Environmental Impact Assessment (Annexes 1–9b)

May 2016

Bangladesh: Power System Expansion and Efficiency Improvement Investment Program (Tranche 3)
Ashuganj 400 MW Combined Cycle Power Plant (East)

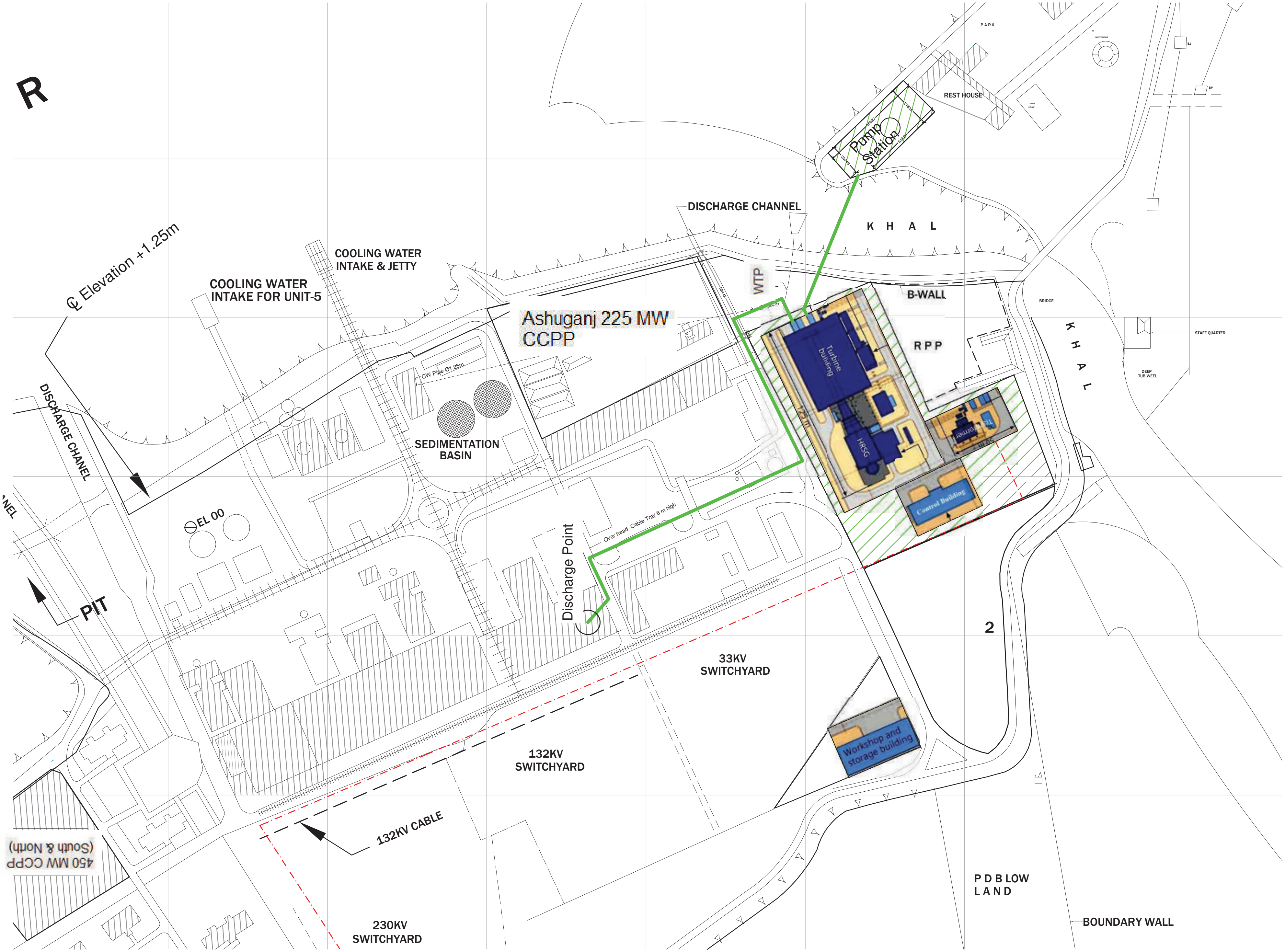
Prepared by Ashuganj Power Station Company Limited (APSCL) for the Asian Development Bank. This is an updated version of the draft EIA posted in October 2015 available on http://www.adb.org/projects/documents/ashuganj-400mw-ccpp-east-updated-eia

Annexure-1

Project Layout of Ashuganj 400MW CCPP (East)

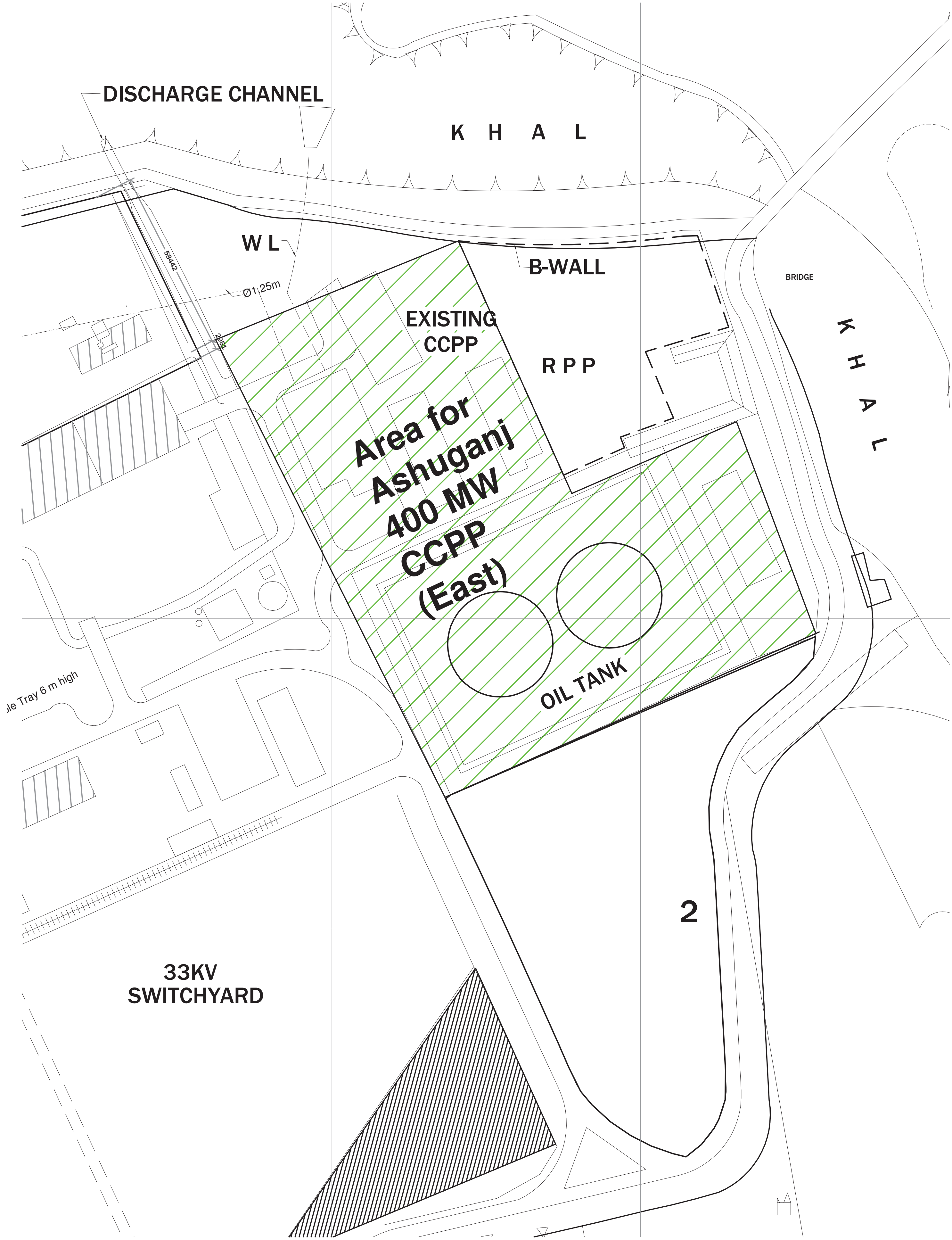
Annexure-1(a)

