Power Acquisition Request

In relation to:

Sindh Nooriabad Power Company Phase II (Private) Ltd.

Submitted before:

National Electric Power Regulatory Authority

Submitted by:

K-Electric Limited

July 13th, 2015

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Chapter 01: Grounds Forming Power Acquisition Request

1.1 Overview

1.1.1 Pakistan today is facing a power crisis of severe nature. The ensuing power shortage has crippled the industry and put the common man in Pakistan under great duress.The power shortage has resulted in a very low GDP during the past five years.While the demand for power grows at a persistent rate of 5 – 6 % annually, the growth in generation capacity is much slower leading to a widening demand and supply gap that has hampered the economy. Furthermore, the combination of higher usage of furnace oil in the generation fuel mix and unchecked T&D losses across the country has led to higher consumer power tariff and lower recoveries. The non-availability of fiscal space to pay the rising subsidy has also led to a soaring in circular debt. Given the dire nature of Pakistan's energy crisis, it is important to utilize all avenues to increase power generation in the country.

1.1.2 Karachi is the financial and trading hub of Pakistan. The availability of port facilities has attracted energy related investments over several decades thus positioning Karachi as the focal point of the energy corridor of Pakistan. Although K-Electric has a customer base of 2.3 million connections across residential, commercial, industrial and agricultural sectors, the actual consumers of power are estimated over 20 million people living in and around Karachi. K-Electric continues to receive a large number of new connection applications on a daily basis. At any particular instant, the volume of these applications usually adds up to several hundred MW. K-Electric recorded a peak demand of 3056 MW in June 2015. This is an increase by over 600 MW within 6-7 years period. Hence the demand of electricity is exponentially increasing with the passage of time and calls for investment in generation capacities for reducing demand-supply gap for the power consumers. In view of the demand-supply gap and the urgency to develop power projects on a fast track basis, K-Electric is pursuing purchase of power from independent power producers. Sindh Nooriabad Power Company Limited Phase II has approached KE for a sale purchase agreement for a 50 MW (net) power to be generated on Gas. The project has achieved financial close and is being developed on a fast track basis. The project, once completed will assist in reducing the demand supply gap and provide power to KE on a fast track basis.

1.2 Project Brief:

1.2.1 Sindh Nooriabad Power Company Phase II (Private) Limited (SNPC II) has taken the initiative to design, construct and operate a Gas – fired electric power generation plant on a fast track basis that will supply 50 MW net power to the Power Purchaser, K-Electric Limited.

1.2.2 SNPC II is a jointly sponsored venture of the Government of Sindh (GoS) and Technomen Kinetics (Pvt.) Limited (TKL.) The project is being established at SITE, Nooriabad approximately 6.5 Km on Nooriabad- Jhimpir Road from the main super Highway, in the province of Sindh. This project will generate electrical power of 49.98 MW (net at mean site conditions) on Natural gas, under an IPP structure.

1.2.3 This Gas fired Combined Cycle Electric Power 50 MW (Net) Generation Facility will consist of 5 x 9.7 MW Wartsila, V 2034 SG reciprocating engines plus steam turbine.

1.2.4 SSGC, Government of Sindh, Sindh Nooriabad Power Company (Private) Limited and Sindh Nooriabad Power Company Phase II (Private) Limited (SNPC II) have jointly signed a Gas Supply Agreement dated June 16th 2014 for a cumulative gas supply of 20 MMCFD of natural gas to the two power plants of 50 MW each.

1.2.5 According to SNPC II, the Project has achieved financial close with funds to be provided by National Bank of Pakistan, Sindh Bank Limited and Privately Placed Term Finance certificate (PPTF) to be subscribed by Government of Sindh.

1.2.6 To determine power evacuation from the Project, the Grid Load Flow study for the connectivity of SNPC II with K-Electric network at its KDA grid through STDC 132 kV transmission line has been conducted by Siemens Pakistan (Pvt.) Limited.

