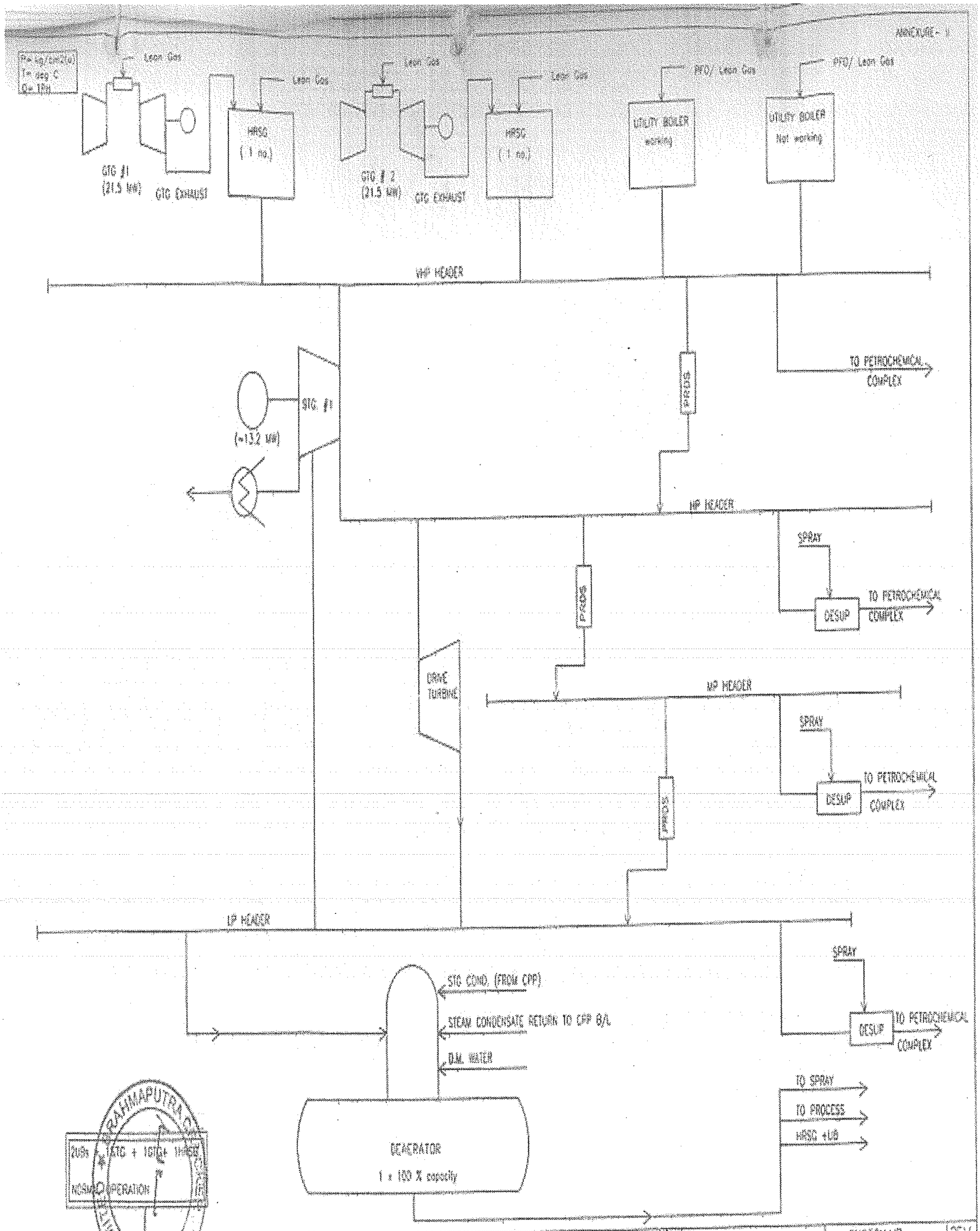
ANNEXURE - II

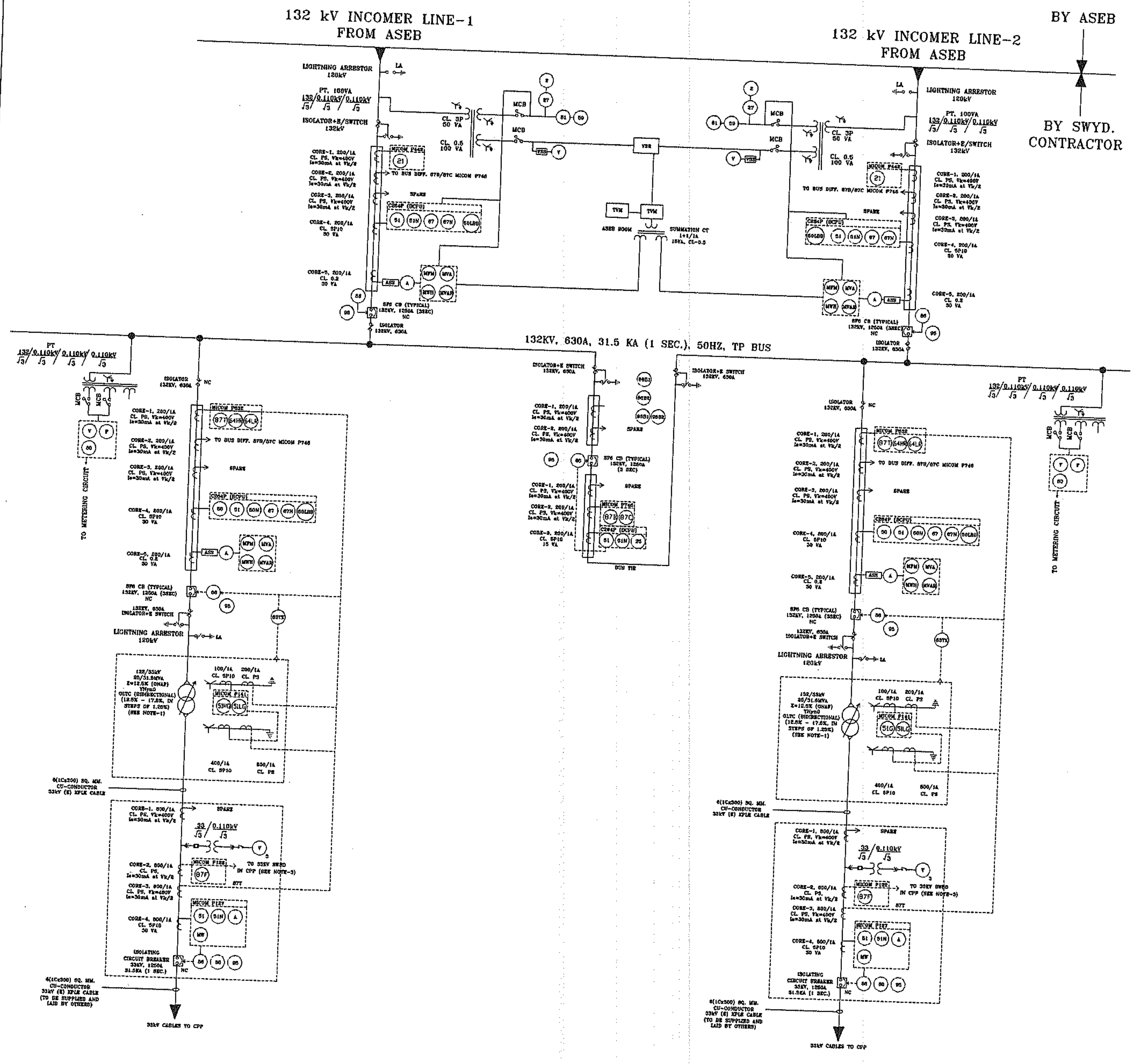


ENGINEERS INDIA LIMITED NEW DELHI			Brahmaputra Petrochemical	1	04.08.09	ISSUED FOR COMMENT	AD	AMG	SMB	INDICATIVE FLOW DIAGRAM
		800700		0	25.06.09	ISSUED FOR COMMENT	AD	AMG	SMB	
	DWG. NO.	REF. DRAWING		NO.	DATE	REVISION	BY	CH	APPD	