Layout Plan of Ashuganj 400MW CCPP (East)


R
℄ Elevation +1.25m
COOLING WATER INTAKE FOR UNIT-5
COOLING WATER INTAKE & JETTY
DISCHARGE CHANNEL
K H A L
WTP
Ashuganj 225 MW CCPP
B-WALL
R P P
Pump Station
REST HOUSE
PARK
BRIDGE
STAFF QUARTER
DEEP TUB WEEL
K H A L
Turbine building
HRSG
Transformer
Control Building
CW Pipe Ø1.25m
SEDIMENTATION BASIN
DISCHARGE CHANEL
EL 00
PIT
Discharge Point
Over head Cable Tray 6 m high
2
33KV SWITCHYARD
132KV SWITCHYARD
132KV CABLE
Workshop and storage building
230KV SWITCHYARD
P D B LOW LAND
BOUNDARY WALL
450 MW CCPP (South & North)

Annexure-1(b)

Project Area with Existing Structures



DISCHARGE CHANNEL
K H A L
W L
Ø1.25m
58442
B-WALL
BRIDGE
K H A L
EXISTING CCPP
R P P
Area for Ashuganj 400 MW CCPP (East)
OIL TANK
Tray 6 m high
2
33KV SWITCHYARD

Annexure-1(c)

Summary of Existing and Proposed Power plants at APSCL

Name of the Plants	Installed / Derated Capacity (MW)	Date in service	Status	**Average** Gas Use (m3/day)	**Total Water use (m3/hr)**	To be Replaced By	**Average** Gas Use (m3/day)	**Water use (m3/hr)**	COD of new Units	Cooling water for condenser (Raw river water)	Raw river water for cooling various equipments.i.e feed pump, lub oil cooler, compressor etc	Raw river water for Closed cooling water circuit	River water for water treatment plant to produce demi water	River water for General use (Office and residential area)	Total Water use (m3/hr)
ASHUGANJ POWER STATION COMPANY LTD															
ST 1 (Unit 1)	64/50	17.08.1970	In Operation	268,493	11,000	a) 225MW CCPP, b) 450MW CCPP (South) & c) 450MW CCPP (North)	a) 926,410 for 225MW CCPP, b) 13,98,860 for 450MW CCPP (South) & c) 13,94,601 for 450MW CCPP (North)	a) 22,000 for 225MW CCPP, b) 29,000 for 450MW CCPP (South) & c) 30,000 for 450MW CCPP (North)	Simple Cycle (225MW): April'15; Combined Cycle (225MW): November'15	10,200	650	-	-	150[1]	11,000
ST 2 (Unit 2)	64/50	08.07.1970	In Operation	268,493	11,000				January'16 (450MW South)	10,200	650	-	-	150[1]	11,000
GT 1	56/40	15.11.1982	Retired in Feb, 2014	263,014	-				February'17 (450MW North)	-	-	-	-	-	-
GT 2	56/40	23.03.1986	In Operation	263,014	-					-	-	-	-	-	-
ST - GT 1 (CCPP)	34/20	28.03.1984	Retired in Feb, 2014	-	5,200					5,000	200	-	-	-	5,200
ST 3 (Unit 3)	150/130	17.12.1986	In Operation	710,274	36,000	400MW CCPP (East)	13,94,600	31,000	2020	28,500	-	1,965	35	-	30,500
ST 4 (Unit 4)	150/150	05.04.1987	In Operation	838,134	36,000					34,000	-	1,965	35	-	36,000
ST 5 (Unit 5)	150/135	21.03.1988	In Operation	719,785	36,000					34,000	-	1,965	35	-	36,000
50 MW GE	50/50	30.04.2011	In Operation	203,889	-					-	-	-	-	-	-
225MW CCPP,										19,800	-	2,000	150[2]	50	22,000
450MW CCPP (South)										27,000	-	1,800	150[3]	50	29,000
450MW CCPP (North)										28,150	-	1,800	-	50	30,000

Note 1: Used for Unit-1,2,3,4,5,Office and Residence

Note 2: Used for Unit-1,2,3,4&5

Note 3: Used for 450MW(South) & 450MW(North)

NON-ASHUNGONJ POWER PLANT					
Name of the Plants	Installed / Derated Capacity (MW)	Date in service	Status	**Average** Gas Use (m3/day)	**Total Water use (m3/hr)**
Aggreko Gas Engine	95/95	16-Mar-11	In Operation	563,958	-
Precision Gas Engine	55/55	29-Mar-09	In Operation	285,209	-
United Ashuganj Gas Engine	53/53	17-Jun-11	In Operation	259,106	-
United Modular Ashuganj Gas Engine	195/195	22-Apr-15	In Operation	984,309	-
Midland Gas Engine	50/50	7-Dec-13	In Operation	261,900	-
TOTAL					
GRAND TOTAL					
Daily Average					

Annexure-2

Gas Specification

BGDCL Gas Analysis

Gas Analysis for Bakhrabad Gas Distribution Co. Ltd.

Sample no: **1**

Sampling date: 28/04/2014 **Time: 6:00 PM** Analysis date: 29/04/2014

Sample Location: **APSCL RMS, Ashuganj**

Temperature: 80 ^{0}F

Pressure: 400 psig Sampled by : Md. Salahuddin

	% Mole	% Wt
Nitrogen	0.536	0.895
CO_2	0.090	0.237
Methane	96.603	92.312
Ethane	1.904	3.410
Propane	0.378	0.992
i-Butane	0.121	0.420
n-Butane	0.085	0.295
i-Pentane	0.053	0.227
n-Pentane	0.037	0.157
Hexanes	0.095	0.474
Heptanes	0.072	0.411
Octanes	0.027	0.171
Nonanes	0.000	0.000
Decanes+	0.000	0.000
Total	100	100

SG: 0.5797 **Base condition: 60^{0}F&14.696 psia**

Ideal Gas Density: 0.0442 lb/ft^3

Mole Weight: 16.7886 gm/mol

Higher Heating Value: 1038.3875 BTU/SCF

Lower Heating Value: 936.2190 BTU/SCF

C5+: 0.1043 GPM (gallon per thousand cubic feet)

C6+: 0.0724 GPM (gallon per thousand cubic feet)

Higher Heating Value: 38.7536 MJ/sm^3

Lower Heating Value: 34.9389 MJ/sm^3

PMRE-[illegible]

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Bangladesh University of Engineering and Technology (BUET)

