National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

NEPRA Tower, Ataturk Avenue(East), G-5/1, Islamabad
Ph: +92-51-9206500, Fax: +92-51-2600026
Web: www.nepra.org.pk, E-mail: registrar@nepra.org.pk

No. NEPRA/R/DL/LAG-281/6225-30 April 24, 2015

Mr. Mokarram Mirza
Authorized Representative
FFBL Power Company Limited
73-Harley Street,
Rawalpindi

Subject: **Generation Licence No. SGC/111/2015**
Licence Application No. LAG-281
FFBL Power Company Limited

Reference: Your letter No. nil, dated October 14, 2014

Enclosed please find herewith Determination of the Authority in the matter of Generation Licence Application of FFBL Power Company Limited (FFBLPCL) along with Generation Licence No. SGC/111/2015 annexed to this determination granted by the National Electric Power Regulatory Authority to FFBLPCL for its 118.00 MW coal based thermal generation facility located at Eastern Industrial Zone, Port Qasim, Karachi, Sindh, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).

2. Please quote above mentioned Generation Licence No. for future correspondence.

Enclosure: **Generation Licence (SGC/111/2015)**

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24.04.15
(Syed Safeer Hussain)

Copy to:

1. Managing Director, Private Power & Infrastructure Board, 50-Nazimduddin Road, F-7/4, Islamabad
2. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore
3. Chief Operating Officer, CPPA, 107-WAPDA House, Lahore
4. Chief Executive Officer, K-Electric Limited, KE House No. 39-B, Sunset Boulevard, Phase-II, DHA, Karachi
5. Director General, Sindh Environmental Protection Agency, Plot No. ST 2/1, Sector 23, Korangi Industrial Area, Karachi

National Electric Power Regulatory Authority (NEPRA)

Determination of the Authority in the Matter of Application of FFBL Power Company Limited for the Grant of Generation Licence

April 22, 2015
Case No. LAG-281

(A). Background

(i). Fauji Foundation Group (FFG) has set a modern Granular Urea and Di-Ammonium Phosphate (DAP) fertilizer manufacturing facility in the name of Fauji Fertilizer Bin Qasim Limited (FFBQL), located at Eastern Zone of Bin Qasim, Karachi, in the Province of Sindh.

(ii). The fertilizer plant is considered to be a very sensitive chemical installation requiring electric power without any interruption. The electricity requirements of FFBQL are being met by installing Gas Turbines (operating on Natural Gas). The current situation of the availability of the Natural Gas is not very encouraging. Due to Supply-Demand gap, there is rationing/load-shedding of Natural Gas for different sectors on a continuous basis. In consideration of the said, the management of FFBQL has decided to set up a coal based Generation Facility/Co-Generation Power Plant within the premises of the above mentioned fertilizer unit. FFG expects that the installation of the coal based Generation Facility/Co-Generation Power Plant will provide safe, continuous, reliable and uninterrupted electric power to its fertilizer plant.

(iii). In order to implement the project, the management of FFBQL decided incorporating a Special Purpose Vehicle-SPV under the provisions of the Companies Ordinance 1984. The SPV was incorporated in the name of FFBL Power Company Limited (FFBLPCL).

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(B). Filing of Application

(i). In accordance with Section-15 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the NEPRA Act), FFBLPCL submitted an application on October 17, 2014 requesting for the grant of Generation Licence.

(ii). The Registrar examined the submitted application and found the same non-compliant with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 ("the Regulations"). In view of the above, Registrar directed FFBLPCL for submitting the missing information/documentation to comply with the requirement of the Regulations. FFBLPCL completed the submission of required information/documentation on October 29, 2014. The Authority admitted the application under Regulation-7 of the Regulations on November 19, 2014 for consideration of grant of a Generation Licence. The Authority approved the draft of the Advertisement/Notice of Admission (NoA) to be published in daily newspapers, for informing and seeking comments of the general public as stipulated in Regulation-8 of the Regulations. The Authority also approved the list of interested/affected parties for inviting comments for assisting the Authority in the matter as stipulated in Regulation-9 (2) of the Regulations. Accordingly, Advertisement/NoA was published in one Urdu and one English National Newspaper on November 27, 2014.

(iii). Apart from the above, separate letters were also sent to Individual Experts/Government Ministries/Representative Organizations etc., informing about the admission of the application of FFBLPCL and for submitting their views/comments in the matter.

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(C). Comments of Stakeholders

(i). In reply to the above, the Authority received comments from four (04) stakeholders. These included Energy Department Govt. of Sindh (EDGoS), Pakistan Mineral Development Corporation (Pvt.) Limited (PMDCPL), Ministry of Petroleum & Natural Resources (MoP&NR) and Ministry of Water & Power (MoW&P). The salient points of the comments offered by the above stakeholders are summarized in the following paragraphs: -

(a). EDGoS supported the grant of Generation Licence to FFBLPCL;

(b). PMDCPL emphasized the need of utilizing indigenous coal alongwith the imported coal for the project. However, PMDCPL supported the grant of Generation Licence to FFBLPCL;

(c). MoP&NR remarked that FFBLPCL intends to install Coal Fired Thermal Power Plant for which no gas is required. Therefore, this Ministry has no objections/comments for the grant of Generation Licence to FFBLPCL; and

(d). MoW&P commented that the Authority may process the request as per provisions of NEPRA Act and GoP guidelines.

(ii). The Authority examined the above comments of the stakeholders and found the same in support of the grant of the Generation Licence except to the observation of PMDCPL of utilizing indigenous coal. In consideration of

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the above, the Authority considered it appropriate seeking perspective of FFBLPCL on the observations of PMDCPL.

(iii). Apart from the said, the Authority had a detailed deliberation on the various aspects of the proposed project including sizing, technology, cost and efficiency etc. of the project and observed the following:-

(a). Worldwide, there is a trend to install larger coal based Power Plants of more than 200 MW. Why FFBLPCL intends to install a smaller Power Plant (of 118 MW) which is inherently less efficient and more adverse for environment?

(b). FFBLPCL has opted installing sub critical Circulating Fluidized Bed (CFB) Boiler Technology for the project. Has FFBLPCL considered other options before optimizing the selected Technology for the project?

(c). The anticipated cost of the project is US $ 2.25 Million/ MW (approximately) which is exuberantly high as compared to the bench mark established by the Authority in its determination for Up-Front Tariff for coal projects, (of size of 200 MW) for which a cost of US $ 1.62 Million/MW is allowed;

(d). The Net Plant Efficiency of the proposed Generation Facility/Coal Power Plant is on lower side (i.e. 29.2%) as compared to the bench mark efficiency (i.e. 37%), which the Authority has determined in the Up-Front Tariff for coal projects.

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(iv). On the above observations, the Authority considered it appropriate inquiring the point of view of FFBLPCL on its observations as explained above.

(D). Response of FFBLPCL

(i). FFBLPCL through its letter dated February 03, 2015 submitted detailed replies of the issues that PMDCPL and the Authority have raised on different aspects of its Project.

