



National Electric Power Regulatory Authority Islamic Republic of Pakistan

Registrar

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No. NEPRA/R/DL/LAG-382/1519-267

August 31, 2017

Mr. Muhammad Iqbal Khan
Deputy Director (EI&C),
Pakistan Atomic Energy Commission,
Coal Fired Power Plants,
P.O Box No. 2971,
Islamabad

Subject: **Grant of Generation Licence No. SGC/120/2017
Licence Application No. LAG-382
Pakistan Atomic Energy Commission (PAEC)**

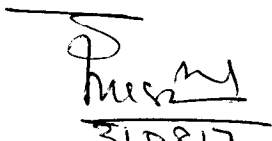
Reference: *PAEC's application vide letter dated August 29, 2016.*

Enclosed please find herewith Generation Licence No. SGC/120/2017 granted by National Electric Power Regulatory Authority (NEPRA) to Pakistan Atomic Energy Commission (PAEC) for its 50.00 MW Coal Fired Plant located at KCP Complex, Jauharabad, District Khushab, in the province of Punjab, pursuant to Section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997). Further, the determination of the Authority in the subject matter is also attached.

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

Enclosure: **Generation Licence
(SGC/120/2017)**




310817
(Syed Safer Hussain)

Copy to:

1. Secretary, Ministry of Water and Power, A-Block, Pak Secretariat, Islamabad.
2. Chief Executive Officer, NTDC, 414-WAPDA House, Lahore.
3. Chief Executive Officer, CPPA-G, ENERCON Building, Sector G-5/2, Islamabad.
4. Chief Executive Officer, Faisalabad Electric Supply Company (FESCO), Abdullahpur, Canal Bank Road, Faisalabad.
5. Director General, Environment Protection Department, Government of Punjab, National Hockey Stadium, Ferozpur Road, Lahore

National Electric Power Regulatory Authority
(NEPRA)

Determination of the Authority
in the Matter of Application of Pakistan Atomic Energy
Commission for the Grant of Generation Licence

August 31, 2017
Case No. LAG-382

(A). Background

(i). The electric power sector of the country is experiencing a supply-demand gap. Due to the shortage of electricity, the utilities are finding it hard to meet with the requirements of its consumers especially industrial concerns.

(ii). In order to cope with the above mentioned situation, various industrial concerns are contemplating to set up generation facilities using cheaper resources for supplying to their industrial concerns. To meet the electricity requirement of its KCP complex located at Jauharabad, district Khushab in the province of Punjab, Pakistan Atomic Energy Commission (PAEC) planned to set up a 50 MW indigenous coal based generation facility/Thermal Power Plant.

(iii). In accordance with Section-15 of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (the "NEPRA Act"), read with the NEPRA Licensing (Application and Modification Procedure) Regulations, 1999 (the "Licensing Regulations") PAEC submitted an application on August 29, 2016 requesting for the grant of generation licence. The matter was taken up in different regulatory meetings and the Authority rejected the application on December 06, 2016 due to lower efficiency.

(iv). Being aggrieved with said decision of the Authority, PAEC filed a motion for leave for review. The Authority considered the review application in its regulatory meeting held on January 18, 2017 and decided to admit the same. Further, the Authority also decided to give an opportunity of hearing to PAEC in the matter.



(v). Accordingly, the hearing was held on February 14, 2017 which was attended by the representatives/professionals of PAEC. The representatives of PAEC gave a detailed presentation on the various aspects of the project and confirmed that the proposed generation facility is meant for captive use and only occasional surplus will be supplied to the utility on take and pay basis and there will be no liability on account of capacity payment for the utility.

(B). Admission of Application

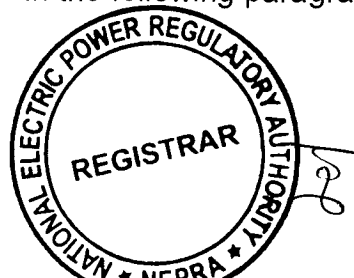
(i). Based on the proceedings of the hearing and other submitted information, the Authority re-considered the matter in its regulatory meeting held on March 07, 2017 and decided to admit the application for consideration of the grant of the generation licence as stipulated in Regulation-7 of the Licensing Regulations.

(ii). The Authority approved an advertisement to invite comments of general public, interested and affected persons in the matter as stipulated in Regulation-8 of the Licensing Regulations. Accordingly, notices were published in one (01) Urdu and one (01) English newspapers on March 23, 2017.

(iii). In addition to the above, the Authority also approved a list of stakeholders for seeking their comments for assistance of the Authority in the matter in terms of Regulation-9(2) of the Licensing Regulations. Accordingly, letters were sent to the said stakeholders on March 24, 2017, soliciting their comments for assistance of the Authority.