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Annexure-3

Gas Interconnection Layout

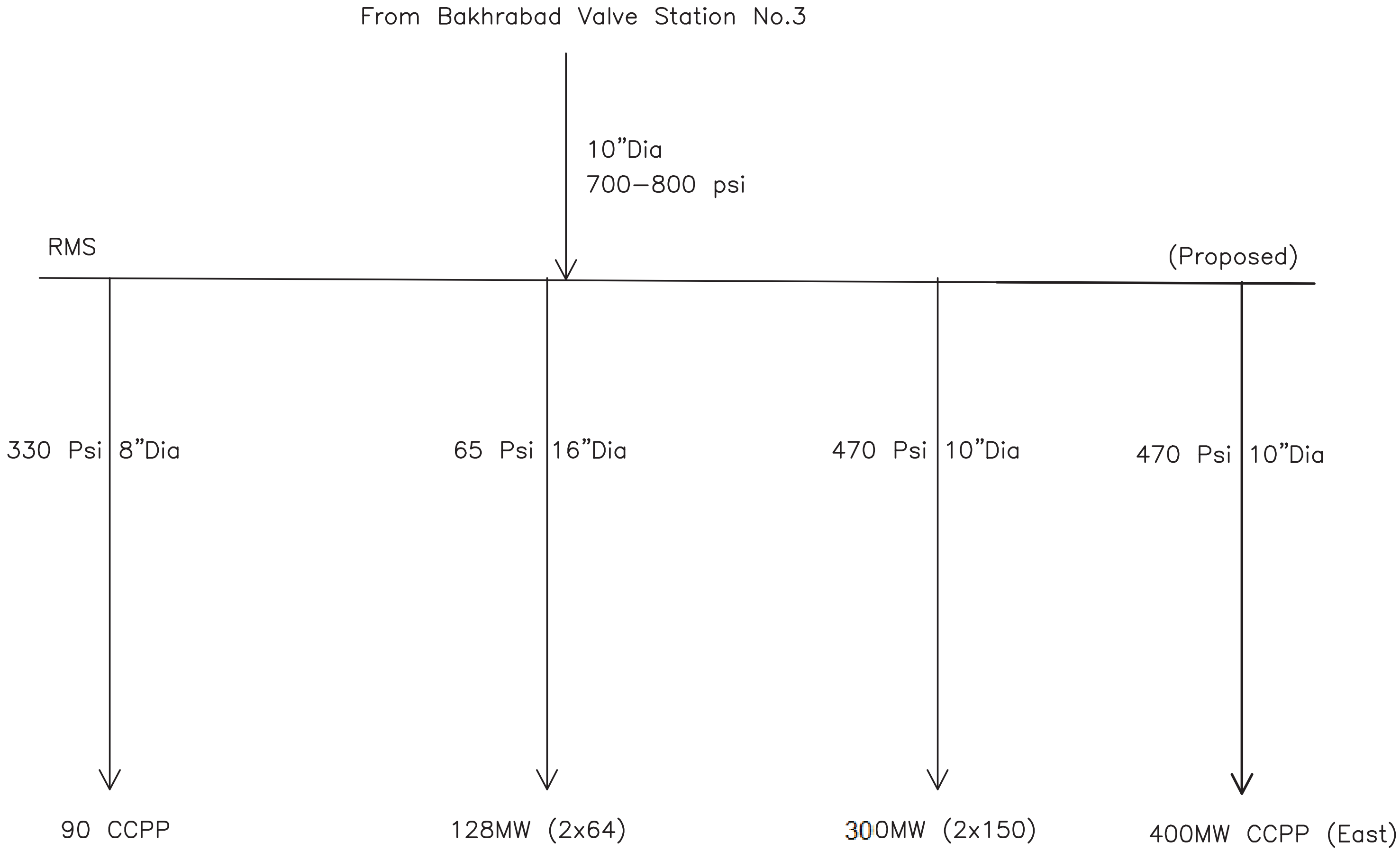
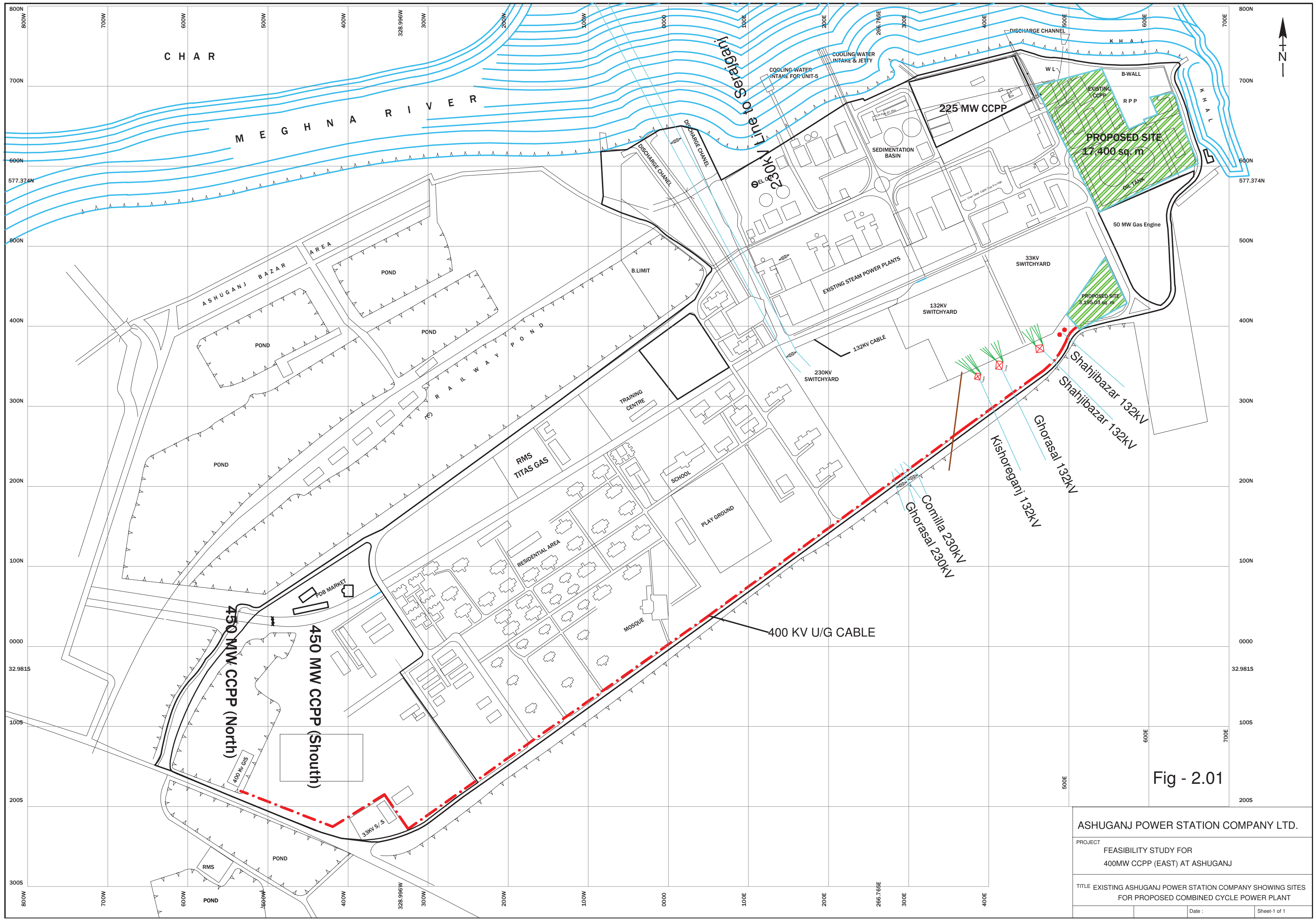


Fig - 2.03

ASHUGANJ POWER STATION COMPANY LTD.			
PROJECT FEASIBILITY STUDY FOR 400MW CCPP (East) AT ASHUGANJ			
TITLE EXISTING BAKHRABAD GAS RMS FOR ASHUGANJ POWER STATION COMPANY LTD. SHOWING FOR PROPOSED 400MW CCPP (EAST)			
		Date :	Sheet–1 of 1

Annexure-4

Electrical Interconnection Layout


CHAR
MEGHNA RIVER
230KV Line to Serajganj
225 MW CCPP
PROPOSED SITE
17,400 sq. m
EXISTING CCPP
RPP
B-WALL
OIL TANK
50 MW Gas Engine
33KV SWITCHYARD
132KV SWITCHYARD
230KV SWITCHYARD
132KV CABLE
EXISTING STEAM POWER PLANTS
SEDIMENTATION BASIN
COOLING WATER INTAKE FOR UNIT-5
COOLING WATER INTAKE & JETTY
DISCHARGE CHANNEL
KHAL
ASHUGANJ BAZAR AREA
POND
RAILWAY POND
B.LIMIT
TRAINING CENTRE
RMS TITAS GAS
SCHOOL
PLAY GROUND
RESIDENTIAL AREA
MOSQUE
FOB MARKET
Shahjibazar 132kV
Shahjibazar 132kV
Ghorasal 132kV
Kishoreganj 132kV
Comilla 230kV
Ghorasal 230kV
400 KV U/G CABLE
450 MW CCPP (North)
450 MW CCPP (Shouth)
400 kv GIS
33KV S/S
RMS
N
Fig - 2.01
ASHUGANJ POWER STATION COMPANY LTD.
PROJECT
FEASIBILITY STUDY FOR
400MW CCPP (EAST) AT ASHUGANJ
TITLE EXISTING ASHUGANJ POWER STATION COMPANY SHOWING SITES
FOR PROPOSED COMBINED CYCLE POWER PLANT
Date :
Sheet-1 of 1

Annexure-5

Plant and Machinery

Plant and machinery will include the following:

a. 1 Unit of 289MW (ISO rated) Gas Turbine Generating Unit & ancillaries
b. 1 Set of Heat Recovery Boiler
c. 1 Unit of 135MW Steam Turbine Generating Unit
d. One 3-phase, Step-up Transformers 15.75/230 kV, 525 MVA for GT Unit
e. 15.75kV Isolated Phase Bus Duct for GT up to Transformer Terminal
f. 230kV indoor type GIS Switchgear Equipment of 1-bays for GT generator transformers at power plant site
g. 230kV single core XLPE underground cable.
h. 15.75/6.6kV GT Unit Auxiliary transformer, 6.6kV switchgears and 6.6/0.4kV auxiliary transformers and LVAC Distribution system
i. Battery Charger and Batteries with DC Distribution system
j. Unit Control /DCS system
k. CW Pumps and Pipe lines
l. Gas RMS and Gas Pipe line
m. Over head crane, mobile crane and workshop equipment

Annexure-6

Engine Catalogue

Siemens Combined Cycle Reference Power Plant SCC5-4000F 1S

400 MW-Class 50 Hz

Answers for energy.