1.2.7 SNPC II is in the process of entering into a Wheeling Agreement with Sindh Transmission & Dispatch Company Limited (STDC) to construct and operate an 85 KM double circuit 132 kV transmission line for evacuation of power from the Project Site and to KE's grid station located at KDA Scheme 33 (KDA GS). It is envisaged that the billing meters of transported electricity from the SNPC's power plant will be located at KDA GS. The Authority is requested to consider and approve the wheeling charges as a pass through item under the Wheeling Agreement to be signed between STDC and SNPC.

1.2.8 To execute this Gas Combined Cycle Project, SNPC II has entered into an EPC agreement with Technomen Kinetics LLC-FZ while the basic design has been provided by Wartsila Pakistan (Pvt) Limited. Wartsila Pakistan (Pvt.) Limited is expected to be appointed as Operations and Maintenance contractor.The Project is expected to be commissioned by the end of October 2015 on a simple cycle mode and will generate power on a combined cycle by January 2016.

1.2.9 The SNPC II has concluded key agreements including EPC Contract and GSA and is in the final stage of concluding the Wheeling Agreement. Additionally, it has achieved financial close for the Project.

1.2.10 Subject to approval of the Authority, SNPC II has proposed the sale of dedicated 50 MW to KE under a 25 years Power Acquisition Contract ("PAC").

1.3 Process leading to Submission of PAR

1.3.1 SNPC II approached KE for the sale of 50 MW electrical power from the Project. In view of the power shortage and rising demand, KE showed its interest in purchasing this power subject to the approval of Authority and requested SNPC II to submit a power sale proposal.

1.3.2 Following request of K-Electric, SNPC II submitted a power sale proposal which is attached as Annexure II

1.3.3 After a careful review and discussions with SNPC II on the power sale proposal, K- Electric has agreed in principle for purchase of power from SNPC II subject to various regulatory approvals.

1.4 Submission of Application for Generation License

1.4.1 SNPC II had initially submitted application for Generation License to NEPRA nominating HESCO as the power purchaser. Later, due to strong interest shown by KE, SNPC II re-applied to NEPRA for a change of power purchaser from HESCO to KE. The Authority approached KE vide letter no. NEPRA/RDL/LAG-279/1128, seeking KE's confirmation for purchase of power from SNPC II. K-Electric vide its reply dated 26th Jan, 2015 has communicated NEPRA about its willingness to purchase power from SNPC II. The case of Generation License award to SNPC II is still pending with NEPRA.

1.5 Submission before Authority

1.5.1 Upon receipt of the power sale proposal from SNPC II, K-Electric hereby submits its power acquisition request ("PAR") to NEPRA, in accordance with Interim Power Procurement Regulations (IPPR) 2005 and hereby requests the Authority to approve the following:

- Proposed power acquisition from SNPC II under IPPR 2005;
- Consider the power sale proposal, power acquisition request and determine reference tariff;
- Assess the indexation, escalation and adjustment methodologies as described in the power sale proposal and reviewed in power acquisition request;
- Allow necessary adjustment and revisions of reference tariff at the time of commercial operations date; and
- Any other matters stated in the power acquisition request.

1.5.2 The supply of 50 MW (net) from SNPC II is expected to provide a fast track relief to the power consumers within KE's network. Given the short time frame for the COD, the Authority is requested to expedite this Power Acquisition Request under the IPPR 2005 so that KE and SNPC II may proceed further and formalize the arrangements.

Chapter 02 Economic Justification of the Project

2.1 In view of the growing electricity demand in the KE's franchise areas, the KE Management has decided to consider the sale proposal of SNPC II for the following reasons:

- Cost of gas is lower compared with oil fired generation which should have favourable effect on consumer tariff.
- Natural gas is produced locally and as such reduces burden on energy import bill.
- Reduction in the GoP's subsidy payments and hence improvement in the circular debt situation
- SNPC II providing a quicker power generation option considering Project is being implemented on a fast track basis with the Combined Cycle power plant expected to be online in January 2016.
- Reliable base load supply 24/7
- Potential use of the Project as black start facility in case of widespread power outage.

