National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/R/LAG-01/ 12157-64 July 10, 2019

Chief Executive Officer,
Central Power Generation Company Limited (CPGCL),
Thermal Power Station, Guddu,
Tehsil Kashmore, Sindh.

Subject: **Modification in Generation Licence No: GL/02/2002**
Licence Application No. LAG-01
Central Power Generation Company Limited, (CPGCL)

Reference: *CPGCL's Licensee Proposed Modification (LPM) vide its letter dated June 21, 2017 (received on June 29, 2017)*

The Authority has approved the Modifications in Generation Licence No. GL/02/2002 in respect of Central Power Generation Company Limited (CPGCL), pursuant to NEPRA Licensing (Application and Modification Procedure) Regulations 1999; enclosed please find herewith

(i) Determination of the Authority in the matter of Authority Proposed Modification in the Generation Licence of Central Power Generation Company Limited Regarding Unit-3 of it TPS Guddu. (12 Pages)

(ii) Determination of the Authority in the matter of Licensee Proposed Modification of CPGCL for Extension in the Term of its Generation Licence and Inclusion of Unit-6 of TPS Quetta in the same. (12 Pages)

(iii) Modification-II in the Generation Licence No. GL/02/2002 alongwith Changes in the Generation Licence as Annexure-A (02 Pages), Changes in Schedule-I (29 Pages) and Changes in Schedule-II (02 Pages).

Enclosure: **As above**

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY REGISTRAR NEPRA

10.07.19

(Syed Safeer Hussain)

Copy to:

1. Secretary, Power Division, Ministry of Energy, A-Block, Pak Secretariat, Islamabad.
2. Managing Director, NTDC, 414-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Chief Executive Officer, Sukkur Electric Supply Company (SEPCO), Old Thermal Power Station, Sukkur.
5. Chief Executive Officer, Quetta Electric Supply Company (QESCO), 14-A Zarghoon Road, Quetta.
6. Chief Executive Officer, Multan Electric Power Company (MEPCO), NTDC Colony, Khanewal Road Multan.
7. Director General, Environment Protection Department, Government of Sindh, Complex Plot No. ST-2/1, Korangi Industrial Area, Karachi.

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of the Authority Proposed Modification in the Generation Licence of Central Power Generation Company Limited Regarding Unit-3 of its TPS Guddu

July
~~June~~ 10, 2019
Case No. LAG-02

(A). Background

(i). The Authority granted a generation licence (No. GL/02/2002, dated July 01, 2002 and subsequently modified through modification-I dated April 26, 2013) to Central Power Generation Company Limited (CPGCL/GENCO-II) with a cumulative Installed Capacity of 2431.70 MW for its two (02) generation facilities (i.e. an old generation facility having a combination of Conventional Steam Turbine Units and Combined Cycle Power Plant (CCPP) with installed capacity of 1655 MW and a new Gas based CCPP with installed capacity of 776.70 MW) at Thermal Power Station Guddu (TPS Guddu).

(ii). Old Gas based CCPP of TPS Guddu consists of thirteen (13) Gas & Steam based Units (2x110 MW + 2x210 MW + 6x100 + 2x136 + 1x143 MW), commissioned between 1974 and 1994. New Gas based CCPP consists of three (03) units (2x255.60 MW + 265.50 MW), commissioned in 2014.

(B). Communication of Authority Proposed Modification (APM)

(i). At the time of grant of the generation licence, the remaining useful life of the Unit-3 of Thermal Power Station (TPS) Guddu was set to ten (10) years from the date of issuance of the licence which expired on June 30, 2012.

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In this regard, CPGCL/GENCO-II did not apply the Authority for extension of useful life of the said unit.

(ii). In this regard, the Authority in its different regulatory meetings deliberated upon the performance of the said unit and observed that due to lower efficiency of the unit and non-availability of the primary fuel (i.e. natural gas), the operation of the unit on the alternate fuel i.e. Residual Furnace Oil (RFO) is becoming very costly to the Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), which is resulting in increased overall basket price making the unit uneconomical and unviable for operation.

(iii). In consideration of the above, it was decided to initiate the proceedings of APM to exclude the Unit-3 from the generation licence of CPGCL/GENCO-II. Accordingly, under Section-26 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, as amended or replaced from time to time ("the NEPRA Act") read with the Regulation-10(1) of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 ("the Licensing Regulations"), an APM was communicated to CPGCL/GENCO-II on December 28, 2015.

(iv). In the text of the proposed APM it was stated that the existing Schedule-I & II of the generation licence of CPGCL/GENCO-II indicating Unit-3 of the TPS Guddu as generating unit, would be replaced with new/modified Schedule-I & II excluding the said unit from the generation licence. In statement of the reasons in support of the APM, it was mentioned that the Unit-3 of TPS Guddu use natural gas as the primary fuel and RFO as alternative fuel. Due to non-availability of the natural gas, Unit-3 of TPS Guddu is operated on RFO. The efficiency of the unit has reportedly deteriorated from designed/37.55% to 25.889% which is very low as compared to other generation facilities operating/having efficiency of around 56%. Due to the said, these units are ranked at the bottom of the merit order. The generation of electricity from the aforementioned units is costing CPPA-G an approximate cost of Rs.

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19.2629/KWh on RFO which is resulting in an increased consumer end tariff making these units uneconomical and unviable for operation.

(v). In order to inform the general public and other stakeholders, as required under the Regulation-10(4) of the Licensing Regulations, the Registrar published a notice of the APM in one (01) English and one (01) Urdu newspaper (The DAWN and daily Jang) respectively, on December 30 & 31, 2015, inviting their comments in the matter within a period of fourteen (14) days from the publication.

(vi). Apart from the above, separate letters were also sent to government ministries, attached departments and representative organizations etc. on December 31, 2015. Through the said letters, the stakeholders were informed about the APM and publication of notice of APM in the press. Further, the said entities were invited to submit their views and comments in the matter for assisting the Authority.

(C). Response of CPGCL/GENCO-II and Stakeholders on APM

(i). In response, CPGCL/GENCO-II through its letter dated January 18, 2016 opposed the proceedings of APM and contested the figures of efficiency and useful life of the units communicated in the APM. CPGCL submitted that unit is being operated on the request of System Operator and is generating 140.00 MW. Further, it clarified that the unit is operating only on Natural Gas costing Rs. 7.95/KWh including establishment and other charges and did not agree to the communicated APM.

(ii). In response to the notice of APM published in the press, the Authority received comments from Anwar Kamal Law Associates (AKLA) only. In its comments AKLA strongly supported the APM proceedings with certain queries regarding delays in initiating APM.

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(iii). The Authority examined the above comments of stakeholders & response of CPGCL/GENCO-II and observed that the licensee/CPGCL did not agree to the communicated APM. Therefore, the Authority decided to convene a public hearing in the matter, as stipulated in Regulation-10(6) of the Licensing Regulations.

(D). Public Hearing

(i). The Public Hearing was convened on July 13, 2016. Accordingly, the following Issues were framed by the Authority for the said public hearing:-

(a). According to the terms and conditions of the generation licence (No.GL/02/2002 dated July 01, 2012), Unit-3 of TPS Guddu had a remaining useful life of ten (10) years which expired on June 30, 2012 and has not been extended in terms of Rule-5(2) of the NEPRA Licensing (Generation) Rules, 2000 ("the Rules"). Then how the operation of this unit is justified?

(b). Why did the licensee (CPGCL/GENCO-II) not apply for extension in the useful life of Unit-3 of TPS Guddu, if it considers that these plants can be operated for a further period?

(c). Due to non-availability of Natural Gas, Unit-3 of TPS Guddu is being operated on RFO and their efficiency has reportedly dropped to 25.899%. Due to operation on expensive alternate fuel and very low efficiency, per unit generation cost of the unit is very high and it is ranked at the bottom of merit order. In view of the said, is generation from this unit economically viable and in the interest of consumers?

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(d). Why did CPPA not agitate this issue in the past, which has been overburdening the electricity consumers and causing deterioration in the economy of the country by increasing the consumer end Tariff?

(e). Why did DISCOs not agitate this issue despite the fact that DISCOs are responsible to procure and supply electricity to their consumers at economical rate?

(f). The utilization factor of this unit has been 13.72%, 12.65%, 12.42% and 11.75% for the FY-2010-11, FY-2011-12, FY-2012-13, and FY-2013-14 respectively, which is very low. Does retaining this unit with such low utilization factor merit?

(g). According to the State of Industry Report 2015, various units of GENCO-II have remained off-bar since long due to their poor efficiency levels. The overall net efficiency of GENCO-II is also very low at 25.63%. Furthermore, due to various maintenance issues, forced outages and fuel constraints etc. resulting in annual capacity utilization of 37.52%, the overall performance of GENCO-II is not satisfactory. Why?

(h). Has CPGCL/GENCO-II taken any measures to rehabilitate this unit and to make its operation economically viable? What will be the effect of the planned rehabilitation (if any), in terms of efficiency, unit cost and life of the unit?

(i). What has been the impact of the import of RLNG on operation of this unit? Is allocation of precious resource (RLNG) to this low efficiency unit justified, whereas power

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plants with higher efficiency are suffering from fuel constraints?

(ii). The public hearing was held on July 13, 2016 which was attended by representatives of CPGCL/GENCO-II, CPPA-G, GENCO Holding Company Limited, Northern Power Generation Company Limited (NPGCL/GENCO-III), Ministry of Water and Power (MoW&P), Sui Northern Gas Pipelines Limited (SNGPL), Mari Petroleum Company Limited and other stakeholders and representatives of the general public.

(iii). In the said public hearing, CPGCL made a presentation before the Authority submitted its point of view on the communicated APM and issues of hearing that:-

(a). Unit-3 was commissioned in December 1980 and afterwards it has only operated for less than twenty five (25) years in terms of running hours. Therefore, the unit still has more than five (05) years of useful life;

(b). The generation licence is valid June 30, 2017 and based on the said understanding it did not approach the Authority for the extension;

(c). The Unit-3 of TPS Guddu is only being operated on natural gas on requirement of the System Operator;

(d). The system operator/NPCC operates these units as per the merit order. The current position of TPS Guddu is 16th in the overall merit list for the last few months due to operation on gas;

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(e). When operated on gas, per unit cost of generation from TPS Guddu is lower than many Thermal IPPs, Solar and Wind power plants.

(f). The Unit-3 was less utilized by the system operator in the last three years due to unavailability of natural gas in-spite the availability factor of the Unit was around 90%.

(g). During the months of March, April and May, 2016 when gas was made available, these units were operated by the system operator and the utilization factor of TPS Guddu remained 67%, 84% and 61% for the said months;

(h). Major overhauling of Turbine, Generator, Boiler, Furnace, Burners, H.P. Heaters, Boiler Feed Pumps and Combustion Air & Flue Gas Ducts along with other essential auxiliaries of the Unit-3 has been carried out.