SIEMENS

Siemens SCC5-4000F 1S – The next step in advanced single-shaft plant technology

The Siemens Combined Cycle (SCC™) single-shaft reference power plant has evolved over the years to be the plant of choice for combined cycle power plants in the 400 MW-class in the 50 Hz world. The first single-shaft plant with a Siemens F-class gas turbine was built in 1997. Currently, there are more than 40 Siemens single-shaft plants in service or under construction/commissioning throughout the world.

The primary focus of our Reference Power Plant (RPP) program is to develop plant designs that offer high customer benefit through low life-cycle costs. Furthermore, the modular concept used in the RPP program allows easy adaptation to specific customer needs and site requirements.

The combination of world-class gas and steam turbine and generator technologies with trend setting power plant system integration results in a highly efficient plant that provides reliable low-cost electricity.

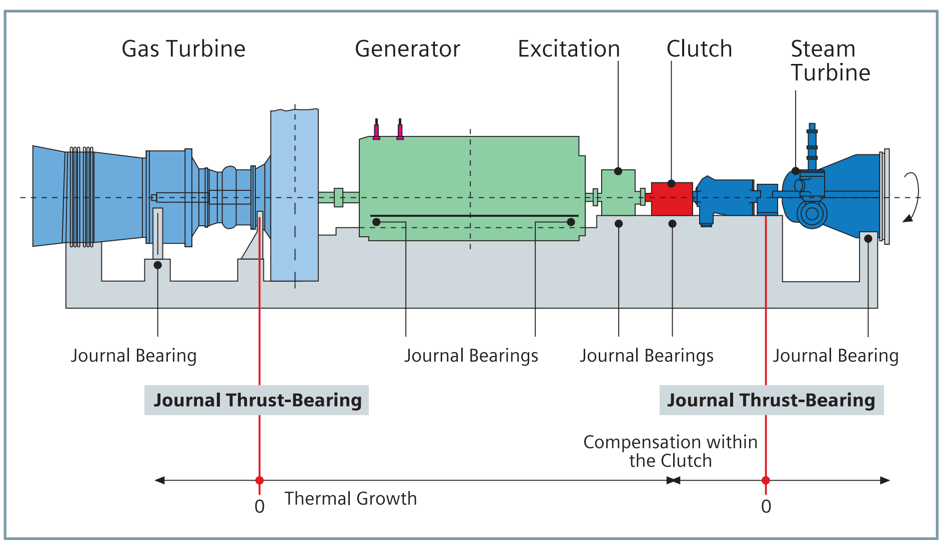
The base design of the SCC5-4000F 1S RPP provides an optimum balance between capital cost, plant performance, as well as operational and maintenance considerations.

Pre-engineered modular options have been developed to further address individual needs. Plant exhaust emissions are minimized by the proven Siemens dry low NOx Hybrid Burner Ring (HBR) combustion system.

The SCC5-4000F 1S RPP is designed around advanced, well-proven and reliable Siemens equipment, including:

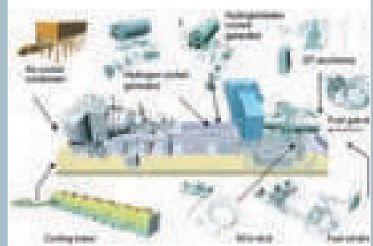
- One Siemens Gas Turbine (SGT™) SGT5-4000F
- One Siemens Steam Turbine (SST™) SST5-3000 or SST5-5000 (depending on ambient conditions)
- One Siemens hydrogen-cooled Generator (SGen™) SGen5-2000H
- The Siemens Power Plant Automation system (SPPA™)

All three main components are arranged on a single shaft. A Synchronous Self-Shifting (SSS) clutch is installed between the generator and steam turbine. This provides high operating flexibility and reliability.

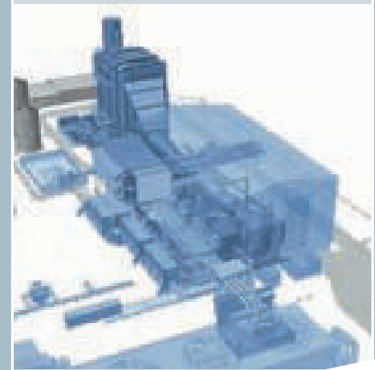


Project Specific
based on “clean sheet”

Reference Power Plant
based on multiple modules



Standardized Power Block



1980s
Customized solution

1990s
Reference Power Plant design

2000s
Competitive solution in an open market

Logical evolution in RPP development

The requirements for power plants dramatically changed with the advent of deregulated and liberalized markets. Economic factors, such as life-cycle costs, net present value and internal rate of return became the customer’s focus. In response, Siemens launched its Reference Power Plant development program in the 1990s with special emphasis on life-cycle cost optimization.

The main focus of the Siemens single-shaft RPP development is a core base design called the Power Block. This comprises the complete turbine building including all associated equipment therein, the complete water/steam cycle including the Heat Recovery Steam Generator (HRSG), and additional adjacent components and systems such as the electrical transformers and the Power Control Centers (PCCs).

The RPP development starts with customer requirements and includes feedback from project execution and operation and maintenance experiences.

During the development, modern design methods including Quality Function Deployment, FMEA and Six Sigma are used.

Site specific requirements, such as water supply systems mainly influence the scope outside the Power Block and can easily be adapted. Economic modeling of design variants inside the Power Block, such as redundancy of feedwater and condensate pumps result in a base design that is optimized from the customer’s point of view.

By optimizing the core of the plant, i.e. the Power Block, only a limited number of variants and options are required. This results in a large number of plants with an identical design of the Power Block. This replication in turn allows Siemens to select the suppliers of all of the major components, thereby allowing the use of proven equipment and proven suppliers.

This Siemens RPP approach offers significant advantages for the customer, including:

- Low initial investment
- Reduced lead time
- Higher availability and reliability
- Increased quality and lower risk

Flexible solutions to match your needs

Two main variants are available for the SCC5-4000F 1S reference power plant. These are characterized by the implementation of two different steam turbines:

- The SST5-3000 incorporates a single-flow axial exhaust low-pressure steam turbine providing best economical benefit at medium to high condenser back pressure. The typical application for the SST5-3000 is in combination with a wet cooling tower at ambient temperatures above 12°C (54°F) or with an air-cooled condenser.
- The SST5-5000 incorporates a two-flow low-pressure steam turbine with increased exhaust area, which makes it the choice for low condenser back pressure. The typical application for the SST5-5000 is in combination with once-through cooling or a wet cell cooling tower at ambient temperatures below 12°C (54°F).

Application of either of the two depends not only on specific cooling conditions, but also on the economic evaluation of efficiency and power output.

Both designs incorporate a carefully selected number of pre-engineered options. This allows flexibility to adapt the SCC5-4000F 1S to specific customer requirements and site conditions.

Examples of options include fuel oil as a back-up fuel, different cold end variants (cooling tower, once-through cooling, or air-cooled condenser), a drum-type or BENSON® Once-Through HRSG, etc.

Our flexible scope of supply ranges from a Power Train, Power Island, Power Block to a complete Turnkey Plant.

