National Electric Power Regulatory Authority
Islamic Rebublic of Pakistan

Registrar

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No. NEPRA/R/LAG - 01 /4191 - 4193 26 - 4 - 2013

Chief Executive Officer,
Central Power Generation Company Ltd.
(CPGCL/GENCO-II)
Guddu Thermal Power Station,
Guddu (Kashmore), Sindh

Subject: **Modification in Generation Licence No. GL/02/2002, Dated 01.07.2002 of Central Power Generation Company Ltd. (CPGCL)**

Reference: *CPGCL's authorized representative Precision Advocates & Legal Consultants letter dated 31.07.2012.*

It is intimated that the Authority has approved "Licensee Proposed Modification" in Generation Licence No. GL/02/2002 in respect of Central Power Generation Company Limited (CPGCL) pursuant to Regulation 10(11) of the NEPRA Licensing (Application & Modification Procedure) Regulations, 1999.

2. Enclosd please find herewith modified Generation Licence GL/02/2002 along with modified Schedule-I & Schedule-II, as approved by the Authority. Determination of the Authority is also enclosed herewith.

Encl: i) Modified Generation Licence along with Schedule-I & Schedule-II
ii) Determination of the Authority

(Syed Safeer Hussain)

Copy to:

1. Managing Director, NTDC, 414 WAPDA House, Shaharah-e-Qauid-e-Azam, Lahore.
2. Director General, Pakistan Environmental Protection Agency, House No. 311, Main Margalla Road, F-11/3, Islamabad.

Determination of the Authority in the Matter of Communicated Licensee Proposed Modification (LPM) of Central Power Generation Company Limited (CPGCL)

April ,2013
Application No. LAG-01

(A). Background & Communication of LPM

(i). National Electric Power Regulatory Authority ("the Authority") granted a Generation License (No. GL/02/2002 dated July 01, 2002) to CPGCL/GENCO-II for its Thermal Generation facilities (with a cumulative installed Capacity of 1655.00 MW) located at TPS, Guddu, Taluka Kashmore, District Jacobabad, in the Province of Sindh.

(ii). Later on, CPGCL proposed to install a new 747.00 MW Combined Cycle Power Plant (CCPP) at TPS Guddu. In view thereof CPGCL filed a LPM under Regulation-10 of the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 (the Regulations), on July 31, 2012. CPGCL in the "Text of the proposed Modification" submitted that two Gas Turbines of 261.00 MW each, Two HRSG and One Steam Turbine Unit of 225.00 MW may kindly be added under Schedule I & II of its Generation Licence. Further, CPGCL in the "Reason in Support of Modification" statements stated that it has an installed capacity of 1655 MW and a net capacity of 1419.82 MW in terms of its Generation License granted by NEPRA. Out of various units comprising its generation facilities, Unit 1-2 operated on gas were commissioned in 1974 and have been in operations for more than 32 years. Their design efficiency of 110.00 MW each has reduced to 75 MW each along with an increase in their heat rates leading to an increased consumption of a precious resource i.e. natural gas. Similarly, steam units 3 & 4 running on fuel oil with a de-rated capacity of 140 MW each against a design efficiency/capacity of 210 MW, needed efficient operations. The decision was therefore taken to replace these units with 747.00 MW Gas

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Turbine Combined Cycle Power Plant (CCPP) comprising of two Gas Turbines of 261 MW each, two HRSG and one steam turbine unit of 225 MW.

(iii). Regarding the "Impact on Tariff" CPGCL stated that the proposed plant would operate on gas by diverting the gas quota of existing steam units 1-4 of CPGCL with higher efficiency thus in terms of the Regulations 10(2)(b) & (c) the induction of proposed units would make the most economic use of the indigenous gas, leading to reduction of generation cost by way of efficient use of available quota.

(iv). About the "Quality of Service (QoS)" and "Performance", CPGCL submitted that the proposed modification would not have any impact on the QoS and its performance under the granted Generation Licence.

(B). <u>Processing of LPM</u>

(i). After the completion of all required information as stipulated under the Regulation 10 of the Regulations by CPGCL, the Registrar accepted the LPM as required under the Regulation 10 (4) of the Regulations and submitted the same for the consideration of the Authority.

(ii). The Authority considered the matter in its Regulatory Meeting (RM-12-547), held on September 18, 2012 and admitted the communicated LPM of CPGCL for further processing. The Authority further decided to publish the communicated LPM in the press, seeking comments from general public, interested and affected parties. Accordingly, the Notice of LPM was published in the leading newspapers on September 28, 2012 informing the general public about the communicated LPM and for submitting their views either in favor or against the proposed LPM. Apart from the notice in the press, separate notices were also sent to experts, government ministries and representative organizations, interested and affected parties, inviting their views and comments in the matter.

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(iii). In response to the above published notice of LPM in the press and subsequent correspondences made with other stakeholders, NEPRA received comments from eight (08) stakeholders. These included Gresham's Eastern (Private) Limited (GEPL), Karachi Shipyard & Engineering Works Limited (KSY&EWL), Sui Southern Gas Company Limited (SSGCL), Mari Gas Company Limited (MGCL), Pakistan Petroleum Limited (PPL), Energy Department Government of Sindh (EDGoS), Central Power Purchasing Agency (CPPA) of National Transmission and Despatch Company Limited (NTDC) and Ministry of Water & Power (MoW&P). The salient points of the comments offered by the above mentioned stakeholder are summarized in the following paragraphs: -

(a). GEPL submitted that CPGCL has not been transparent in its application. It should have submitted (a) Life Cycle Assessment report from a Third Party Assessor of International repute and who is from a panel that is approved by World Bank, ADB and IDB (b) Refurbishment cost of the Turbine from its manufacturer to "Zero Hour" basis (c) Efficiency improvement modifications from the manufacturer of the Gas Turbine and their costs as well as improved heat rates. (d) Condition of the HRSG and its life cycle assessments. (e) Condition of the Steam Turbine and its life cycle assessment and efficiency improvement package. (f) Condition of the Balance of plant and the life cycle assessment. (g) Flue Gas analysis of the Exhaust. (h) Three Year log book of the plant showing all parameters of operation especially heat rate. (i) Feasibility Study for the new plant and its cost versus enhanced efficiency factor. (j) CPGCL statement of fact of the cost of power generated from the new project versus the cost of power produced by similar projects with the IPPs supported with factual documentation. (k) CPGCL statement what is intended for the present plan. Whether it will be sold for scrap, modified, or left as a "moth-balled" unit. (l) CPGCL statement whether the new intended plant will be based on ICGC technology. i.e. whether the

