	Chief Engineer/ Civil/General Services
	Address	Chief Engineer/ Civil/General Services Room No.107, 'A' Block, APGENCO, Vidyut Soudha, Hyderabad - 500 004 Ph. No. 040 - 23499413/ 23499453 Fax: 040 - 23302883 E-mail: environment_apgenco@yahoo.co.in
	Pin Code	500 004
	E-mail	environment_apgenco@yahoo.co.in
	Telephone No.	040 - 23499413/ 23499453
	Fax No.	040 - 23302883
16	Details of Alternative Sites examined, if any. Location of these sites should be shown on a topo sheet.	No alternatives sites have been consider as the proposed project is an expansion.
17	Interlinked Projects	No Interlinked projects are proposed.
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
22	Whether there is any Government Order/ Policy relevant/relating to the site	No
23	Forest land involved (hectares)	No forest land is Involved

Sr. No.	Item	Details
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 litigation is pending against the project.

(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.)

S. 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)	Yes	The proposed 1 X 800 MW Supercritical Coal based Thermal Power plant is an extension to the existing plant. The requirement of land will be much less due to integration of facilities like coal handing, water systems with the other stage of the plant. 85 acres of existing land will be used for main plant and other facilities. Additional 230 acres will be acquired for ash pond for existing and the proposed plants
1.2	Clearance of existing land, vegetation and buildings?	Yes	The existing vacant land will be leveled and graded.
1.3	Creation of new land uses?	Yes	85 acres of existing land will be used for main plant and other facilities. Additional 230 acres will be acquired for ash pond for existing and the proposed plants.
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	---

1.7	Temporary sites used for construction works or housing of construction workers?	No	Temporary sites for construction works or housing of construction workers are not required as 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	Coal conveying belts, water transport lines etc.
1.10	Reclamation works?	No	Not applicable
1.11	Dredging?	No	Not applicable
1.12	Offshore structures?	No	Not applicable
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.
1.14	Facilities for storage of goods or materials?	Yes	Temporary storage sheds are proposed.
1.15	Facilities for treatment or disposal of solid waste or liquid effluents?	Yes	ETP and STP will be provided for treatment of plant effluents and sewage from plant & colony. 100% dry ash handling systems are proposed for disposal of fly ash (solid waste) in dry form.
1.16	Facilities for long term housing of operational workers?	Yes	Existing colony with additional facilities 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 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	No Closure or diversions of existing transport routes/infrastructure leading to changes in traffic movements.

1.20	New or diverted transmission lines or pipelines?	No	No New or diverted transmission lines/pipelines
1.21	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	No	No Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses/Aquifers.
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 Krishna river.
1.24	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	To a limited extent.
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	No Long-term dismantling or decommissioning or restoration works.
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 stage will be employed. 100 Nos. of permanent staff will work in the power plant during operation stage.
1.29	Introduction of alien species?	No	No Introduction of alien species

1.30	Loss of native species or genetic diversity?	No	No loss of native species or genetic diversity
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 expansion project. Agricultural land for ash pond will be acquired.
2.2	Water (expected source & competing users) unit: KLD	Yes	Water requirement is 48,000 KLD and will be met from Krishna river
2.3	Minerals (MT)	Yes	Raw material is coal: 12023 TPD
2.4	Construction material – Cement, steel, stone, aggregates, sand/soil (expected source – MT)	Yes	Cement : 16,500 MT Structural Steel : 7,700 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)	Yes	Electricity required will be met from the existing station.
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	No Changes in occurrence of disease or affect disease vectors.
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: 4560 TPD (501 tph coal with 38% ash) Bottom Ash : 912 TPD Fly ash: 3648 TPD
4.3	Hazardous wastes (as per Hazardous Waste Management Rules)	Yes	To limited extent. However The Hazardous wastes generated from the proposed project will be complied with the hazardous wastes (management and handling) Rules with all the latest amendments.
4.4	Other industrial process wastes	No	There will not be any other industrial process wastes generated from the

			proposed plant except the wastes mentioned in section 4.2.
4.5	Surplus product	No	There is no surplus product generation.
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	Yes	Scrap
4.9	Contaminated soils or other materials	No	No Contaminated soils or other materials are anticipated
4.10	Agricultural wastes	No	Not Envisaged
4.11	Other solid wastes	No	No other solid wastes except mentioned in section 4.2.