Scope of supply

SCC Power Train	SCC Power Island	SCC Power Block	SCC Turnkey
SGT-PAC	SCC Power Train	SCC Power Island	SCC Power Block
• SST-PAC w/o condenser – Steam turbine incl. auxiliaries w/o piping – Generator incl. auxiliaries – SSS Clutch – ST electrical and I&C • Options	• HRSG • Condenser incl. air removal system • Boiler feed pumps • Condensate pumps • Critical valves • Fuel pre-heater with filter, metering station etc. • Power Island controls • Options	• Detailed design of turbine building, foundation and structures • HVAC inside Power Block area • Cranes inside turbine building • Water/steam cycle • Cooling water system with wet cooling tower and circulating water pumps • Service- and closed cooling water system • Electrical equipment • Power Block controls • Fire fighting inside Power Block • Options	• Additional fuel supply systems and cooling systems • Water treatment • Raw water system • Waste water system • Tanks • Additional – Buildings/structures – Cranes/hoists – Fire protection/fighting – Plant piping/valves – Electrical plant • Erection/Commissioning • Further options
Power Train equipment Performance/Delivery	**System integration/ Optimized operability**	**Replication of standardized components**	**Total EPC plant wrap**

Plant layout

The main building is a compact structural-steel building of rectangular design and houses the gas turbine, generator and steam turbine along with their associated components.

The main gas turbine auxiliaries are arranged on a steel platform along side the gas turbine. The common lube oil system for gas turbine, generator and steam turbine is arranged at ground floor level.

All generator auxiliaries are directly arranged next to the generator either on the main steel platform or on the ground floor.

The auxiliary components for the water/steam cycle and the closed cooling water system are located in an annex to the turbine building. The air-intake filter house is located above the annex at the side of the main bay of the turbine building. The filtered air is led straight into the gas turbine compressor by way of an aerodynamically optimized oblique steel-fabricated duct, in which a silencer is installed.

Access to the building is provided via the entrance bay next to the turbine-generator set. Adequate access for inspection and maintenance is provided for all main and auxiliary equipment.

An overhead traveling crane runs the full length of the turbine building and is capable to lift all the heavy equipment in the building including the generator. Special attention has been given to provide short moving distances and adequate dismantling and laydown areas for major maintenance operations, as well as good accessibility to buildings and components for maintenance.

The HRSG as well as the annexed feedwater pumps are designed for outdoor installation.

The pre-fabricated and pre-tested Power Control Centers (PCCs) for electrical and I&C equipment are located outdoors close to the turbine buildings to ensure short connection runs.

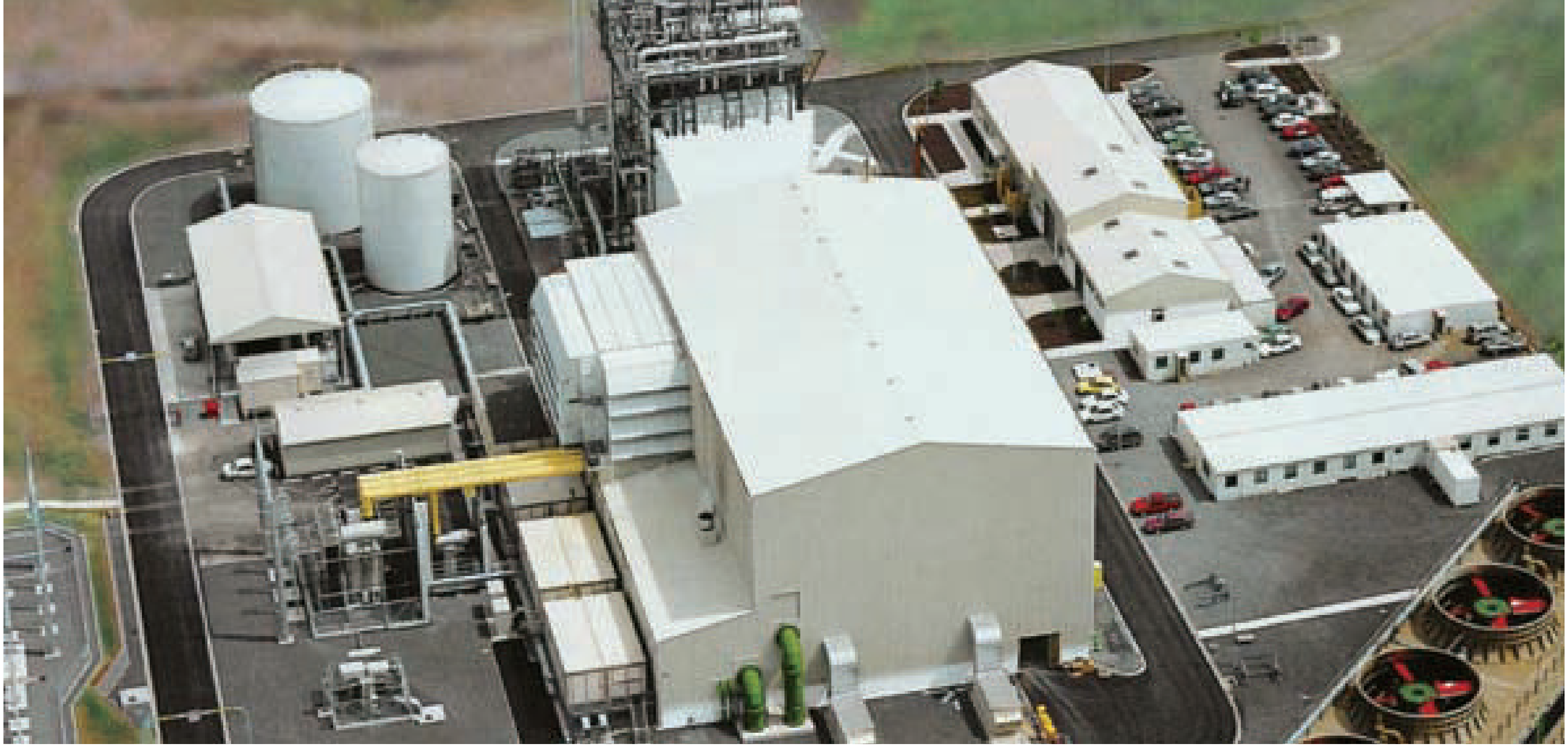
The central control room and administration building are arranged close to the turbine building. Layout provisions are made in the plant for a workshop and storage building.

A forced-draft cooling tower is arranged behind the turbine building with the circulating water pump also in outdoor installation. In case of once-through cooling, the water intake and outfall structure is designed according to site requirements.