(ii). On the Selection of the proposed Size of the Project, it was submitted that the decision for not opting for a higher capacity plant is based on account of a number of factors mainly (a). Prevailing Situation of the Power Sector of Pakistan (in particular the Inter-Corporate Circular Debt); (b). Absence of Sovereign Guarantee (the Landers's point of view); (c). Technical considerations (Land and Water availability and grid proximity); and (d). The availability of financial resources available with FFG/FFBQL for undertaking the proposed project. FFBLPCL clarified that the power sector circular debt is hovering in the range of Rs. 400-500 Billion due to which payments to power producers/generation companies are delayed considerably. As the proposed project will be a coal fired Generation Facility/Co-Generation Power Plant, its continuous operational viability will be dependent on timely payments from power off-taker, primarily for making payments to offshore coal suppliers and Lenders. The firm/irrevocable commitments for coal supply are made through Letter of Credit and require a minimum commitment time of two (02) months. In the absence of timely payments, the project will not be able to meet its payment obligations to international coal suppliers. The said situation will not only impact its operations but the plant will be deemed unavailable for dispatch to the off-taker. This situation may lead to the suspension of the Capacity Payments for the project resulting in default under Financing Documents. By opting for a relatively smaller size of the project, the sponsors have tried to avoid the risk of higher power sector receivables. Further, being a transaction among private entities including FFBLPCL, FFBL and K-Electric

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Limited (KEL), the incentives and safeguards (i.e. the Sovereign Guarantee under Implementation Agreement with Government of Pakistan for projects under Power Policy 2002) will not be available for this project/transaction. In absence of Sovereign Guarantee, it is not conducive for the Sponsors to go for larger size project. Further, the Lenders are also reluctant to fund a larger size plant without any political risk coverage and repayment risk. It was submitted that Coal based power plants are a new phenomenon in Electric Power Sector of the Country. At the moment, there is no notable established /operational Coal Fired plant in the private or public sector. Therefore, lending institutions also view such projects with scepticism. As explained above, in the current scenario the sponsors of the Project are directly exposed to the associated large risks. In view of the said, the size of the project was selected as 118.00 MW. This will make the project bankable for the potential lenders and less risky for the Sponsors.

(iii). FFBLPCL submitted that a further consideration in selecting the 118.00 MW size was the land and water availability and grid availability/proximity for power evacuation. As the project fuel is imported coal, it is critical that the project is located near the sea ports of the Country to ensure minimum coal transportation charges. The Fertilizer Complex of the Sponsor is located within the premises Port Qasim Authority, Karachi ("PQA"). The existing fertilizer Complex of FFBQL has additional land available with it and the same will be used for the development of the proposed 118.00 MW project without going into the exercise for acquiring new land. Furthermore, by using the existing land, access to ancillary facilities such as water connection/demineralised water plant etc. is readily available at the project site thus making its economically more viable. This will facilitate the erection, Construction commissioning and afterwards operational activities without any delay. A project of larger magnitude will be requiring significant more quantity of water which will only be possible by utilizing more water from the Sea. This will involve extensive infrastructure like pumping stations, desalination facilities and about 15 km long intake pipeline and return waste water pipeline of the same length. This will involve acquiring

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right of way for land in PQA for pipeline which is highly complicated owing to no existing corridor for such facilities. The project site (is within the existing parcel of land available in the Fertilizer Complex of the sponsors) and lies in the service territory of KEL with its 132KV transmission line(s) passing adjacent to the project location. In lieu of above & tight project timelines, the export of power will be feasible in terms of reliability and lead time for KEL. It was submitted that besides this Coal power project, the Sponsor is also undertaking other new investment ventures into development of meat and dairy production facilities in addition to its existing investments in Banking, Wind Energy and Cement Sector. The Sponsor has to balance its investment portfolios and at present with the financial resources available for investment with the Sponsor, an 118.00MW Generation Facility/Co-Generation Power Plant has been conceived and envisaged to be set up. This presents a balance between risk and return for a project of this magnitude acceptable to the Sponsor. As such, we are of the considered view that the adopted project size was the most feasible option to proceed further on. With regards to adverse environmental impact the detailed Environmental Impact Assessment (EIA) of the project of FFBLPCL had already been approved by Environmental Protection Agency, of the Govt. of Sindh (EPA Sindh) and it has granted the required NOC for the project. It was confirmed that FFBLPCL will adhere to the requirements of EPA Sindh. Being aware of the environmental obligations, the Company has designed the plant to meet World Bank Guidelines (WBG) i.e. more stringent with respect to SO_x & NO_x emissions instead of following local National Environmental Quality Standards (NEQS). Further, the limestone injection system (Sorbent Handling System) is being installed to reduce the SO_x emissions and achieve the required WBG limits. Furthermore, Continuous Emission Monitoring System (CEMS) is being installed allowing effective emissions monitoring and automatic corrective actions. This has resulted in additional capital expenditure but will result in reduced emissions.

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(iv). Regarding the selection of Sub Critical CFB Boiler Technology for the project, it was submitted that the said option was selected after detail evaluation by the Engineering Consultant and the main factor was CFB technology's capability to burn variety of Coals. As overall coal requirements for the project is relatively low (~ 471,000 Metric Tons Per Year), it is not feasible to have coal supply fixed from one Coal source and mine rather the coal supply that will be managed through contractual / spot buying from international coal suppliers market, as such CFB Technology provides the best option being able to cater a variety of coals. Moreover, CFB Boiler Design technology will also allow us to procure coal at much better rates during tight market situations and even use of some local coal by co-mixing it with imported coal which would be beneficial for the off-takers of energy from the project in terms of increased availability/reliability of output. By way of clarification, it is submitted that the supercritical steam parameters based Steam Turbine Generators (STG) are not available in less than 100.00 MW frame size. Accordingly, the only option left for the FFBLPCL was to select the subcritical based Boilers and Steam Turbine Generators.

(v). About the higher Tentative/Anticipated cost of the project, FFBLPCL submitted that it is of the considered opinion that cost of project should not be a specific concern at the Generation License stage and the Authority would, at the stage of filing of Power Acquisition Request (PAR) by KEL, has the full right to review the part of the cost that is being charged to end consumers of KEL and detailed submissions to that end would be provided to the satisfaction of the Authority. Notwithstanding the above, the project envisages a Generation Facility/Co-Generation Power Plant based on sub-critical technology comprising of both 50Hz and 60Hz Steam Turbine Generators and associated systems. As such cost of this project cannot be objectively compared to cost of a conventional 200.00 MW coal project. Furthermore, the project envisages mainly European and Korean equipment as part of its complex (non-Chinese Boilers, European origin STGs, Pumps and majority of Balance of Plant Static/Rotary equipment) and accordingly the

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cost of 200.00 MW plant proposed in the NEPRA upfront tariff cannot be used as an across the board benchmark.

(vi). Regarding the lower Net Plant Efficiency of the proposed Coal based Generation Facility/Co-Generation Power Plant, it was submitted the project is based on Sub-Critical Technology. The steam pressure & temperature conditions of 92 bar & 515°C are optimum considering the size of STGs. Consequently the net efficiency of 29% is justifiably reasonable and relatively higher than the comparable project for which the Authority had determined the tariff.

(E). Analysis of the Authority

(i). The key feature of the application of FFBLPCL is that it intends setting up a Co-Generation Facility with an Installed Capacity of 118.00 MW [consisting of 2 x 24 MW (60 Hz) Steam Turbines + 1 x 10 MW (60 Hz) Steam Turbine and 1 x 60 MW (50 Hz) Steam Turbine]. The Project will be capable of generating 500 Metric Tons per Hour (MTPH) of Steam (at 515°C and 92 bar pressure) through two (02) CFB High-Pressure Coal Fired Boilers each with a capacity of 250 MTPH.

(ii). The Project shall sell up to 60.00 MW (Net) of power to KEL at a frequency of 50 Hz and 42.0 MW power to FFBQL at a frequency of 60Hz. The Authority has observed that the electric power requirements of existing Fertilizer Complex of FFBQL are currently met thorough 2 x 26.3 MW (Gross ISO) Gas Turbines (General Electric) at 13.8KV, 3 phase, 60 Hz, using Natural Gas under a long term Gas Supply Agreement (GSA) with Sui Southern Gas Company Limited (SSGCL). As the fertilizer plant of FFBQL is on 60 Hz frequency, therefore, it is neither connected to the system of NTDC nor to that of KEL. In view of the said, FFBQL is not a consumer of KEL or any other utility. The Electric Power supply from FFBLPCL from the proposed Coal based Generation Facility will also be on 60 Hz and will replace the current gas based power of the CPP of FFBQL;

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(iii). The Authority after having considered the submissions of FFBLPCL including the Project Feasibility Study, the received comments of stakeholders, the issues that came across during processing (which were raised by the Authority), the rejoinders of FFBLPCL submitted in the matter and other related documents (including the NEPRA Act, relevant Rules and Regulations). The findings of the Authority in this regard are given in the following paragraphs.