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 SO ₂ : 5511 kg/hr (for worst coal consumption of 501 tph and sulphur 0.55%) NO _x : 1372 kg/hr (flue gas volume: 635 Nm ³ /sec, NO _x conc: 600 mg/Nm ³).
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 levels are generated from Turbines & Generators. Expected noise level is 90 dB (A), 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 dB(A)
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 Environment 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 substances	No	Only minimum quantity of chemicals required will be stored within the plant premises and safety precautions will be 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, landslides, cloudburst etc.)?	No	The project site is situated in the earthquake zone-III 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 <ul style="list-style-type: none"> ➤ 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	Not Envisaged
9.3	Set a precedent for later developments	Yes	❖ Development of local community ❖ Improvement in Quality of life ❖ Ecological balance by sustainable development.
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 within 10 km radius.
2	Areas which are important or sensitive for ecological reasons - Wetlands, watercourses or other water bodies, coastal zone, biospheres, mountains, forests	No	Kondapalli Reserve forest and Prakasam barrage are existing within 10 km.

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	-----
7	Defence installations	No	-----
8	Densely populated or built-up area	Yes	Vijayawada city (16 km) SE
9	Areas occupied by sensitive man-made land uses (<i>hospitals, schools, places of worship, community facilities</i>)	Yes	
10	Areas containing important, high quality or scarce resources (ground water resources, surface resources, forestry, agriculture, fisheries, tourism, minerals)	No	-----
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	-----

(IV) Proposed terms of reference for EIA studies

TOR is enclosed.

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:

Place:

CHIEF ENGINEER/CIVIL/GENERAL SERVICES

TERMS OF REFERENCE (TOR)

FOR

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PLAN

FOR

PROPOSED

Dr. NARLA TATA RAO THERMAL POWER PROJECT STAGE – V (1X 800 MW)
(Formerly Vijayawada TPS) Ibrahimpatnam, Krishna District, Andhra Pradesh.

Submitted to

**MINISTRY OF ENVIRONMENT AND FORESTS
GOVERNMENT OF INDIA**

By

**ANDHRA PRADESH POWER GENERATION CORPORATION LTD
(APGENCO)**

Vidyut Soudha, Hyderabad – 500 004

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 Generation Corporation Limited (APGENCO) is a State Public Sector Undertaking Company engaged in Power Generation including Operation and Maintenance of the power plants. APGENCO contributes major share of power required for AP grid. The state of Andhra Pradesh has peaking shortage of 1663 MW i.e (-) 12.5% and energy shortage of 4284 MU i.e (-) 6.4 %. The peak load in Andhra Pradesh system at the end of 11th plan is 14721 MW and it will be 21845 MW by the end of 12th plan. To meet the demand, APGENCO proposed to install one unit of 800 MW capacity under Dr. NTTPS Stage - V.

Location of the project:

800 MW Supercritical Coal based Thermal Power plant is proposed under Stage-V near Dr. Narla Tata Rao Thermal Power Station (NTTPS), Ibrahimpatnam, Krishna District, Andhra Pradesh. The site is situated in Latitude 16° 35' 33"N and Longitude 80° 32' 03"E. The major habitation center near the site is at Ibrahimpatnam, at a road distance of 2 Km and Vijayawada at a distance of ~16 Km. The National Highway No.7 passes at about 2.0 Km from the site. Nearest Airport is Gannavaram at 32 km.

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° C. Boiler will be of pulverized fuel. Coal with ash content 38% will be used. Cooling system is Natural Draft Cooling Towers with recirculation arrangement. The chimney height is 275 meters. ESP efficiency is 99.89% to limit out let dust concentration below 100 mg/Nm³. Water will be met from Krishna River. 230 Acres of land will be acquired for expansion of existing ash pond for all the units. No forest land is involved.

Details of the existing units and proposed unit

Stage	Capacity MW	Unit No	Date of Commissioning	Supplier	Fuel
I	210	1	1.11.1979	BHEL	coal
	210	2	10.10.1980	BHEL	coal
II	210	3	05.10.1989	BHEL	coal
	210	4	23.08.1990	BHEL	coal
III	210	5	31.03.1994	BHEL	coal
	210	6	24.02.1995	BHEL	coal
IV	500	7	06.04.2009	BHEL	coal
V	800	8	Proposed		coal

Objective of EIA study

The objective is to carry out the Environmental Impact Assessment (EIA) study to identify, predict and evaluation of 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 i.e. 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). Carrying out emission and effluent tests for existing units. Quantification and characterization of Air and Water effluents from the existing units. Measurement of noise levels at the existing sources and at the sensitive places.

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 with Dr. NTTPS complex, 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 also 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, PM_{2.5}, SO₂, NO_x, CO, Hg & O₃. Details of monitoring parameters, frequency, locations etc. are given in Annexure-A. Flue gas emissions and fugitive emissions at different locations of the existing units will be measured.

(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. Noise levels of the existing units will also be measured. 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 analyzed for pH, Temperature, TDS, Turbidity, DO, Iron, Fluoride, Nitrates etc. The effluent water quality and quantity from the existing units will be studied. 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 non-skilled workers available and the role of women in the labour force.