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(iv). In the said hearing, CPGCL/GENCO-II also took a stance that generation licence was granted to it in 2002 for a term of fifteen (15) years which is valid till 2017. Therefore, CPGCL/GENCO-II understands that legally its generation licence is valid and based on the said understanding it did not approach the Authority for modification of licence with respect to extension in useful life of Unit-3 of TPS Guddu. However, this aspect was clarified during the hearing that term of generation licence commensurate with the maximum expected useful life of the units of a generation facility. Unit-3 of TPS Guddu is one of the units along with other units of TPS Guddu comprising the generation facility of CPGCL/GENCO-II. Useful life of Unit-3 expired in 2012 and cannot be equated with the remaining term of licence which is based on the other units. In view of foregoing, the Authority observed that if CPGCL/GENCO-II contends that Unit-3 of TPS Guddu has been upgraded and rehabilitated and has the capacity for further operation, it could have applied for extension in useful life of TPS Guddu through LPM. Later on,

CPGCL/GENCO-II communicated LPM on June 29, 2017 for renewal of the term of its generation licence and extending the useful life of Unit-3 of TPS Guddu for another twenty five (25) years i.e. upto 2042 and also for inclusion of 28 MW Gas based Unit-6 of TPS Quetta in its generation licence. LPM is a separate matter which has been dealt under Regulation 10(2) of the Licensing Regulations through separate proceedings and will be disposed of through a separate decision/determination of the Authority.

(v). After the proceedings of the public hearing, the Authority under Regulation-10(9) of the Licensing Regulations published a notice in the press on October 29, 2016 seeking comments regarding the proceedings of the public hearing. However, the Authority did not receive comments from any of the stakeholders.

(E). Evaluation/Analysis

(i). The Authority has examined the entire case in detail including the already granted generation licence, the APM initiated by the Authority, response of CPGCL/GENCO-II, comments of stakeholders, operational data of the Unit-3 of TPS Guddu, the framed Issues, response of CPGCL/GENCO-II on the framed issues and relevant rules and regulations.

(ii). The Authority observes that in terms of Regulation-10(1) of the Licensing Regulations, it is empowered to modify a licence in accordance with an APM. In this regard, Regulation-10(5) of the Licensing Regulations prescribes the criteria to modify a licence through an APM subject to and in accordance with such further changes as it may deem fit if, in its the opinion such modification (a). does not adversely affect the performance by the licensee of its obligations; (b). does not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to it; (c). is or is likely to be beneficial to the consumers; (d). is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence; and (e).is

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reasonably necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the licensee.

(iii). During the public hearing CPGCL/GENCO-II made submissions to present its point of view for retaining Unit-3 of TPS Guddu in its generation licence and the reasons in support of its claim.

(iv). Regarding the issues of *expiry of useful life of the Unit-3 of TPS Guddu and failure to apply for extension in term in the useful life of these units*, CPGCL/GENCO-II submitted that tentatively the useful life of thermal power plant is considered as thirty years, based on its efficient operation and safety factors. If properly maintained and timely rehabilitated, these plants can be operated for more years. Further, the unit was commissioned in December 1980 and afterwards it has only operated for less than twenty five (25) years in terms of running hours. Therefore, the unit still has more than five (05) years of useful life. Further, the generation Licence was granted to CPGCL/GENCO-II in 2002 for a term of fifteen (15) years which is valid till 2017. So CPGCL/GENCO-II understands that legally its generation licence is valid and based on the said understanding it did not approach the Authority for the extension.

(v). In this regard, the Authority observes that the normal operating life of a steam turbine is taken as 30-35 years based on round the year operation which can be extended based on actual operation hours and proper maintenance. According to the generation licence granted to CPGCL/GENCO-II on July 01, 2002, Unit-3 of TPS Guddu consists of a 210 MW steam turbine of Russian make. Further, at the time of grant of the generation licence, the remaining useful life of the generating Unit-3 of TPS Guddu was set to ten (10) years from the date of issuance of the licence. The said unit of TPS Guddu outlived its useful life in June 30, 2012. In view of the said, the Authority considers that the operation of this unit beyond its licenced useful life cannot be allowed. Further, life of Unit-3 of TPS Guddu expired in 2012 cannot be

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equated with the remaining term of the licence which is based on other units comprising the generation facility.

(vi). Regarding the issue of *non-availability of natural gas/operation of the units on costly alternate fuel (i.e. (RFO) and the impact of the import of RLNG on operation of these units*, CPGCL/GENCO-II submitted that Unit-3 of TPS Guddu has never been operated on the alternate fuel (i.e. RFO) since their commissioning except for testing purpose or if demanded by system operator on the actual merit order, if deemed necessary by NPCC. However, no generation has been done on RFO in last few years. This unit is only being operated on natural gas on the demand of system operator. If gas is made available, the utilization factor of the unit will be enhanced. In this regard, the Authority has observed that Unit-3 of TPS Guddu has natural gas as the primary fuel and RFO as alternative fuel. Due to non-availability of the natural gas, the only option for the operation of the said unit is the alternative fuel (i.e. RFO) which is very costly. Even if gas is available, its utilization in less efficient plant is not advisable. In view of the said, the Authority considers that the generation from Unit-3 of the TPS Guddu is economically not viable nor it is in the interest of consumers.

(vii). Regarding the *lower position of Unit-3 in the merit order and high per unit cost*, CPGCL/GENCO-II submitted that the exact ranking of units of TPS Guddu is 16th on gas fuel as per merit order issued by NTDC in May 2016, which is higher than many newly installed IPPs. Further, per unit generation cost from TPS Guddu less than many efficient IPPs. In consideration of the said, the Authority has observed that Unit-3 of TPS Guddu operates in open cycle mode and its net efficiency is very low (i.e. about 25.8%) and the use of scare resources like natural gas with very low efficiency is not justified. Even if operated on natural gas, the ranking of this unit in the merit order is very low due to very high per unit generation cost therefore the said unit is not viable for operation any more.

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(viii). Regarding the issue of *less utilization factor the Unit-3 of TPS Guddu*, CPGCL/GENCO-II submitted that these units were less utilized by the system operator in the last three years due to unavailability of natural gas despite the availability factor of these units was above 90%. However, during the months of March, April and May, 2016 when gas was made available, these units were operated by the system operator and the utilization factor of TPS Guddu remained 67%, 84% and 61% for the said months which is very high as compared to solar power plants which is less than 30%. In this regard, the Authority has observed that review of the E-Forms (which provide information regarding the operational performance of the generating units) submitted by CPGCL/GENCO-II on monthly and annual basis reveals that the utilization factor of Unit-3 of TPS Guddu for the FY-2016-17 and FY-2017-18 remained less than 20% which is on very low side.

(ix). On the issue of *lower efficiency of the generating Unit-3 of TPS Guddu*, CPGCL/GENCO-II submitted that the said unit has been upgraded and rehabilitated and being operated efficiently. In this regard, the Authority has observed that the designed efficiency of Unit-3 is 37.55%. Whereas, the reported net efficiency of the said unit is 25.889% which is on very low side.

(x). Regarding, the issue of rehabilitation of the Unit-3 of TPS Guddu, CPGCL/GENCO-II submitted that major overhauling of Unit-3 has been carried out including that of Turbine, Generator, Boiler, Furnace, Burners, H.P. Heaters, Boiler Feed Pumps and Combustion Air & Flue Gas Ducts along with other essential auxiliaries. In this regard, the Authority has observed that after expiry of the useful life in 2012, no proper rehabilitation, up-gradation or major overhauling has been carried out to make the units feasible for further operation except some partial rehabilitation i.e. which has not contributed to any significant efficiency gain and the same is far below the designed efficiency.

(xi). In consideration of the above, the Authority concluded that the Unit-3 of TPS Guddu is operating quite below its designed efficiency. Further,

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due to non-availability of natural gas, the said unit is mostly not operative or required to be operated on alternate fuels (i.e. RFO), which makes it un-economical due to higher per unit cost.

(xii). Foregoing in view, the Authority considers that Unit-3 of TPS Guddu is not viable for further operation anymore, therefore the same may be excluded from the generation licence of CPGCL/GENCO-II.

(F). Decision of the Authority

(i). In view of the above analysis, the Authority hereby decides to exclude Unit-3 of the TPS Guddu from the generation licence of CPGCL/GENCO-II. Accordingly, the generation licence of CPGCL/GENCO-II (No. GL/02/2002 dated July 01, 2002) stands modified. For the changes made in the generation licence through this APM and other parallel proceedings of LPM, the annexure attached to the determination of the Authority in the matter of LPM of CPGCL/GENCO-II may be referred. This Modification is subject to the provisions contained in the NEPRA Act, relevant rules framed thereunder, terms & conditions of the generation licence and other applicable documents.

Authority

Rafique Ahmed Sheikh
(Member)

22/6/19

Saif Ullah Chattha
(Member)

24.6.2019

Rehmatullah
(Member)

10.6.19

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National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of the Licensee Proposed Modification of Central Power Generation Company Limited for Extension in the Term of its Generation Licence and Inclusion of Unit-6 of TPS Quetta in the Same

July
~~June~~ 10, 2019
Case No. LAG-02

(A). Background

(i). The Authority granted a generation licence (No. GL/02/2002, dated July 01, 2002 and subsequently modified through modification-I dated April 26, 2013, to Central Power Generation Company Limited (CPGCL/GENCO-II) having a cumulative Installed Capacity of 2431.70 MW for its two (02) generation facilities (i.e. an old generation facility having a combination of Conventional Steam Turbine Units and Combined Cycle Power Plant (CCPP) with installed capacity of 1655 MW and a new Gas based CCPP with installed capacity of 776.70 MW) at Thermal Power Station Guddu (TPS Guddu).

(ii). Old generation facility of TPS Guddu consists of thirteen (13) Gas & Steam based Units (2x110 MW + 2x210 MW + 6x100 + 2x136 + 1x143 MW), commissioned between 1974 and 1994. The New Gas based CCPP consists of three (03) units (2x255.60 MW + 265.50 MW), commissioned in 2014.

(B). Communication of LPM

(i). Under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, as amended or replaced from time to time ("the NEPRA Act") read with the Regulation-10(1) of the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 ("the Licensing Regulations"), the Authority initiated an Authority Proposed Modification (APM) in the generation licence of CPGCL/GENCO-II for excluding Unit-3 of TPS Guddu

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from its generation fleet. The APM was communicated to CPGCL/GENCO-II on December 28, 2015. The very basis of APM was that Unit-3 of TPS Guddu has already outlived its useful life, which expired on June 30, 2012. Further, its efficiency has deteriorated from 37.55% to 25.889%, making the generation of electricity from the said unit uneconomical and unviable which is costing at Rs. 19.2629/KWh on alternate fuel i.e. Furnace Oil, due to unavailability of Natural gas.