(iv). **Worldwide, there is a trend to install larger coal based Power Plants of more than 200 MW. Why FFBLPCL intends to install a smaller Power Plant (of 118 MW) which is inherently less efficient and more adverse for environment?** The Authority considers that the submissions made by FFBLPCL on selection of a smaller Power Plant are worth considering. FFBLPCL has selected the size of the Generation Facility/Co-Generation Power Plant duly considering the availability of the required land, location from the load centre and most importantly the water requirements. Apart from the said factors, the availability of required funds is also a very important aspect that decides the size of the Generation Facility/Co-Generation Power Plant. This is also important as setting up such a facility is a very capital intensive venture. Keeping in view all the said factors, the decision of FFBLPCL to limit the size to 118.00 MW merits consideration.

(v). **FFBLPCL has opted installing sub critical CFB Boiler Technology for the project. Has FFBLPCL considered other options before optimizing the selected Technology for the project?** The Authority has observed that keeping in view of the size of the project and possible source of coal two main technologies for boiler burning coal could have been considered for the project. These included (a). Pulverized Coal (PC) Boiler; (b). CFB Coal Boiler. FFBLPCL selected the design of the boiler after a detailed techno-economical comparison of available coal-fired boiler technologies for this particular project, taking into account the power requirement as well as investment cost, emissions requirements,

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performances, coal selection and the equipment expected reliability. Therefore, for providing more flexibility of operation the CFB Boiler Technology has been selected due to its ability to provide improved thermal efficiency and its excellent ability to burn a wide range of coals from international to local as well as bituminous to sub-bituminous through the same boiler.

(vi). <u>The anticipated cost of the project is US $ 2.25 Million/ MW (approximately) which is exuberantly high as compared to the bench mark established by the Authority in its determination for Up-Front Tariff for coal projects, (of size of 200 MW) for which a cost of US $ 1.62 Million/MW is allowed?</u> The Authority has observed that the proposed Generation Facility/Co-Generation Thermal Power Plant of FFBLPCL will have a Total Installed Capacity of 118.00 MW [consisting of 2 x 24 MW Condensing Steam Turbines (of 60 Hz) + 1 x 10 MW Extraction Steam Turbine (of 60 Hz) and 1 x 60 MW Condensing Steam Turbine (of 50 Hz)]. The Project will have two (02) CFB High-Pressure Coal Fired Boilers each with a capacity of 250 MTPH (total of 500 MTPH of Steam at 515°C and 92 bar pressure). The Project shall supply upto 60.00 MW (Net) of power to KEL at a frequency of 50 Hz. Whereas, about 42.00 MW of Electric Power will be supplied to FFBQL at a frequency of 60Hz. In view of the said, it is clear that proposed Generation Facility/Co-Generation Power Plant is unique in nature. It consists of Steam Turbines and generators operating on 50 Hz and 60 Hz (which is costlier as it requires more poles and windings). In view of the dynamics and the specific requirements of the proposed Generation Facility/Co-Generation Power Plant, the submissions of FFBLPCL on the particular issue merit consideration.

(vii). <u>The Net Plant Efficiency of the proposed Generation Facility/Co-Generation Power Plant is on lower side (i.e. 29.2%) as compared to the bench mark efficiency (i.e. 37%), which the Authority has determined in the Up-Front Tariff for coal projects.</u> Keeping in view

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the sizing of the Generation Facility/Co-Generation Power Plant, selection of the CFB (Sub-Critical) boiler and coal quality, the Authority considers that the Gross Efficiency of the proposed Generation Facility/Power Plant with 32.80% Gross and about 29.00% Net Efficiency is worth considering.

(viii). In light of the explanation give above, the Authority is of the considered view that issues pertaining to the application of FFBLPCL for the grant of Generation Licence have been replied and addressed. Therefore, the Authority considers that FFBLPCL qualifies for the grant of Generation Licence in terms of the Regulations and the Rules.

(F). Grant of Generation Licence

(i). The importance of electricity in the development of the economy of any country is beyond any doubt. The sustainable and affordable electric power is a key for socio-economic development of any Country. The Economic Growth of any Country is directly linked with the availability of safe, secure, reliable and cheaper supply of electricity.

(ii). In view of the said reasons, the Authority is of the considered opinion that for sustainable development all indigenous power generation resources including Coal, Hydel, Wind, Solar and other RE resources must be developed on priority basis in the public and private sector. The Authority considers that at present there is considerable Supply-Demand gap due to which Distribution Companies are unable to supply electric power to consumers/customers on a continuous basis. In view of the said, the Industrial Units/Concerns are exploring other options to get electricity on a continuous basis. In view of the said, the Authority considers that the proposal of FFBLPCL for setting up a Coal based Generation Facility/Co-Generation Power Plant for supplying (58.00 MW) to another group company in the name of FFBQL and to that KEL (60.00 MW) is worth considering.

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(iii). In this regard, the Authority clarifies that pursuant to provisions of Section-21 of the NEPRA Act, a Generation Company (like the instant case of FFBLPCL) can make sale of electric power to Bulk Power Consumer(s)/BPC(s) within the Exclusive Service Territory of a Distribution Company. Whereas, BPC is a consumer which purchases or receives electric power at one premise in an amount of one (01) MW or more or in such other amount and voltage level and with such other characteristics as the Authority may determine. It is pertinent to mention that FFBQL is a Fertilizer Unit which has current load requirement of around 58.00 MW (at 60 HZ frequency). The Authority in terms of the power conferred upon in Section-2(ii) of the NEPRA Act, considers FFBQL a BPC of FFBLPCL. Accordingly, the Authority allows FFBLPCL supplying to FFBQL as stipulated in Section-21 of the NEPRA Act. In terms of Section 2(v) of the NEPRA Act, where the ownership, operation, management and control of distribution facilities located on private property and used solely to move or deliver electric power to the person owning, operating, managing and controlling those facilities or to tenants thereof is not included in the definition of "distribution". The distribution facilities (i.e. Underground cables) to be used for delivery of electric power to FFBQL are located on private property (without involving any public property or any third party), will be owned, operated, managed and controlled by the respective BPC. Therefore, the supply of electric power to FFBQL by FFBLPCL does not constitute a distribution activity under the NEPRA Act. In view of the said, FFBLPCL will not be required a Distribution Licence.

(iv). The Authority has duly considered the details provided by FFBLPCL in its application for the grant of Generation Licence, the comments of the stakeholders and other proceedings of the case. In this regard, the Authority is satisfied that FFBLPCL has complied with all the requirements of the relevant Rules and Regulations. Therefore, the Authority is satisfied that FFBLPCL qualifies for the grant of Generation Licence.

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(v). The term of a Generation Licence under the Rule-5 (1) of the Rules is to be commensurate with the maximum expected useful life of the units comprised in a generating facility. According to the information provided, after the Generation Facility of FFBLPCL will have a useful life of thirty (30) years. In this regard, the Authority considers that the information provided by FFBLPCL for fixing the term of its Generation Licence is prudent and in line with other similar projects of similar technology. Accordingly, the Authority fixes the term of the Generation Licence of FFBLPCL to thirty (30) years from the Commercial Operation Date (COD) of the Generation Facility.

(vi). Regarding the Tariff, it is hereby clarified that under Section-7(3)(a) of the NEPRA Act, the determination of tariff, rate and charges etc. is the sole responsibility of the Authority. In terms of Section-31 of the NEPRA Act read with relevant provisions of the NEPRA (Tariff Standards and Procedure) Rules, 1998, a Generation Company may file a Tariff petition for determination of its Generation Tariff. Further, in terms of Section-32 of the NEPRA Act read with relevant provisions of the NEPRA Interim Power Procurement (Procedures and Standards) Regulations, 2005, a Generation Company may approach a Transmission or Distribution company for filing a Power Acquisition Request (PAR) and for negotiating a Power Acquisition Contract (PAC). Therefore, FFBLPCL may opt either of the methodology and approach the Authority accordingly. Further, the Authority directs FFBLPCL to charge KEL only such tariff from the Power Purchaser as determined, approved or specified by the Authority as stipulated in Rule-6 of the Rules. Regarding the matter of rates, charges, terms and conditions of tariff between FFBLPCL and its BPC (i.e. FFBL), the same will not affect any other consumer or third party. Therefore, for the purpose of tariff to be charged from BPC, the Authority considers it appropriate directing FFBLPCL and FFBL agreeing to a bilateral agreement and submitting the same to it for approval and record. Accordingly, FFBLPCL will then be allowed to charge the agreed tariff to BPC subsequent to the grant of the Generation Licence, in accordance with Rule-6(1)(b) of the Rules.