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new Gas Turbine can work on Thar Coal which is suitably gasified as this technology will do away with the need for NG from SSGC/SNGPL sources;

(b). KSY&EWL stated that it is fully capable to provide and install the power plants with the collaboration of one of the world renowned manufacturers. We are confident that we will also be given an equal opportunity to participate;

(c). SSGC remarked that the proposed Power Project of CPGCL is not on its network but to the network of SNGPL, PPL and Mari Gas;

(d). MGCL stated that the proposed modification would make most economic use of the indigenous gas leading to reduction of generation cost of electricity by way of efficient use available quota. MGCL has no objection on the desired modification;

(e). PPL remarked that gas allocation from Kandhkot gas field for GENCO-II Power Plant at Guddu is 200 MMCFD (i.e. 100 MMCFD direct to WAPDA and 100 MMCFD through SNGPL) up till May 2013. However, GENCO-II has been continuously not utilizing the allocated gas resulting in not only revenue loss to PPL but also in terms of depriving country from availability of less expensive electricity. PPL has therefore already approached Ministry of Petroleum and Natural Resources for revising the gas allocation from Kandhkot gas field in favor of other interested buyers from fertilizer sector who are in dire need, have the capacity to use this gas and pay the price. We suggest that any up-gradation of generating capacity at GENCO-II may only be made subject to availability of fuel gas from other sources;

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(f). EDGoS stated that LPM could be supported if the plant(s) would generate electricity by reduction in generation cost. Further, additional Energy generated would also be added in the National Network to overcome the energy crisis;

(g). CPPA in its comments supported the proposal for replacement of the unit 1-2 (operated on Gas) and steam unit 3 & 4 (running on fuel oil) with 747 MW CCPP comprising of two Gas Turbines of 261 MW each, two HRSG and one Steam Turbine Unit of 225 MW;

(h). MoW&P supported the proposed modification as it will increase the efficiency as well as capacity of the CPGCL.

(iv). The Authority observed that only three stakeholders raised certain observations regarding the transparency of the application as well as the availability of fuel to the new proposed CCPP. In view of the above and for the purpose of fair adjudication, the comments of GEPL, KSY&EWL and PPL were sent to CPGCL for its rejoinder and response to the observations made by the said stakeholders.

(v). CPGCL on the observations of GEPL submitted that the application for LPM has been filed under the Regulations applicable in the matter in compliance with the requirement set forth under the said law. Therefore, it is incorrect to state that application of CPGCL has been non-transparent. Further, the application has been filed under the Regulations along-with all such supporting documents as required under the law. Additional set of documents as stated by GEPL are not required under the Regulations. CPGCL further submitted that the commissioned set of plants is in operation and the new plant will augment the existing strength of CPGCL. The prospects of using Thar Coal are pre-mature as the coal itself is undergoing feasibility stage. However, the new plant is being procured based on the specification of gas to be made available to CPGCL.

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(vi). About the observations of KSY&EWL, the Counsel of CPGCL stated that the letter of October 15, 2012 is nothing but an expression of interest for undertaking generation activity at their premises. This in no way should be construed as opposition to CPGCL LPM. NEPRA may guide KSEW to undertake necessary steps for engaging in the business of power generation.

(vii). Regarding the comments of PPL, it was submitted as per clause-3(b) of the Second Supplemental Agreement of Kandhkot GSA with PPL, the minimum quantity to be used in a calendar year is 30751MMCF, while the TPS Guddu has already used 27098 MMCF gas up to 15-11-2012. So, only 3753 MMCF gas is to be used up to 31st December 2012. Our previous history shows that we have always used more than the minimum quantity. However it is clarified that in September 2012 due to heavy rains specially in district Kashmore the water was filled in the basement of our Power Station so, resultantly all the units were stopped in emergency. The emergency was declared by the Government of Sindh. Consequently the gas consumption in September and October remained on minimum side. But it was an act of God and was beyond the control of human beings which is covered under the clause of forced majeure in GSA. Despite floods during the current year the minimum contract capacity would hopefully be utilized by the end of current year therefore, the objection of PPL is pre-mature at the moment. Similarly, the insistence of PPL to onward supply gas to fertilizer allocated to CPGCL is against the stated policy of the GOP, whereby power sector has priority over fertilizer sector. As far as the matter of 747 MW CCP Guddu project is concerned, the case for gas allocation has already been put up in ECC of the cabinet by the Ministry of Water & Power. The sub Committee of the ECC has very kindly recommended the same for the consideration of ECC of the Cabinet. So, very soon before the commissioning of new units of 747 MW CCPP project, CPGCL will get the separate allocation for these units. The Authority considered the above reply of CPGCL and is convinced that CPGCL has available gas to operate the new CCPP.

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(C). Approval of LPM

(i). The Authority considers that in order to meet the growing demand of electricity in the country, it is imperative that efforts should be made to add more Generation Capacity on urgent basis not only by setting up new power plants but also by enhancing capacity of the existing power plants wherever possible.

(ii). The Authority is of the considered view that the proposal of CPGCL for addition of Generation Capacity is worth considering as additional electric power will be available to the energy starved National Grid. This will not only result in better performance for CPGCL with respect to supply of additional power to the system but will also result in better utilization of resources as the new CCPP according to CPGCL would have an efficiency around 57%, the highest among all the Public and Private Sector Plants existing in the country. The Authority has noticed that the proposed installation of plants would likely be beneficial to the consumers as the efficiency of this CCPP is relatively high which would result in lowering of the price of electricity for the end consumer. The Authority further observed that the addition of new turbines would also ensure the licensee obligation to provide safe and reliable electricity to the consumers.

