



**National Electric Power Regulatory Authority  
Islamic Republic of Pakistan**

2<sup>nd</sup> Floor, OPF Building G-5/2, Islamabad  
Tele: 9206500, Fax: 9210215  
E-Mail: info@nepra.org.pk

**Registrar**

No. NEPRA/R/LAG-81/5290-91

21.06.2006

Mr. Shahid Abdullah  
Director  
Sapphire Electric Company Ltd.  
7-A/K, Main Boulevard,  
Gulberg-II, Lahore

Subject: **Grant of Generation Licence IGSP/05/2006**  
**Licence Application No. LAG-81**  
**M/s. Sapphire Electric Company Ltd. (SECL)**


Please refer to your application No. nil dated 06.02.2006 to NEPRA for a Generation Licence.

2. Enclosed here is Generation Licence No. IGSP/05/2006 granted by the Authority to M/s. Sapphire Electric Company Ltd. The Licence is granted to you pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

3. Please quote above mentioned Generation Licence No. in your future correspondence with the Authority.

DA/as above.



  
21.06.06.  
(Mahjoob Ahmad Mirza)

Copy for information to Director General, Pakistan Environmental Protection Agency,  
44-E, Office Tower, Blue Area, Islamabad.

**National Electric Power Regulatory Authority  
(NEPRA)  
Islamabad – Pakistan**

**GENERATION LICENCE**

No. IGSPL/05/2006

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), the Authority hereby grants a Generation Licence to:

**M/s Sapphire Electric Company Limited**  
(Installed Capacity: 235 MW ISO Gross)

**For its Plant at Sheikhopura-Muridke Road**

**Incorporated under the Companies Ordinance, 1984  
Under Certificate of Incorporation**

**No. 0000004173/20050101 Dated January 18, 2005**

to engage in generation business subject to and in accordance with the Articles of this Licence.

Given under my hand this 21<sup>st</sup> day of JUNE, Two  
Thousand & Six, and expires on 27<sup>th</sup> day of FEBRUARY, Two  
Thousand & THIRTY NINE

  
\_\_\_\_\_  
Registrar



## Article 1 Definitions

1.1 In this Licence

- (a) "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997);
- (b) "Authority" means the National Electric Power Regulatory Authority constituted under section 3 of the Act;
- (c) "Licensee" means M/s Sapphire Electric Company Limited
- (d) "Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000.

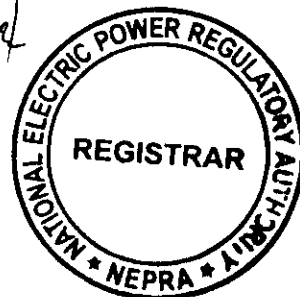
1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or in the Rules.

## Article 2 Application of Rules

This Licence is issued subject to the provisions of the Rules, as amended from time to time.

## Article 3 Generation Facilities

3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the power generation facilities of the Licensee are set out in Schedule-I to this Licence.



3.2 The net capacity of the Licensee's generation facilities is set out in Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial specifications and other details specific to generation facilities before commissioning of the generation facilities.

#### **Article 4 Term**

4.1 The Licence is granted for a term of 30 years after the commercial Operation date.

4.2 Unless revoked earlier, the Licensee may ninety days (90) days prior to the expiry of the term of the Licence, apply for renewal of the Licence under the Licensing (Application and Modification Procedures) Regulation, 1999

#### **Article 5 Licence fee**


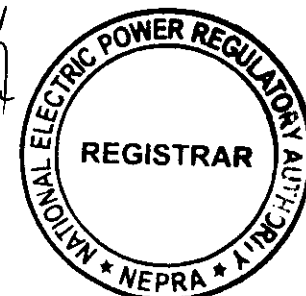
After the grant of the Generation Licence, the Licensee shall pay to the Authority the Licence fee, in the amount and manner and at the time set out in National Electric Power Regulatory Authority (Fees) Rules, 2002.

#### **Article 6 Tariff**

The licensee shall charge from its consumers only such tariff which has been approved by the Authority.

#### **Article 7 Competitive Trading Arrangement**

7.1 The Licensee shall participate in such measures as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and

operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that, any such participation shall be subject to any contract entered between the Licensee and another party with the approval of the Authority.

7.2 Any variation or modification in the above-mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of the parties thereto and such terms and conditions as may be approved by the Authority.

### **Article 8 Maintenance of Records**

For the purpose of sub-rule (1) of Rule 19 of the Rules, copies of records and data shall be retained in standards and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

### **Article 9 Compliance with Performance Standards**

The Licensee shall conform to the relevant NEPRA rules on Performance Standards as may be prescribed by the Authority from time to time.

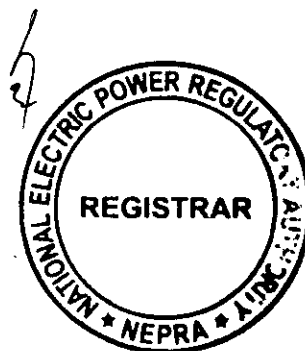
### **Article 10 Compliance with Environmental Standards**

The Licensee shall conform to the environmental standards as may be prescribed by the relevant competent authority from time to time.

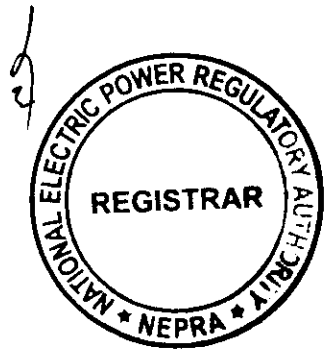
### **Article 11 Provision of Information**

11.1 The obligation of the licensee to provide information to the Authority shall be in accordance with Section 44 of the Act.