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(vii). The proposed Generation Facility/Co-Generation Power Plant of FFBLPCL, for which Generation Licence has been sought, will be based on Imported/Local Coal. The Generation Facilities using Imported/Local Coal may be harmful to environment because of emission of Green House Gases (GHG) and production of ash and other effluents. The Sponsors have also confirmed that proposed Generation Facility/Co-Generation Power Plant will have (a). Flue gas de-dusting and treatment equipment; (b). Bottom ash and fly ash handling equipment; (c). Sorbent (Limestone) Handling Plant and (d). Highly Reliable Ash Handling System. The whole installation will be in accordance to the WBG and NEQS. The project will have (a). NO_x = 510 mg/Nm3 (b). SO_2 = 1,500 mg/Nm^3 (c). Dust = 50 mg/Nm3 and (d). CO = 800 mg/Nm^3. Taking into account the technology of the boiler and the use of international coal, the said limits of emission values will be achieved through crushed limestone injection in CFB boiler and will not require additional/external Wet Flue Gas (WFG) de-sulphurization. Further, there will be no need for separate flue gas desulphurization system (FGD). The SO_x removal will be carried out by injecting limestone ($CaCO_3$) in boiler. Due to lower combustion temperature no selective catalytic reduction-SCR required. There will be no Ash slagging. Whereas, the Bottom Ash Removal system will be of simple chute system. FFBLPCL has confirmed that the proposed Generation Facility/Co-Generation Power Plant will be complying with required NEQS without any exception. FFBLPCL has also submitted a copy of the NoC issued by of EPAGoS. In order to ensure that the Generation Facility/Co-Generation Power Plant conforms to the environmental standards during the term of its Generation Licence, a separate article has been included along with other terms and conditions. Further, the Authority also directs FFBLPCL to submit a Quarterly/Bi-Annually report confirming that operation of its Generation Facility/Co-Generation Power Plant is compliant with the required NEQS as prescribed by EPAGoS.

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(viii). In view of the above, the Authority hereby decides to approve the grant of Generation Licence to FFBLPCL on the terms and conditions set out in this determination and the Generation Licence annexed to it. The grant of Generation Licence will be subject to the provisions contained in the NEPRA Act, relevant rules and regulations framed there under including the Grid Code.

Authority

HimayatUllah Khan
Member

22.4.15

Khawaja Muhammad Naeem
Member

22/4/15

Maj. (R) Haroon Rashid
Member/Vice Chairman

22/4/15

Brig. (R) Tariq Saddozai
Chairman

24/4/15

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24.04.15

National Electric Power Regulatory Authority
(NEPRA)
Islamabad – Pakistan

GENERATION LICENCE

No. SGC/111/2015

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

FFBL POWER COMPANY LIMITED

Incorporated under the Companies Ordinance, 1984
Under Corporate Universal Identification No. 0088996, Dated June 27, 2014

for its Imported/Local Coal Based Generation Facility/Co-Generation Power Plant Located at Eastern Industrial Zone, Port Qasim, Karachi in the Province of Sindh

(Total Installed Capacity: 118.00 MW Gross)

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

Given under my hand this 24th day of April Two Thousand & Fifteen and expires on 30th day of March Two Thousand & Forty Seven.

Registrar

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Article-1
Definitions

1.1 In this Licence

(a). "Act" means "the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997";

(b). "Authority" means "the National Electric Power Regulatory Authority constituted under Section-3 of the Act";

(c). "Bulk Power Consumer-BPC" means a consumer who purchases or receives electric power at one premises, in an amount of one megawatt or more;

(d). "Bus Bar" means a system of conductors in the generation facility/Co-Generation Power Plant of the Licensee on which the electric power of all the generators is collected for supplying to the Power Purchaser;

(e). "Co-Generation Power Plant" means the generation facility for simultaneous production of both electric power and heat or steam for industrial processes from a common fuel source;

(f). "Commercial Operations Date (COD)" means the Day immediately following the date on which the generation facility/Co-Generation Power Plant of the Licensee is commissioned and starts supplying to the BPC or the Power Purchaser;

(g). "Distribution Company" means "a company to whom the Authority has granted a distribution licence under Section 20-21 of the Act and engaged in the distribution of electric power.

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(h). "Grid Code" means the grid code prepared by NTDC and approved by the Authority, as it may be revised from time to time by NTDC with any necessary approval by the Authority;

(i). "IEC" means International Electrotechnical Commission or any other entity created for the like purpose and its successors or permitted assigns;

(j). "IEEE" means the Institute of Electrical and Electronics Engineers and its successors or permitted assigns;

(k). "KEL" means "K-Electric Limited and its successors or permitted assigns;

(l). "Licensee" means "FFBL Power Company Limited" and its successors or permitted assigns;

(m). "NTDC" means National Transmission and Despatch Company Limited and its successors or permitted assigns;

(n). "Power Purchase Agreement" means the Power Purchase Agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase of electric power/energy generated by the generation facility/Co-Generation Power Plant of the Licensee, as may be amended by the parties thereto from time to time;

(o). "Power Purchaser" means any Distribution Company including KEL or any BPC which has entered or be entering into a Power Purchase Agreement with the Licensee, for the purchase of electric power/energy generated by the generation facility/Co-Generation Power Plant of the Licensee, as may be amended by the parties thereto from time to time;

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(p). "Regulation" means "the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999" as amended or replaced from time to time;

(q). "Rules" mean "the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000".

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

Article-2
Application of Rules

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

Article-3
Generation Facilities

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

3.2 The net capacity of the generation facility/Co-Generation Power Plant of the Licensee is set out in Schedule-II hereto.

3.3 The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Co-Generation Power Plant before its COD.

Article-4
Term of Licence

4.1 The Licence is granted for a term of thirty (30) years after the COD of the generation facility/Co-Generation Power Plant.

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4.2 Unless suspended or revoked earlier, the Licensee may apply for renewal of the Licence within ninety (90) days prior to the expiry of the term of the Licence, as stipulated in the Regulations.

Article-5
Licence fee

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

Article-6
Tariff

The Licensee shall charge only such tariff which has been determined, approved or specified by the Authority in terms of Rule-6 of the Rules.

Article-7
Competitive Trading Arrangement

7.1 The Licensee shall participate in such manner as may be directed by the Authority from time to time for development of a Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority. Provided that any such participation shall be subject to any contract entered into between the Licensee and another party with the approval of the Authority.

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

Article-8
Maintenance of Records

For the purpose of sub-rule (1) of Rule-19 of the Rules, copies of records and data shall be retained in standard and electronic form and all such records and data

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shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.

Article-9
Compliance with Performance Standards

The Licensee shall comply with the relevant provisions of the National Electric Power Regulatory Authority Performance Standards (Generation) Rules 2009 as amended from time to time.

Article-10
Compliance with Environmental Standards

10.1 The Licensee at all times shall comply with the environmental standards as may be prescribed by the relevant competent authority as amended from time to time.

10.2 The Licensee shall provide a certificate on a bi-annual basis, confirming that the operation of its generation facility/Co-Generation Power Plant is in line with environmental standards as prescribed by the relevant competent authority.

Article-11
Power off take Point and Voltage

The Licensee shall deliver power to the Power Purchaser at the outgoing bus bar of its grid station. The up-gradation (step up) of generation voltage up to the required Interconnection voltage level will be the responsibility of the Licensee.