Chapter 03 Overview of the Power Sale Proposal

3.1 Summary of Sale Proposal

Project Company	Sindh Nooriabad Power Company Phase II (Pvt) Limited. (SNPC II)
Major Sponsors	Government of Sindh (GOS) & Technomen Kinetics (Pvt.) Ltd. (TKL)
Project Capacity	52.094 MW (Gross) 49.98 MW (Net)
Interconnectivity	132 KV T/L of STDC from Project Site to KE's KDA GS
Project Location	Nooriabad, Sindh, Pakistan
Plant Technology	Gas fired reciprocating engines (Wartsila V20 34 SG)
Project Lifecycle	25 Years from COD
Power Purchaser	K-Electric Limited
Type of Fuel	Gas
Plant Factor	92%
Energy Production	437.86 GWh at 100% Load Factor
Energy Production	402.83 GWh at 92% Load Factor

Project Cost		**USD**
EPC Cost		47,424,374
Project Management		600,000
Financing Fees & Charges		962,706
Custom Duties		2,420,074
Land / Expenses		50,000
Insurance during construction		701,048
Non EPC Cost		2,085,000
Mobilization Advance for O&M		135,774
Technical/ Legal/ Financial Advisory		250,000
Power and Fuel during Construction		707,894
Interest During Construction		4,832,265
Total		60,169,135
Capital Structure		
Project Financing	Percentage	USD
Equity	20%	12,033,827
Debt	80%	48,135,308
Total Financing	100%	60,169,135

Financing Terms	Loan period: 10 years Interest Rate: KIBOR + 3.0% p.a. KIBOR: 10.18% p.a.
Levelized Tariff	PKR 7.6026/kWh at 100% load factor PKR 0.5830/kWh wheeling charges
Concession Documents	- Power Acquisition Contract - Gas Supply Agreement - O&M Agreement - EPC Agreement
Construction period	18 months after Financial Close for Combined Cycle Gas power plant
Applicable Framework	Interim Power Procurement Regulations 2005

3.2 Cost of the Complex:

3.2.1 The total cost of the Project is estimated at USD 60.17 million including offshore and onshore components of EPC costs, custom duties, non-EPC costs, insurance, fuel and power during commissioning, financing and other charges, interest during construction and miscellaneous other costs.

3.2.2

EPCM Cost	USD
EPC - OFFSHORE	40,334,574
EPC - ONSHORE	7,089,800
Total EPC Cost	**47,424,374**
Gas Supply Pipeline & CMS-Non-EPC	1,800,000
Residential Colony-Non-EPC	235,000
Landscaping etc.-Non-EPC	50,000
Custom Duties	2,420,074
Land/Expenses	50,000
Fuel for Test/First Fill, days	707,894
Insurance	701,048
Mobilization Advance for O & M	135,774
Project Development & Mgmt. Cost	600,000
Technical/Legal/Financial Advisory	250,000
Financing Fee & LC Charges	481,353
Other Fee & Charges	481,353
Project Cost Excluding IDC	**55,336,870**
Interest During Construction	4,832,265
Project Cost Including IDC	**60,169,135**

3.3 Financing Plan

The Project cost of US$ 60.17 million will be financed at a debt equity ratio of 80:20.

Project Financing	Percentage	US$ million
Debt	80%	48.135
Equity	20%	12.034
Total Financing	100%	60.169

National Bank of Pakistan was mandated to ensure project financing for SNPC II. The Project achieved financial close with funding commitments as follows:

Project Financing	PKR Million
- National Bank of Pakistan	3,000 Million
- Sindh Bank Limited	1,000 Million
- Privately Placed Term Finance Certificate (PPTF) subscribed by Government of Sindh	814 Million

3.4 Tariff Components

SNPC II has provided a cost plus tariff on 'Take or Pay' mechanism, which is essentially broken down into variable component (i.e., Energy Purchase Price) and fixed component (i.e., Capacity Purchase Price). The variable tariff component includes Fuel Cost and Variable Operations and Maintenance Cost. The fixed component includes Fixed Operations and Maintenance Cost, Insurance, and Working Capital Charge, Return on Equity "ROE", Return on Equity during Construction, Withholding Tax and Debt Servicing (Principal + Interest).