*[Handwritten signatures and initials]*



11.2 The licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be required from time to time by the Authority and which is or ought to be or have been in the control or possession of the licensee.

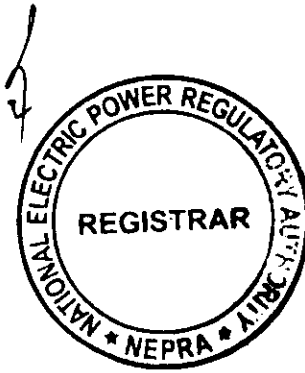


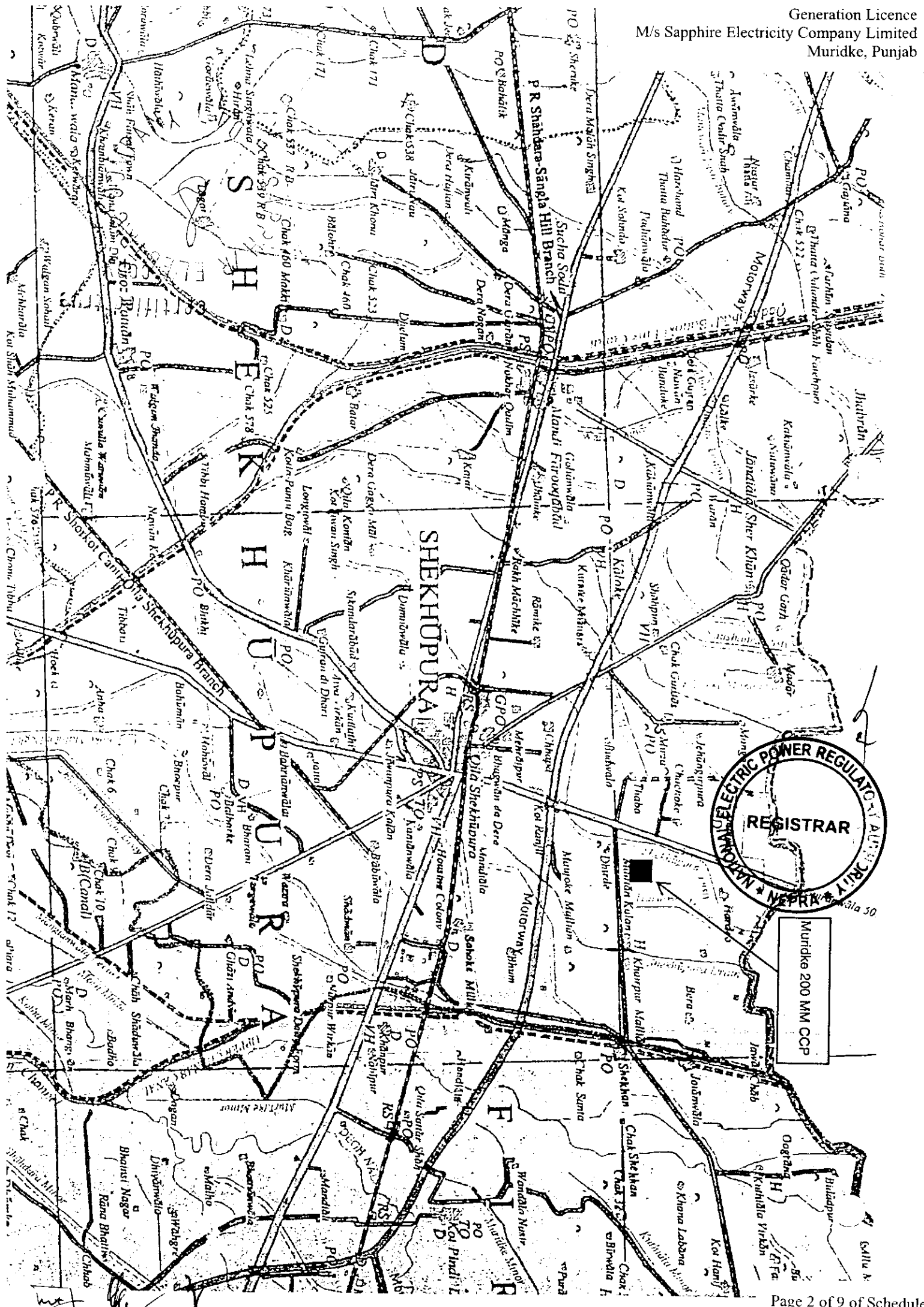
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## SCHEDULE-I