Article-12
Provision of Information

12.1 The obligation of the Licensee to provide information to the Authority shall be in accordance with Section-44 of the Act.

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

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Article-13
Design & Manufacturing Standards

All the components of the generation facility/Co-Generation Power Plant shall be designed, manufactured and tested according to the latest IEC, IEEE or any other equivalent standards. All plant and equipment shall be unused and brand new.

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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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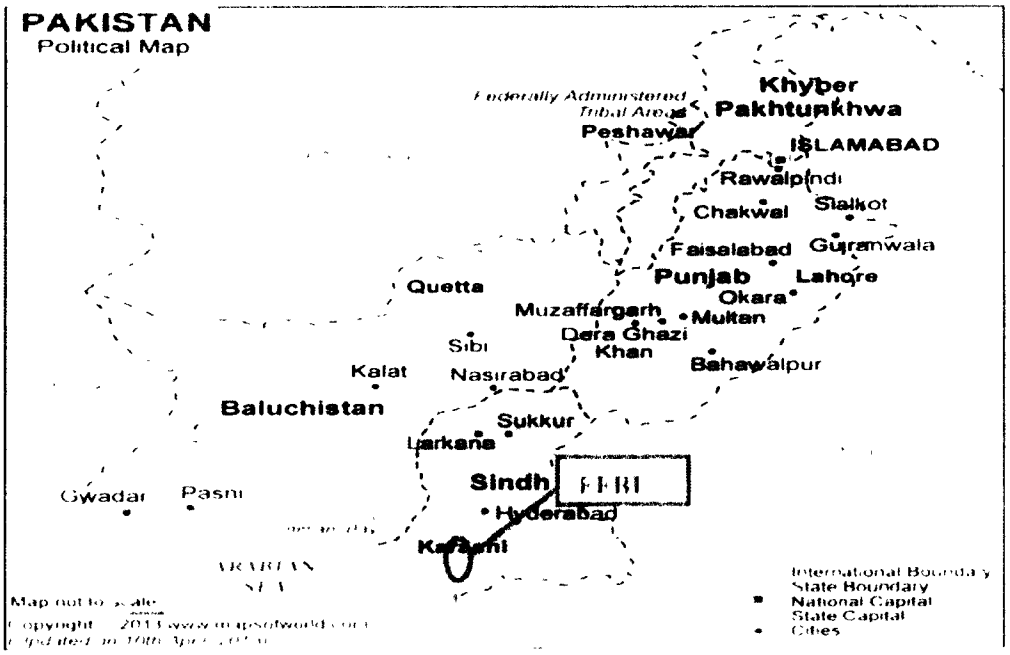

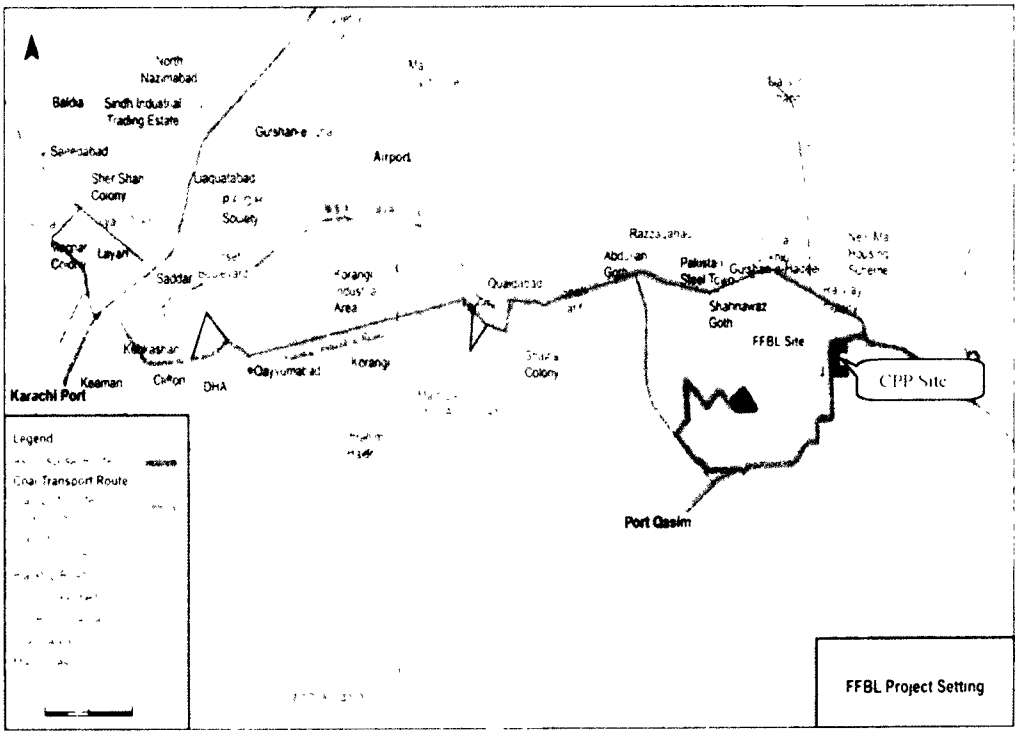

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Layout of Existing and Proposed Facilities at Fertilizer Plant Complex

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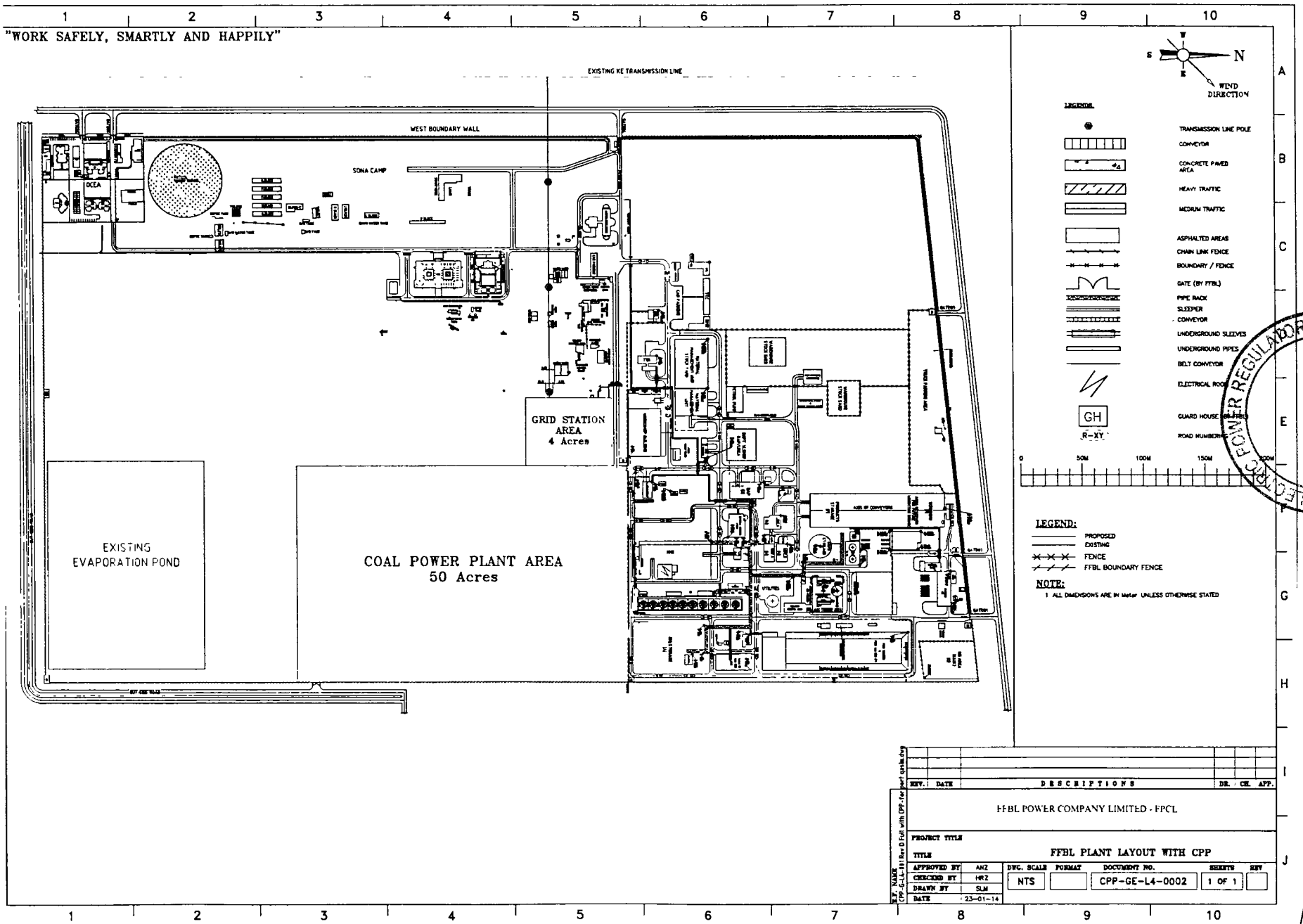
"WORK SAFELY, SMARTLY AND HAPPILY"



REV.	DATE	DESCRIPTIONS	DR.	CH.	APP.