Tariff Inputs	PKR/kWh At 100%		
	Year 1-10	Year 11-25	Levelized (1-25)
Variable Operating Costs			
Fuel Cost	4.0017	4.0017	4.0017
Variable O&M	0.9728	0.9728	0.9728
Total EPP	**4.9744**	**4.9744**	**4.9744**
Fixed Operating Costs			
Fixed O&M	0.4161	0.4161	0.4161
Insurance	0.1553	0.1553	0.1553
Working Capital	0.0687	0.0687	0.0687
CPP: Operating Costs	**0.6401**	**0.6401**	**0.6401**
Fixed Capital Cost			
ROE	0.5032	0.5032	0.5032
ROEDC	0.0690	0.0690	0.0690
Withholding Tax	0.0429	0.0429	0.0429
Debt Servicing	2.0284	0.0000	1.3731
CPP: Capital Cost	**2.6436**	**0.6151**	**1.9882**
Total tariff	**8.2580**	**6.2296**	**7.6026**

At 100% plant capacity factor, the average tariff works out to be Rs. 8.2580 per kWh in the first 10 years and drops to Rs.6.2296 per kWh between years 11 to 25. The main reason for drop of tariff from 11th year is the completion of debt servicing to the lenders. The levelized tariff for years 1-25 at 100% plant capacity factor is Rs.7.6026 per kWh.

3.4.1 Fuel Cost Component

The working of the Fuel Cost Component ("FCC") is based on the guaranteed efficiency parameters of 41.63% HHV (net) basis by the Project Company. Plant Heat rate will be finalized at the time of COD on the basis of relevant commissioning tests. SNPC Ii has proposed 5 units of 9.7 MW each Wartsila V20 34 SG Reciprocating engines for the Gas

fired power technology and after including steam turbine generator the total net capacity is 49.98 MW.

The Reference gas price is 488.23 Rs/MMBTU (HHV basis) notified by OGRA on 1st January 2013. The price does not include Gas Infrastructure Development Cess (GIDC). The national assembly passed GIDC Act 2015 on May 19, 2015. GIDC has been notified for IPPs by OGRA at 100 Rs/MMBTU. If GIDC becomes applicable, the same will be invoiced by SNPC II as part of Fuel Cost Component through addition to the current gas price and passed through to KE/Consumers. The impact of GIDC on Reference Fuel Cost Component Tariff is Rs. 0.8198 per kWh.

SNPC, SNPC II, Government of Sindh, and SSGC have entered into a Gas Supply Agreement (GSA) on June 16th, 2014. According to this GSA, SSGC has allocated a total of 20 MMCFD of natural pipeline quality gas for SNPC and SNPC II for a period of 25 years.

The Authority is requested to approve the adjustment of Fuel Cost Component with gas price and GIDC changes.

SNPC II has submitted Heat Rate and Output Degradation Tables for the purpose of seeking an approval from the Authority of its adjustment to Fuel Cost Component. The Authority is requested to determine whether the proposed indexation mechanism for Heat Rate and Output Degradation as stated in the Power Sales Proposal should be approved for future adjustments to Fuel Cost Component and provide a mechanism for its application.

3.4.2 Variable O&M Component

The variable O&M Cost Component includes the cost of consumables of variable nature such as, spare parts, chemicals, turbine oil, lube oil and other supplies. The Variable O&M Component has been calculated at 100% capacity factor and has been split between foreign and local components. The Local Variable O&M Cost Component is Rs. 0.432 per kWh while the Foreign Variable O&M Cost Component is Rs. 0.541 per kWh.

The indexation of Foreign Variable O&M Cost Component shall be based on the foreign exchange variation and foreign consumer price inflation. The indexation of Local Variable O&M Cost Component shall be indexed with Pakistan Wholesale Price Index as notified by Pakistan Bureau of Statistics. The Authority is requested to determine whether the proposed indexation mechanism is appropriate.