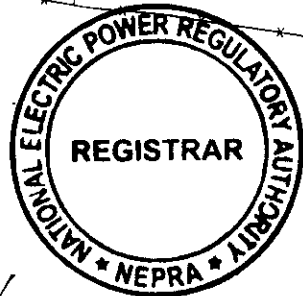
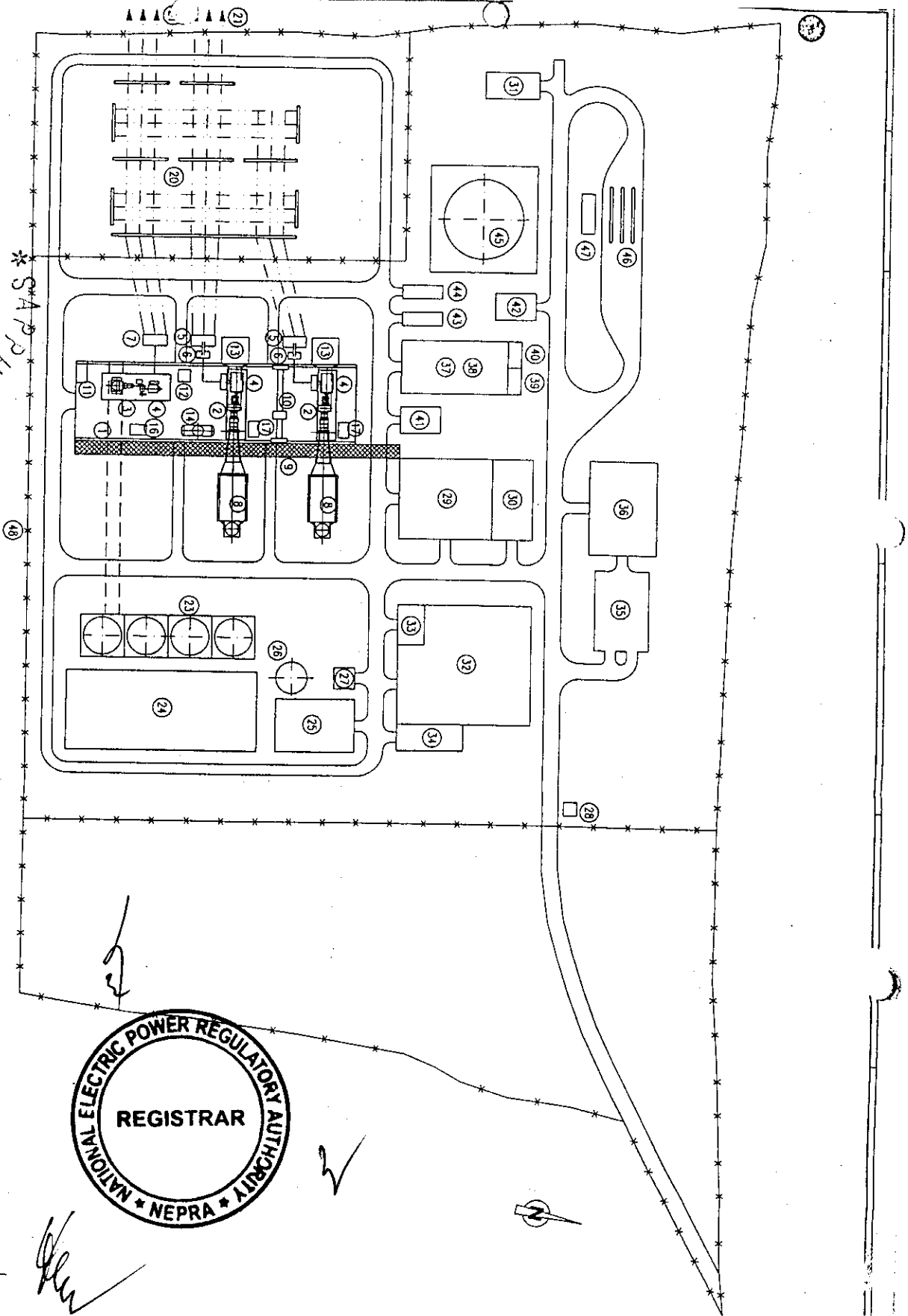
The location, size (capacity in MW) technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the Generation Facilities of the Licensee.