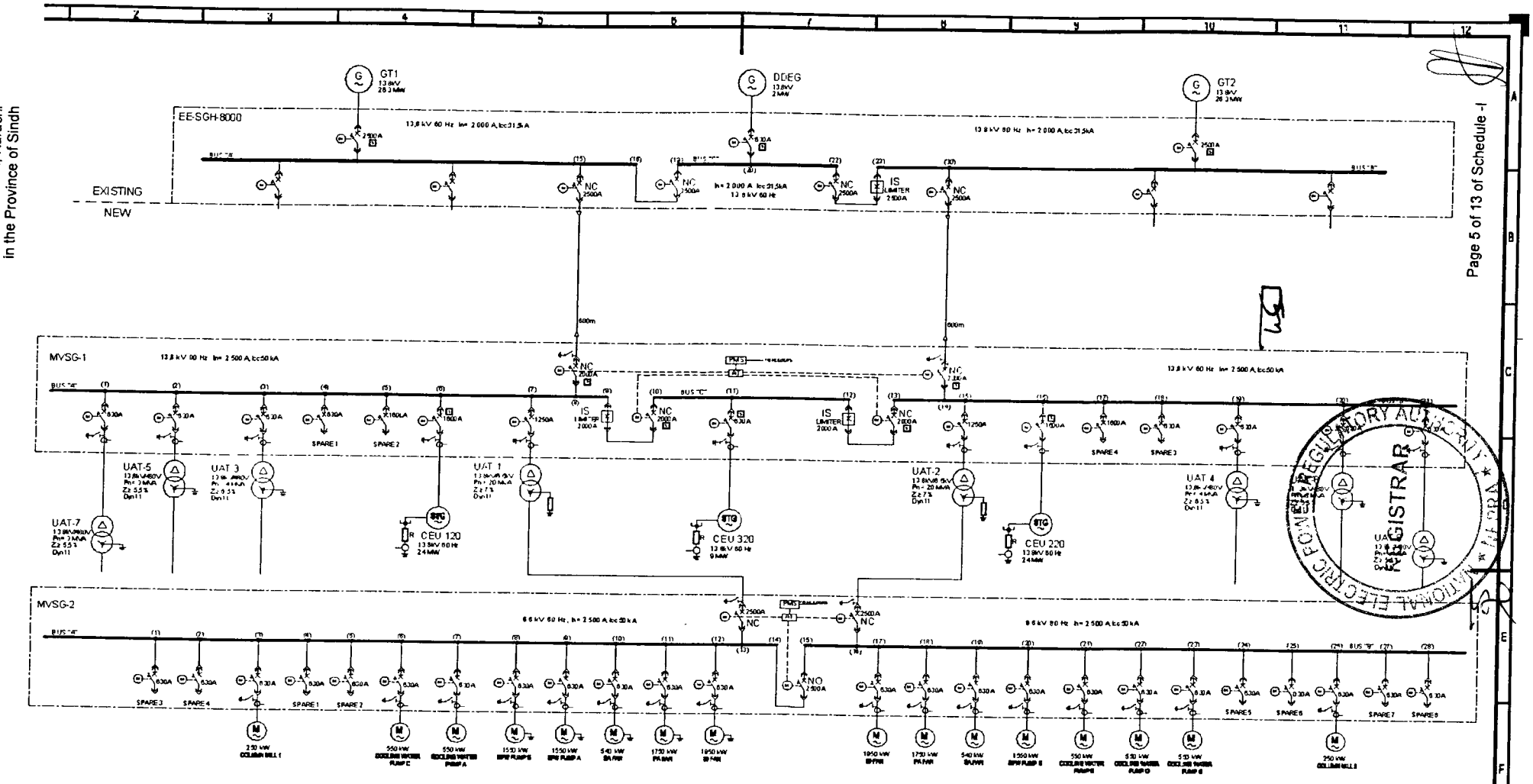
FFBL POWER COMPANY LIMITED - FPCL

PROJECT TITLE

TITLE: FFBL PLANT LAYOUT WITH CPP

		DWG. SCALE	FORMAT	DOCUMENT NO.	SHEETS	REV
APPROVED BY	ANZ	NTS		CPP-GE-L4-0002	1 OF 1	
CHECKED BY	HRZ					
DRAWN BY	SJM					
DATE	23-01-14					

F:\...\CPP-G-L4-001 Rev 0 Fdt with CPP-for report cpnlte.dwg



NOTES

1 ALL TRANSFORMERS EQUIPED WITH NO-LOAD TAPS ( )

LEGEND

MVSG	- MEDIUM VOLTAGE SWITCHGEAR
LVSW	LOW VOLTAGE SWITCHGEAR
MCC	- MOTOR CONTROL CENTRE
UAT	- UNIT AUXILIARY TRANSFORMER
AST	AUXILIARY SERVICE TRANSFORMER
STG	- STEAM TURBINE GENERATOR
UPS	UNINTERRUPTIBLE POWER SYSTEM
UDB	- STG UPS DISTRIBUTION PANEL
CVDCDP	COMMON VDC DISTRIBUTION PANEL
EDB	EMERGENCY DISTRIBUTION BOARD
MH	- MATERIAL HANDLING

SYMBOLOGY

- SYNCHRONIZING/SYNCHROCHECK FACILITIES
- AUTOMATIC TRANSFER SYSTEM
- POWER (ELECTRICAL) MANAGEMENT SYSTEM
- WITHDRAWABLE MOTORIZED CIRCUIT BREAKER
- DISCONNECTOR
- UNDER LOAD DISCONNECT SWITCH (ULDS)
- WITHDRAWABLE VACUUM CONTACTOR
- AUTOMATIC CIRCUIT BREAKER
- CURRENT LIMITING REACTOR (CLR)
- VOLTAGE TRANSFORMER
- ELECTRICAL MOTOR
- EARTH RESISTOR
- FUSE
- INVERTER OR RECTIFIER
- BATTERY