(iii). The Authority has considered the objections of the stakeholders including GEPL, KSY&EWL and PPL as explained at Para B(iii)(a), B(iii)(b) and B(iii)(e) above and has also taken into account the response of CPGCL. The Authority observes that the explanation offered by CPGCL to the reservations of the stakeholders is satisfactory and therefore in terms of Regulation 10(11) of the Regulations, the Authority hereby approves the communicated LPM in the Generation Licence of CPGCL for addition of two (02) Gas Turbines (255.60 MW each), two (02) HRSG and One (01) Steam Turbine (of 265.50 MW), increasing the total installed capacity of CPGCL from the existing 1655.00 MW to 2431.70 MW.

(iv). Accordingly, the already granted Generation Licence (No. GL/02/2002 dated July 01, 2002) in the name of CPGCL is hereby modified. The revised Face

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Sheet indicating the required changes along with Revised/Modified Schedule-I & II of the Generation Licence are attached as Annexure to this determination. The grant of such a Licensee Proposed Modification would be subject to the provisions contained in the NEPRA Act, relevant rules framed there under and terms and conditions of the Licence.

Authority

Major (R) Haroon Rasheed
Member

Khawaja Muhammad Naeem
Member

Habibullah Khilji
Member

Shaukat Ali Kundi
Member/Vice Chairman

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National Electric Power Regulatory Authority (NEPRA)

Islamabad – Pakistan

GENERATION LICENCE

GL/02/2002

In exercise of the Powers conferred upon the National Electric Power Regulatory Authority (NEPRA) under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, the Authority hereby modifies the Generation Licence granted to CENTRAL POWER GENERATION COMPANY LIMITED (issued on July 01, 2002 and expiring on June 30, 2017), to the extent of changes mentioned as here under:-

(i). Changes in **Schedule-I** attached as Modified Schedule-I; and

(ii). Changes in **Schedule-II** attached as Modified Schedule-II.

This **Modification-I** is given under my hand this 26th of **April Two Thousand** & **Thirteen**

Registrar

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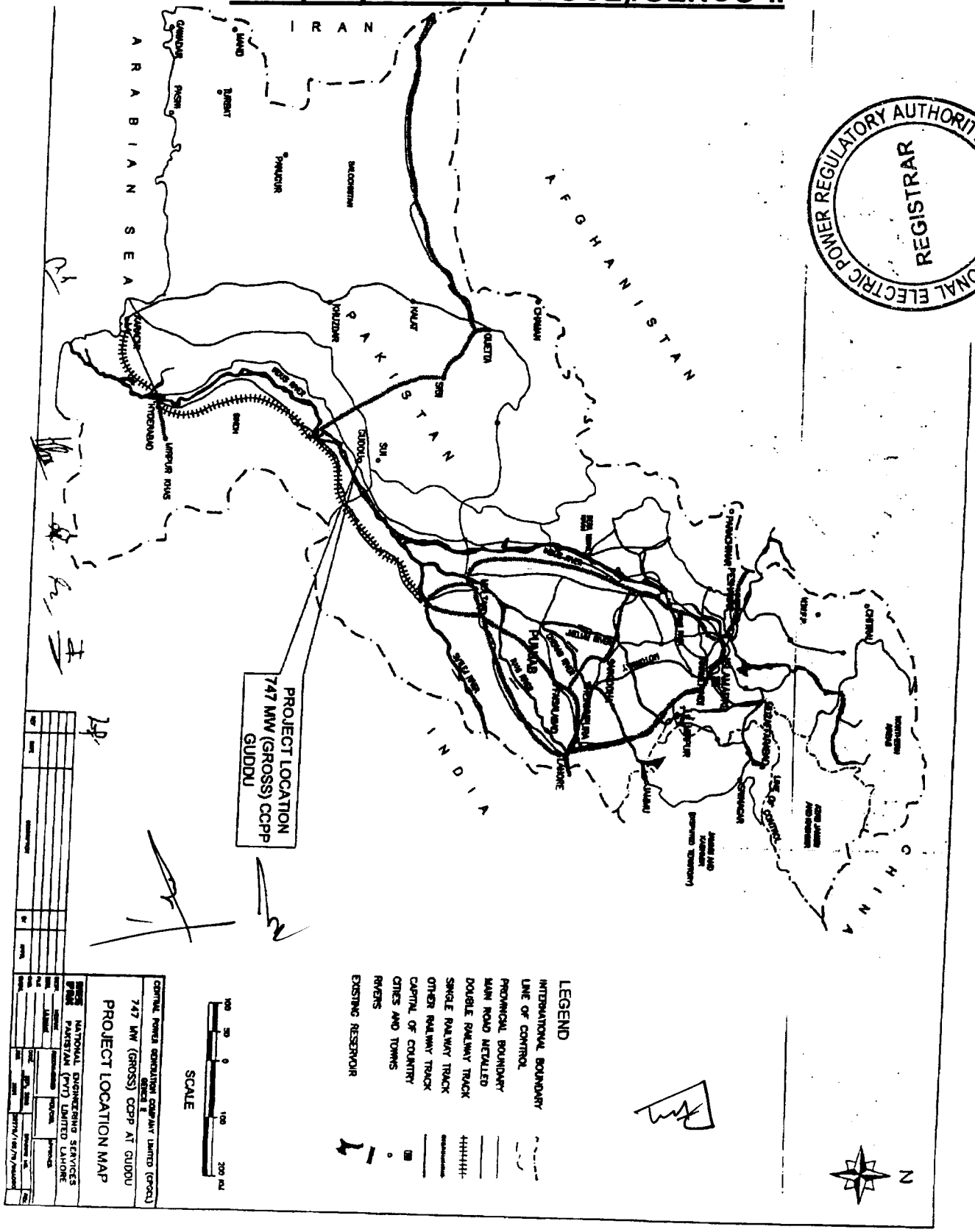
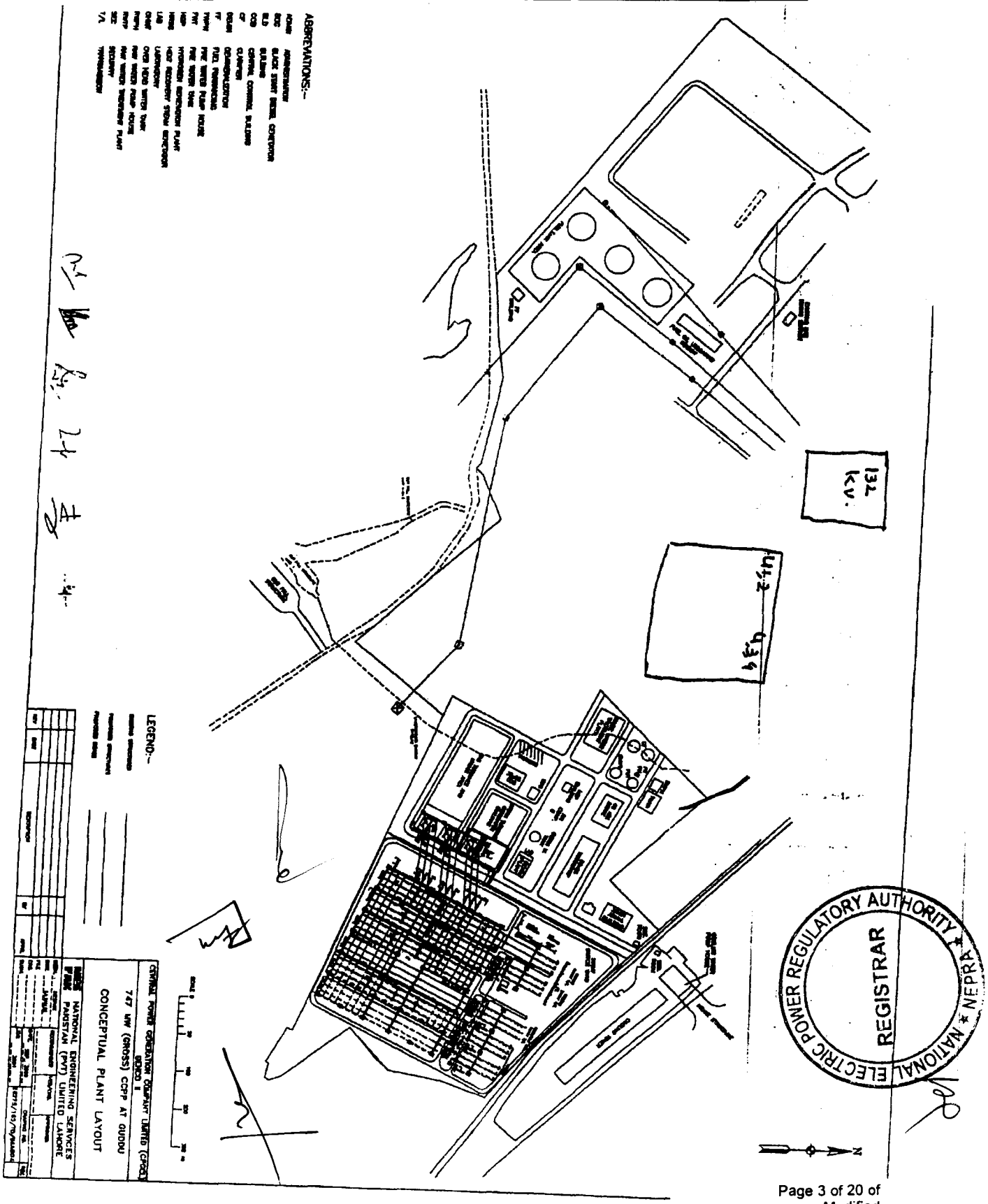
SCHEDULE-I