DTL YNHWG S COMPANY LTD  
 SAPHIRE ELECTRIC COMPANY LTD  
 COPY  
 CERTIFIED TRUE

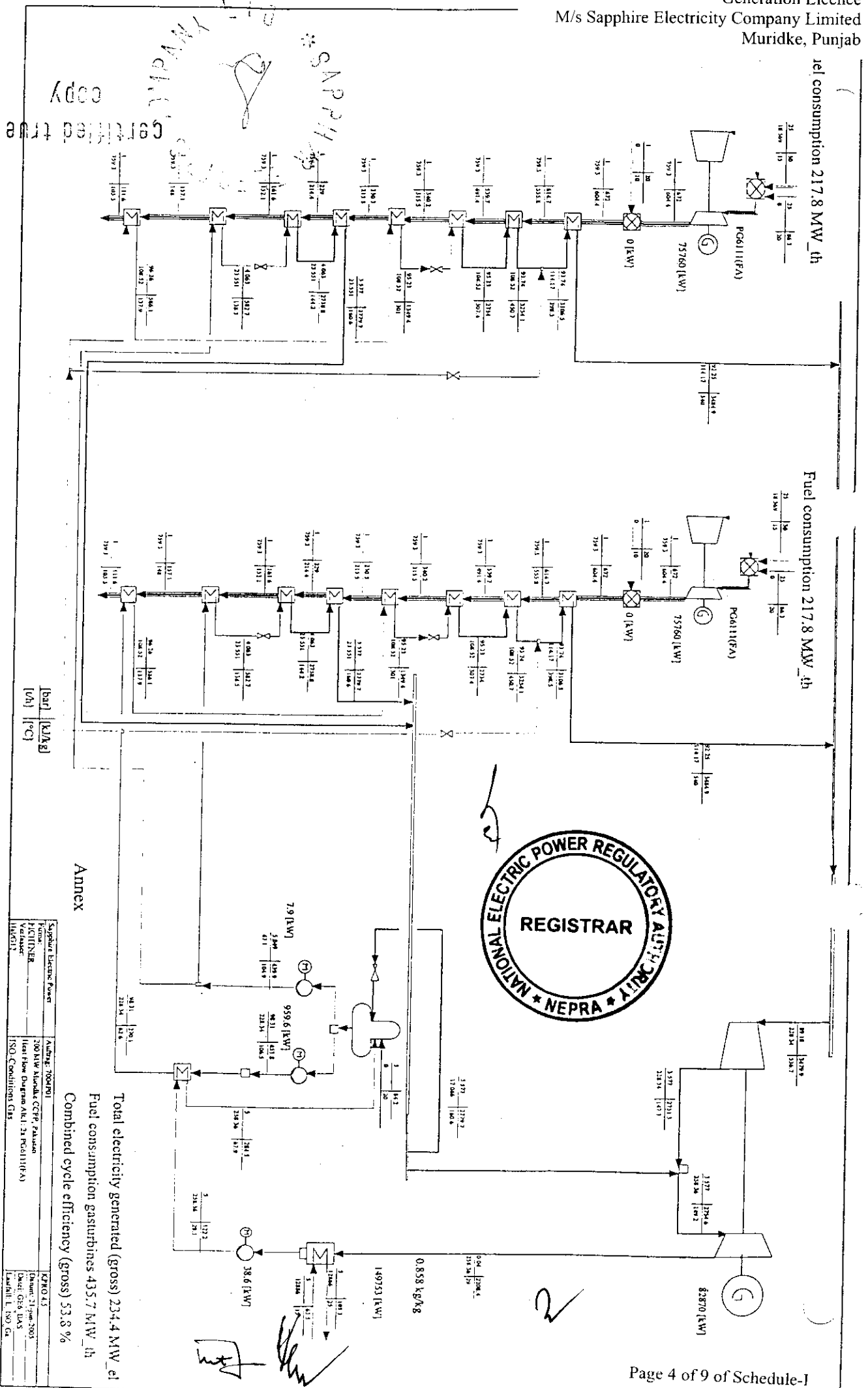


**MAIN COMPONENTS**

- 1 TURBINE BUILDING
- 2 CAST IRON (CI)
- 3 STEAM TURBINE (ST)
- 4 CONDENSERS
- 5 UNIT MAIN TRANSFORMER CT
- 6 UNIT AUXILIARY TRANSFORMER CT
- 7 UNIT MAIN TRANSFORMER ST
- 8 HEAT RECOVERY STEAM GENERATOR (HRSG)
- 9 PIPE BRIDGE
- 10 CRANES
- 11 LOCAL CONTROL ROOM
- 12 GENERATOR EXTERIOR & CONTROL CIRCUITS
- 13 AIR INTAKE DUCT
- 14 FEED WATER TANK
- 15 BLOW DOWN TANK
- 16 CONDENSATE PUMP
- 17 FEED WATER PUMPS
- 18 NOT USED
- 19 COOLING WATER PIPE DUCT
- 20 220 KV HIGH VOLTAGE SWITCHYARD
- 21 220 KV TRANSMISSION LINE
- 22 220 KV AUXILIARY SWITCHYARD & CONTROL BUILDING
- 23 COOLING TOWER
- 24 WATER STORAGE, RAW WATER, FIRE WATER STORAGE
- 25 WATER TREATMENT BUILDING
- 26 DEMINERALIZED WATER TANK
- 27 FIRE FIGHTING
- 28 CATERPILLER FOR POWER PLANT
- 29 WORKSHOP AND STORE
- 30 OUTDOOR STORAGE
- 31 GAS PRESSURE REDUCING / BOOSTER STATION
- 32 COOKING WATER TREATMENT BUILDING
- 33 HAZARDOUS GOODS STORE BUILDING
- 34 SEWAGE TREATMENT
- 35 PARKING AREA
- 36 ADMINISTRATION BUILDING
- 37 CONTROL CONTROL ROOM
- 38 SWITCHGEAR, AUXILIARY AND IEC BUILDING
- 39 HIGH VOLTAGE AUXILIARY TRANSFORMER
- 40 LOW VOLTAGE AUXILIARY TRANSFORMER
- 41 EMERGENCY DIESEL
- 42 CENTRAL AUXILIARY BUNKER
- 43 CENTRAL COMPRESSED AIR STATION
- 44 OIL PLUMBING STATION
- 45 OIL STORAGE TANK
- 46 OIL-LANDLIFT STATION
- 47 OIL-LANDLIFT PUMPS
- 48 POWER PLANT BOUNDARY (FENCE)