SKETCH NO.: 6607-128-16-44-FD-01

REV.: 1

(18)


132 kV INCOMER LINE-1
FROM ASEB
132 kV INCOMER LINE-2
FROM ASEB
BY ASEB
BY SWYD. CONTRACTOR
LIGHTNING ARRESTOR 120kV
PT, 100VA 132/√3 / 0.110kV/√3 / 0.110kV/√3
ISOLATOR+E/SWITCH 132kV
MCB
CL. 3P 50 VA
CL. 0.5 100 VA
VSR
TVM
ASEB ROOM
SUMMATION CT
SF6 CB (TYPICAL) 132KV, 1250A (3SEC) NC
ISOLATOR 132KV, 630A
132KV, 630A, 31.5 KA (1 SEC.), 50HZ, TP BUS
ISOLATOR+E SWITCH 132KV, 630A
BUS TIE
TO METERING CIRCUIT
TO BUS DIFF. 87B/87C MICOM P746
SPARE
MICOM P632
132/33kV 25/31.5MVA ONAN/ONAF YNyn0 OLTC (BIDIRECTIONAL) (SEE NOTE-1)
MICOM P141
6(1Cx300) SQ. MM. CU-CONDUCTOR 33kV (E) XPLE CABLE
MICOM P127
ISOLATING CIRCUIT BREAKER 33KV, 1250A 31.5KA (1 SEC.)
(TO BE SUPPLIED AND LAID BY OTHERS)
33kV CABLES TO CPP

NOTES:-

1. EACH TRANSFORMER IS RATED FOR FULL CAPACITY. AT A TIME ONLY ONE SHALL BE OPERATIONAL AND THE OTHER TRANSFORMER SHALL BE HOT STANDBY.
2. METER SHALL BE SUITABLE FOR BIDIRECTIONAL POWER FLOW.
3. SWITCHYARD CONTRACTOR SHALL ALSO LOOSE SUPPLY RECEIVING END 87F RELAY TO BE MOUNTED IN THE OWNER'S 33kV SWITCHBOARD.
4. THE VA BURDEN, KNEE POINT VOLTAGE, RCT VALUES FOR THE CTs/PTs AS APPLICABLE SHALL BE FINALISED AND SUBMITTED SEPARATELY.
5. REPEAT TVMS SHALL BE PROVIDED FOR IMPORT / EXPORT OF POWER. TVM EXTENSION SHALL BE PROVIDED IN THE ASEB METERING ROOM ONLY FOR IMPORT. HOWEVER ALL REQUIREMENTS RELATED TO TARIFF METERING SHALL BE PROVIDED IN LINE WITH THE REQUIREMENTS OF ASSAM STATE ELECTRICITY BOARD.
6. CT, PT AND TRIVECTOR METER FOR TEMPORY METERING SHALL MEET THE REQUIREMENT OF ASEB.
7. INCOMING GANTRY FOR 132kV SWITCHYARD SHALL BE FINALISED WITH ASEB. IT SHALL BE DESIGNED TO TAKE CARE OF THE LOAD OF INCOMING LINE OF ASEB.
8. THIS DRAWING ADDRESSES ONLY THE CORE DISTRIBUTION DIAGRAM. THE DETAILS OF CONTROL LOGIC, PROTECTION, ETC. WITH FULL BLOWNUP DETAILS SHALL BE INCLUDED IN COMMON RELAY (NUMERICAL) METERING AND CONTROL PANEL DRAWING SHOWING ALL ESSENTIAL CONNECTIONS.
9. ASB, LDB AND BATTERY CHARGER SLDS SHALL BE SUBMITTED IN SEPARATE DRAWINGS.