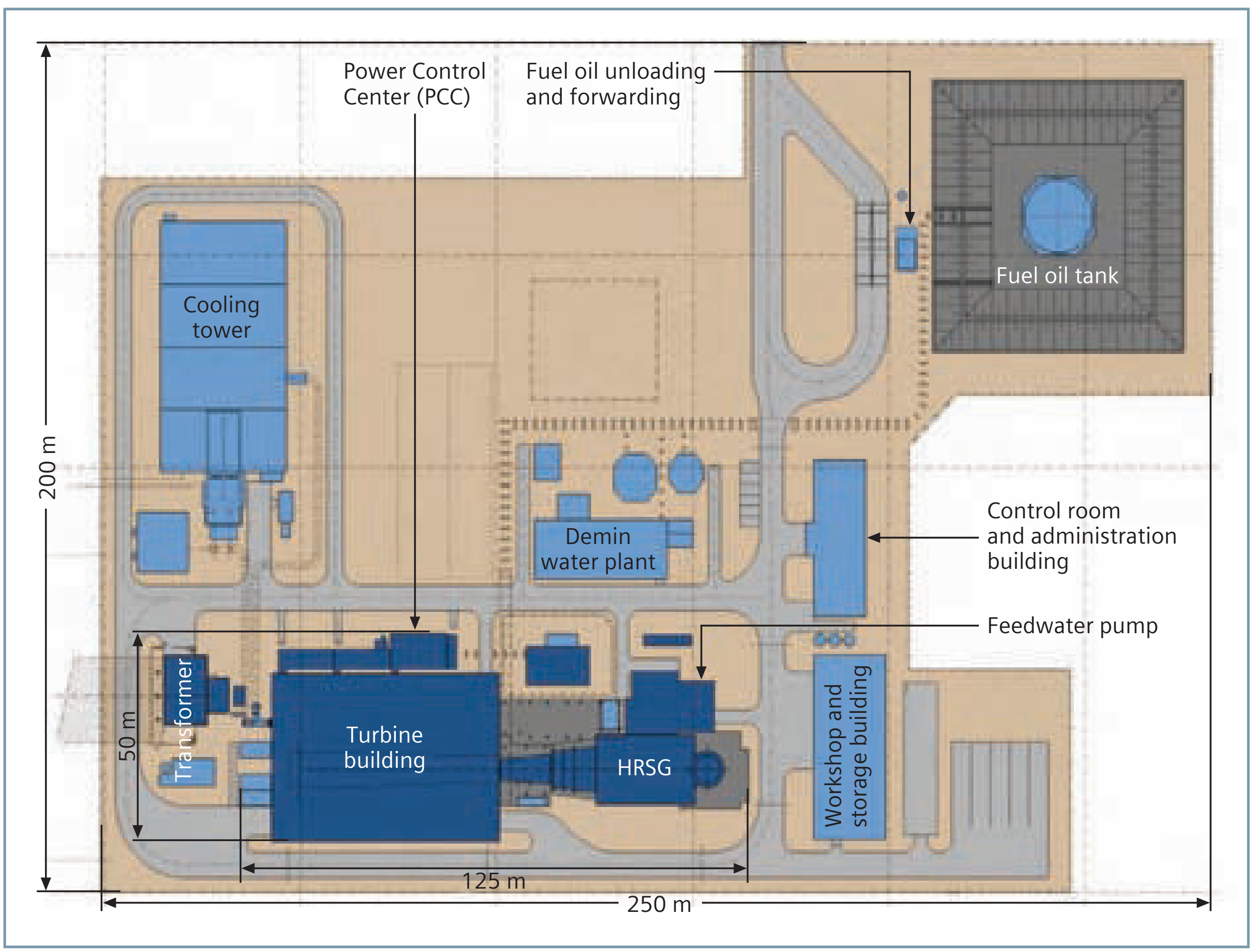
Site terminal points

The SCC5-4000F 1S base design incorporates the following terminal point assumptions:

- Natural gas fuel supply at required conditions at the site boundary
- Raw, fire fighting and potable water from municipal supply at required conditions at site boundary
- Demineralized water tank hook up
- Effluent discharge to municipal connection at site boundary
- Electrical termination at high-voltage bushing of the generator step-up transformer



Plant arrangement



Plot plan SCC5-4000F single-shaft with oil tank and cooling tower

Advanced turbine-generator technology

Single-shaft power train

The gas turbine, generator and steam turbine are arranged on a single-shaft basis. The steam turbine is coupled with a SSS clutch to the generator. This design shows various advantages over 1x1 multi-shaft arrangements including:

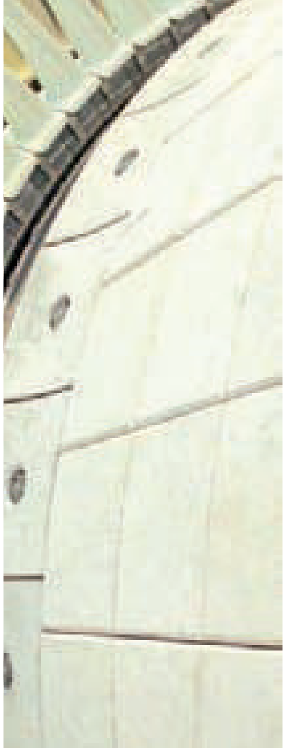
- Smaller footprint due to a more compact arrangement
- Higher efficiency (one hydrogen-cooled generator instead of two air-cooled generators)
- Higher availability due to less components

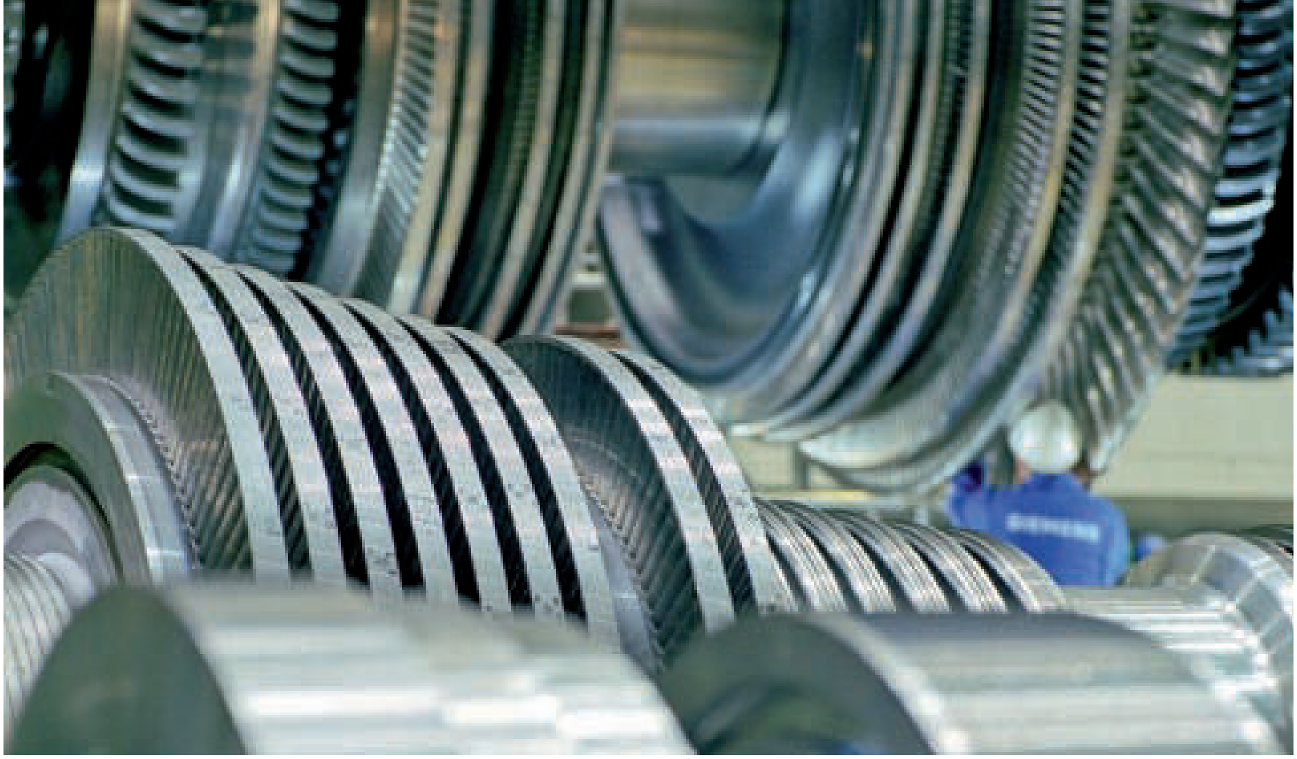
SGT5-4000F gas turbine

Since its introduction in the mid-1990s, the SGT5-4000F has become the work horse of the 50 Hz fleet. Reliable and efficient, it is the most advanced proven gas turbine in its class today.

Features/benefits of the SGT5-4000F are as follows:

- Four-stage turbine for moderate stage loading
- Disk-type rotor with Hirth serrations and central tie bolt for rotor stability
- Low NOx Hybrid Burner Ring (HBR) combustion system for reduced environmental impacts
- Dual fuel capability (on-line transfer)
- Variable inlet guide vanes for improved part-load efficiency
- All blades removable with rotor in place for easy maintenance and shorter outages
- Unique design features for field serviceability



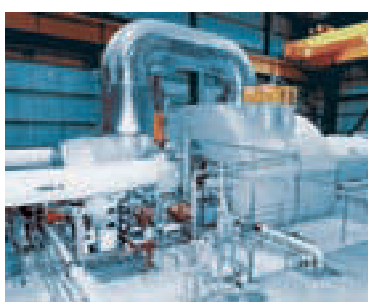


SST5-3000 steam turbine

The SST5-3000 steam turbine comprises a single-flow barrel-type high-pressure turbine and a combined intermediate- and low-pressure turbine element with single-flow axial exhaust. This turbine is mainly applied for wet cooling tower or air-cooled condenser operation.