FFBL | IEG

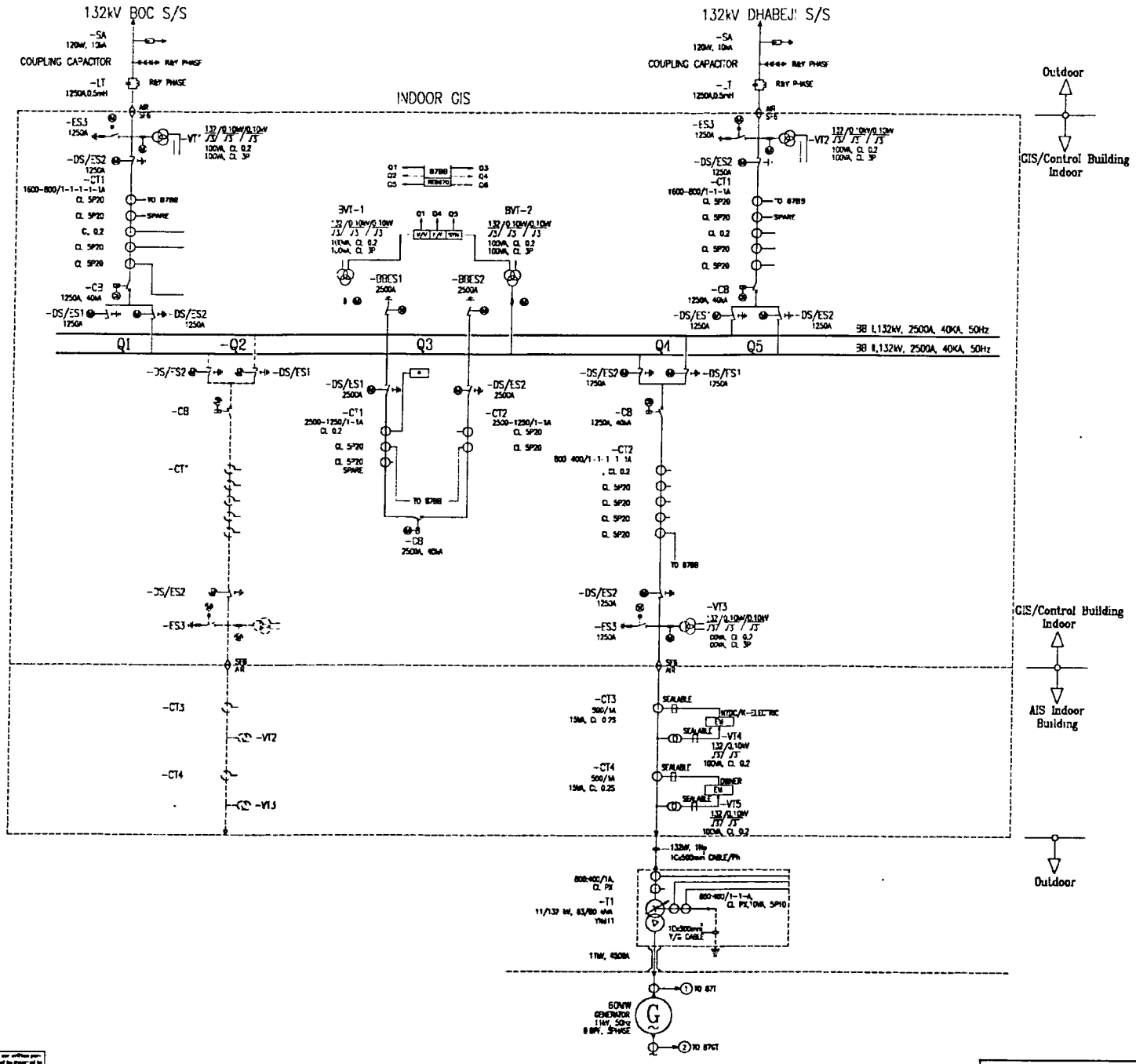
COAL POWER PLANT (CPP) PROJECT - FPCL

CX X000 ELECTRICAL POWER NETWORK
CX X060 SWG - MV SWITCHGEARS

MV SINGLE LINE DIAGRAM

CPP-CX-E2-70501, B		B	01	A2
IEG-1445-39-EDS-002				

Generation Licence
FFBL Power Company Limited
Eastern Industrial Zone
Port Qasim, Karachi
in the Province of Sindh



LEGEND:

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER (CB)
	ISOLATOR WITH EARTHING SWITCH (DS/ES)
	CURRENT TRANSFORMER (CT)
	EARTHING SWITCH WITH SHORT-CIRCUIT MAKING CAPACITY
	VOLTAGE TRANSFORMER WITH INTEGRATED ISOLATING DEVICE (WHMJAC)
	LINE TRAP
	SURGE ARRESTOR
	COUPLING CAPACITOR
	POWER TRANSFORMER (Tx)
	INDUCTIVE VOLTAGE TRANSFORMER (VT)
87L	LINE DIFFERENTIAL PROTECTION
21	LINE DISTANCE PROTECTION
87T	TRANSFORMER DIFFERENTIAL PROTECTION
87GT	GEN TRANSFORMER DIFFERENTIAL PROTECTION
64	RESTRICTED EARTH FAULT PROTECTION
87.B1	BUS BAR PROTECTION
50/51	OVER CURRENT PROTECTION
51N	EARTH FAULT PROTECTION
67N	(SENSITIVE) DIRECTIONAL EARTH FAULT PROTECTION
50SF	HIGH-HIGH SPEED PROTECTION
79/25	AUTO RECLOSE RELAY WITH SYNCHRONISER
25	SYNCHRONISING FOR MANUAL CLOSE
67	DIRECTIONAL O/C RELAY
TMV	DIGITAL TRIVECTOR ENERGY METER
(26)	APPARATUS TEMPERATURE DEVICE
60	PT FUSE FAILURE RELAY
50N	INSTANTANEOUS O/C RELAY EARTH FAULT PROTECTION
27	UNDER VOLTAGE RELAY
59	OVER VOLTAGE RELAY
81	FREQUENCY RELAY
99	OVERFLUXING PROTECTIVE RELAY
74	TRIP CIRCUIT SUPERVISION RELAY
V/V	DOUBLE VOLTMETER
F/F	DOUBLE FREQUENCY METER
SYN	SYNCHRO CHECK METER
PSB	POWER SWING BLOCK
SOF	SWITCH ON TO FAULT
FL	FAULT LOCATOR
	11kV BUSDUCT

NOTES:
1- THE PROPOSED ARRANGEMENT IS PRELIMINARY & MAY BE REVISED AS PER EQUIPMENT APPROVED DURING DETAIL DESIGN.
2- M/S SCOPE OF WORK IS FROM 132kV LINE TERMINATION TO 11kV CABLE UPTO GT

REV	DATE	DESCRIPTION	DRN.	CH
2	16.12.14	REVISED	KA	SM
1	08.10.14	ISSUED FOR TENDER SUBMISSION	KA	SM
0	01.10.14	INTERNAL	KA	SM

DEVELOPER:
FFBL POWER COMPANY LIMITED

DRAWING TITLE
132kV GIS SUBSTATION
132kV GIS SINGLE LINE DIAGRAM (DOUBLE E

APPROVED		DRAWING NO. (1) 3VAE-E14027-P003	DATE
CHECKED			SCALE
DRAWN			SHEET
FORMAT			REVISION

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Interconnection Facilities/ Transmission Arrangements for Dispersal of Power from the Generation Facility/Co-Generation Power Plant

The electric power from the Imported/Indigenous Coal based generation facility/power plant of the Licensee/FFBL Power Company Limited (FFBLPCL) will be supplied to Fauji Fertilizer Bin Qasim Limited* and to the Distribution Company (i.e. K-Electric Limited-KEL).

(2). The Interconnection Facilities (IF)/Transmission Arrangements (TA) for supplying to KEL from the above mentioned generation facility shall be at 132 kV level. The dispersal/interconnection arrangement for supplying to KEL will be consisting on an 132 KV D/C Transmission Line (Measuring 0.6-KM in length) by making In-Out Arrangement of existing 132 kV Dhabeji-BOC Transmission Line at the switchyard (132kV Duplicate Bus) of the Licensee.

(3). Any change in the above mentioned IF/TA for dispersal of electric power as agreed by the Licensee and the Power Purchaser(s) shall be communicated to the Authority in due course of time.