LEGEND:-

	HV BREAKER
	POWER TRAFO WITH OLTC
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	SELECTOR SWITCH
A	AMMETER
V	VOLTMETER
ASS	AMMETER SELECTOR SWITCH
VSS	VOLTMETER SELECTOR SWITCH
MWH	MEGA WATT HOUR METER
MVAR	MEGA VOLT AMPEAR REACTIVE METER
(2)	TIME DELAY RELAY
(21)	DISTANCE PROTECTION RELAY
(25)	CHECK SYNCHRONI. RELAY
(27)	UNDER VOLTAGE RELAY
(50)	INSTANTTANEOUS O/C RELAY
(50N)	INSTANTTANEOUS E/F RELAY
(50LBB)	LOCAL BREAKER BACKUP RELAY
(51)	IDMTL O/C RELAY
(51N)	IDMTL E/F RELAY
(51HG)	HV SIDE STAND BY E/F RELAY
(51LG)	LV SIDE STAND BY E/F RELAY
(59)	OVER VOLTAGE RELAY
(63TX)	AUXI. RELAY FOR TRANSFORMER PROTECTION
(MFM)	MULTIFUNTION METER
LA	LIGHTNING ARRESTOR
	ISOLATOR
	EARTHING SWITCH
	DRAWOUT
	CABLE GLAND TERMINATION
(PF)	POWER FACTOR METER
(MW)	MEGA WATT METER
(MVA)	MEGA VOLT AMPEAR METER
(KWH)	KILO WATT HOUR METER
(64HR)	HV SIDE RESTRICTED E/F RELAY
(64LR)	LV SIDE RESTRICTED E/F RELAY
(67)	DIRECTIONAL O/C RELAY
(67N)	DIRECTIONAL E/F RELAY
(80)	DC SUPPLY FAILURE RELAY
(81)	UNDER FREQUENCY RELAY
(86)	LOCK OUT RELAY
(87CH)	BUS DIFF. CHECK RELAY
(87B)	BUS DIFFRENTIAL RELAY
(87F)	FEEDER DIFFRENTIAL RELAY
(87T)	TRANSFORMER DIFFRENTIAL RELAY
(95)	TRIP CKT. SUPERVISION RELAY

REV.	DESCRIPTION	DRAWN	SIGN	CHECKED	SIGN	APPROVED	SIGN	STATUS
		Name Date		Name Date		Name Date		
		Name Date		Name Date		Name Date		
03	REVISED AS PER EIL'S COMMENTS.	Name A.DAS Date 08.11.10		Name A.DAS Date 08.11.10		Name Date		
02	REVISED AS PER EIL'S COMMENTS.	Name A.DAS Date 03.08.10		Name A.DAS Date 03.08.10		Name Date		
01	REVISED AS PER EIL'S COMMENTS.	Name A.DAS Date 15.03.10		Name A.DAS Date 15.03.10		Name Date		

OWNER :

BRAHMAPUTRA CRACKER AND POLYMER LIMITED

CONSULTANT :

ENGINEERS INDIA LIMITED

PROJECT :
SUPPLY, ERECTION, TESTING & COMMISSIONING OF 132KV
SWITCHYARD AT DIBRUGARH ASSAM

PO NO. : BCPL/NOIDA/C&P/T-161/2009/OPS Dated 18.12.2009

TITLE :