SST5-5000 steam turbine

The SST5-5000 steam turbine comprises a combined high- and intermediate-pressure turbine element and a two-flow low-pressure turbine with a single-side exhaust. The larger exhaust area provided with this low pressure steam turbine enables better performance at sites with access to cold cooling water.



SGen5-2000H generator

The SGen5-2000H is a hydrogen-cooled two-pole generator. This well-proven generator design provides high efficiency and low operation and maintenance costs. It is shipped to the site pre-assembled to facilitate ease of construction.

SSS clutch

A Synchronous Self-Shifting (SSS) clutch is located between the generator and the steam turbine. This allows individual gas turbine start-up without the need for cooling the steam turbine. Once the steam parameters match the requirements of the turbine, the steam turbine turns and synchronizes automatically with the generator. The SSS clutch has been used successfully since 1995 in numerous Siemens single shaft power plants.

Plant design base and performance data

Water/steam cycle and cooling system

To provide high efficiency a triple-pressure reheat cycle is used. The plant design includes options for both a drum-type and a BENSON® Once-Through HRSG.

The BENSON® HRSG, designed and patented by Siemens, provides greatly improved operating flexibility with faster start-up and load change capability. Condensate and feedwater pumps are arranged in a booster set-up for low power consumption. Both main pumps are configured as 2x100% pumps for high availability.

The base design contains a wet cell cooling tower. Available options for cooling include an air-cooled condenser or once-through cooling.

Plant auxiliaries are directly cooled by means of a closed cooling water system using heat exchangers.

The SCC5-4000F 1S is designed with the following conditions:

Boundary	SCC5-4000F 1S RPP design base	
Grid frequency	50 Hz	
Ambient temperature	-20°C to 40°C (-5°F to 105°F) (15°C/59°F design for SST5-3000, 10°C/50°F design for SST5-5000)	
Site elevation	Design 0 m	
Fuel	**Main fuel:**	Natural gas, LHV: 50,012 kJ/kg (Methane at ISO conditions: 21,502 Btu/lbm)
	Back-up fuel:	Fuel oil Cat.II, LHV: 42,600 kJ/kg/18,315 Btu/lbm
Steam parameter	565°C/125 bar 565°C/30 bar 235°C/5 bar	(1,050°F/1,815 psi) (1,050°F/435 psi) (455°F/75 psi)

The advanced Siemens SCC5-4000F 1S

The Siemens SCC5-4000F 1S is a new milestone in the sector of 400 MW-class 50 Hz combined cycle plants. Not only is it one of the most powerful and efficient F-class plants on the market today, but even more important it is the most environmentally friendly with its significant reduction in emissions and water consumption. It builds on years of experience and includes feedback from executed projects. Additionally, it incorporates the feedback of customer interviews and QFD workshops to include the latest market developments. It is the answer to meet any 50 Hz combined cycle power plant needs in the future.

The use of our world-class gas turbine, steam turbine and generator technology combined with our expertise to design and build world-class combined cycle power plants helps to ensure that your plant will remain a sound investment for many years to come.

With the mentioned boundary conditions the following performance is achieved:

Performance	SCC5-4000F 1S (SST5-3000)*	SCC5-4000F 1S (SST5-5000)**
Net plant power output P_{net}	**423 MW** (ISO ambient conditions, reference design)	**434 MW** (10°C/50°F ambient temperature, once-through cooling)
Net plant power efficiency η_{net}	**58.4%** (ISO ambient conditions, reference design)	**58.9%** (10°C/50°F ambient temperature, once-through cooling)
Net plant heat rate	6,164 kJ/kWh (5,842 Btu/kWh)	6,112 kJ/kWh (5,793 Btu/kWh)
Plant NO_x emissions	**Main fuel:** ≤ 25 ppmvd (Base load)	**Main fuel:** ≤ 25 ppmvd (Base load)
Plant CO emissions	**Main fuel:** ≤ 10 ppmvd (Base load)	**Main fuel:** ≤ 10 ppmvd (Base load)
Plant CO_2 emissions	342.1 kg CO_2/MW_{el} (Natural gas)	339.2 kg CO_2/MW_{el} (Natural gas)

* *Standard design; ISO ambient conditions*
** *10°C/50°F ambient temperature, once-through cooling*

Project and site-specific performance data for this and other Siemens combined cycle products can be obtained through SIPEP, the Siemens Plant Performance Estimation Program. For access to SIPEP please contact your Siemens sales representative.

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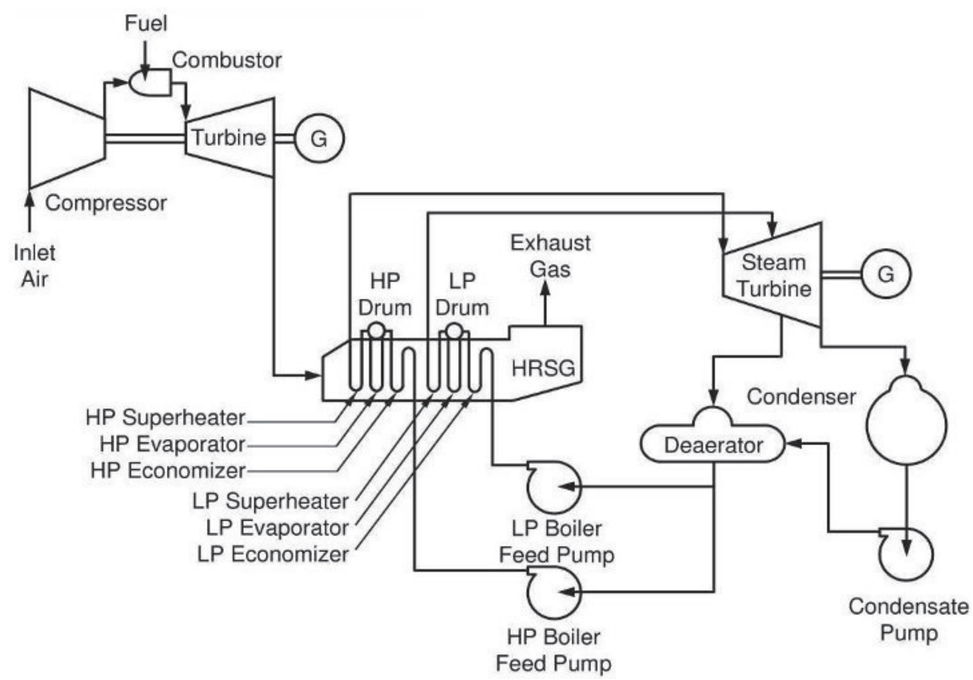
Annexure-7