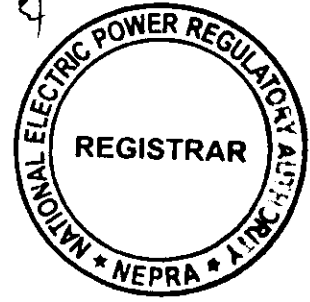


NO.	DESCRIPTION	DATE	BY
1	APPROVE 200 MW COMBINED CYCLE POWER PLANT, PASTH		



Fuel consumption 217.8 MW<sub>th</sub>

Fuel consumption 217.8 MW<sub>th</sub>



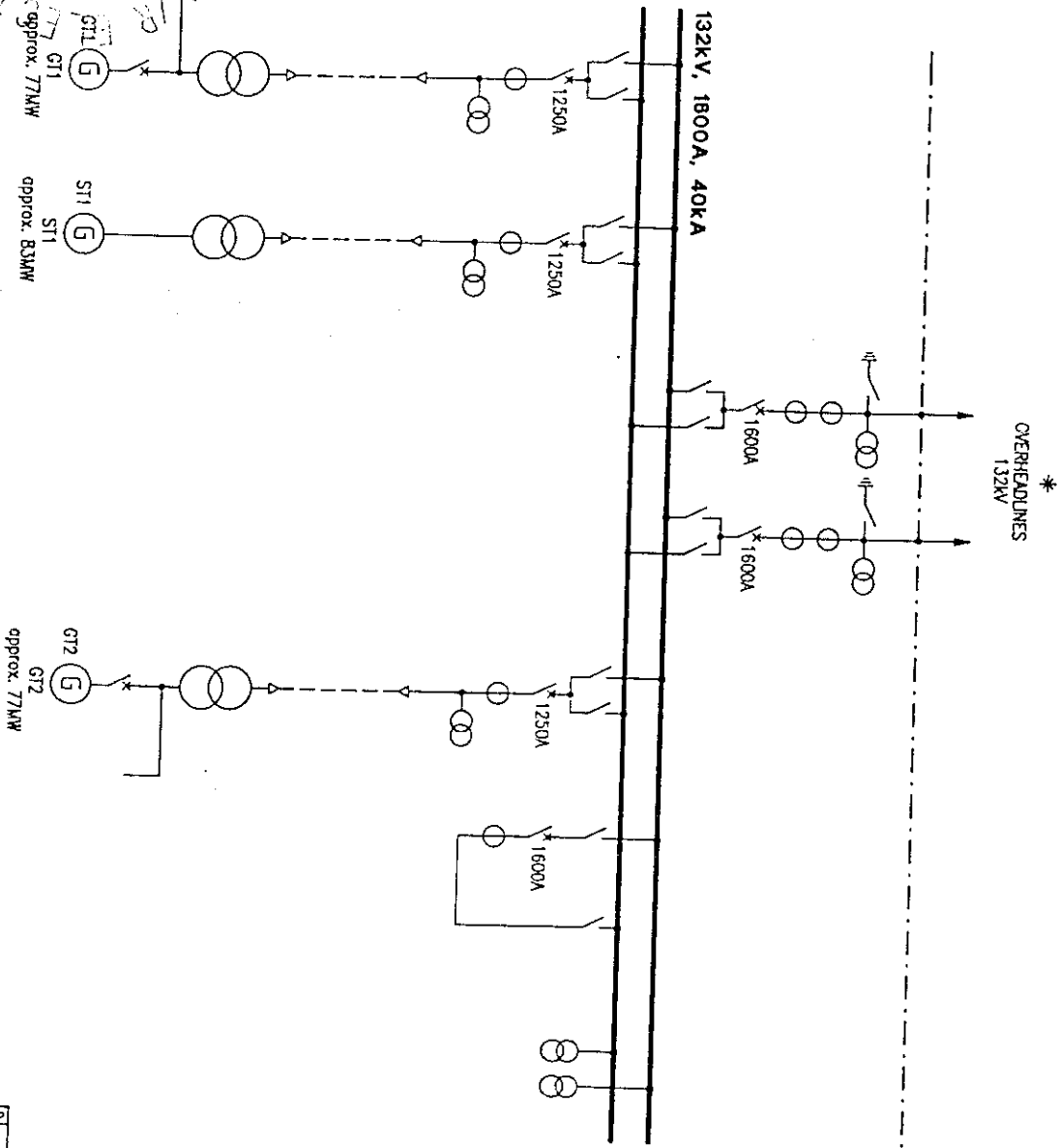
Annex

Total electricity generated (gross) 234.4 MW<sub>el</sub>  
Fuel consumption gas turbines 435.7 MW<sub>th</sub>  
Combined cycle efficiency (Gross) 53.8 %

Barl	(KJ/kg)	(Wh)	(°C)
Sapphire Electric Power	700 (KJ/kg)	200 MWh Muridke CCGT Station	ISO Conditions Gas
Form		Heat flow Diagram AXL 23 (PG111)(FA)	
FIGURE			
Version			
REVISION			
Author: 700 (KJ/kg)			
Checked: 21 June 2003			
Drawn: 05A IAS			
Approved: L. IND. Co.			