(C). Comments of Stakeholders

(i). In reply to the above, this office received comments from three (03) stakeholders. These included Ministry of Petroleum & Natural Resources (MoP&NR), Pakistan Nuclear Regulatory Authority (PNRA), Energy Department Govt. of the Punjab (EDGoPb). The salient points of the comments offered by the said stakeholders are summarized in the following paragraphs: -



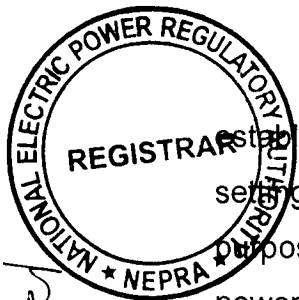
- (a). MoP&NR supported the grant of generation licence to PAEC for the proposed 50.00 MW coal based Thermal Power Plant being set up by it;
- (b). PNRA commented that it regulates nuclear installation and radiation facilities only. The proposed coal based generation facility of PAEC does not fall in the purview of PNRA hence it has no comments to offer in the matter; &
- (c). EDGoPb stated that keeping in view the track record, the Authority may proceed with the processing of the application of PAEC for the grant of generation licence for its proposed coal based generation facility.

(ii). The Authority considered the above comments of the stakeholders and found the same supportive. Accordingly, the Authority considered it appropriate to proceed further in the matter of application of PAEC for the consideration of grant of generation licence as stipulated in the Licensing Regulations and NEPRA Licensing (Generation) Rules 2000 (the "Generation Rules").

(D). Evaluation/Findings

(i). The Authority has examined the submissions of PAEC including the information provided in its application for the grant of generation licence. The Authority has also considered the feasibility study (PC-I) of the project, Grid Interconnection Study (GIS) and provisions of the relevant rules & regulations.

(ii). The Authority has observed that PAEC is a statutory body established under the PAEC Ordinance 1965 entrusted with the objective of setting up of nuclear facilities and other related infrastructure for peaceful purposes. PAEC has sufficient experience in the operation and management of power generation facilities. It is pertinent to mention that PAEC gets development fund through Public Sector Development Program (PSDP). In view of the said, the Authority is of the view that PAEC not only has strong



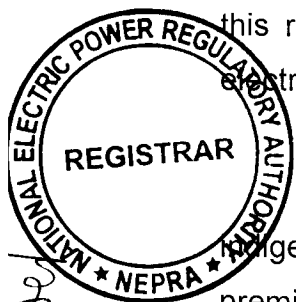
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experience for the development of various type of electric power generation facilities but also has funding available to develop and set up any power project.

(iii). The Authority has noticed that in terms of Section-24 of the NEPRA Act, except exempted by the Authority, a prospective licensee for generation, transmission or distribution licence is required to be a company registered under the Companies Ordinance, 1984 (XLVII of 1984). As explained above, PAEC is not an entity incorporated under the companies ordinance but is a statutory body established under the PAEC Ordinance 1965. In consideration of the said, it is worth mentioning that Regulation-4 of the Licensing Regulations clearly acknowledges the situation dealing with unincorporated applicants and states that an applicant, not being a company registered under the Ordinance, seeking exemption from the Authority pursuant to and for the purposes of Section-24 of the NEPRA Act, shall add a document-in-support setting out the grounds on which the exemption is sought. In this regard, PAEC has made a submission to the Authority for said exemption. In view of the request of PAEC and precedence of similar cases of exemption, the Authority considered it appropriate to accept the current request of PAEC for exempting to be a corporate entity.

(iv). According to the information provided, PAEC has an installation located at Girote, Jauharabad, district Khushab in the province of Punjab. The electric power requirement of the complex are being met through FESCO however, the quality of service from the utility is not satisfactory and there are outages, frequent breakdowns, low voltage problem and other related issues. In view of the occurrence of the event of Fukushima accident in Japan, there are now more stringent requirements from International Atomic Energy Agency (IAEA) that nuclear installation must be supplied uninterrupted electric power. In this regard, IAEA has made it mandatory that such installations be provided electric power from two completely independent sources.

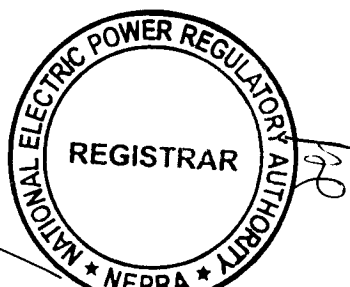
(v). In view of the above, PAEC is planning to set a 50.00 MW indigenous coal based generation facility/Thermal Power Plant within the premises of its complex at Jauharabad, district Khushab for which sufficient quantity of land is already available. The proposed generation facility will be



consisting of two (02) Boilers (98 bar and 540°C), two (02) steam turbines and two (02) synchronous generator units. The boilers will be fed using the local coal of the salt range mines which will be supplied and transported using trucks. In view of the size of the project and possible source of coal PAEC has selected Circulating Fluidized Bed (CFB) coal boiler. The selected technology provides improved thermal efficiency and the excellent ability to burn a wide range of coal. The gross efficiency of the proposed generation facility/Thermal Power Plant will be around 31.25% whereas the net efficiency of same will be 28.00%.