(ii). In response, CPGCL/GENCO-II through its letter dated January 18, 2016, opposed the proceedings of APM and contested the figures of efficiency and useful life of the unit communicated in the APM. CPGCL submitted that unit is being operated on the request of System Operator i.e. National Power Control Centre (NPCC) and is generating 140.00 MW. Further, CPGCL/GENCO-II clarified that the unit is operating only on Natural Gas costing Rs. 7.95/KWh including establishment and other charges and did not agree to the communicated APM.

(iii). As the licensee/CPGCL did not agree to the APM, therefore, in terms of Regulation-10(6) of the Licensing Regulations, the Authority decided to convene a public hearing on July 13, 2016. In the said public hearing, CPGCL made a presentation before the Authority and submitted its point of view on the communicated APM and issues of hearing. Representatives of CPGCL/GENCO-II submitted that the unit was commissioned in December 1980 and afterwards it has only operated for less than twenty five (25) years in terms of running hours. Therefore, the unit still has more than five (05) years of useful life. CPGCL/GENCO-II also submitted that unit is being operated on the request of System Operator and is generating 140 MW. CPGCL further stated that the unit is operating only on Natural Gas costing Rs. 7.95/KWh including establishment and other charges. CPGCL requested the Authority to keep the Unit-3 operational for another five (5) years for emergency use and showed its intention to file Licensee Proposed Modification (LPM) for retaining this unit beyond its original useful life.

(iv). Later on, in accordance with Regulation-10(2) of the Licensing Regulations, CPGCL/GENCO-II communicated a Licensee Proposed Modification

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(LPM) to the Authority on June 29, 2017. In the text of the proposed modification, CPGCL/GENCO-II proposed to extend the useful life of Unit 1-13 except Unit-4 of TPS, Guddu for another twenty five (25) years i.e. upto 2042 and for inclusion of 28 MW Gas based Unit-6 of TPS Quetta in its generation licence.

(v). Regarding the statement of reasons in support of the modification for extending the term of the Units-1-13 except Unit-4, the CPGCL/GENCO-II submitted that its generation licence is valid till June 30, 2017 and in order to discharge its contractual obligations under the Power Purchase Agreement (PPA) it is required to maintain a generation licence from the Authority which remains valid for the life of PPA. Regarding inclusion of Unit-6 of TPS Quetta in its generation licence, CPGCL/GENCO-II, stated that the company commenced its commercial operation on March 01, 1999 and its complex was initially comprised of three (03) distinctly located generation facilities i.e. at Guddu, Quetta and Sukkur. The commercial operation of the TPS Quetta and Sukkur was discontinued in April 2000. However, on May 14, 2004, Standing Committee of Ministry of Water and Power (MoW&P) decided to make TPS Quetta operational. In this regard, ECC on May 20, 2004 approved 10MMCFD gas during summer months i.e. April to September from 2004 to 2010 and 05 MMCFD in winter i.e. October to March 2006 to 2010 subject to the commissioning of Zurgoon gas field and its integration with Quetta Transmission System. Since then TPS Quetta is operational seasonally, on the requirement of System Operator for only six (06) months in a year on availability of fuel gas w.e.f. April to September and delivering energy on basis of transfer pricing. In this context, the System Operator has approached CPGCL/GENCO-II in the light of the directives of the Authority for obtaining the generation licence for TPS Quetta to legalize its generation. Regarding deletion of Unit-4 from its generation licence, CPGCL/GENCO-II has submitted that the said unit has completed its useful life beyond repair.

(vi). About "statement of the impact on the tariff, CPGCL/GENCO-II submitted that that Tariff Petition for TPS Quetta will be submitted after obtaining the generation licence. Further, CPGCL/GENCO-II also planned for applying modification in existing Tariff for Unit-1 to 13 except Unit-4 for adjustment of Heat

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Rate on partial loading in accordance with manufacturer's calculation correction Curve as allowed for 747 MW CCPP.

(vii). Regarding Quality of Service, CPGCL/GENCO-II stated that the quality of service and performance of the company under the generation licence shall not be affected by approval of this LPM. Regarding Impact on the obligations of the Company under the Licence, CPGCL/GENCO-II submitted that proposed LPM would facilitate the Company in fulfilling its obligations under the licence and PPA.

(C). Processing of LPM

(i). After completion of all the required information as stipulated under the Regulation 10 (2) and 10 (3) of the Licensing Regulations by CPGCL/GENCO-II, the Registrar published the communicated LPM on August 12, 2017 in one (01) English and one (01) Urdu newspaper ("The News" and "daily Express"), informing the general public about the communicated LPM and inviting their comments within a period of fourteen (14) days from the date of the said publication.

(ii). Apart from the above, separate letters were also sent to government ministries, their attached departments and representative organizations etc. on August 16, 2017. Through the said letters, the stakeholders were informed about the communicated LPM and publication of notice in the press. Further, the said entities were invited to submit their views and comments in the matter for assisting the Authority.

(D). Comments of Stakeholders

(i). In reply to the above, the Authority received comments of from five (05) stakeholders including Central Power Purchasing Agency (Guarantee) Limited (CPPA-G), Anwar Kamal Law Associates (AKLA), Sui Southern Gas Company Limited (SSGC), GENCO Holding Company Limited (GHCL) and Quetta Electric Supply Company Limited (QESCO). The salient points of the comments offered by the above mentioned stakeholders are summarized in the following

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paragraphs:-

(a). CPPA-G submitted that CPGCL/GENCO-II has carried out major overhauling of Unit no. 3, 9, 11, 12. However, these units are in standby mode due to shortage of gas as the gas allocated for these units has already been diverted to 747 MW CCPP. Firstly, this office has the concern about the availability of gas to these units. Secondly CPGCL/GENCO-II has neither mentioned about the operational conditions of Unit no. 9, 11 & 12 and nor the present efficiency of these units in the said petition. CPGCL/GENCO-II has submitted that Unit no. 1, 2, 4 & 13 are under shutdown for want of major repair and estimated period for requisite maintenance work for restoration of the Units No. 1 & 2 is 6 months and for Unit no. 4 & 13 is 30 months. CPGCL/GENCO-II must ensure about the operational condition of these units without any trouble and with improved efficiency after maintenance work. CPPA-G highlighted that it has to pay Fixed Charges during maintenance of the Units 1, 2, 4 & 13 i.e. from 6 to 30 months, which will ultimately affect the end consumers. CPPA-G highlighted that CPGCL/GENCO-II has not mentioned operational conditions, thermal efficiency and utilization factor regarding Unit no. 5, 6, 7, 8, 10, and 11 in the petition. Further, CPPA-G opposed the inclusion of Unit no.6 of TPS Quetta having installed capacity of 28 MW on the premise that the same has de-rated capacity of 22 MW and very low thermal efficiency of 19.2%. It argued that thermal efficiency of the plant is only 19.2%, therefore it is not logical to include it in the generation licence because the operation of a 19.2% efficiency plant will negate the concept of optimum utilization of the scarce gas resources. The same gas, if allocated to available plants with much higher efficiency, shall yield as high as three times the electricity generated by TPS Quetta;

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(b). AKLA submitted that units of TPS Guddu have outlived their useful life but these units are still in operation. The operation of these units beyond their useful life is illegal. The capacity payment made to CPGCL/GENCO-II against these units beyond their useful life is also illegal. Despite their low VO&M, the EPP of these gas based units is very high. Moreover, the plant utilization factors of these power plants are very low, which in turn further increases the cost of power purchases from these units. Pakistan's scarce resource is not being used to its optimal economic value. On one hand the power plants of 51% efficiency are not being operated due to non-availability of gas, while on the other hand the power plants of much lower efficiency (19-30%) are being operated on pipeline quality gas. In view of the said, Anwar Kamal Law Associates has requested the Authority to reject the LPM of CPGCL/GENCO-II. If, for any reason, it is necessary to have these plants in the system, their Tariff should be shifted from 'Take or Pay' basis to 'Take and Pay' basis;

(c). SSGC informed that allocation for supply of gas by Government of Pakistan (GoP) to TPS Quetta is up to 2018. SSGC does not have any further GoP directives/approval for any additional allocation to TPS Quetta. SSGC is already facing shortage in indigenous gas supplies to meet the demand of its existing customers. Further, no request from TPS Quetta for supply of gas beyond 2018 is in process/under consideration with SSGC;

(d). GHCL in its comments supported the proposed LPM of CPGCL/GENCO-II; and

(e). QESCO submitted that TPS Quetta plays a vital role in improving Voltage profile, because QESCO system is at tail end of National Grid, therefore, it faces severe Voltage fluctuations during summer season due to dominating agricultural tube-well load.

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TPS Quetta can also be operated as condenser (supplying VARS system) to improve the Voltage level even without availability of fuel gas. QESCO informed that Habibullah Coastal Power Company Limited (HCPC) does not inject full Reactive Power i.e. 92 MVAR as described in Power Purchase Agreement (PPA) which resulted in severe voltage fluctuations, at Quetta load center. In case of any interruption on the Transmission Line of NTDC majority of the Balochistan plunges into darkness. HCPC openly refuses to start generation or delays generation putting QESCO in awkward position. Whereas, TPS Quetta being a public sector power house can be taken on load by demand without any restriction pre-conditions as imposed by IPPs. Foregoing in view, QESCO supported the inclusion of TPS Quetta in the generation licence of CPGCL/GENCO-II.

(ii). The Authority examined the comments of abovementioned stakeholders and it was observed that GHCL & QESCO have supported the proposed LPM of CPGCL/GENCO-II, whereas CPPA-G, AKLA and SSGC have made some serious observations regarding proposed LPM. Accordingly, the Authority considered it appropriated to seek perspective of CPGCL/GENCO-II on the comments of above stakeholders. In this regard, in response to the comments of SSGC CPGCL/GENCO-II submitted that the case for obtaining the Re-gasified Liquefied Natural Gas (RLNG) from SSGC is in progress and SSGC has already offered for provision of RLNG for TPS Quetta. Further, CPGCL/GENCO-II submitted that (a). extension of life of these units was due to less operation (less running hours), (b). the variable O&M of these units is lower as compared to high efficiency IPPs and (c). the Fuel Cost Component of Block-IV remained quite competitive to new and high efficiency IPPs. Moreover, CPGCL/GENCO-II submitted that the merit order issued by system operator from time to time also reflect that CPGCL/GENCO-II has priority over some IPPs due to less cost of kWh.