The Location, Size (i.e. Capacity in MW), Type of Technology, Interconnection Arrangements, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule.

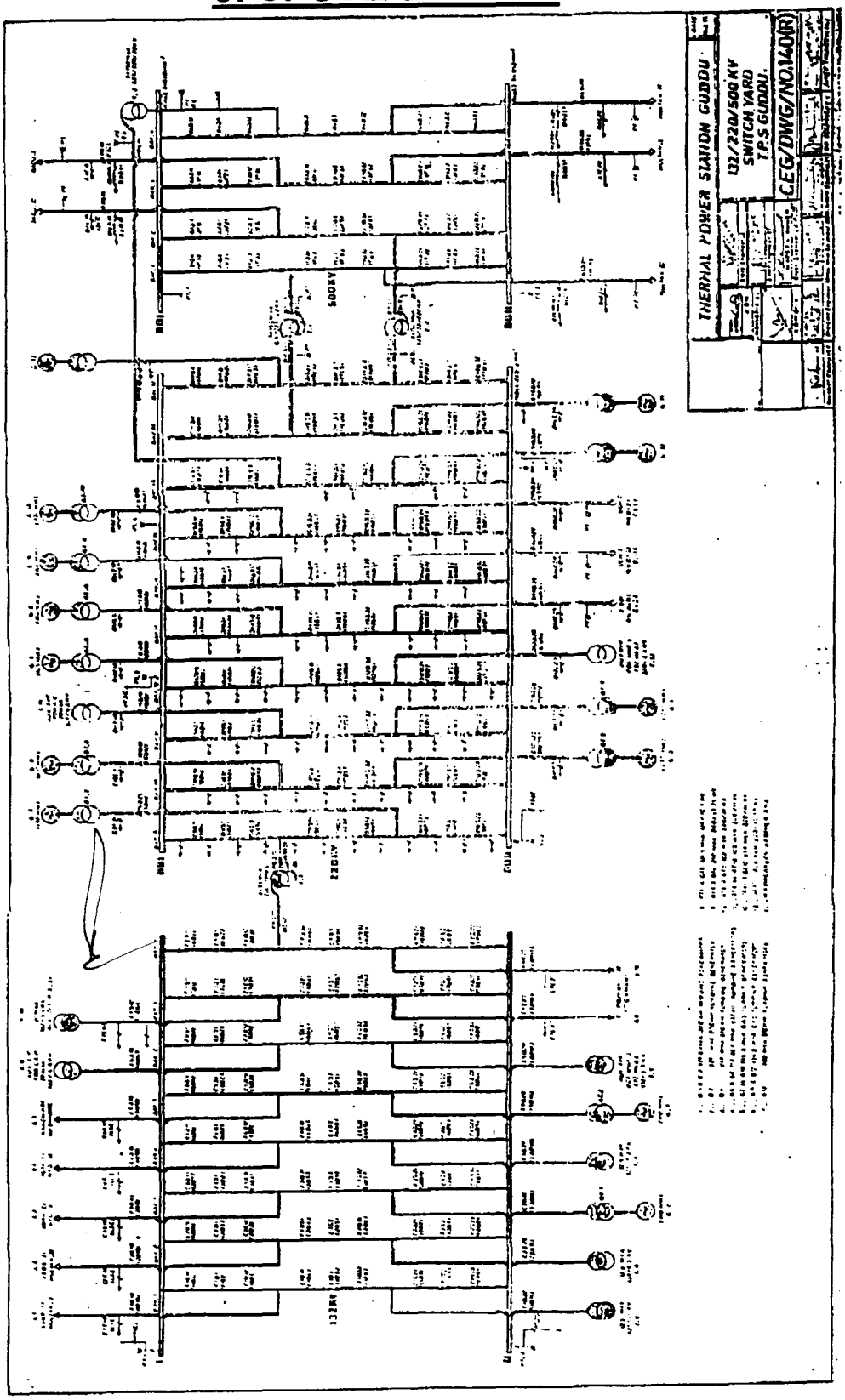
Location Map of Existing TPS Guddu & New 747.00 MW CCPP of Central Power Generation Company Limited (CPGCL)/GENCO-II