* The details of the pertaining to supply arrangement (i e Load, number of feeders, and voltage level etc) for Fauji Fertilizer Bin Qasim Limited and other relating information is provided in the subsequent description of this Schedule-I

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Information Regarding
Distribution Network for Supply of Power to Fauji Fertilizer Bin Qasim Limited-FFBQL By the Licensee (i.e. FFBL Power Company Limited-FFBLPCL)]

(i).	No. of Feeders		02 (Two)
(ii).	Length of Each Feeder (Meter)		Approximately 500 Meter (each)
(iii).	Length of Each Feeder to each Consumer		Approximately 500 Meter (both Feeder to FFBQL)
(iv).	In respect of all the Feeders, describe the property (streets, farms, Agri land, etc.) through, under or over which they pass right up to the premises of customer, whether they cross-over.		The feeders supplying electric power to FFBQL (at 13.8 KV and 60 Hz) are located on land owned by FFBQL, without crossing of any Public or third party Private Property etc.
(v).	Whether owned by FFBLPCL, FFBQL or KEL-(deal with each Feeder Separately)		
	(a).	If owned by FFBQL (furnish particulars of contractual arrangement	FFBQL owns the feeders supplying to it the electric power from FBLPCL
	(b).	Operation and maintenance responsibility for each feeder	The Operation and Maintenance is the responsibility of FFBQL.
(vi).	Whether connection with network of KEL exists (whether active or not)- If yes, provide details of connection arrangements (both technical and contractual)		No, FFBQL is operating on 60 Hz and is not a Consumer of KEL.
(vii).	Any other network information deemed relevant for disclosure to or consideration by NEPRA.		FFBQL operates at 60 Hz frequency, therefore cannot be connected with Network of KEL.

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Information Pertaining to the Fauji Fertilizer Bin Qasim Limited-FFBQL [being/to be Supplied by the Licensee (i.e. FFBL Power Company Limited-FFBLPCL)]

(i).	No. of Consumer(s)		One (01)
(ii).	Location of consumer(s) [distance and/or identity of premises]		Fauji Fertilizer Bin Qasim Limited-FFBQL, Plot No. EZ/I/P-1 Eastern Zone, Port Qasim, Karachi.
(iii).	Contracted Capacity and Load Factor for FFBQL		22.00 MW-58.00 MW
(iv).	Specify Whether		
	(a).	FFBQL is an Associate undertaking of the FFBLPCL- If yes, specify percentage ownership of equity;	FFBLPCL is a subsidiary of FFBQL
	(b).	There are common directorships:	Yes/Six(06) out of Nine (09) Directors of FFBLPCL are also Directors of FFBQL
	(c).	Either can exercise influence or control over the other.	Yes
(v).	Specify nature of contractual Relationship		
	(a).	Between each FFBQL and FFBLPCL.	FFBQL will enter into Off-take Agreement with FFBLPCL
	(b).	FFBQL and KEL.	No.
(vi)	Any other network information deemed relevant for disclosure to or consideration by NEPRA.		N/A

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Detail of Generation Facility/Co-Generation Power Plant

(A). General Information

(i).	Name of the Company/ Licensee	FFBL Power Company Limited
(ii).	Registered /Business Office the Company/ Licensee	73-Harley Street, Rawalpindi
(iii).	Location of the Generation Facility/ Co-Generation Power Plant	Adjacent to Fauji Fertilizer Bin Qasim Limited in the Eastern Industrial Zone, Bin Qasim, Karachi, in the Province of Sindh.
(iv).	Type of the Generation Facility/ Co-Generation Power Plant	Thermal Generation Facility

(B). Plant Configuration

(i).	Installed Capacity/ Size the Generation Facility/ Co-Generation Power Plant	118.00 MW			
(ii).	Type of Technology of the Generation Facility/ Co-Generation Power Plant	Conventional Thermal Power Generation Facility with Circulating Fluidized Bed (CFB) Sub-Critical Boiler and Steam Turbines			
(iii).	Number of Units/Size (MW)	Unit-1	Unit-2	Unit-3	Unit-4
		1 x 24 MW Steam Turbine	1 x 24 MW Steam Turbine	1 x 10 MW Steam Turbine	1 x 60 MW Steam Turbine
		60 Hz			50 Hz
(iv).	Unit Make/Model & Year of Manufacture	Unit-1	Unit-2	Unit-3	Unit-4
		General Electric Model No. T6-7MC9 Year 2015	General Electric Model No. T6-7MC9 Year 2015	General Electric Model No. SNC1-4 Year 2015	General Electric Model No. SC2-19 Year 2015-2016

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		Boilers	Hyundai Heavy Industries Korea
(v).	Expected COD of the Generation Facility/ Co-Generation Power Plant	March 31, 2017 (Expected)	
(vi).	Expected Useful Life of the Generation Facility/ Co-Generation Power Plant from COD	30 Years (Minimum)	

(C). Fuel/Raw Material Details

(i).	Primary Fuel	Imported/Local Coal			
(ii).	Alternate Fuel	Not Applicable			
(iii).	Start Up Fuel	(a).	Natural Gas (NG)		
		(b).	High Speed Diesel Oil (HSD) will be used only if Natural Gas Supply/Connection is not available to the Company/Licensee		
(iv).	Fuel Source (Imported/Indigenous)	Primary Fuel		Start Up Fuel	
		Imported Sub-Bituminous Coal from the countries surrounding Indian Ocean, i.e. Indonesia, South Africa, Botswana or Australia, etc./Local Coal within the country from any available source		Indigenous/ Imported	
(v).	Fuel Supplier	Primary Fuel		Start Up Fuel	
		Xsarta, Banpu, Kaltim Prima Coal and others		NG	Sui Southern Gas Company Limited-SSGC
				HSD	Through any Oil Marketing Company (OMC) including PSO, Shell, Caltex etc.

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(vi).	Supply Arrangement	Primary Fuel	Start Up Fuel	
		Trucks/ Conveyors/ Stacker/ Reclaimer	NG	Through Gas Pipeline
			HSD	Through Oil tankers
(vii).	No of Storage Bunkers/Tanks/Open Yard	Primary Fuel	Start Up Fuel	
		Longitudinal Covered Yard	NG	Not Applicable
			HSD	02 x Closed Storage Tanks
(viii).	Capacity of Storage Facilities	Primary Fuel	Start Up Fuel	
		60,000 Metric Tons bulk storage	NG	N/A
			HSD	300 m^3 (Approximately)
(ix).	Gross Storage Capacity	Primary Fuel	Start Up Fuel	
		60,000 tons bulk storage	NG	N/A
			HSD	300 m^3 (Approximately)

(D). Emission Values

		Primary Fuel	Start Up Fuel
(i).	SO_x (mg/Nm^3)	1,500 mg/Nm^3	As Per National Environmental Quality Standards (NEQs)
(ii).	NO_x (mg/Nm^3)	510 mg/Nm^3	-do-
(iii).	CO_2	N/A	-do-
(iv).	CO (mg/Nm^3)	800 mg/Nm^3	-do-
(v).	PM_{10}	50 mg/Nm^3	-do-

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(E). Cooling System

(i).	Cooling Water Source/Cycle	Clarified Process Water from Fauji Fertilizer Bin Qasim Limited-FFBQL (Open Re-circulating Mechanically Induced Draft Towers with 05 cycles of concentrations)

(F). Plant Characteristics

		Unit-1	Unit-2	Unit-3	Unit-4
(i).	Generation Voltage	13.8KV	13.8KV	13.8KV	11.00 KV
(ii).	Frequency	60 Hz			50 Hz
(iii).	Power Factor	0.8 (lagging)/0.95(leading)			0.80 (lagging)/ 0.90(leading)
(iv).	Automatic Generation Control (AGC)	Yes			
(v).	Ramping Rate	Will be provided Later			
(vi).	Time required to Synchronize to Grid	Will be provided Later			

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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

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SCHEDULE-II

(1).	Total Gross Installed Capacity of the Generation Facility/Co-Generation Power Plant	118.00 MW
(2).	De-rated Capacity of the Generation Facility/Co-Generation Power Plant at Reference Site Conditions	115.00 MW
(3).	Auxiliary Consumption of the Generation Facility/Co-Generation Power Plant	12.00 MW
(4).	Total Net Capacity of the Generation Facility/Co-Generation Power Plant at Reference Site Condition	103.00 MW

Note

All the above figures are indicative as provided by the Licensee. The Net Capacity available to Power Purchaser(s) for dispatch will be determined through procedure(s) contained in the Power Purchase Agreement or any other applicable document(s).

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