SINGLE LINE DIAGRAM OF 132KV SWITCHYARD

AREVA

DLF IT PARK, MAJOR ARTERIAL ROAD,
AREVA T&D INDIA LIMITED
BLOCK-AF, 8TH FLOOR, TOWER-C
NEWTOWN KOLKATA-700 156

DRAWING NO.	TOTAL SH.	SH.No.	REV
E041-A1-SLD-001	A1 SCALE NTS	1	03

DRAWN NAME	DRAWN DATE	CHKD. NAME	CHKD. DATE	APPD. NAME	APPD. DATE
A.DAS	21.01.10	N.K.C.	21.01.10		

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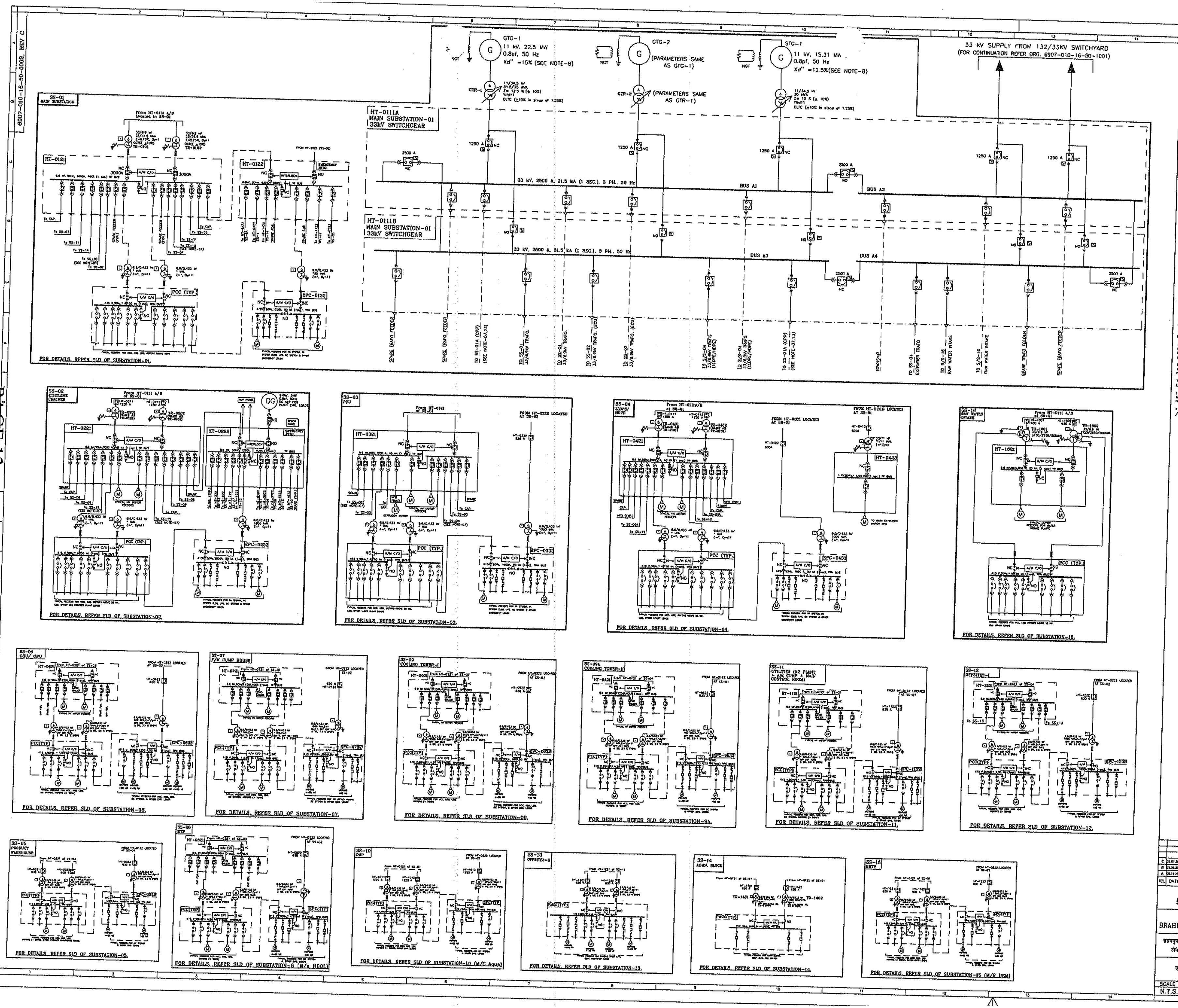
GTG-1
11 kV, 22.5 MW
0.8pf, 50 Hz
Xd'' =15% (SEE NOTE-8)
GTG-2
(PARAMETERS SAME AS GTG-1)
STG-1
11 kV, 15.31 MW
0.8pf, 50 Hz
Xd'' =12.5%(SEE NOTE-8)
NGT
GTR-1
GTR-2
(PARAMETERS SAME AS GTR-1)
11/34.5 kV
20 MVA
OLTC (±10% in steps of 1.25%)
33 kV SUPPLY FROM 132/33KV SWITCHYARD
(FOR CONTINUATION REFER DRG. 6907-010-16-50-1001)
HT-0111A
MAIN SUBSTATION-01
33kV SWITCHGEAR
HT-0111B
MAIN SUBSTATION-01
33kV SWITCHGEAR
33 kV, 2500 A, 31.5 kA (1 SEC.), 3 PH., 50 Hz
BUS A1
BUS A2
BUS A3
BUS A4
1250 A
2500 A
NC
NO
SPARE TRAFO FEEDER
TO SS-01A (CPP) (SEE NOTE-07,13)
TO SS-01 33/6.6kV TRAFO.
TO SS-02 33/6.6kV TRAFO. (CCU)
TO S/S-04 33/6.6kV TRAFO (LLDPE/HDPE)
TOWNSHIP
TO SS-04 EXTRUDER TRAFO
TO S/S-16 RAW WATER INTAKE
SS-01 MAIN SUBSTATION