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(iii). In this regard, the Authority has observed that AKLA had highlighted the same issues in the matter of APM proceedings of these units. The Authority considered the comments of AKLA and other stakeholders and held a public hearing on July 13, 2016 wherein, these issues were deliberated in detail.

(iv). In addition to the above, the Authority also considered it appropriate to seek specific comments of NPCC of NTDC in the matter. In this regard, NPCC in its comments recommended that; (a). Unit 5-13 of TPS Guddu may be retained in the generation licence of CPGCL; (b). Inefficient Block-I (i.e. Units 1-2) and Block-II (i.e. Units 3-4) may be replaced by new efficient units because these units have already completed their useful life, so that the existing infrastructure may be utilized; (c). Black start facility may be provided with the new units so that in case of system disturbance/tripping, restoration process can be started quickly, as most of the units in South are steam units (Port Qasim, HUBCO, Jamshoro etc.) and does not have the Black Start Facility. Furthermore, NPCC supported the inclusion of Unit-6 of TPS Quetta in the generation licence of CPGCL/GENCO-II for its important role regarding; (a). Black Start facility; (b). Voltage regulation; (c). Power supply to Quetta city area in island mode in case of any disturbance on NTDC/QESCO network; and (d). Support 220/132 kV Transformers loading within limits at 220 kV Quetta industrial grid.

(v). In view of the said, the Authority considered it appropriate to process the LPM of CPGCL/GENCO-II as stipulated in the relevant regulations and NEPRA Licensing (Generation) Rules 2000 ("the Generation Rules").

(E). Findings/Analysis

(i). The Authority has examined the entire case in detail including the already granted generation licence, information submitted along with the application of LPM, comments of stakeholders, response of CPGCL/GENCO-II to the comments, operational data of the units comprised in generation licence of CPGCL/GENCO-II and relevant rules and regulations.

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(ii). The Authority observes that in terms of Regulation-10(2) of the Licensing Regulations, a licensee may, at any time during the term of a licence, communicate to the Authority an LPM setting out (a). the text of the proposed modification, and (b). a statement of the reasons in support of the modification, and (c). a statement of the impact on the tariff, quality of service and the performance by the licensee of its obligations under the licence.

(iii). Regarding criteria of modification in a licence, the Authority observes that in terms of Regulation-10(5) of the Licensing Regulations, it is entitled to modify a licence in accordance with an APM or LPM, subject to and in accordance with such further changes as the Authority may deem fit if, in the opinion of the Authority such modification (a). does not adversely affect the performance by the licensee of its obligations; (b). does not cause the Authority to act or acquiesce in any act or omission of the licensee in a manner contrary to the provisions of the NEPRA Act or the rules or regulations made pursuant to it; (c). is or is likely to be beneficial to the consumers; (d). is reasonably necessary for the licensee to effectively and efficiently perform its obligations under the licence; and (e).is reasonably necessary to ensure the continuous, safe and reliable supply of electric power to the consumers keeping in view the financial and technical viability of the licensee.

(iv). The main features of the LPM under consideration are that the Authority granted CPGCL/GENCO-II a generation licence (No. GL/02/2002, dated July 01, 2002) for its thermal generation facilities/power plants located at Guddu. The Authority also allowed CPGCL/GENCO-II a modification in the said generation licence dated April 26, 2013, for enhancement of capacity by addition of new Gas based CCPP with installed capacity of 776.70 MW. According to the existing generation licence of CPGCL/GENCO-II, the installed capacity of CPGCL/GENCO-II is 2431.70 MW, consisting of two (02) generation facilities (i.e. an old Gas based Combined Cycle Power Plant (CCPP) with installed capacity of 1655 MW and a new Gas based CCPP with installed capacity of 776.70 MW) at Thermal Power Station Guddu (TPS Guddu).

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(v). <u>TPS Guddu:</u> The Authority observes that TPS Guddu consists of an Old Gas based CCPP comprising of thirteen (13) Gas & Steam based Units (2x110 MW + 2x210 MW + 6x100 + 2x136 + 1x143 MW), commissioned between 1974 and 1994 and a New Gas based CCPP comprising of three (03) units (2x255.60 MW + 265.50 MW), commissioned in 2014, in this regard, the Authority has observed the following:-

(a). Units 1-2 of TPS Guddu were commissioned in 1974. According to the PC-1, life of the said units was declared as thirty (30) years which was expiring in 2004. However, after rehabilitation of these units (which was completed on June 30, 2013) the life of units was extended up to June 2018, which has also been expired. Moreover, the analysis of the dispatch data of the units for the last five years indicates that Unit-2 has zero availability & utilization factor for the last five years. Whereas, Unit-1 has zero availability & utilization factor for last two (02) years (i.e. 2016-17 to 2017-18) and the same is very low for the remaining three (03) years;

(b). Units 3-4 of TPS Guddu were commissioned in 1980 and 1985 respectively. According to the PC-1, life of the said units was declared as thirty (30) years. In this regard, CPGCL/GENCO-II has already requested to exclude Unit-4 from its generation licence. Regarding Unit-3, it is pertinent to mention that the same has completed its useful life in 2012 and the Authority has also initiated APM to exclude the same from the generation licence of CPGCL/GENCO-II. Further, the Authority has also observed that efficiency of the Unit-3 has deteriorated from 37.55% to 25.889% making the generation of electricity from the said unit uneconomical and unviable. Moreover, the utilization factor of the said unit has remained very low;

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(c). Units 5-10 of TPS Guddu were commissioned in 1987, 1988, 1985, 1986, 1986 and 1986 respectively. According to the PC-1,

life of the said units was declared as thirty (30) years which has expired in 2017, 2018, 2015, 2016, 2016 and 2016 respectively. In this regard, the Authority has observed that although the normal operating life of a steam turbine is taken as 30-35 years based on round the year operation. However, the same can be extended based on proper maintenance and actual operation hours. Further, the Units 5-10 of TPS Guddu were commissioned in the year 1985-1988 and have consumed more than thirty (30) years from COD. Based on the very fact and other operational parameters, at the time of grant of licence the remaining useful lives of the said units was set as fifteen (15) years till June 30, 2017. According to the generation licence, the said units of TPS Guddu have also outlived their useful lives in 2017. However, based on numbers of hours of operation these units have more than five (05) years remaining life/operational years. Moreover, the Authority has also observed that performance of these units have remained satisfactory as the availability & utilization factor of the same has remained very high. Further, in view of the critical location of TPS Guddu, the Authority is of the considered view that the presence of Units 5-10 in the generation licence of CPGCL/GENCO-II is vital as in case of any issue with New 747 MW CCPP, the role of Units 5-10 will be very important for stability of the National Grid;

(d). Units 11-13 of TPS Guddu were commissioned in 1992, 1992 and 1994. According to the PC-1, life of the said units was declared as thirty (30) years so useful life of these Units will expire in 2022 and 2024;

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(e). **<u>Unit-6 of TPS Quetta:</u>** Units-6 of the TPS Quetta was commissioned in 1999. According to the PC-1, life of the said unit was declared as thirty (30) years so useful life of Units-6 of TPS Quetta will expire in 2029. In this regard, the Authority observes

that as mentioned by the QESCO and NPCC the inclusion of TPS Quetta is very important for the Voltage Regulation, Grid Stability, availability of Black Start facility in the region of QESCO and Power supply to Quetta city area in island mode in case of any disturbance on NTDC/QESCO network.

(F). Decision of the Authority

(i). In view of the above analysis, the Authority hereby decides to approve the communicated LPM of CPGCL/GENCO-II with changes in terms of Regulation-(10)(11)(a) of the Licensing Regulations and extends the term of the generation licence (No. GL/02/2002, dated July 01, 2002) of CPGCL/GENCO-II till June 30, 2042. Further, the Authority decides to exclude Units 1-4 of TPS Guddu from the generation licence of CPGCL/GENCO-II and to include the Unit-6 of TPS Quetta in the same. Moreover, the Authority also decides to extend the useful life of Units 5-10 of TPS Guddu for further five years i.e. upto 2023.

(ii). Accordingly, the generation licence (No. GL/02/2002, dated July 01, 2002) granted to CPGCL/GENCO-II is hereby modified. The revised/modified schedules of the generation licence are attached as annexure to this determination. The approval of the LPM is subject to the provisions contained in the NEPRA Act, relevant rules framed there under, terms & conditions of the generation licence and other applicable documents.

Authority

Rafique Ahmed Sheikh
(Member)

Saif Ullah Chattha
(Member)

Rehmatullah
(Member)

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National Electric Power Regulatory Authority (NEPRA)

Islamabad – Pakistan

GENERATION LICENCE

GL/02/2002

In exercise of the powers conferred under Section-26 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, as amended or replaced from time to time, the Authority hereby modifies the Generation Licence (No. GL/02/2002) granted to **CENTRAL POWER GENERATION COMPANY LIMITED/CPGCL/GENCO-II** (issued on July 01, 2002, modified dated April 26, 2013), to the extent of changes mentioned as here under:-

(i). Changes in the **Generation Licence** are attached as Annexure-A; and

(ii). Changes in **Schedule-I** of the generation licence are attached as Revised/Modified Schedule-I; and

(iii). Changes in **Schedule-II** of the generation licence are attached as Revised/Modified Schedule-II.

This **Modification-II** is given under my hand on 10th day of ~~June~~ July Two Thousand & Eighteen

10.07.18

Registrar

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Annexure-A

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Modification-II in Generation Licence (No. GL/02/2002, dated July 01, 2002) of Central Power Generation Company Limited/GENCO-II

(A). Face Sheet

(i). On the Face Sheet (i.e. the first page of the generation licence), in the last line the phrase "expires on 30th day of June, Two Thousand & Seventeen" is deleted and is replaced by the phrase "expires on 30th day of June, Two Thousand & Forty Two."

(B). Article-4

(i). Article-4 of the generation licence is rephrased as "the term of this Licence is valid upto June 30, 2042."

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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.