3.4.3 Insurance

The annual cost of insurance proposed by SNPC II is 1.35% of the engineering, procurement and construction cost of the project. The Insurance Component shall cover all risk, machinery breakdown, third party liability, business interruption and consequential loss.

Insurance Component shall be indexed to PKR/USD exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan. Authority is requested to determine whether the proposed indexation mechanism is appropriate.

3.4.4 Working Capital

The Working Capital Component includes the financing cost of trade debtors and sales tax receivables, on the following basis. A borrowing rate of 3 months KIBOR plus 2% has been assumed as working capital cost.

Working Capital Assumptions		
Trade Debtors	Days	**30**
Sales Tax Receivable	Days	**30**

SNPC II has proposed that the Working Capital Component shall be periodically adjusted for any change in 3 months KIBOR and variation in fuel price. Authority is requested to determine whether the proposed indexation mechanisms and sources are appropriate.

3.4.5 Fixed O&M Component

The Fixed O&M Cost Component proposed by the Project Company represents (a) O&M Contract Fee (b) Remuneration of staff and executives of plant operations (c) Overheads and Miscellaneous Costs including rent, utilities, local taxes, transportation, tax and legal fees, audit, environmental monitoring and company overheads.

The Fixed O&M Component is split between local and foreign components. The Foreign Fixed O&M Cost Component shall be indexed with the foreign exchange rate variation and foreign inflation while Local Fixed O&M Cost Component shall be indexed with Pakistan Wholesale Price Index. Authority is requested to determine whether the proposed indexation mechanisms and sources are appropriate.

3.4.6 Return on Equity and Return on Equity during Construction

The project sponsors have requested an IRR of 18%. The Tariff Table includes both ROE and ROEDC Components.

The ROE and ROEDC Components of the Reference Tariff shall be indexed to the PKR/USD exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan, on a quarterly basis. Authority is requested to determine whether the proposed indexation mechanisms and sources are appropriate

3.4.7 With-holding Tax

SNPC II has assumed a withholding tax of 7.5% on dividends which is payable as a separate component of tariff.

3.4.8 Long Term Debt

SNPC II has achieved financial close and the Project debt arrangement is through National Bank of Pakistan Limited, Sindh Bank Limited and Privately Placed Term Finance Certificate (PPTF). The terms of the project loans are provided below.

Loan period:	10 years
Repayment:	Quarterly
Interest Rate:	3 Month KIBOR + 3% p.a

3.4.9 Wheeling Charge

SNPC II and Sindh Transmission & Dispatch Company Limited (STDC) are at an advanced stage of concluding a long term Wheeling Agreement in relation to power wheeling originating from SNPC II and ending at KE's Grid Station located at KDA Scheme no. 33, Karachi through ownership, construction, operation and maintenance of a 132 kV double circuit 85 KM long Transmission Line. STDC has already begun the process of construction and is scheduled to complete the Transmission Line in accordance with the schedule of SNPC II's operation on simple cycle mode. STDC is a wholly owned company of Government of Sindh and has received a transmission license from Government of Sindh.

STDC through open competitive bidding has awarded work for laying the 85 km transmission line from Nooriabad to KDA grid. The total project cost for the transmission line and its connectivity with the KDA grid is estimated at PKR 1,549 million. This also includes other costs such as interest during construction (IDC), insurance and development and management costs. The details are included in the PSP attached and summarized below:

EPCM Cost	PKR in Million
EPC Cost	1,475
Interest During Construction	46
Insurance	17
Development & Management	10
Project Cost Including IDC	**1,549**

The proposed levelized wheeling tariff is 0.5830 Rs/kWh:

Tariff Inputs	PKR/kWh	PKR/kWh	PKR/kWh
	Year 1-10	Year 11-25	Levelized (1-25)
Fixed Charge	0.5081	0.2782	0.4338
Variable Charge	0.1492	0.1492	0.1492
Total Charge	0.6573	0.4274	0.5830

The Fixed Charge of wheeling consists of capital costs and operating costs. The capital costs include Debt Servicing Costs and Returns on Equity. The operating Costs include Insurance, Operations and Maintenance Costs, and Working Capital Charge. Since both SNPC and SNPC II will be using the same transmission line for supplying power of 50 MW each to KE, hence the Fixed Charge is calculated using the total supply of 100 MW.