(vi). The efficiency of the proposed generation facility/Thermal Power Plant is below the benchmark efficiency of 39% set up by the Authority in the case of upfront tariff determined by the Authority for coal power projects. In this regard, the Authority has observed that major portion of the electric power generated by PAEC is meant for captive use and only occasional surplus will be supplied to the utility/FESCO on take and pay basis and there will be no liability on account of capacity payment for the utility. Therefore, it will not have any adverse impact on the end consumers.

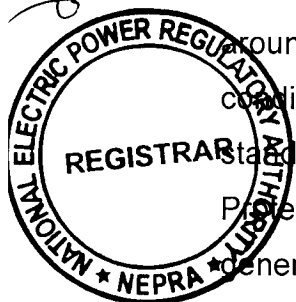
(vii). The electric power generation facility/Thermal Power Plant of PAEC will be primarily used for its own use to the tune of 28.00 MW. The generation facility will be synchronized to the system of the concerned utility and surplus available from the generation facility will be fed to it. It is estimated that the generation facility will have a net output of 40.00 MW and therefore, around 12.00 MW will be available to the utility in summer whereas around 18.00 MW can be spared in winter season for the utility. In this regard, GM (Planning) NTDC has carried out the Grid Interconnection Study (GIS) of the project and has confirmed that the surplus available from the generation facility/Thermal Power Plant can be fed to the utility through a 132 kV Double Circuit (D/C) transmission line (Measuring about 3-KM in length on ACSR Lynx Conductor) connecting the generation facility with existing ABC Girote grid station of FESCO. It is pertinent to mention that FESCO through its letter dated May 31, 2017 has endorsed the GIS conducted by NTDC confirming that the proposed arrangement will not have any adverse impact on its system.



(viii). The Authority has observed that the proposed coal based generation facility/Thermal Power Plant of PAEC is a conventional steam turbine based unit in which a huge quantity of water will be required for generation of steam. In this regard, PAEC has confirmed that underground water at site will be the main source of supply for the proposed generation facility/Thermal Power Plant. In this regard, deep well turbines will be set up to pump the ground water.

(ix). As explained above, the proposed generation facility/Thermal Power Plant of PAEC is based on indigenous coal of salt range. The coal based generation facilities/Thermal Power Plant may be harmful to environment because of emission of SO_x, NO_x, Particulate Matters, Green House Gases-GHG, production of ash and other effluents. In this regard, PAEC confirmed that proposed generation facility/Thermal Power Plant will have air emission control equipment including an Electro Static Precipitator (ESP). Further, for Flue Gas Desulfurization (FDG), the CFB boiler will have the in-situ desulfurization capability which will reduce the SO_x emissions upto NEQS acceptable levels. CFB boilers are low temperature combustion boilers which ensure that NO_x emission complies with National and Global standards on emission/environment. Waste water would be treated and utilized in-plant, with a small quantity of effluent discharged after further treatment to meet environmental standards.

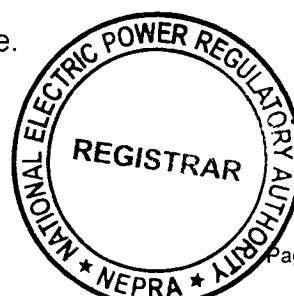
(x). Further, conventional solid wastes (Bottom and Fly Ash) would be disposed at the ash yard, while hazardous waste would be collected and treated in-plant. Periodic monitoring of groundwater would be done to prevent water contamination. Efforts would be made to maximize use of fly ash and gypsum to reduce waste disposal. Water would be constantly sprayed in the coal yard to reduce coal dust. Sound attenuation material would be applied on machinery generating high noise levels. Pollution monitoring system inside and around the station would be set up to constantly monitor the environmental conditions. In short, PAEC has assured compliance of the environmental standards and has also provided a No Objection Certificate from Environmental Protection Agency Govt. of Punjab (EPAGoPb). However, to ensure that the generation facility/Thermal Power Plant conforms to the environmental standards during the term of the generation licence, a separate article (i.e.



Article-11) has been included along with other terms and conditions binding the PAEC to comply with relevant environmental standards all the time.

(xi). In terms of Rule-3 of the Generation Rules, the Authority may grant a generation licence to any person to engage in the generation business. The said rule stipulates various conditions pertaining to the grant of generation licence as explained in Rule-3(2), Rule-3 (3), Rule-3(4), Rule-3(5) and Rule-3(6); In the particular case under consideration, the conditions of Rule-3(2) and Rule-3(3) stands satisfied as PAEC has provided details of location, technology, size, net capacity, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facilities. The provision of Rule-3(4) of the Generation Rules regarding holding a public hearing is not applicable as there is no issue which requires this practice.