Process Flow Diagram

Process Flow Diagram of Ashuganj 400MW Combined Cycle Power Plant (East) Project



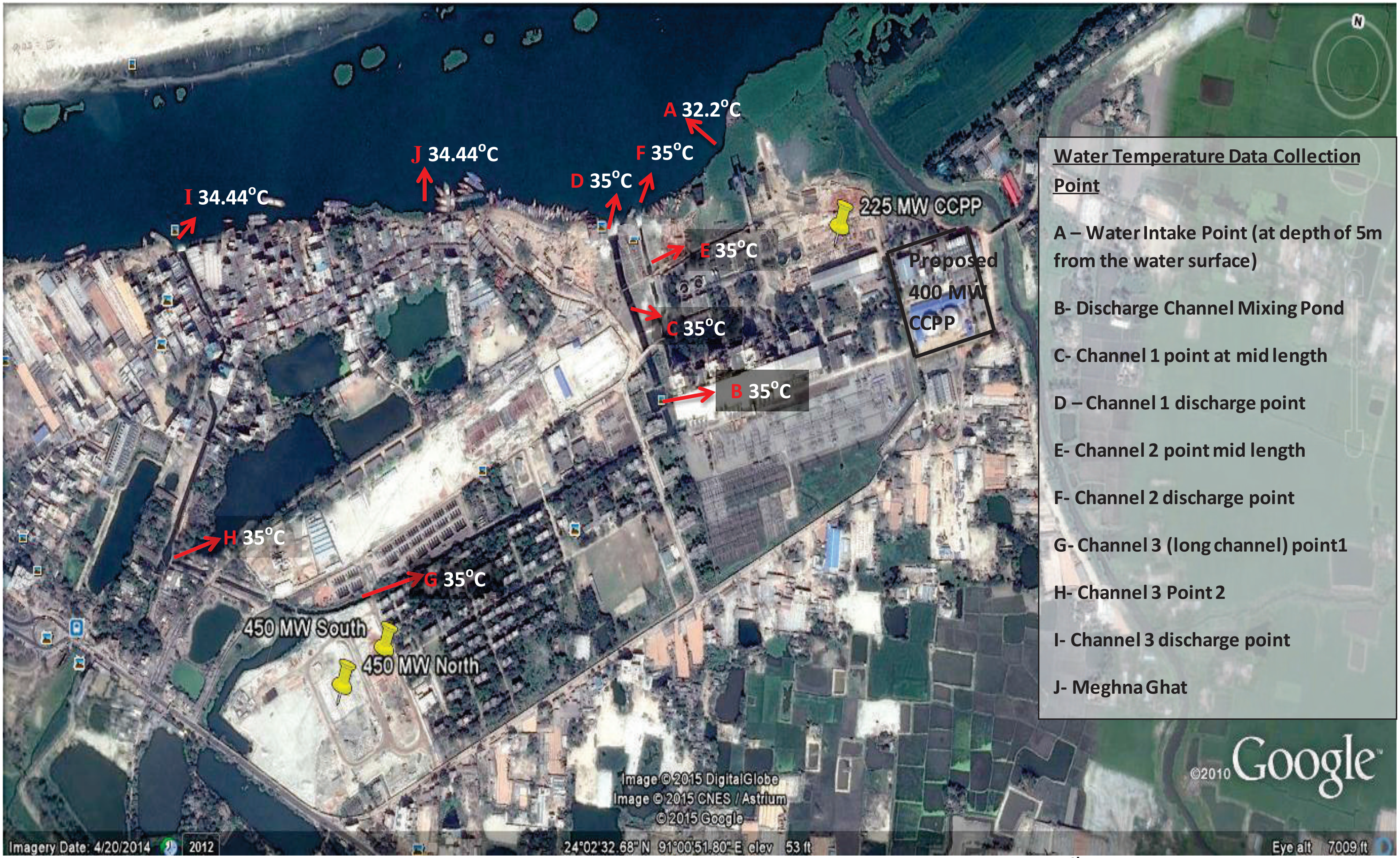
Annexure-8

Layout Plan for Cooling Water Discharge

PARK
REST HOUSE
Pump Station
DISCHARGE CHANNEL
K H A L
COOLING WATER INTAKE & JETTY
W L
B-WALL
BRIDGE
Ashuganj 225MW CCPP Plant
GCB
R P P
K H A L
Store & Workshop
Turbine building
SEDIMENTATION BASIN
Transformer
Control Building
HRSG
125 m
Over head Cable Tray 6 m high
50MW Gas Engine Power Plant
2
33KV SWITCHYARD
Workshop and storage building
132KV SWITCHYARD
132KV CABLE
P D B LOW LAND
BOUN
230KV SWITCHYARD

Annexure-9 (a)

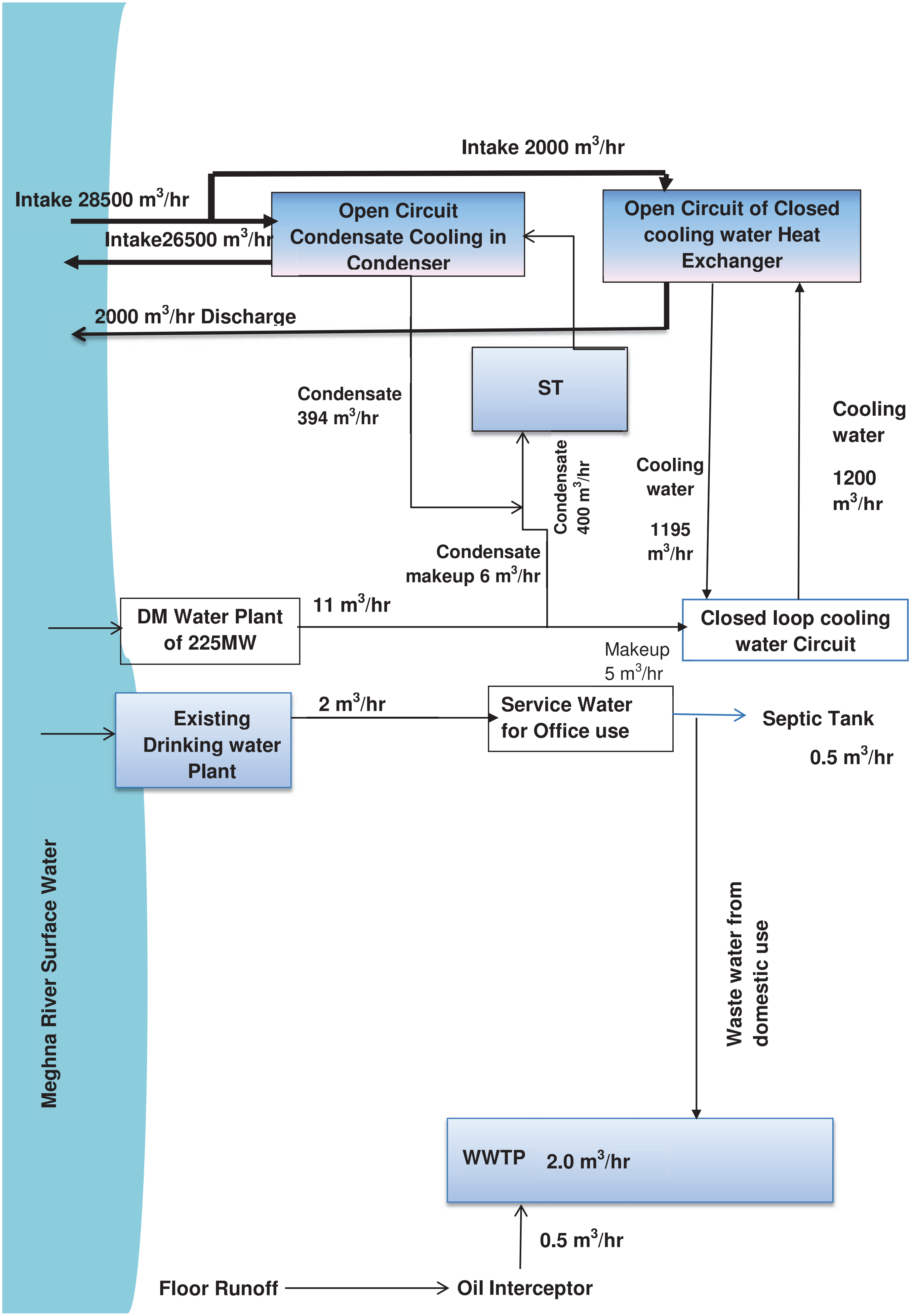
Surface Water Temperature at Different Locations of Meghna River



Surface Water Temperature at Various Locations of Meghna River (Measured on 29th July, 2015)

Annexure 9 (b)

Water Use Break Down



Intake 2000 m³/hr
Intake 28500 m³/hr
Open Circuit Condensate Cooling in Condenser
Open Circuit of Closed cooling water Heat Exchanger
Intake26500 m³/hr
2000 m³/hr Discharge
ST
Condensate 394 m³/hr
Condensate 400 m³/hr
Cooling water 1195 m³/hr
Cooling water 1200 m³/hr
Condensate makeup 6 m³/hr
DM Water Plant of 225MW
11 m³/hr
Closed loop cooling water Circuit
Makeup 5 m³/hr
Existing Drinking water Plant
2 m³/hr
Service Water for Office use
Septic Tank
0.5 m³/hr
Waste water from domestic use
Meghna River Surface Water
WWTP 2.0 m³/hr
0.5 m³/hr
Floor Runoff
Oil Interceptor