Collection of epidemiological data on prominent endemic diseases like malaria, filaria, 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 utilization 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 may 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

CHIEF ENGINEER/CIVIL/GENERAL SERVICES

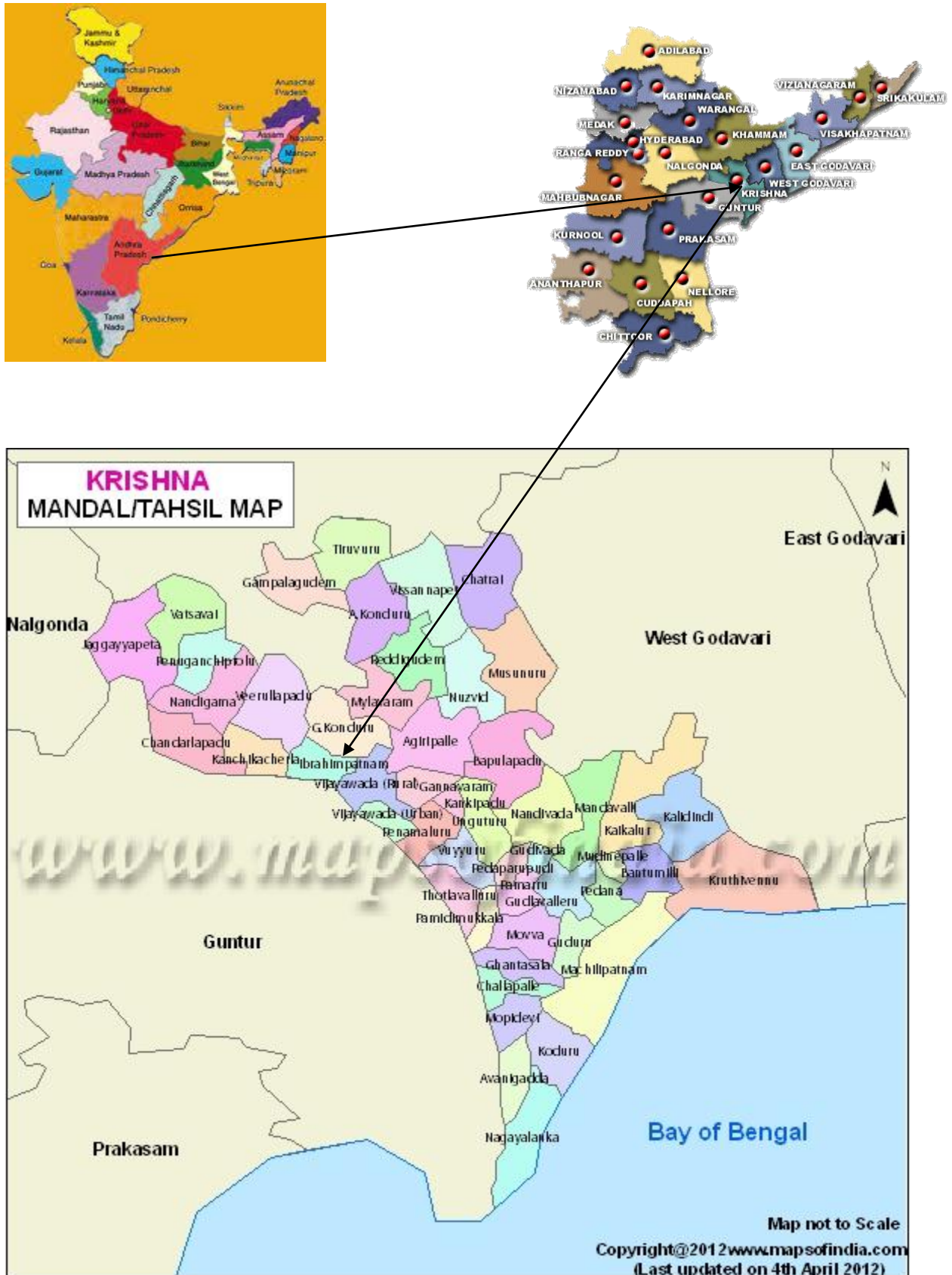
Annexure-A

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 O ₃	10	Twice a week, 24 hourly sampling	
(c)	Noise	Leq. Max, Min	10	Weekly basis, Day & Night	
2	Water				
	Ground/Surface water	All the parameters specified under the IS:10500	7/5	Fortnightly basis	
3	Soil	pH, electrical conductivity, organic carbon, NPK contents etc.	7	Weekly basis	
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		

Chief Engineer/Civil/General Services

THE LOCATION MAP OF THE PROJECT SITE



10 Km Radius Topographical Map Showing Project Location