HT-0121
HT-0122
PCC (TYP.)
EPC-0132
SS-02 ETHYLENE CRACKER
HT-0221
HT-0222
DG
EPC-0233
SS-03 PPU
HT-0321
EPC-0333
SS-04 LLDPE/HDPE
HT-0421
HT-0423
EPC-0433
SS-16 RAW WATER INTAKE
HT-1601
SS-06 GSU/CPU
SS-07 F/W PUMP HOUSE
SS-09 COOLING TOWER-I
SS-09A COOLING TOWER-II
SS-11 UTILITIES (N2 PLANT & AIR COMP & MAIN CONTROL ROOM)
SS-12 OFFSITES-I
SS-05 PRODUCT WAREHOUSE
SS-08 ETP
SS-10 DMP
SS-13 OFFSITES-II
SS-14 ADMN. BLOCK
SS-15 RWTP
A/M C/O
FOR DETAILS, REFER SLD OF SUBSTATION-01.
FOR DETAILS, REFER SLD OF SUBSTATION-02.
FOR DETAILS, REFER SLD OF SUBSTATION-03.
FOR DETAILS, REFER SLD OF SUBSTATION-04.
FOR DETAILS, REFER SLD OF SUBSTATION-16.
FOR DETAILS, REFER SLD OF SUBSTATION-06.
FOR DETAILS, REFER SLD OF SUBSTATION-07.
FOR DETAILS, REFER SLD OF SUBSTATION-09.
FOR DETAILS, REFER SLD OF SUBSTATION-9A.
FOR DETAILS, REFER SLD OF SUBSTATION-11.
FOR DETAILS, REFER SLD OF SUBSTATION-12.
FOR DETAILS, REFER SLD OF SUBSTATION-05.
FOR DETAILS, REFER SLD OF SUBSTATION-8 (M/S HDOL)
FOR DETAILS, REFER SLD OF SUBSTATION-10 (M/S Aqua)
FOR DETAILS, REFER SLD OF SUBSTATION-13.
FOR DETAILS, REFER SLD OF SUBSTATION-14.
FOR DETAILS, REFER SLD OF SUBSTATION-15 (M/S UEM)