(xii). Further, Rule-3(5) of the Generation Rules stipulates that the Authority may refuse to issue a licence where the site, technology, design, fuel, tariff or other relevant matters pertaining to the generation facility proposed in an application for a generation licence are either not suitable on environmental grounds or do not satisfy the least cost option criteria. In this regard, the Rule-3(5) of the Generation Rules also stipulates the conditions pertaining to least cost option criteria which include (a). sustainable development or optimum utilization of the renewable or non-renewable energy resources proposed for generation of electric power; (b). the availability of indigenous fuel and other resources; (c). the comparative costs of the construction, operation and maintenance of the proposed generation facility against the preferences indicated by the Authority; (d). the costs and right-of-way considerations related to the provision of transmission and interconnection facilities; (e). the constraints on the transmission system likely to result from the proposed generation facility and the costs of the transmission system expansion required to remove such constraints; (f). the short-term and the long-term forecasts for additional capacity requirements; (g). the tariffs resulting or likely to result from the construction or operation of the proposed generation facility; and (h) the optimum utilization of various sites in the context of both the short-term and the long-term requirements of the electric power industry as a whole.



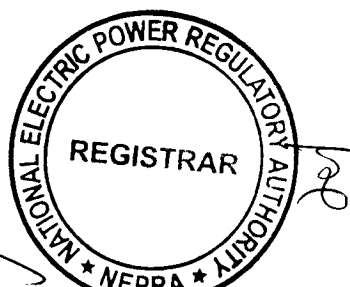
(xiii). The Authority considers that the project is being developed as captive power plant whereby most of the energy will be consumed in-house and only occasional surplus available will be supplied to FESCO on “take and pay” basis, meaning thereby PAEC will be entitled for payment in respect of the units it actually delivers to FESCO. The Authority is of the considered view that being a captive power plant and agreeing to a “take and pay” arrangement, the tariff likely to result will be very competitive. Further, being based on local/indigenous coal the tariff will be further rationalized as it will not have any indexation on account of fuel price adjustment due to change in currency that is normally admissible for the imported fuel. The estimated cost of the project is Rs. 7000 million which is equivalent to U.S. \$ 1.33/MW and the same is comparable and reasonable with coal projects being installed in the country and will result in very reasonable cost for the end consumer.

(xiv). The sponsors of the project had carried out the GIS which concludes that a 132 kV D/C transmission line (Measuring about 3.00 KM) will be required to connect the project with the system of FESCO. Further, the study has confirmed that the project will not face any constraints in transmission system. Further, being located at reasonable distance from the thick population, the project will not result in costs and right-of-way issues for the provision of transmission and interconnection facilities.

(xv). In view of the above, the Authority is of the considered view that the project of PAEC fulfills the eligibility criteria for grant of generation licence as stipulated in the NEPRA Act, rules and regulations and other applicable documents.

(E). Grant of Generation Licence

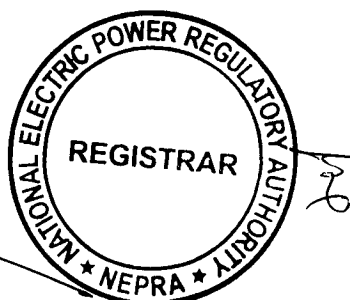
(i). Electricity is a fundamental element for the economic growth of any country. The electricity consumption per capita has a strong correlation to the social development indices (human development index, life expectancy at birth, infant mortality rate, and maternal mortality) and economic indices (such as GDP per capita etc.).



(ii). Increasing electricity consumption per capita can directly stimulate economic growth and indirectly achieve enhanced social development. In short, the economic growth of any country is directly linked with the availability of safe, secure, reliable and cheaper supply of electricity. The Authority is well aware of the fact that presently there is severe shortage of electricity in the country and that as a result of huge supply-demand gap the distribution companies are facing difficulties in serving their consumers. Due to the prevailing situation, the industrial units are forced to make their own arrangements to meet their electricity requirements.

(iii). Regarding compliance with the environmental standards, the Authority directs PAEC to ensure that the project will comply with the environmental standards during the term of the generation licence. In view of the said, the Authority has included a separate article (i.e. Article-11) in the generation licence along with other terms and conditions that the licensee will comply with relevant environmental standards. Further, the Authority directs PAEC to submit a report on a bi-annual basis, confirming that operation of its generation facility/Thermal Power Plant is compliant with required environmental standards as prescribed by the concerned environmental protection agency.

(iv). The term of a generation licence under Rules-5(1) of the Generation Rules is to commensurate with the maximum expected useful life of the units comprised in a generating facility, except where an applicant for a generation licence consents to a shorter term. According to the information provided by PAEC, its generation facility/Thermal Power Plant will achieve Commercial Operation Date by December 31, 2017 and will have a useful life of thirty (30) years from its COD. In this regard, it is clarified that as per international standards the life of a brand new steam turbine is taken as thirty (30) years. Therefore, it is considered that information provided by PAEC about the useful life of its generation facility/Thermal Power Plant is consistent with international benchmarks of other similar cases. In view of the said, the Authority has fixed the term of the generation licence as thirty (30) years from COD of the project.