CERTIFICATE OF APPROVAL  
\*SAPPHIRE  
copy

REFER TO:  
PRINCIPLE SINGLE LINE DIAGRAM  
GENERATING UNITS  
FILE No.: FACAD\_004



**LEGEND :**  
GT GAS TURBINE  
ST STEAM TURBINE  
\* VOLTAGE LEVEL FORMALLY STILL  
TO BE CONFIRMED

OTHERS  
LIMIT OF SUPPLY  
MURIDKE

**NATIONAL ELECTRIC POWER REGULATORY AUTHORITY**  
**REGISTRAR**  
NEPRA

D	Date	Name	Signature
C			
B			
A			

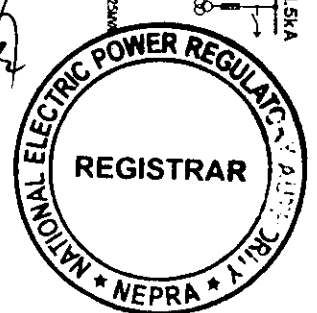
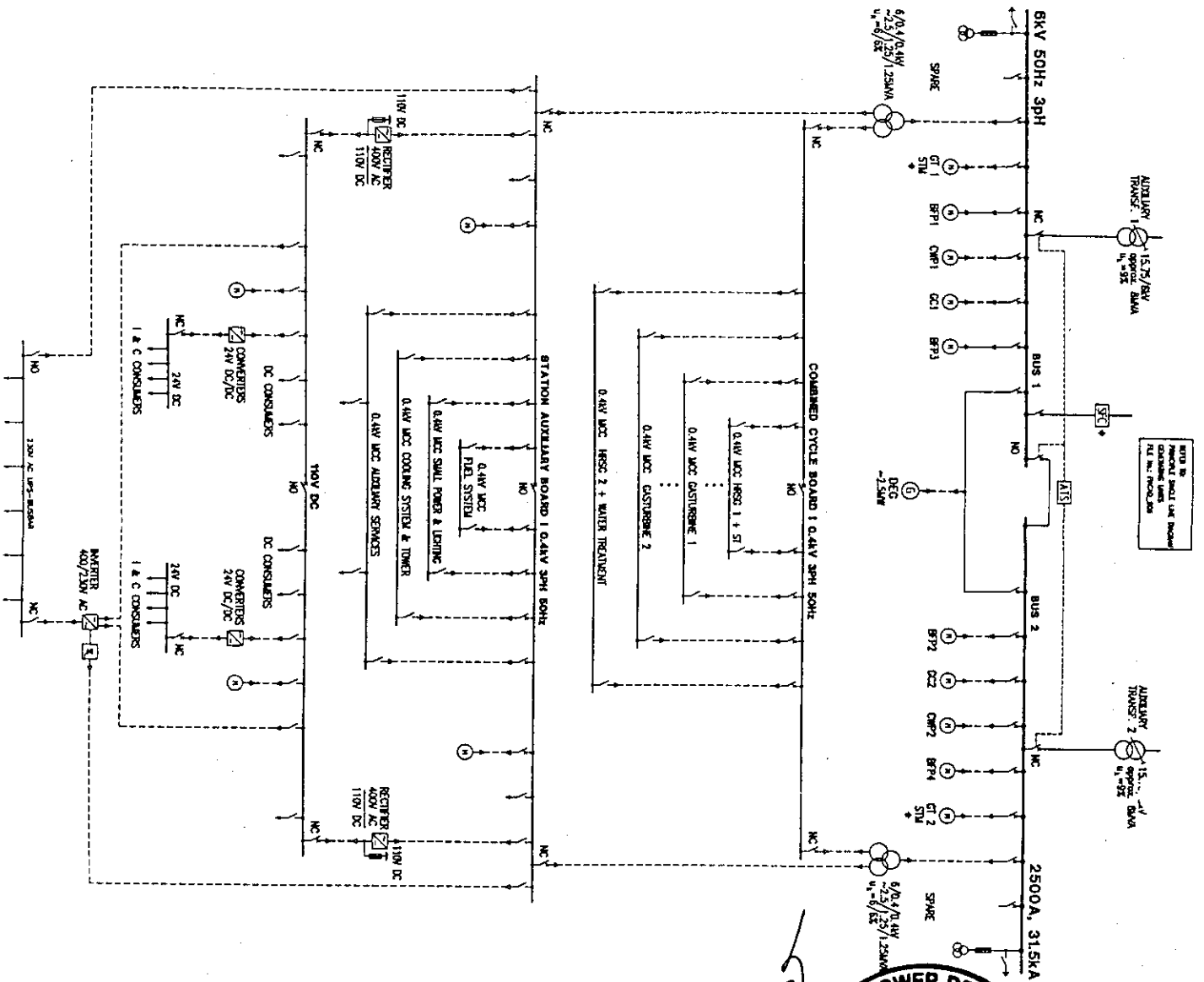
**FICHTNER**  
MURIDKE 200 MW  
COMBINED CYCLE POWER PLANT, PAKISTAN

PRINCIPLE SINGLE LINE DIAGRAM  
132KV GRID CONNECTION  
ALTERNATIVE 2+1

Supervised by: \_\_\_\_\_  
Checked: O.A. 08.05.19UEHLE  
Date: \_\_\_\_\_  
Scale: \_\_\_\_\_  
Sheet: \_\_\_\_\_  
Size: A2 Project No: 7004P01 File: FACAD\_031

\*SAPPHIRE ELECTRICITY COMPANY  
 Certified true

- HV AUX. TRANSFORMERS
- 6KV SWITCHGEAR
- LV AUX. TRANSFORMERS
- 0.4KV SWITCHGEAR
- 0.4KV SWITCHGEAR
- 110V DC SWITCHGEAR
- 110/24V DC/DC CONVERTERS
- 24V DC SWITCHGEAR
- 400/230V AC INVERTER
- 230V UPS



Sl. No.	Particulars	Quantity	Unit	Value
1	MANUFACTURE 200 AMP			
2	COMBINED CYCLE POWER PLANT PART			
3	POWER SUPPLY USE			
4	POWER SUPPLY USE			

2

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- LEGEND :
- ATS AUTOMATIC TRANSFER SWITCH
  - SEC STATIC FREQUENCY CONVERTER
  - EC ELECTRONIC CHANGE-OVER EQUIPMENT
  - INT INTERLOCKED
  - BRP BOILER FEED WATER PUMP
  - CWP CLOSED COOLING WATER PUMP
  - CCS GAS COMPRESSOR
  - DEG DIESEL EMERGENCY (BLACK START) GENERATOR
  - STM STARTING MOTOR
  - NC NORMALLY CLOSED
  - NO NORMALLY OPEN
  - \* TYPE OF CASTURBANE STARTING SYSTEM ( SFC OR MOTOR )
  - DEPENDS ON MANUFACTURERS STANDARD

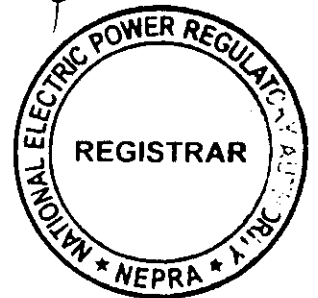
## Plant Details

### General Information

1. Name of Applicant M/s Sapphire Electric Company Limited
2. Registered Office 270, Sector I-9, Industrial Area, Islamabad
3. Business Office 7-A/K, Main Boulevard, Gulberg-II, Lahore
4. Plant Location Near Village Dir Da Doghran on Sheikupura-Muridkee Road, District Shekupuara, Punjab
5. Type of Generation Facility Thermal (Combined Cycle)