REF. DWG. NO.	REFERENCE DRAWING
6907-010-16-50-1001	132KV SWITCHYARD - SINGLE LINE D

NOTES :-

1. This SLD is indicative only and is intended to highlight the distribution philosophy and broadly defines major electrical equipment.

2. Primary HV distribution voltage shall be 33KV and secondary HV distribution voltage shall be 6.6KV in line with Engineering Design Basis.

3. For 33 kV Switchboards, the exact sequence of outgoing feeders shall be finalised during vendor drawings.

4. Only typical outgoing feeders are shown in the SLD for 6.6kV & 415V Switchboards.

5. The details regarding outgoing feeders of 6.6kV & 415 V switchboards, quantities of various electrical equipments such as distribution transformers, PCCs, MCCs, ASBs, LDBs etc. and their ratings, relays & meters to be provided for each feeders etc., shall be finalised within the detailed SLDs of individual units / substations.

6. Detailed SLDs for the following substations shall be developed by EIL.

a. Main Substation :SS-01
b. Ethylene cracker :SS-02
c. Polypropylene :SS-03
d. LLDPE/HDPE :SS-04
e. Product Warehouse :SS-05
f. GSU/ CPU :SS-06
g. Fire Water P/H :SS-07
h. Cooling Tower-I :SS-09
i. Cooling Tower-II :SS-09A
j. Utilities :SS-11
k. Offsites-I :SS-12
l. Offsites-II :SS-13
m. Administration Block :SS-14
n. Raw Water Intake :SS-16

7. Detailed SLDs for the following substations shall be developed by the respective EPCC / Package Contractors.

a. CPP UTILITY :SS-1A (BHEL)
b. ETP :SS-08 (HDOL)
c. DM Plant :SS-10 (AQUA DESIGN)
d. RWTP :SS-15 (UEM)
e. 132kV SWYD :SWYD CONTROL BUILDING (SEIL)

Electrical Loads for Naphtha unloading gantry, Naphtha Tanks, Tool Storage and Catalyst storage buildings will be fed from ETP package substation, SS-08 as Owner defined loads.

8. The rating and impedance values shown for the Generators, Generator Transformers and Grid Transformers are indicative only. The exact values shall be as per actual tested values of the machines by BHEL/SEIL.

9. All Generator transformer incomers, bus-couplers, tie breakers and grid incomers shall be provided with synchronising facility.

10. 33 KV switchboards HT-0111A and 0111B shall be arranged in double bus configuration.

11. 6.6kV emergency DG & emergency power distribution scheme shown in the SLD for Petrochemical Plant loads is indicative. For details of emergency loads refer respective substation SLDs for various process units / offsites area.

12. Power factor improvement capacitors shall be provided in each bus section of normal 6.6 kV switchboards in major substations. Exact requirements shall be as indicated in respective substations SLDs.

13. Substation, SS-01A has been envisaged for the power distribution to CPP Utilities/Auxiliaries. This substation is by BHEL (CPP Contractor).

14. All equipment ratings are indicative and provisional. The same shall be finalised during detailed engineering and indicated in the detailed SLD of respective substations.

* EXACT RATINGS/VALUES AS PER DETAILED SLDs OF RESPECTIVE SUBSTATIONS /VENDOR DRAWINGS.

LEGEND

- Ⓖ GENERATOR
- NGT FOR GENERATOR
- HV CIRCUIT BREAKER
- POWER TRANSFORMER WITH OLTC
- POWER/DISTRIBUTION TRANSFORMER
- DRAWOUT FEATURE
- AIR CIRCUIT BREAKER
- SWITCH
- FUSE
- CONTACTOR
- BIMETALLIC RELAY
- MOTOR
- CABLE GLAND
- NO NORMALLY OPEN
- NC NORMALLY CLOSED
- MINIATURE CIRCUIT BREAKER
- BREAKERS TO BE PROVIDED WITH SYNCHRONISING FACILITY
- EMERGENCY STOP PUSH BUTTON

REV.	DATE	REVISIONS	BY	CHKD	APPD	APPD	REMPC
C	11.01.2013	REVISED & REISSUED FOR ENGINEERING	SMK	HK	BRB		
B	03.09.2010	ISSUED FOR ENGINEERING	SMK	HK	AKS/AK	NS	
A	05.12.2009	ISSUED FOR APPROVAL	SMK	MKS	AKS/AK		

इंजीनियर्स इंडिया लिमिटेड ENGINEERS INDIA LIMITED
(A Govt. of India Undertaking)

ब्रहमपुत्र क्रैकर एवं पोलिमर लिमिटेड
BRAHMAPUTRA CRACKER AND POLYMER LIMITED

ब्रहमपुत्र पैट्रोकैमिकल काम्प्लैक्स
लेपेटकटा, डिब्रूगढ़ असम

BRAHMAPUTRA
PETROCHEMICAL COMPLEX
LEPETKATA, DIBRUGARH ASSAM

एकल रेखा चित्र

OVERALL SINGLE LINE DIAGRAM

SCALE	JOB NO.	UNIT	DEPT.	SECT.	DWG. NO.	REV.
N.T.S.	6907	010	16	50	0002	C

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