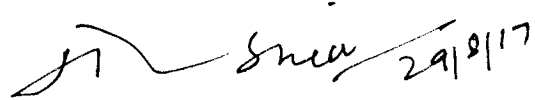


(v). Regarding the tariff, it is hereby clarified that under Section-7(3)(a) of the NEPRA Act, determining tariff, rate and charges etc. is the sole prerogative of the Authority. In view of the said, the Authority through Article-6 of the generation licence directs PAEC to charge the power purchaser only such tariff which has been determined, approved or specified by the Authority. The Authority directs PAEC to adhere to the Article-6 of the generation licence in letter and spirit without any exception.

(vi). In view of the above, the Authority hereby approves the grant of generation licence to PAEC on the terms and conditions set out in the generation licence annexed to this determination. The grant of generation licence will be subject to the provisions contained in the NEPRA Act, relevant rules, regulations framed thereunder and the other applicable documents.

Authority:

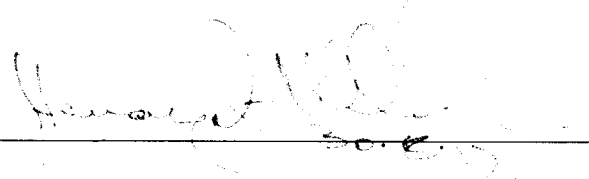
Maj. (R) Haroon Rashid
(Member)


29/8/17

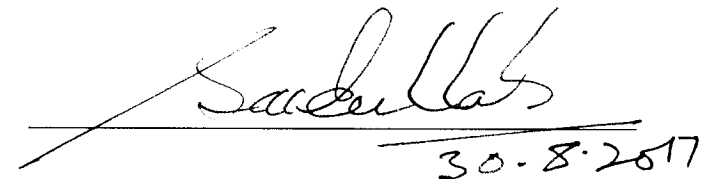
Syed Masood-ul-Hassan Naqvi
(Member)


29/8

Himayat Ullah Khan
(Member)

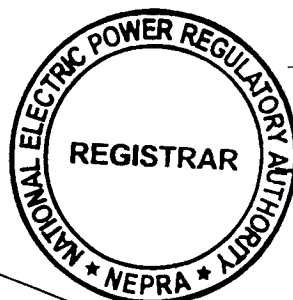

30/8/17

Saif Ullah Chattha
(Member/Vice Chairman)


30.8.2017

Tariq Saddozai
(Chairman)


31/08/17



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

GENERATION LICENCE

No. SGC/120/2017

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

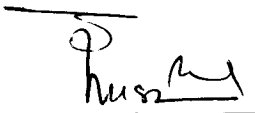
PAKISTAN ATOMIC ENERGY COMMISSION-PAEC

**for its Coal Based Generation Facility Located At KCP Complex Jauharabad,
District Khushab in the Province of Punjab**

(Installed Capacity: 50.00 MW Gross)

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

Given under my hand this 31st day of August Two Thousand & Seventeen and expires on 30th day of December Two Thousand & Forty Seven.


310817

Registrar







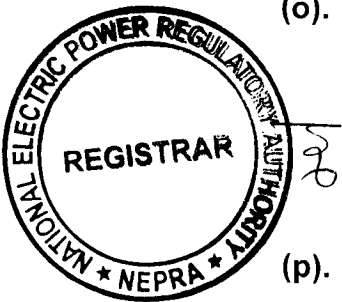
Article-1
Definitions

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). "Applicable Documents" mean the Act, the rules and regulations framed by the Authority under the Act, any documents or instruments issued or determinations made by the Authority under any of the foregoing or pursuant to the exercise of its powers under the Act, the Grid Code, the applicable Distribution Code, if any, or the documents or instruments made by the Licensee pursuant to its generation licence, in each case of a binding nature applicable to the Licensee or, where applicable, to its affiliates and to which the Licensee or any of its affiliates may be subject;
- (d). "Applicable Law" means all the Applicable Documents;
- (e). "Bus Bar" means a system of conductors in the generation facility/Thermal Power Plant of the Licensee on which the electric power from all the generators is collected for supplying to the Power Purchaser;
- (f). "Commercial Operations Date (COD)" means the day immediately following the date on which the generation facility/Co-Generation Facility/Power Plant of the Licensee is commissioned;
- (g). "CPPA-G" means Central Power Purchasing Agency (Guarantee) Limited or any other entity created for the like purpose;