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General Information
About the Company/Licensee

(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	Plant-I	Plant-II	Plant-III
		Guddu, on Right bank of River Indus near Guddu Barrage, Sindh		Shaikh Mandah 12 km in North-West of Quetta city on the Chaman-Ziarat Road, Balochistan
(iv).	Type of Generation Facility	Plant-I	Plant-II	Plant-III
		Combined Cycle Thermal Power Plant (with Gas Turbine, HRSG and Steam Turbines)		Open Cycle Thermal Power Plant

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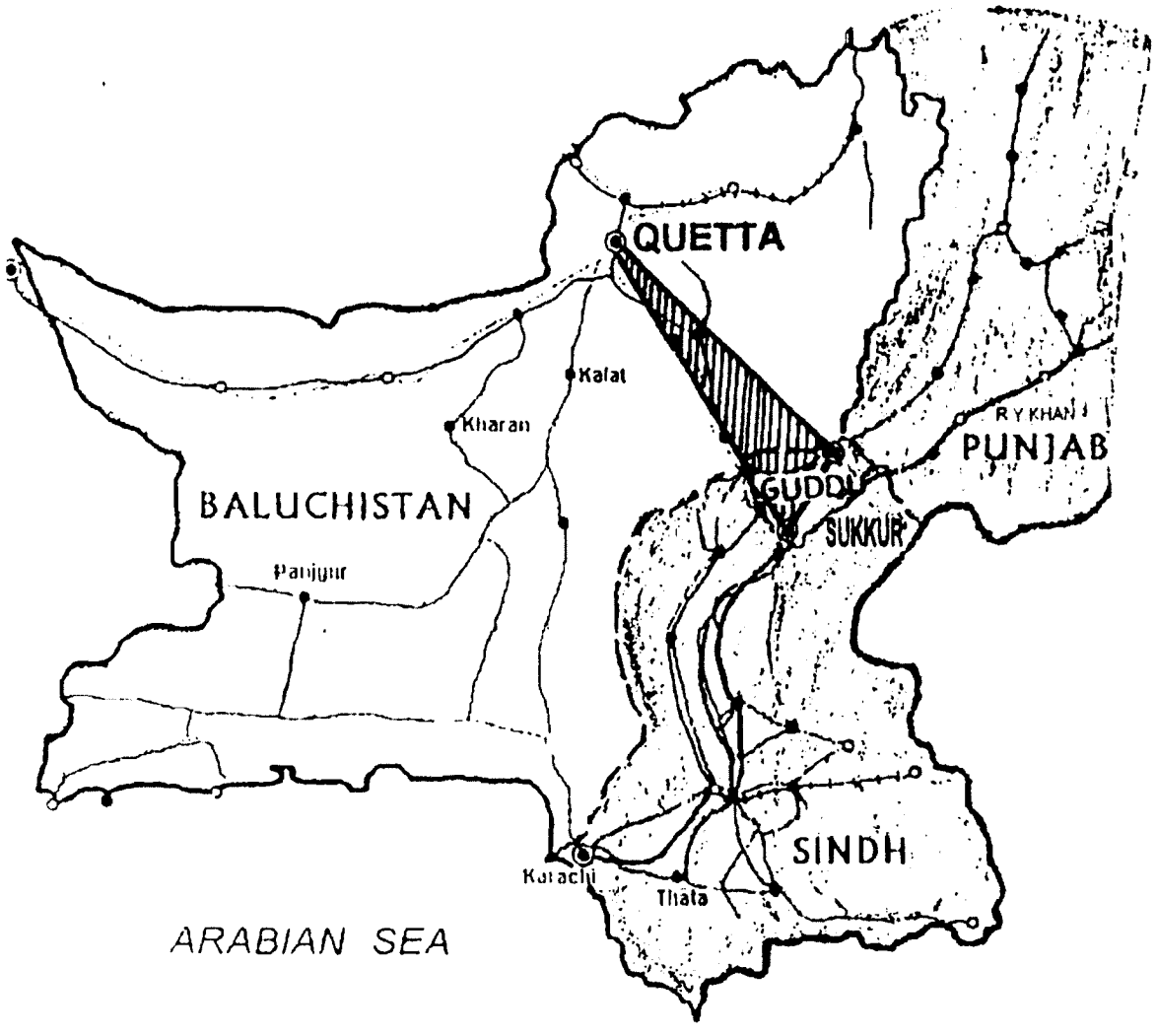
Location
of Power Plants/Generation Facilities of CPGCL/GENCO-II



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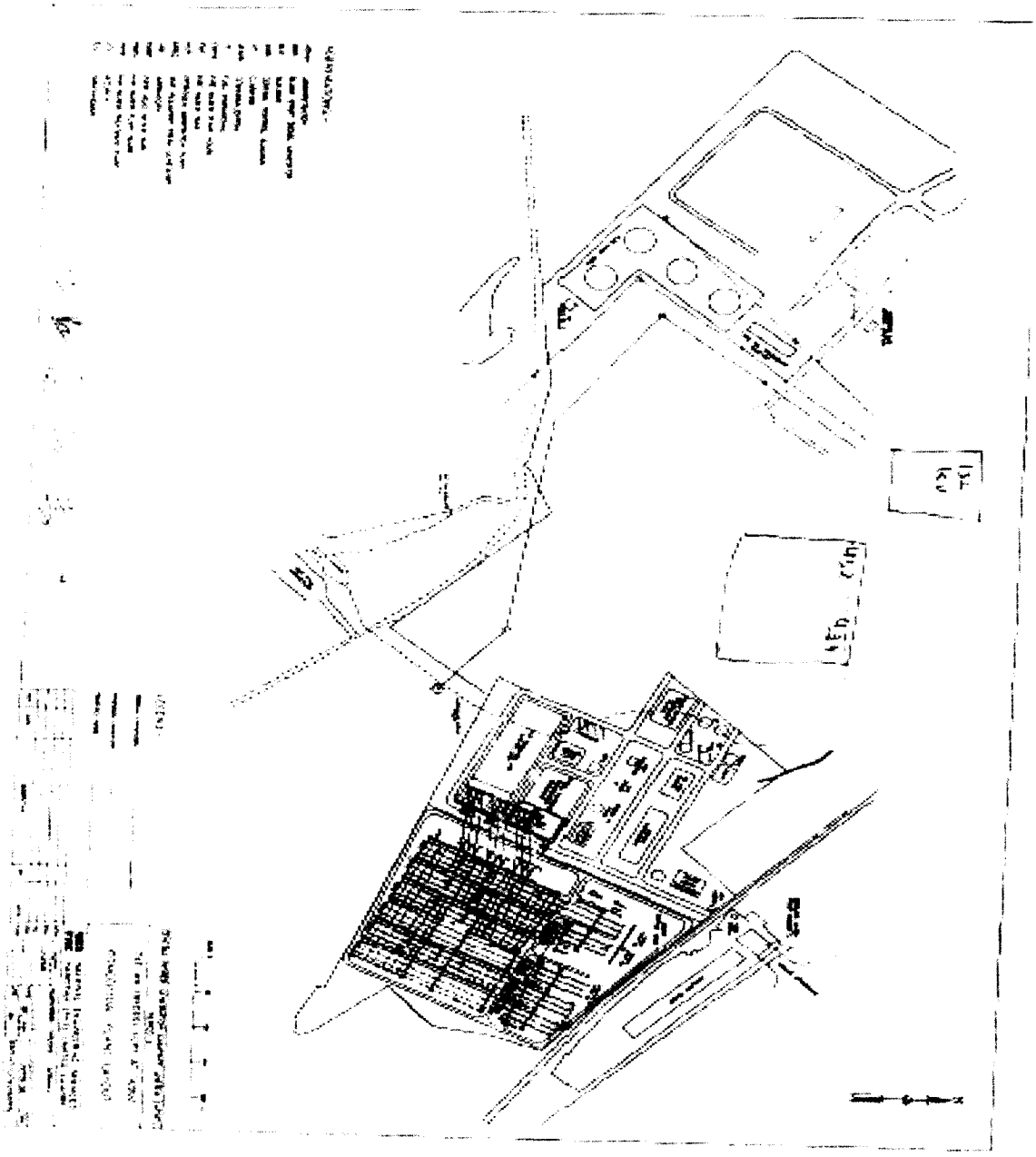
Plant-I
Old TPS Guddu

Plant Layout
of Old TPS Guddu of CPGCL/GENCO-II



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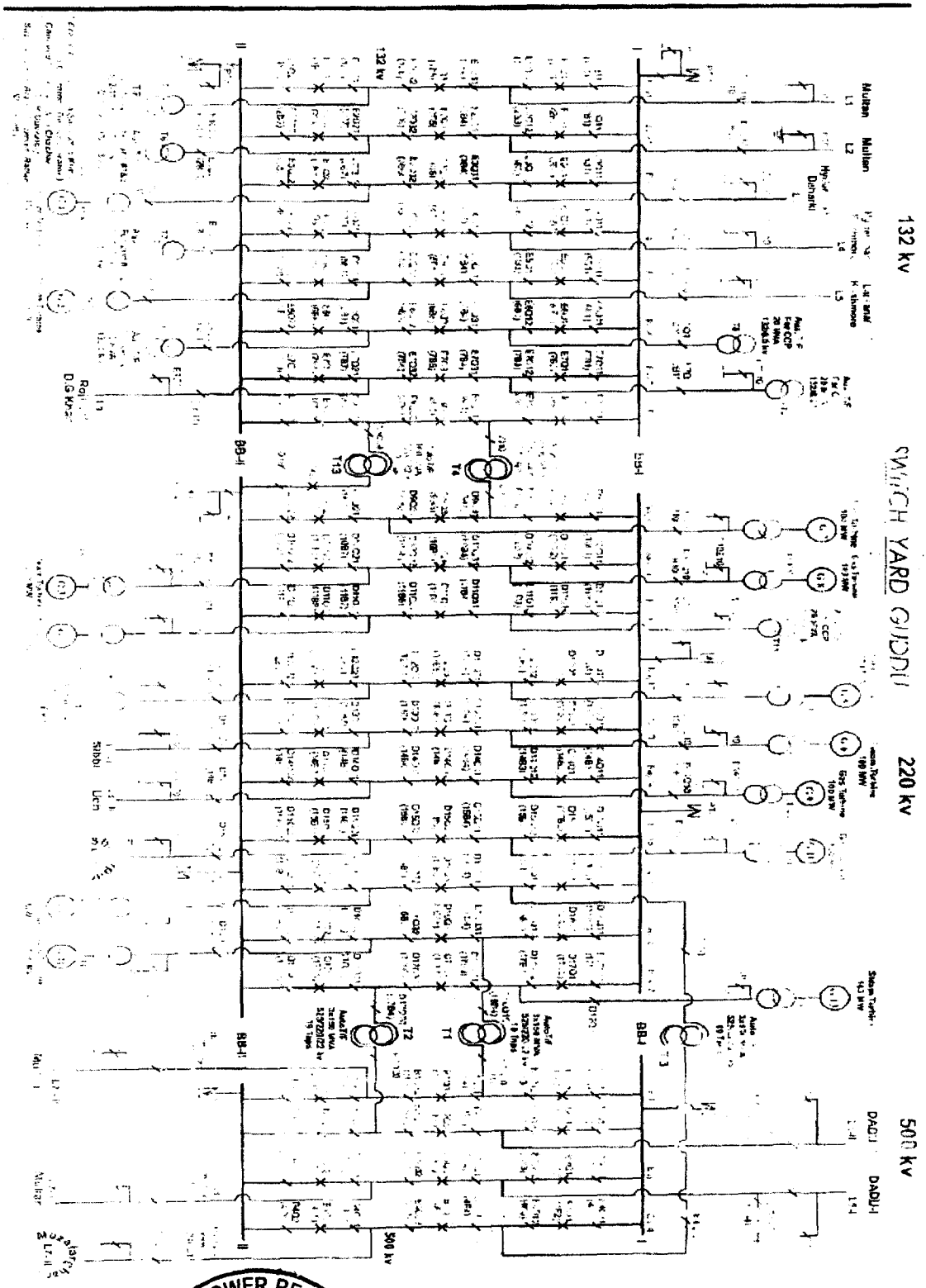
Single Line Diagram (Electrical) of Old TPS Guddu of CPGCL/GENCO-II