Plant Layout Map of Existing TPS Guddu & New 747.00 MW CCPP of CPGCL/GENCO-II



Single Line Diagram (Electrical) of Exiting TPS Guddu of CPGCL/GENCO-II



Interconnection/Transmission Facilities for Dispersal of Power from Existing Generation Facilities of TPS Guddu of CPGCL/GENCO-II

POWER EVACUATION FROM TPS GUDDU

1. TRANSMISSION LINES EMANATING FROM TPS GUDDU

Sr. No.	Voltage (Kv)	Circuit	Controlling Breakers	Capacity
01.	500	Multan-1	B3Q3&B3Q3	1000 MW/1200A
02.	500	Multan-2 (Muzaffergarh)	B4Q3&B4Q3	1000 MW/1200A
03.	500	Multan-3	B1Q3&B1Q3	1000 MW/1200A
04.	500	Dadu-1	B3Q1&B3Q3	1000 MW/1200A
05.	500	Dadu-2	B2Q1&B2Q3	1000 MW/1200A
06.	220	Sibbi	D13Q1&B2Q3	1000 MW/1200A
07.	220	Uch-1	D14Q2&D14Q3	300 MW/750A
08.	220	Uch-2	D15Q2&D15Q3	300 MW/750A
09.	132	Multan-1 (Sadiqabad)	E1Q2&E1Q3	300 MW/750A
10.	132	Multan-2 (Sadiqabad)	E2Q2&E2Q3	100 MW/600A
11.	132	Hyderabad-1 (Daharki)	E3Q2&E3Q3	100 MW/600A
12.	132	Hyderabad-2 (Ghotki)	E4Q2&E4Q3	100 MW/600A
13.	132	Kandh Kot (Kashmore)	E5Q2&E5Q3	100 MW/600A
14.	132	D.G Khan-1 (Rojhan)	E7Q2&E7Q3	100 MW/600A
15.	132	D.G Khan -2 (Rojhan)	E8Q2&E8Q3	100 MW/600A

2. AUTO TRANSFORMERS AT TPS GUDDU

Sr. No.	Voltage (kV)	Transformer	Controlling Breakers	Capacity (MVA)
01.	500 / 220	T-1	B1Q1&B1Q3/D16Q1&D16Q3	3 x 150 = 450
02.	500 / 220	T-2	B2Q2&B2Q3/D17Q2&D17Q3	3 x 150 = 450
03.	500 / 220	T-3	B4Q1&B4Q3/D18Q1&D18Q3	3 x 150 = 450
04.	220 / 132	T-4	D9Q1&D9Q3/E8Q1&E8Q3	3 x 75 = 225

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TRANSMISSIONS

System connected through NTDC with

132Kv Lines

Sadiq Abad - I	GRID
Sadiq Abad - II	GRID
Daharki	GRID
Ghotki	GRID
Kandh Kot	GRID
Rojhan - I	GRID
Rojhan - II	GRID

220Kv Lines

Sibbi	GRID
Uch - I	GRID
Uch - II	GRID

500Kv Lines

Dadu - I	GRID
Dadu - II	GRID
Multan - I	GRID
Multan - II	GRID
Multan - III	GRID

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Details of Existing Generation Facility/Thermal Power Plant*

(A). General Information

(i).	Name of Applicant	Central Power Generation Company Limited (CPGCL)/GENCO-II
(ii).	Registered /Business Office	TPS Guddu, Taluka Kashmore, District Jacobabad, Sindh
(iii).	Plant Location	Guddu, on Right bank of River Indus near Guddu Barrage
(iv).	Type of Generation Facility	Conventional Thermal Generating Units (i.e. Steam Turbines) and Combined Cycle Power Plant (with Gas Turbine, HRSG and Steam Turbines)

(B). Plant Configuration

(i).	Plant Size Installed Capacity (Gross ISO)	1655 MW						
(ii).	Type of Technology	Thermal						
(iii)	Number of Units/Size (MW)	Phase -I	Unit-1			Unit-2		
			110 MW			110 MW		
		Phase -II	Unit-3			Unit-4		
			210 MW			210 MW		
		Phase -III	Unit -5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10
			100 MW	100 MW	100 MW	100 MW	100 MW	100 MW
		Phase -IV	Unit-11			Unit-12		
			136 MW			136 MW		