- (h). "Distribution Code" means the distribution code prepared by the concerned XW-DISCO and approved by the Authority, as it may be revised from time to time with necessary approval of the Authority;
- (i). "Energy Purchase Agreement (EPA)" means the energy purchase agreement, entered or to be entered into by and between the Power Purchaser and the Licensee, for the purchase and sale of electric energy generated by the generation facility/Thermal Power Plant Co-Generation Facility/Power Plant, as may be amended by the parties thereto from time to time;
- (j). "FESCO" means Faisalabad Electric Supply Company Limited K-Electric Limited or its successors or permitted assigns;
- (k). "Generation Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000;
- (l). "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 necessary approval by the Authority;
- (m). "Law" means the Act, relevant rules and regulations made there under and all the Applicable Documents;
- (n). "Licensee" means **Pakistan Atomic Energy Commission**;
- (o). "Licensing Regulations" mean the National Electric Power Regulatory Authority Licensing (Application & Modification Procedure) Regulations, 1999 as amended or replaced from time to time;
- (p). "Power Purchaser" means any XW-DISCO or FESCO or CPPA-G which will be purchasing electric energy from the Licensee, pursuant to an Energy Purchase Agreement-EPA for procurement of electric power;



- (q). "Thermal Power Plant" means the generation facility using fossil fuel for generation of electric power;
- (r). "XW-DISCO" means "an ex-WAPDA distribution company engaged in the distribution of electric power".

1.2 Words and expressions used but not defined herein bear the meaning given thereto in the Act or rules and regulations issued under the Act.

Article-2 Applicability of Law

This licence is issued subject to the provisions of the Applicable Law, as amended from time to time.

Article-3 Generation Facilities

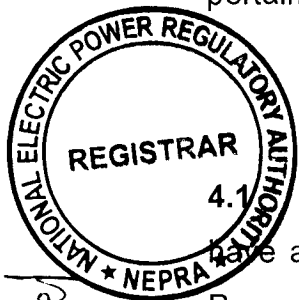
3.1 The location, size (capacity in MW), technology, interconnection arrangements, technical limits, technical functional specifications and other details specific to the generation facility/Thermal Power Plant of the Licensee are set out in Schedule-I of this Licence.

3.2 The net capacity of the generation facility/Thermal Power Plant of the Licensee is set out in Schedule-II hereto. The Licensee shall provide the final arrangement, technical and financial specifications and other specific details pertaining to its generation facility/Thermal Power Plant before its COD.

Article-4 Term of Licence

4.1 This licence shall become effective from the date of its issuance and will have a term of thirty (30) years from the COD of the generation facility/Thermal Power Plant of the Licensee.

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



Article-5
Licence fee

The Licensee shall pay to the Authority the licence fee as stipulated in the National Electric Power Regulatory Authority (Fees) Rules, 2002 as amended from time to time as amended or replaced from time to time.

Article-6
Tariff

The Licensee shall charge the Power Purchaser only such tariff which has been determined, approved or specified by the Authority.

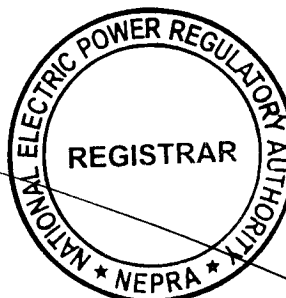
Article-8
Competitive Trading Arrangement

8.1 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.

8.2 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-9
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 shall, subject to just claims of confidentiality, be accessible by authorized officers of the Authority.



Article-10
Compliance with Performance Standards

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

Article-11
Compliance with Environmental & Safety Standards

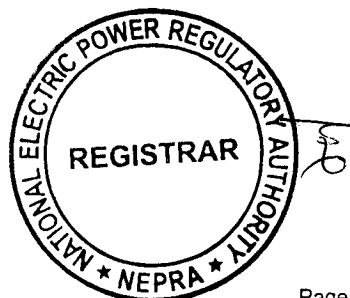
The generation facility/Thermal Power Plant of the Licensee shall comply with the environmental and safety standards as may be prescribed by the relevant competent authority from time to time.

Article-12
Provision of Information

In accordance with provisions of Section-44 of the Act, the Licensee shall be obligated to provide the required information in any form as desired by the Authority without any exception.