### 6. Plant Configuration

- i. Plant Size Installed Capacity Gross ISO 235 MW
- ii. Type of Technology Combined Cycle Technology
- iii. Number of Units/Size 2 x 76 MW (Gas Turbines)  
1 x 83 Mw (Steam Turbine)
- iv. Unit Make & Model Gas Turbine (G.E.)/ PG 6111 (FA)  
Steam Turbine (G.E.)
- v. De-rated Capacity at site conditions 213 MW (Gross Site Condition)  
209 MW (Net Site Condition)
- vi. Auxiliary Consumption 4 MW
- vii. Commissioning date February 2009 (Anticipated)
- viii. Expected Life of the Facility from Commercial Operation Date 30 Years

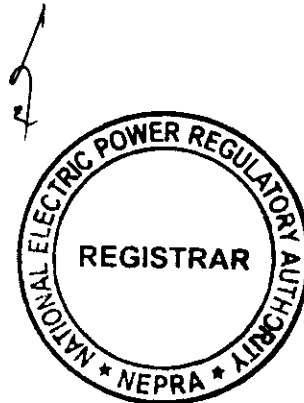


**7. Fuel Details**

- |       |  |  |
|-------|--|--|
| i.    | Primary Fuel                                 | Natural Gas  |
| ii.   | Alternative Fuel                             | HSD  |
| iii.  | Back-up Fuel                                 | HSD  |
| iv.   | Fuel Source<br>(Imported/Indigenous)         | Indigenous   |
| v.    | Fuel Supplier                                | Sui Northern Gas Pipelines Limited (SNGPL)                                 |
| vi.   | Supply Arrangement                           | Through an pipeline having an approximate length of almost 0.50 Kilometer. |
| vii.  | No. of Storage Tanks<br>for backup fuel      | 2  |
| viii. | Storage Capacity of<br>Tanks for backup fuel | 15 days of backup fuel   |

**8. Emission Values**

- |      |                  |                        |
|------|------------------|------------------------|
| i.   | SO <sub>x</sub>  | <b>Gas</b><br>0.053t/d |
| ii.  | NO <sub>x</sub>  | 125mg/Nm <sup>3</sup>  |
| iii. | PM <sub>10</sub> | 50mg/Nm <sup>3</sup>   |



**9. Cooling System**

- |    |                               |   |
|----|-------------------------------|---|
| i. | Cooling Water<br>Source/Cycle | Well water/Closed Circuit (water used for make up only) |
|----|-------------------------------|---|

*Sui Northern Gas Pipelines Limited*

*Handwritten signatures and marks:*  
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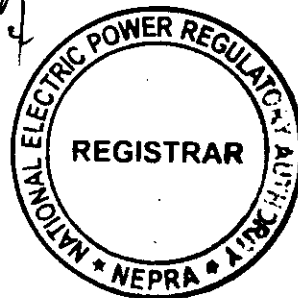
10. Project Cost (As per application) wt

- i. Total (U.S. \$) 181.52 Million
- ii. Debt (U.S. \$) 136.140 Million
- iii. Equity (U.S. \$) 45.380 Million

11. Plant Characteristics

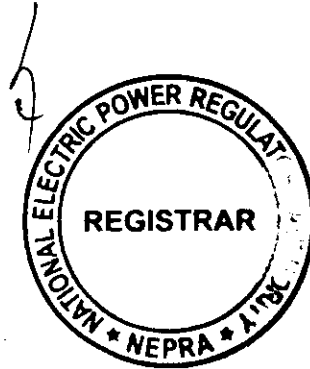
- i. Generation Voltage -
- ii. Frequency 50 Hz (with 5% tolerance)
- iii. Power Factor Preliminary 0.8-0.9 (To be discussed as part of PPA)
- iv. Automatic Generation Control To be discussed as part of PPA
- v. Ramping Rate To be discussed as part of PPA
- vi. Time required to Synchronize to Grid and loading the complex to full load To be discussed as part of PPA

*S. I. Kaur*



## SCHEDULE-II

The net capacity of the Licensee's Generation Facilities



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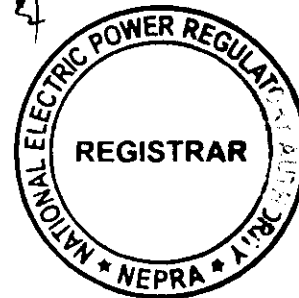
## SCHEDULE-II

1.	Installed Capacity Gross ISO	235 MW
2.	De-rated Capacity at Site Conditions	213 MW
3.	Auxiliary Consumption	4 MW
4.	Net Capacity of the Plant at Site Conditions	209 MW

**Note**

All the above figures are indicative as provided by the Licensee. The Net Capacity available to NTDC for dispatch and other purchasers will be determined through procedures contained in the Agreements or Grid Code.