* As provided by CPGCL

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(iv).	Unit Make & Model	Phase -I	Unit-1				Unit-2		
			Czechosolovakia				Czechosolovakia		
		Phase -II	Unit-3				Unit-4		
			Russia				China		
		Phase -III	Unit-5	Unit-6			Unit-7	Unit-8	
			USA	USA			USA	USA	
		Phase -IV	Unit-11	Unit-12					
			Germany	Germany					
(v).	Commissioning / Commercial Operation date (of each Unit)	Phase -I	Unit-1	Unit-2					
			March 30, 1974	Oct 06, 1974					
		Phase -II	Unit-3	Unit-4					
			Dec 07, 1980	Dec 29, 1985					
		Phase -III	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10	
			Dec 18, 1987	March 22, 1988	Dec 20, 1985	April 01, 1986	March 06, 1986	April 12, 1986	
		Phase -IV	Unit-11	Unit-12					
			Sep 27, 1992	Dec 07, 1992					
(vi).	Expected Life of the Facility from Commercial Operation/ Commissioning Date	As per PC-1 Life of each unit is declared 30 Years							
(vii).	Expected	Phase-	Unit-1	Unit-2					

	Remaining useful Life (in years) of each unit at the time of grant of original Generation Licence (No. GL/02/2002, dated July 01, 2002)	I	6 years		6 years					
		Phase-II	Unit-3		Unit-4					
			10 years		15 years					
		Phase-III	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10		
			15 years	15 years	15 years	15 years	15 years	15 years		
		Phase-IV	Unit-11					Unit-12		
			22 years					22 years		
(vii).	Expected Remaining useful Life (in years) of each unit at the time of this Modification-I	Phase-I	Unit-1		Unit-2					
			At least another 5-6 years after completion of the rehabilitation work expected to be completed on June 30, 2013		At least another 5-6 years after completion of the rehabilitation work expected to be completed on June 30, 2013					
		Phase-II	Unit-3		Unit-4					
			Completed its original useful on June 30, 2012. However, CPGCL is planning to rehabilitate the same. The matter of rehabilitation plan, expected completion date and expected useful life after rehabilitation is being taken up separately.		03 years (approximately)					
		Phase-III	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10		
			05 years	05 years	05 years	05 years	05 years	05 years		
		Phase-IV	Unit-11					Unit-12		
			12 years					12 years		

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(C). Fuel Details

				Primary Fuel	Alternative Fuel
(i).	Primary Fuel/Alternative Fuel	Phase-I	Unit-1	Gas	-
			Unit-2	Gas	-
		Phase-II	Unit-3	Gas	Furnace Oil
			Unit-4	Gas	Furnace Oil
		Phase-III	Unit-5	No Fuel Used	-
			Unit-6	No Fuel Used	-
			Unit-7	Gas	-
			Unit-8	Gas	-
			Unit-9	Gas	-
			Unit-10	Gas	-
		Phase-IV	Unit-11	Gas	-
			Unit-12	Gas	-
			Unit-13	No Fuel Used	-
(ii).	Fuel Source for each of the above (i.e. Imported/Indige-nous)	Indigenous			
(iii).	Fuel Supplier for each of the above	Gas		Kandh Kot, Mari, Tullow Fields (SNGPL/SSGCL)	
		Furnace Oil		PSO	
(iv).	Supply Arrangement for each of the above	Gas		Supply through Pipelines	
		Furnace Oil		Supply by Road from PSO Karachi	
(v).	No of Storage Tanks/Gross Storage	53400 M. Tons			

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(D). Emission/Effluents Values

	Emissions/ Effluents	PAK Standards (NEQS)	Measured Values
(i).	CO	0.8 ppm	Nil
(ii).	Sox	0.4 ppm	0.41 ppm
(iii).	NOx	0.4 ppm	Nil
(iv).	Effluents	6-9 pH	Nil

(E). Cooling System

(i).	Cooling Water Source/Cycle	Primary Source (Open Cycle)	Canal Water supply from Begari Sind (B.S) Feeder eminiting from Right Bank of River Indus at Guddu Barrage
		Secondary Source (Close Cycle)	Water Supply through Tube Wells and Floating Pump House from Guddu Barrage.

(F). Plant Characteristics

		Phase-I		Phase-II		Phase-III						Phase-IV		
	Units	1	2	3	4	5	6	7	8	9	10	11	12	13
(i).	Generation Voltage (KV)	10.5	10.5	15.75	15.75	11	11	11	11	11	11	11	11	15.75
(ii).	Frequency (Hz)	50	50	50	50	50	50	50	50	50	50	50	50	50

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(iii).	Power Factor	-	-	0.9	0.85	0.85	0.85	0.85-0.9	0.85-0.9	0.85-0.9	0.85-0.9	0.85	0.85	0.85
(iv).	Automatic Generation Control (AGC)/Yes (Y)/No (N)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
(v).	Ramping Rate MW/Min	2	2	2	2	10	10	15	15	15	15	20	20	8
(vi).	Time required to Synchronize to Grid and loading the complex to full load (Min).	2.5	2.5	2.5	2.5	4	4	20	20	20	20	4	4	3.5

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776.70 MW (ISO)
&
747.00 MW (at Mean Site Condition)
New Combined Cycle Power Plant (CCPP) &
at
TPS Guddu

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Details of New 747.00 MW CCPP Generation Facility /Thermal Power Plant†

(A). Plant Configuration

(i).	Plant Size Installed Capacity (Gross at Average Site Conditions)	776.70 MW			
(ii).	Type of Technology	Combined Cycle Power			
(iii).	Number of Units/Size (MW)	Gas Turbine	GT-1 255.60 MW (ISO)	GT-1 255.60 MW (ISO)	
		Steam Turbine	ST 1 x 265.50 MW (ISO)		
(iv).	Unit Make & Model	Gas Turbine	G.E./PG9351(MS 9001 FA)		
		Steam Turbine	Harbin Turbine Company China.		
(v).	Commissioning and Commercial Operation date	GT-1 August 22, 2014	GT-2 September 24, 2014	ST March 19, 2014	
(vii).	Expected Life of the Facility from Commercial Operation Date	30 years (approximately)			

(B). Fuel Details

(i).	Primary Fuel	Natural Gas (NG)
(ii).	Alternate/Back-up Fuel	High Speed Diesel Oil (HSDO)
(iii).	Fuel Source (Imported/Indigenous)	Indigenous