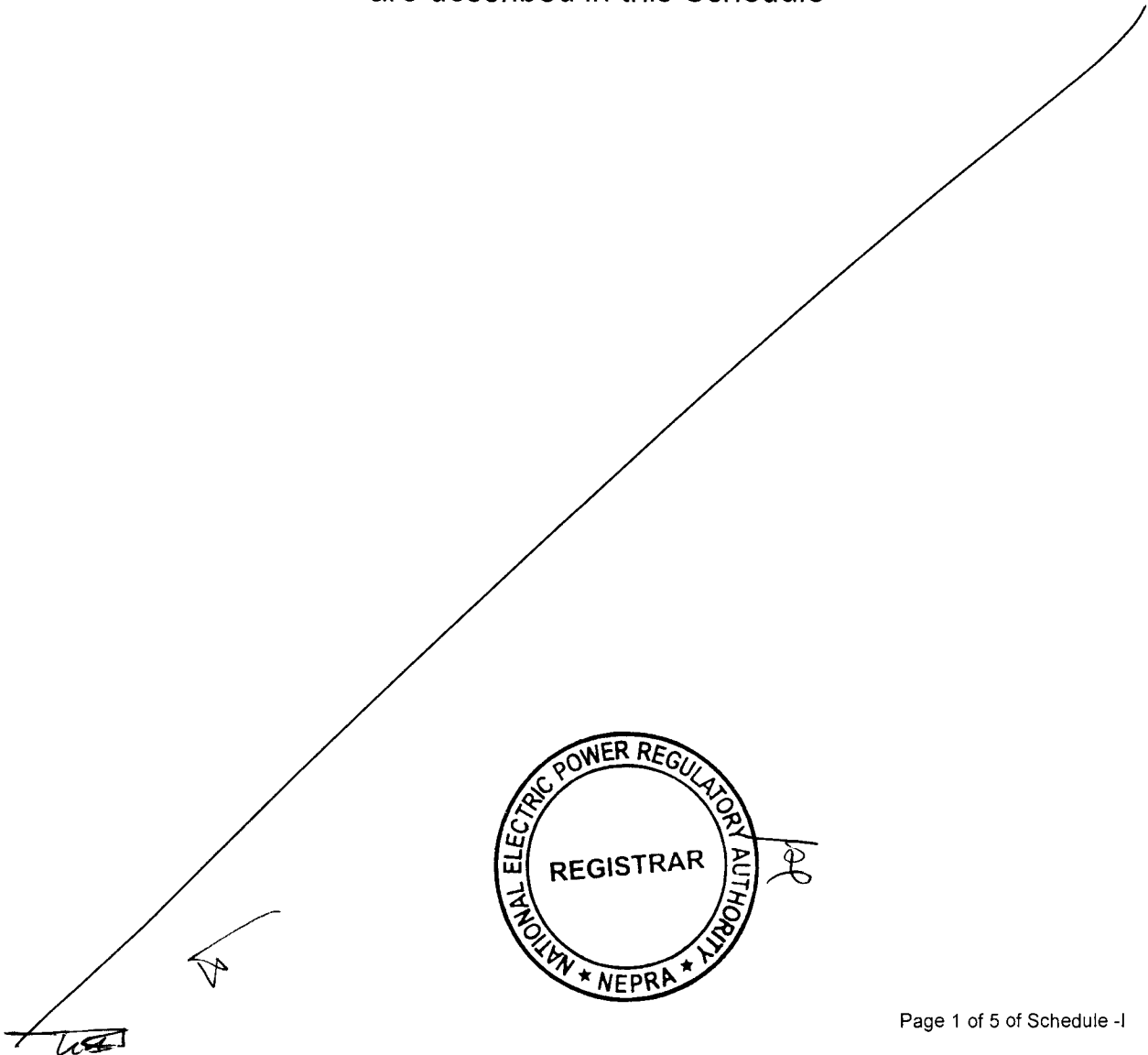
Article-13
Power off take Point and Voltage

The Licensee shall deliver the electric power to the Power Purchaser at the outgoing Bus Bar of its generation facility/Thermal Power Plant. The Licensee shall be responsible for the up-gradation (step up) of generation voltage up to the required dispersal voltage level.



SCHEDULE-I

The 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



**Interconnection Facilities/
Transmission Arrangements for Dispersal of Electric Power from
the Generation Facility/Thermal Power Plant**

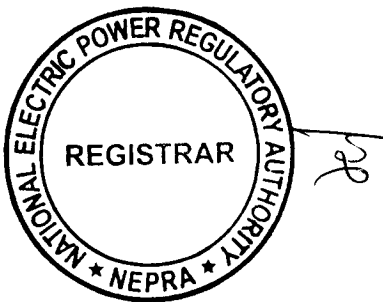
The electric power from the indigenous coal based generation facility/Thermal Power Plant of Licensee-Pakistan Atomic Energy Commission (PAEC) will be dispersed to the load center of FESCO.

(2). The interconnection facilities/transmission arrangements for supplying to national grid from the above mentioned generation facility shall be at 132-KV level. The dispersal/interconnection arrangement for connecting the generation facility/Thermal Power Plant of the Licensee will be a 132-KV Double Circuit (D/C) Transmission line (on ACSR Lynx Conductor Measuring about 3-KM in length) connecting with ABC Girete grid station of FESCO.