Interconnection/Transmission Facilities for Dispersal of Power from Old 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 the Old TPS Guddu of CPGCL/GENCO-II*

(A). Plant Configuration

(i).	Plant Size Installed Capacity (Gross ISO)	1015 MW†					
(ii).	Type of Technology	Thermal					
(iii)	Number of Units/Size (MW)	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10
		100 MW	100 MW	100 MW	100 MW	100 MW	100 MW
		Unit-11		Unit-12		Unit-13	
		136 MW		136 MW		143 MW	
(iv).	Unit Make & Model	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10
		USA	USA	USA	USA	USA	USA
		Unit-11		Unit-12		Unit-13	
		Germany		Germany		Germany	
(v).	Commissioning/ Commercial Operation date (of each Unit)	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10
		Dec 18, 1987	Mar 22, 1988	Dec 20, 1985	Apr 01, 1986	Mar 06, 1986	Apr 12, 1986
		Unit-11		Unit-12		Unit-13	
		Sep 27, 1992		Dec 07, 1992		March 17, 1994	
(vi).	Remaining useful Life at the time of Modification-I dated April 26, 2013	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10
		05 years	05 years	05 years	05 years	05 years	05 years
		Unit-11		Unit-12		Unit-13	
		12 years		12 years		-	
(vii).	Remaining useful Life at the time of this Modification-II dated June__, 2019‡	Unit-5	Unit-6	Unit-7	Unit-8	Unit-9	Unit-10
		05 years	05 years	05 years	05 years	05 years	05 years
		Unit-11		Unit-12		Unit-13	
		04 years		04 years		06 years	

* As provided by CPGCL

† Unit 1-4 excluded from the generation licence through this modification.

‡ Remaining life Unit 5-10 extended for another 5-years through this modification.

(B). Fuel Details

		Units	Primary Fuel	Alternative Fuel
(i).	Primary Fuel/Alternative Fuel	Unit-5	No Fuel Used	-
		Unit-6	No Fuel Used	-
		Unit-7	Gas	-
		Unit-8	Gas	-
		Unit-9	Gas	-
		Unit-10	Gas	-
		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		

(C). Emission/Effluents Values

	Emissions/ Effluents	PAK Standards (NEQS)	Measured Values
(i).	CO	0.8 ppm	Nil
(ii).	Sox	0.4 ppm	0.41 ppm

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(iii).	NOx	0.4 ppm	Nil
(iv).	Effluents	6-9 pH	Nil

(D). 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.

(E). Plant Characteristics

	Units	5	6	7	8	9	10	11	12	13
(i).	Generation Voltage (KV)	11	11	11	11	11	11	11	11	15.75
(ii).	Frequency (Hz)	50	50	50	50	50	50	50	50	50
(iii).	Power Factor	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
(v).	Ramping Rate MW/Min	10	10	15	15	15	15	20	20	8
(vi).	Time required to Synchronize to Grid and loading the complex to full load (Min).	4	4	20	20	20	20	4	4	3.5

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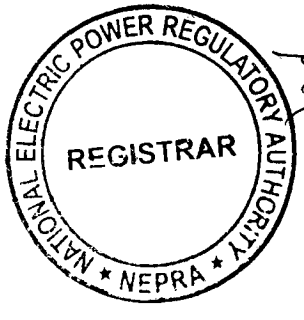
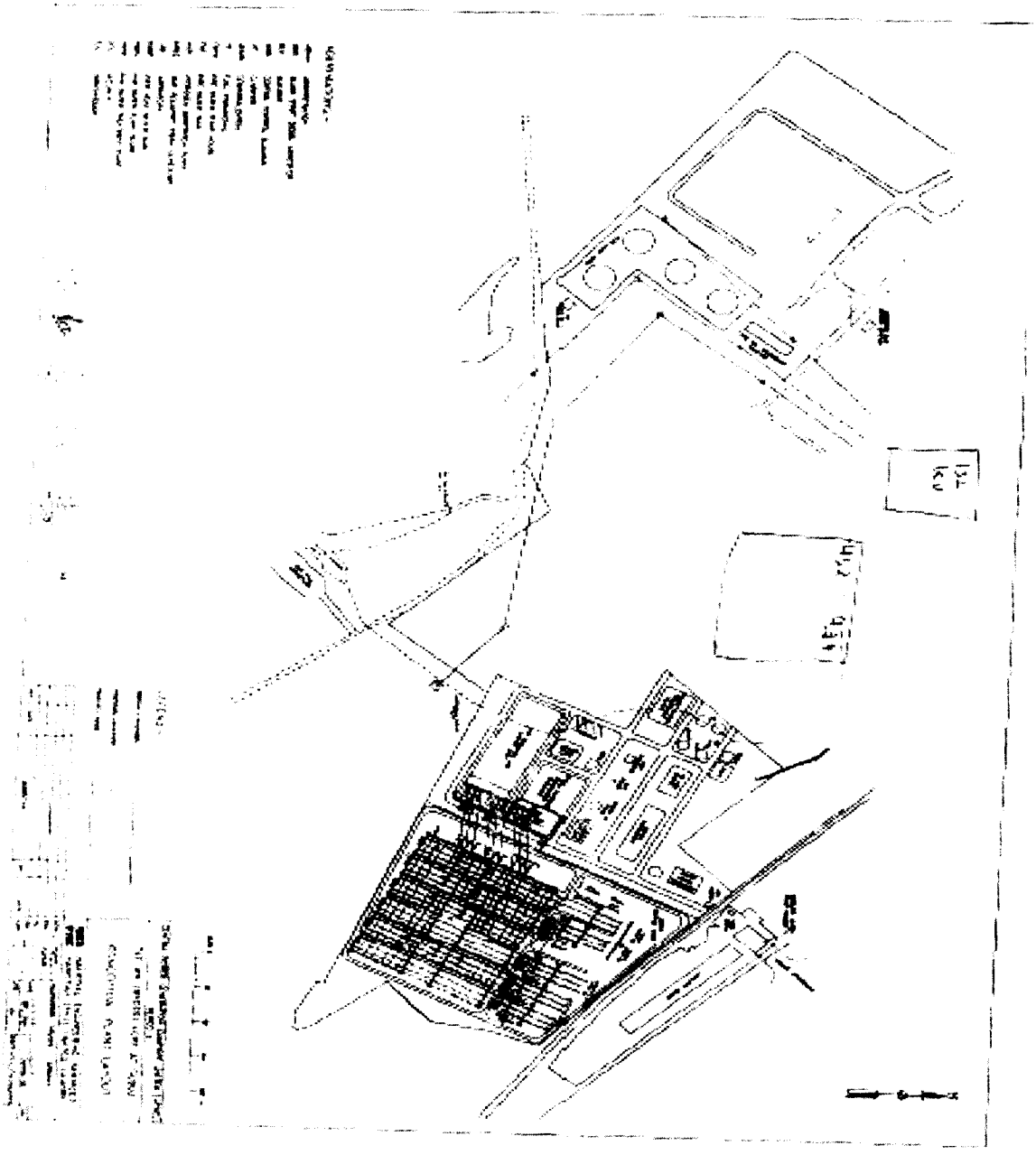
Plant-II
New 747.00 MW CCPP at TPS Guddu



Plant Layout of New 747.00 MW CCPP of CPGCL/GENCO-II at TPS Guddu



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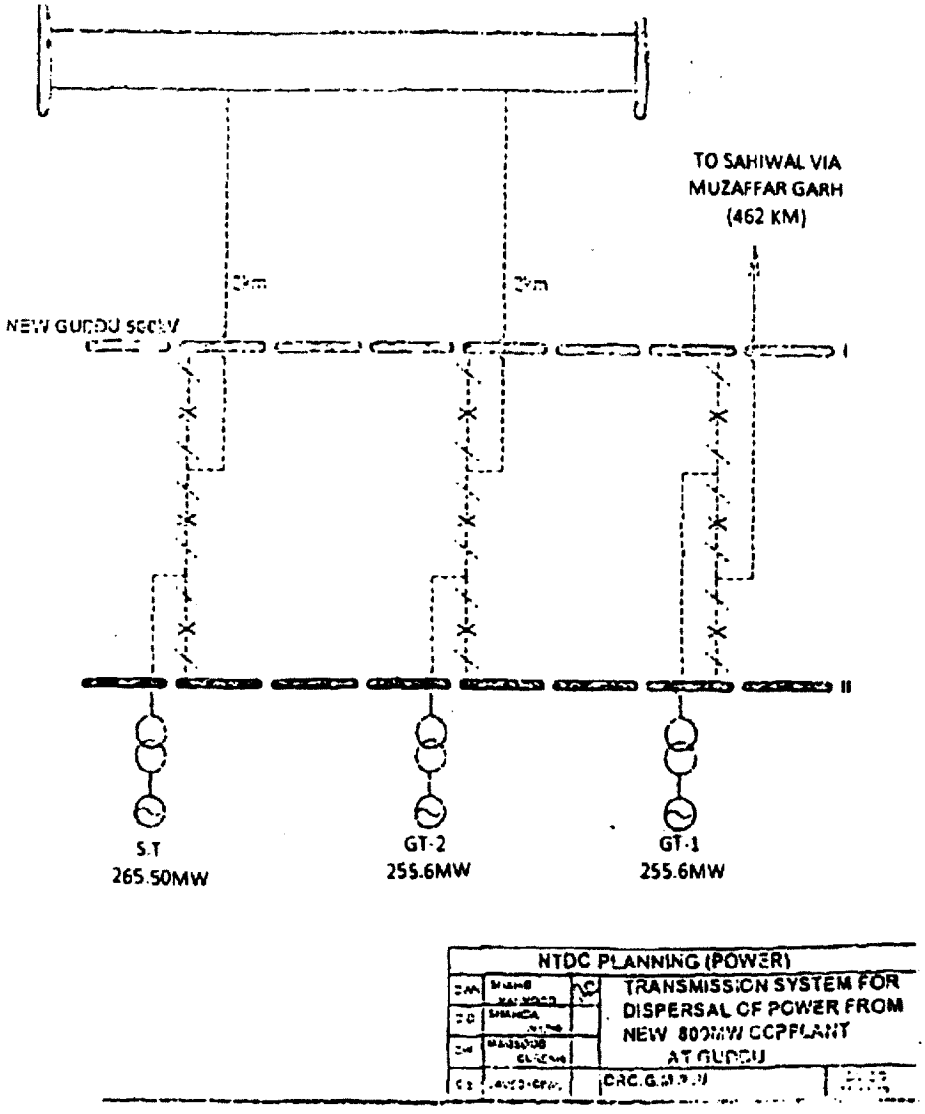
Single Line Diagram (Electrical) of New 747.00 MW CCPP of CPGCL/GENCO-II at TPS Guddu