† As provided by CPGCL

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(iv).	Fuel Supplier	Primary Fuel	Alternate/Back-up Fuel
		SNGPL, Mari Gas, PPL	PSO
(v).	Supply Arrangement	Primary Fuel	Alternate/Back-up Fuel
		Pipe line	Oil Tankers
(vi).	No of Storage Tanks for Main / Alternate /Backup Fuel	Primary Fuel	Alternate/Back-up Fuel
		Not Applicable	04 Tanks
(vii).	Storage Capacity of each Tank	Primary Fuel	Alternate/Back-up Fuel
		Not Applicable	17,715 M^3
(viii).	Gross Storage of Tank(s)	Primary Fuel	Alternate/Back-up Fuel
		Not Applicable	70,860 M^3

(C). Emission Values

(i).	SO_x	Primary Fuel	Alternate/Back-up Fuel
		275 PPM	Not Applicable
(ii).	NO_x	Primary Fuel	Alternate/Back-up Fuel
		15 ppmvd	42 ppmvd
(iii).	CO	Primary Fuel	Alternate/Back-up Fuel
		25 ppmvd	20 ppmvd
(iv).	PM_{10}	Primary Fuel	Alternate/Back-up Fuel
		50mg/nm^3	Not Applicable

(D). Cooling System

(i).	Cooling Water Source/Cycle	Raw Water / Canal Water / Open Cycle & Close Cycle.

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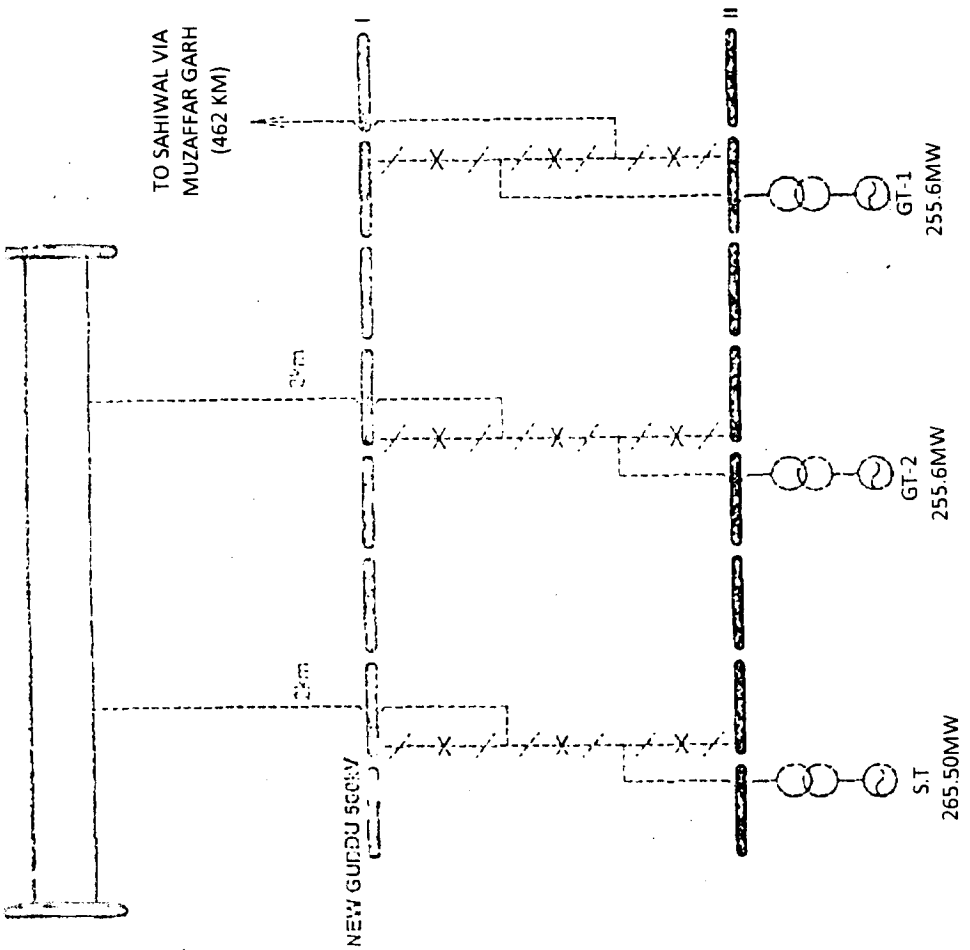
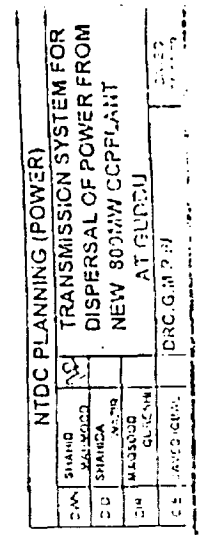
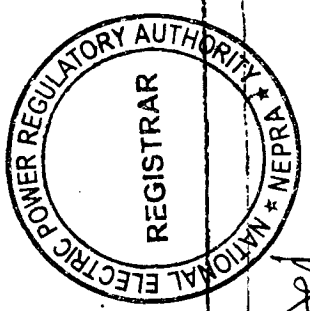
(E). Plant Characteristics

(i).	Generation Voltage	GT-1	GT-2	ST
		15 KV	15 KV	20 KV
(ii).	Frequency	50 Hz		
(iii).	Power Factor	0.85		
(iv).	Automatic Generation Control	Yes		
(v).	Ramping Rate (MW per Minutes)	GT-1	GT-2	ST
		17.357	17.357	1.891
(vi).	Time required to Synchronize to Grid and loading the complex to full load (Hours)	GT-1	GT-2	ST
		0.26	0.26	1.5

Single Line Diagram (Electrical) of New 747.00 MW CCPP of CPGCL/GENCO-II







Interconnection/Transmission Facilities for Dispersal of Power from New 747.00 MW CCPP of CPGCL/GENCO-II at TPS Guddu

The Electrical Power from new 747.00 MW CCPP shall be dispersed through 500 KV Sub-Station and Transmission Line link with the following scope:-

(a). A new 500 kV Sub-station will be constructed at 747.00 MW CCPP Project Guddu;

(b). A new 500 KV D/C Transmission Line measuring about 2.5 Km, from 500 KV Sub-station of 747.00 MW CCPP to 500 KV Existing Transmission Line Guddu- Multan circuit-III will be constructed by making an In-Out arrangement;

The final Interconnection and Transmission Arrangement(s) [including length of line, type of conductor etc.] for the dispersal of power, if other than above will be communicated to NEPRA in due course of time.