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

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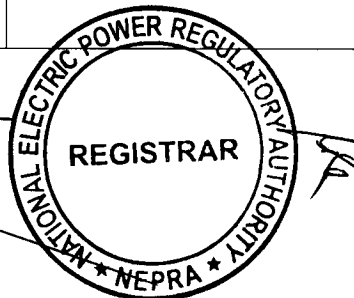
**Details of
Generation Facility/
Power Plant**

(A). General Information

(i).	Name of Licensee	Pakistan Atomic Energy Commission
(ii).	Head Office of the Licensee	House No. 7, Main Double Road, G-11/3, Islamabad.
(iii).	Location of the generation facility	KCP Complex Jauharabad, District Khushab in the Province of Punjab
(iv).	Type of generation facility	Coal Fired Thermal Power Plant

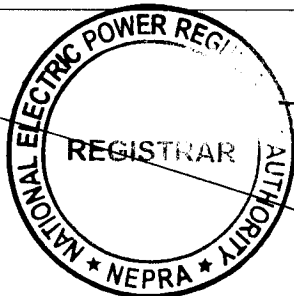
(B). Plant Configuration

(i).	Installed Capacity/ Size of the generation facility	50.00 MW	
(ii).	Type of Technology	Conventional generation facility/Thermal Power Plant with Sub Critical Boiler and Steam Turbine	
(iii).	Number of Units/Size (MW)	2 x 25.00 MW	
(iv).	Unit Make/Model/Type & Year of Manufacture Etc.	Steam turbine	Sub Critical, Condensing Steam Turbines of Qingdao Jineng Turbine Co.
		Boiler	Sub-critical, CFBC Boiler of Sichuan Chuanguo Boiler Co. (SCBC), Chengdu
(v).	Expected COD of the generation facility	December 31, 2017	
(vi).	Expected Useful Life of the generation facility from COD	30 years	



(C). Fuel/Raw Material Details

(i).	Primary Fuel	Local sub-bituminous coal		
(ii).	Alternative Fuel	Imported sub-bituminous coal		
(iii).	Start-Up Fuel	High Speed Diesel Oil (HSD)		
(iv).	Fuel Source	Primary Fuel	Alternative Fuel	Start-Up Fuel
		Indigenous	Imported	Indigenous /Imported
(vi).	Fuel Supplier	Primary Fuel	Alternative Fuel	Start-Up Fuel
		Any Local coal supplier	Any Local coal supplier	PSO/Shell/ any other OMC Company.
(v).	Supply Arrangement	Primary Fuel	Alternative Fuel	Start-Up Fuel
		Trucking (Mine mouth Plant)	Marine Shipment/ Trucking/ Railway	Oil tankers
(vi).	No. of Storage Bunkers/Tanks/ Open Yard	Primary Fuel	Alternative Fuel	Start-Up Fuel
		One shed / open yard	One shed / open yard	Two (02) Tanks
(vii).	Storage Capacity of each shed/Open Yard / Tanks	Primary Fuel	Alternative Fuel	Start-Up Fuel
		40 days (34000 Tons)	40 days (34000 Tons)	2 x 50 m ³
(viii).	Gross Storage	Primary Fuel	Alternative Fuel	Start-Up Fuel
		40 days (34000 Tons)	40 days (34000 Tons)	100 m ³



(D). Emission Values

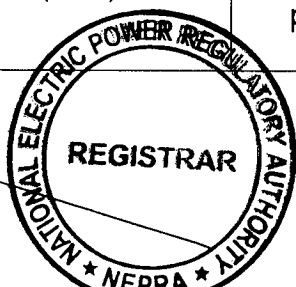
		Primary Fuel	Alternative Fuel	Start-Up Fuel
(i).	SO _x (mg/Nm ³)	<200	<200	To be provided later
(ii).	NO _x (mg/Nm ³)	<200	<200	-Do-
(iii).	CO ₂	To be provided later	To be provided later	-Do-
(iv).	Particulate Matter (mg/Nm ³)	<100	<100	-Do-

(E). Cooling System

(i).	Cooling Water Source/Cycle	Ground water (through Deep Well Turbines)
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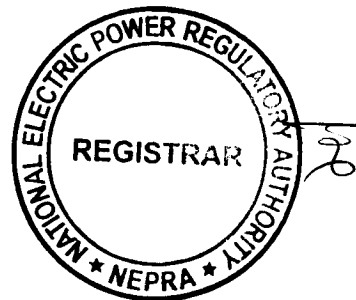
(F). Plant Characteristics

(i).	Generation Voltage	11 KV		
(ii).	Frequency	50Hz (± 2%)		
(iii).	Power Factor	0.85 lagging to 0.95 leading		
(iv).	Automatic Generation Control	Yes		
(v).	Ramping Rate (MW/min)	50%~100% load	between 25% to 50% load	under 25% load
		To be provided later	To be provided later	To be provided later
(vi).	Time required to Synchronize to Grid (Hrs.)	Hot Start	Warm Start	Cold Start
		To be provided later	To be provided later	To be provided later



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 are given in this Schedule



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SCHEDULE-II

(1).	Total Gross Installed Capacity of the Generation Facility	50.00 MW
(2).	De-rated Capacity of Generation Facility at Reference Site Conditions	50.00 MW
(3).	Auxiliary Consumption of the Generation Facility	00.00 MW
(4).	Total Installed Net Capacity of Generation Facility at Reference Site Conditions	50.00 MW

Note

All the above figures are indicative as provided by the Licensee. The net capacity available to Power Purchaser for dispatch will be determined through procedure(s) contained in the EPA or Applicable Documents.