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

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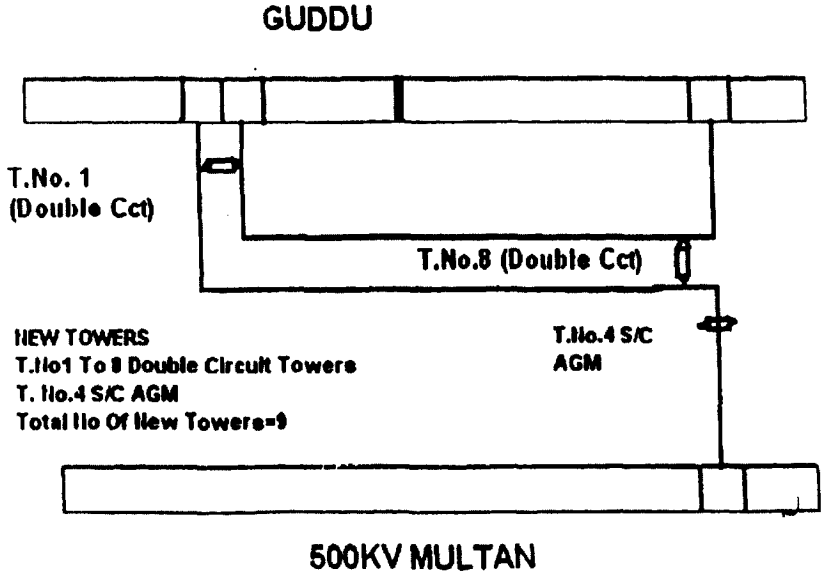
Schematic diagram of Interconnection/Transmission Facilities for Dispersal of Power from New 747.00 MW CCPP of CPGCL/GENCO-II at TPS Guddu

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

SINGLE LINE DIAGRAM SHOWING THE ARRANGEMENT FOR LOOPING IN & OUT OF 500kv S/C T/L GUDDU-MULTAN(3RD)



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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	GT-2
			255.60 MW (ISO)	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	GT-2	ST
		August 22, 2014	September 24, 2014	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

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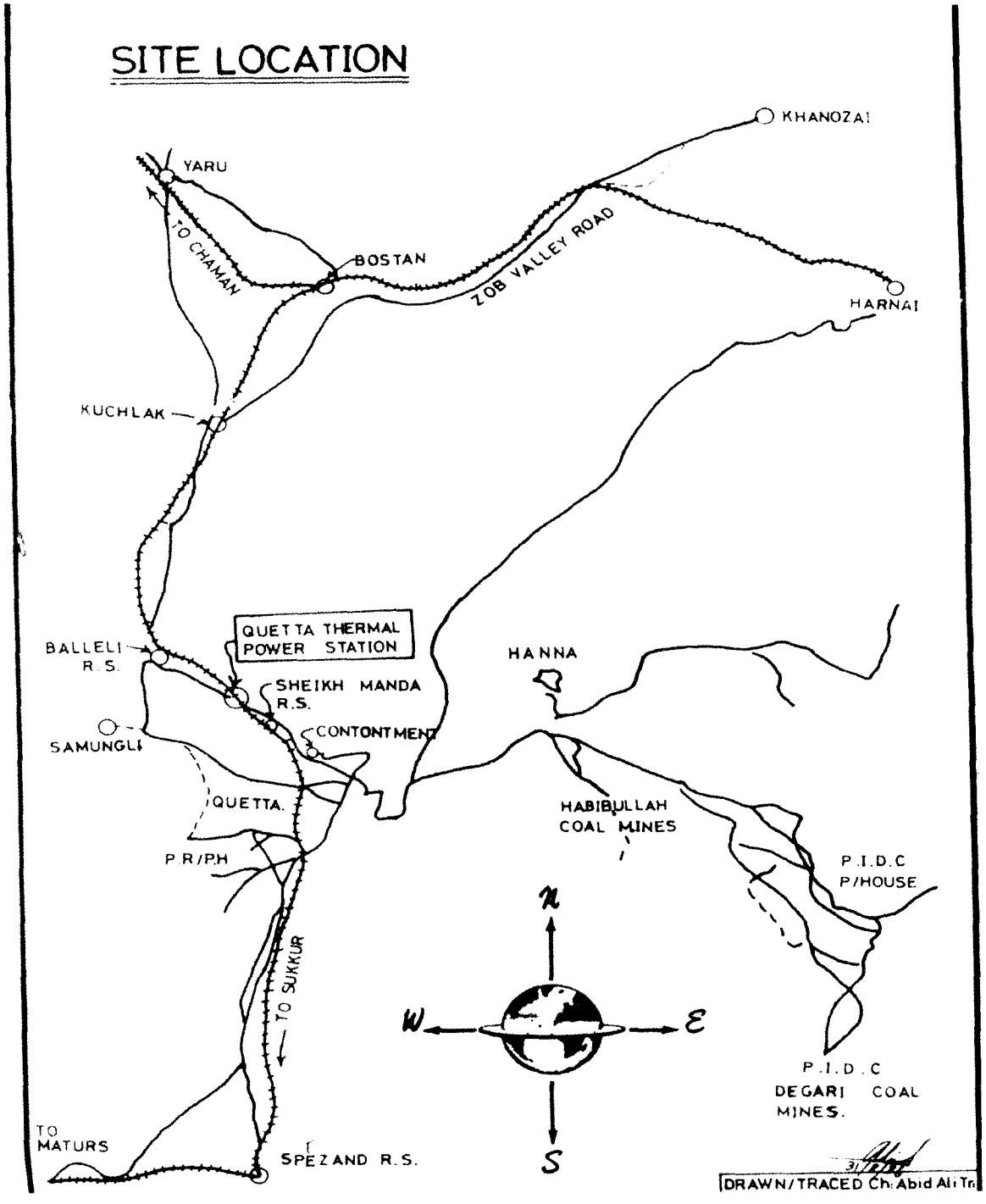
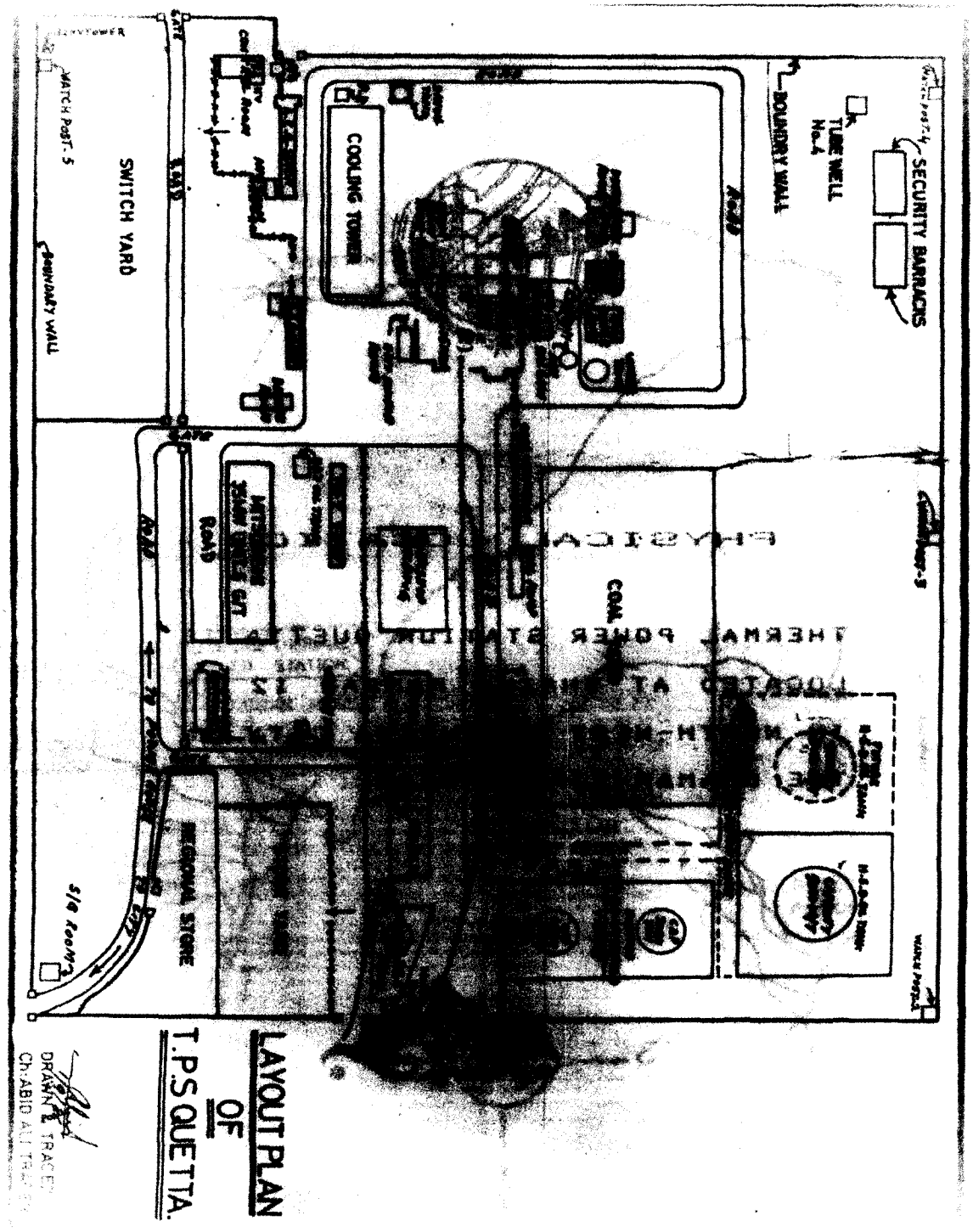
Plant-III
Unit-6 of TPS Quetta