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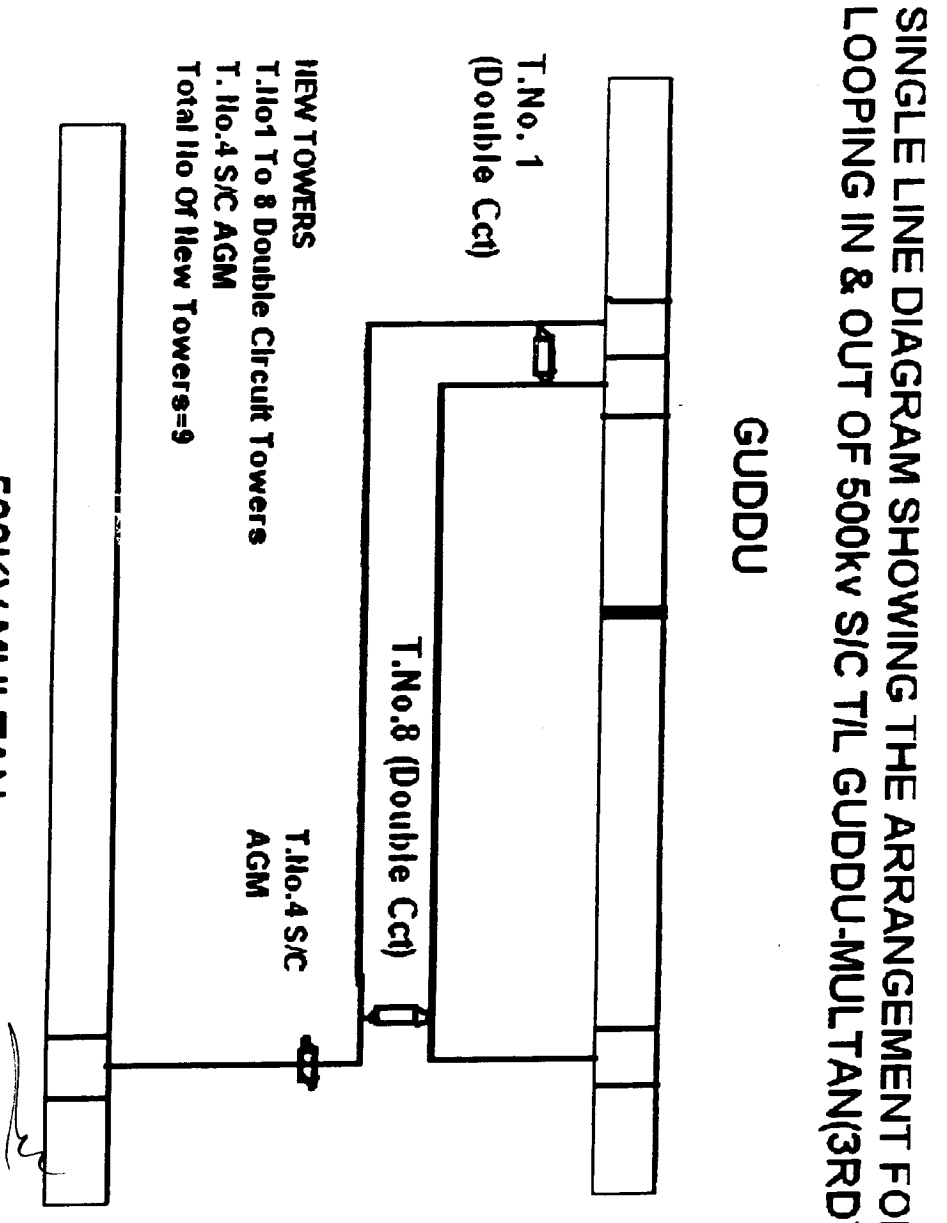
Schematic diagram of Interconnection/Transmission Facilities for Dispersal of Power from New 747.00 MW CCPP of CPGCL/GENCO-II at TPS Guddu



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SCHEDULE-II

The Installed/ISO Capacity (MW), De-Rated Capacity At Mean Site Conditions (MW), Auxiliary Consumption (MW) and the Net Capacity At Mean Site Conditions (MW) of the Generation Facilities of Licensee is given in this Schedule

SCHEDULE-II*

Description	Unit No.	Date of Commissioning	Installed Capacity (MW)	De-rated Capacity (MW)	Net Capacity* After Auxiliary Consumption (MW)
Existing Generation Facility of TPS Guddy	1.	March 30, 1974	110.00	85.00	78.20
	2.	October 06, 1974	110.00	85.00	78.20
	3.	December 07, 1980	210.00	180.00	164.70
	4.	December 29, 1985	210.00	180.00	169.20
	5.	December 18, 1987	100.00	85.00	82.02
	6.	March 22, 1988	100.00	85.00	82.02
	7.	December 20, 1985	100.00	95.00	93.57
	8.	April 01, 1986	100.00	95.00	93.57
	9.	March 06, 1986	100.00	95.00	93.57
	10.	April 12, 1986	100.00	95.00	93.57
	11.	September 27, 1992	136.00	130.00	128.05
	12.	December 07, 1992	136.00	130.00	128.05
	13.	March 17, 1994	143.00	140.00	135.10
New 747.00 MW CCPP of TPS Guddu	1.	August 22, 2014	255.60	243.00	241.72
	2.	September 24, 2014	255.60	243.00	241.72
	3.	March 19, 2014	265.50	261.00	237.35
Grand Total			2431.70	2227.00	2140.61

* As provided by Licensee/CPGCL

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Note

All the above figures are indicative as provided by the Licensee. The Net Capacity available to Power Purchaser (i.e. NTDC/CPPA) for dispatch will be determined through procedure(s) contained in the Bi-lateral Agreement(s), Grid Code or any other applicable document(s).

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