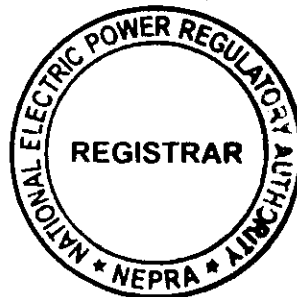
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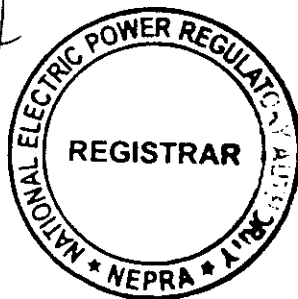
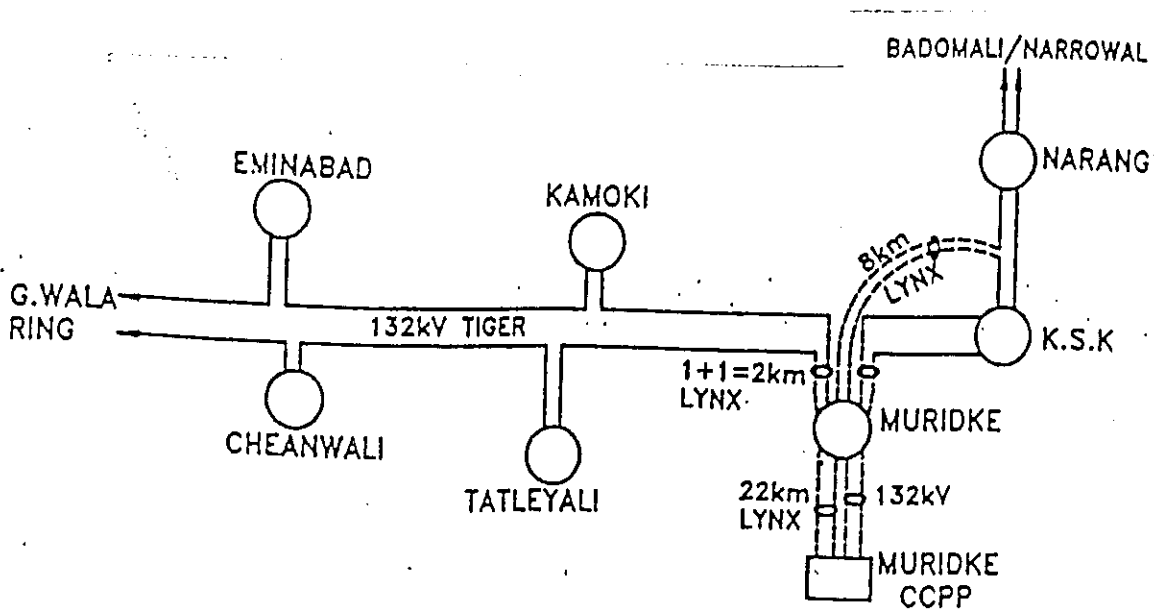


## INTERCONNECTION SCHEME FOR THE POWER DISPERSAL OF THE PLANT

The power of the power plant shall be dispersed to system directly within LESCO and GEPCO load center at 132 KV voltage level as follows

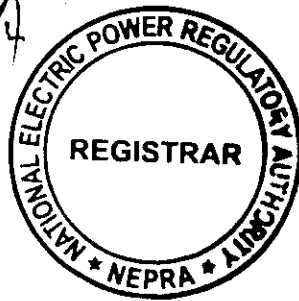
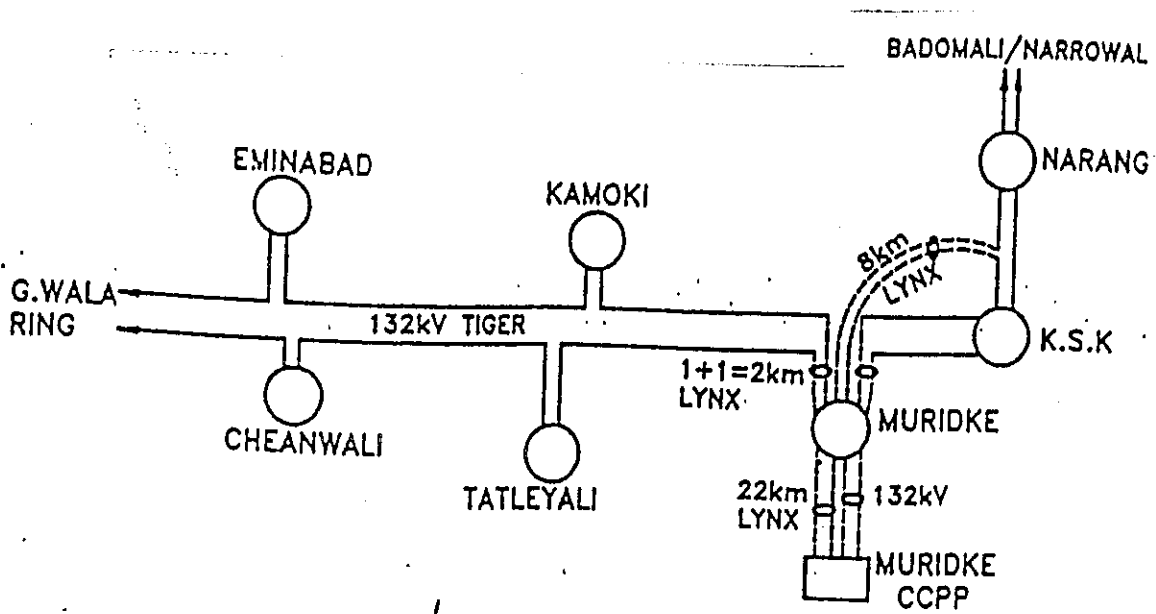
1. A new 132 KV Grid station (Muridke) about 22 Km from the proposed site of Sapphire Electric Power Plant.
2. Two (2) new 132 KV D/C Transmission Lines each with a length of approximately 22 Km on Lynx Conductor from Sapphire Electric Power Plant to New Muridke Grid Station.
3. 132 KV D/C Transmission Line on Lynx Conductor for making Double In-Out of 132 KV D/C Kala Shah Kaku-Kamoki/Tatlay Ali Transmission Line at 132 KV new Muridke Grid Station.
4. 132 KV D/C Transmission Line on Lynx Conductor for making In-Out of 132 KV S/C Kaka Shah Kaku-Narang Transmission Line at 132 KV new Muridke Grid Station.





*Sui L...*

*[Handwritten marks]*



*Sui Kumar*

*Net*