Location
of Unit-6 of TPS Quetta of CPGCL/GENCO-II



Plant Layout
of Unit-6 of TPS Quetta of CPGCL/GENCO-II



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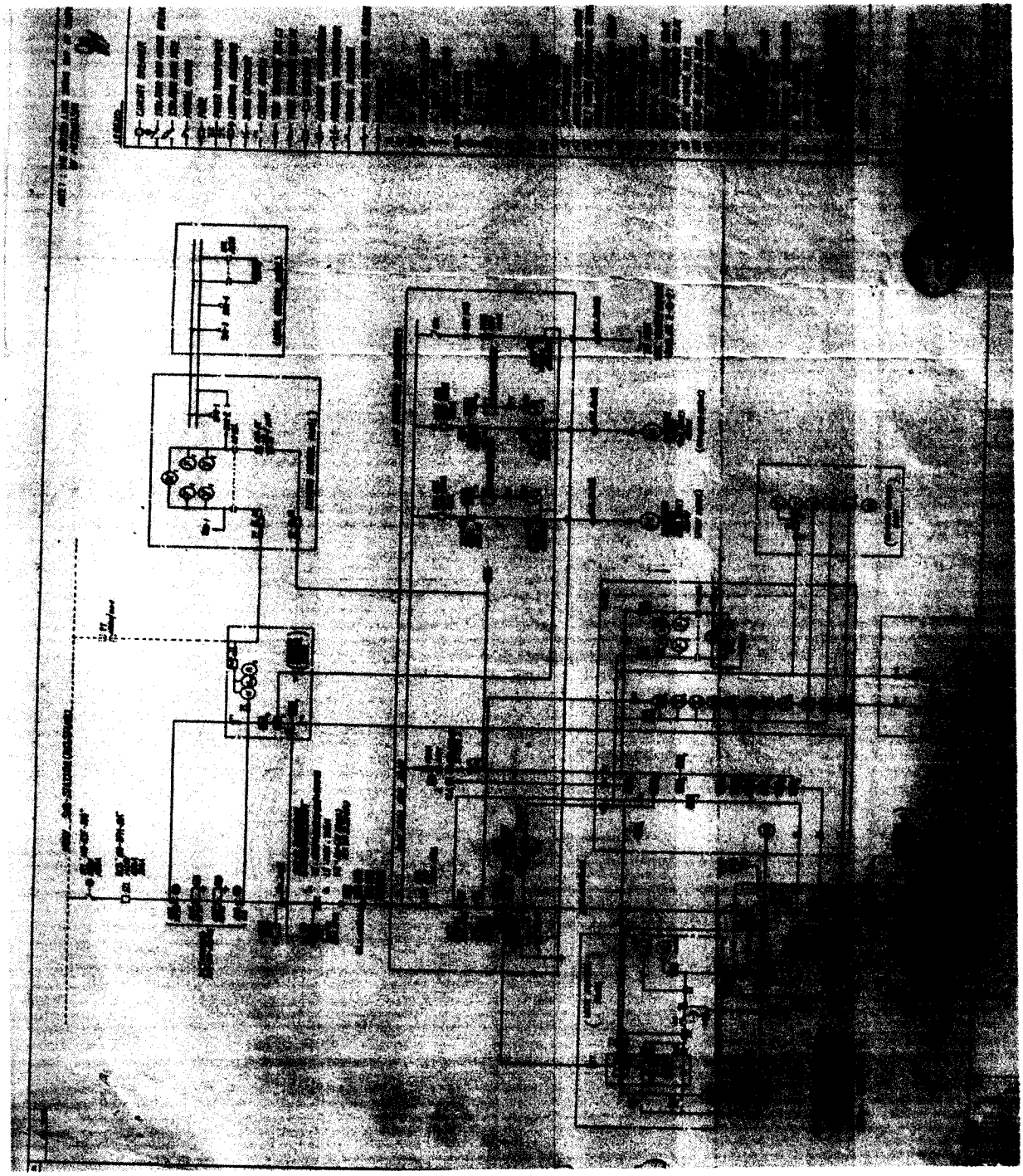
Single Line Diagram (Electrical) of Unit-6 of TPS Quetta of CPGCL/GENCO-II



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Interconnection/Transmission Facilities for Dispersal of Power from Unit-6 of TPS Quetta of CPGCL/GENCO-II

The Electrical Power from Unit 6 of TPS Quetta shall be disbursed through existing 132 kV Transmission Line link with the following scopes:-

(a). 132 kV Transmission Line linked from 132 kV Shaikhmanda Grid and National Grid Station Sibbi & Guddu.

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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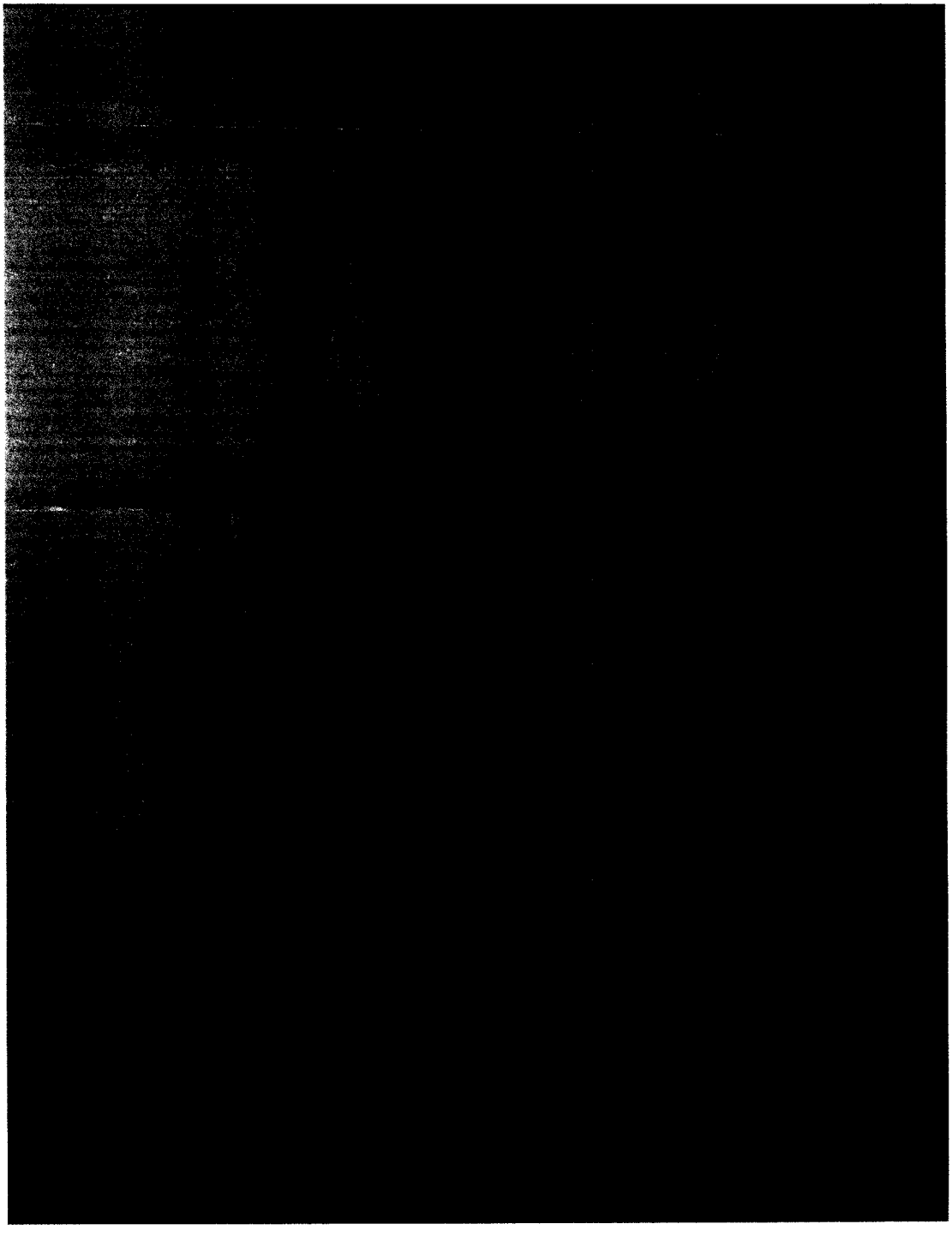
Schematic diagram of Interconnection/Transmission Facilities for Dispersal of Power from Unit-6 of TPS Quetta of CPGCL/GENCO-II



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Details
of Unit-6 of TPS Quetta of CPGCL/GENCO-II

(F). Plant Configuration

(i).	Plant Size Installed Capacity (Gross at Average Site Conditions)	28 MW
(ii).	Type of Technology	Open Cycle Power (Gas Turbine)
(iii).	Number of Units/Size (MW)	28 MW
(iv).	Unit Make & Model	MITSUBISHI MW-25
(v).	Commissioning and Commercial Operation date	November 12, 1984
(vii).	Expected Life of the Facility from Commercial Operation Date	30 years (approximately)

(G). Fuel Details

(i).	Primary Fuel	Natural Gas (NG)	
(ii).	Alternate/Back-up Fuel	High Speed Diesel Oil (HSDO)	
(iii).	Fuel Source (Imported/Indigenous)	Indigenous	
(iv).	Fuel Supplier	Primary Fuel	Alternate/Back-up Fuel
		M/S SSGCL, QUETTA	PSO

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(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	02 Tanks	
(vii).	Storage Capacity of each Tank	Primary Fuel	Alternate/Back-up Fuel	
		Not Applicable	Tank No. 2	Tank No. 6
			2000MT	5000 MT
(viii).	Gross Storage of Tank(s)	Primary Fuel	Alternate/Back-up Fuel	
		Not Applicable	7000 MT	

(H). Emission Values

(i).	SO_x	As per PAK Standards (NEQS)
(ii).	NO_x	
(iii).	CO	
(iv).	PM_{10}	

(I). Cooling System

(i).	Cooling Water Source/Cycle	Not Applicable

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(J). Plant Characteristics

(i).	Generation Voltage	11 KV
(ii).	Frequency	50 Hz
(iii).	Power Factor	0.85
(iv).	Automatic Generation Control	Yes
(v).	Ramping Rate (MW per Minutes)	2 MW
(vi).	Time required to Synchronize to Grid and loading the complex to full load (Hours)	0.28

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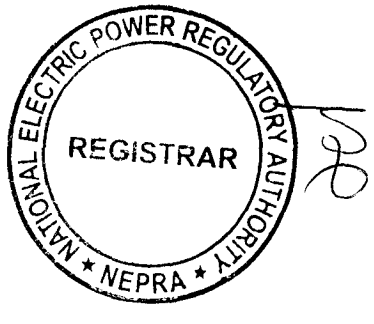
SCHEDULE-II

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)
Old Generation Facility of TPS Guddu	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
TPS Quetta	6.	November 12, 1984	28.00	22.00	21.56
Grand Total			1819.70	1719.00	1671.87

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).

* As provided by Licensee

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