The Variable Charge will be calculated through application of Transmission Line losses of 3% (as per the NEPRA determination for NTDC for 220 kV and 500 kV networks) on the Energy Purchase Price invoiced by SNPC II to KE each month. The application of LAL factor has been assumed at one (1) until the same is established by NEPRA. The Variable Charge shall be applied on the units delivered by SNPC II at the Entry Point.

Keeping in view unique arrangement with STDC and the regulatory regime of NEPRA for KE consumers, the structure has been carefully examined and decided as follows:

1. SNPC II shall enter into a long term Wheeling Agreement with STDC.
    a. Rights and obligations of Parties to be defined in the Wheeling Agreement.
    b. STDC to receive energy at Entry Point (SNPC II interconnection point) and deliver energy at Exit Point (KE GS located at KDA Scheme 33).
    c. STDC to invoice SNPC II for the wheeling charges as per the Wheeling Agreement and SNPC II to make payments to STDC after recovering the same from KE under the approved mechanism.
    d. Transmission loss to be fixed at 3% of energy transmitted through 132 kV line. SNPC II to deal directly with STDC for any matters leading to liquidated damages.
2. At the time of raising EPP invoice, SNPC II shall invoice the wheeling charges to K-Electric based on:
    a. Fixed Charge (i.e., recovery with returns of capital costs and operating costs).
    b. Variable Charge (i.e., the approved % of transmission loss times prevailing Energy Price times LAL factor).
    c. SNPC II shall recover the shortfall in Energy Payment from KE, which is due to difference of readings at Entry and Exit Points, from the Variable Charge of wheeling. Any excess or shortfall related to variable charge shall be dealt with between SNPC and STDC in the Wheeling Agreement.
3. K-Electric shall pay wheeling charges to SNPC II on due date and pass through the wheeling costs to consumers together with EPP and CPP costs paid to SNPC II.

3.4.10 Economic Assumptions:

The Reference Generation Tariff has been calculated based on the following economic assumptions:

PKR- USD Exchange Rate	101.72 PKR/USD (Transaction Date: March 17, 2015, Settlement Data: March 19, 2015. Source SBP
Gas Price HHV Basis	Base fuel price taken as PKR 488.23/MMBtu on HHV basis as notified by OGRA on 1st January 2013

3 Month KIBOR	10.18% 3 Month offer side KIBOR notified by Reuters (as per October 2014) and published by State Bank of Pakistan or as amended from time to time
Pakistan Wholesale Price Index	214.73 As per August 2014
US Consumer Price Index	237.85 As per August 2014

3.4.11 Indexations

The Authority is requested to allow the following indexations on the Tariff Cost Components:

Tariff Cost Component	Tariff Indexation & Adjustment
Fuel Cost Component	Delivered Fuel Price Heat Rate and Output Degradation
Variable O&M (Foreign)	US$ to PKR variation & US CPI
Variable O&M (Local)	Pakistan WPI
Fixed O&M (Foreign)	US$ to PKR variation & US CPI
Fixed O&M (Local)	Pakistan WPI
Insurance	US$ to PKR variation
Cost of Working Capital	Adjustments for relevant KIBOR variations
Return on Equity and Return on Equity During Construction	US$ to PKR variation
Interest//Mark-up Payments	Adjustments for relevant KIBOR variations

Reference Wheeling Tariff

Year	Debt Repayment	Return on Equity	Insurance	O&M	Working Capital	Total	MDI	Fixed Charge		Variable Charge	Total
	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	MW	Rs./kW/ Month	Rs./kWh	T. Losses Rs/kWh	Rs/k Wh
1	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
2	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
3	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
4	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
5	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
6	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
7	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
8	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
9	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
10	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
11		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
12		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
13		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
14		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
15		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
16		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
17		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
18		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
19		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
20		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
21		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
22		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
23		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
24		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
25		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
Average (1-10)	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
Average (1-20)	197	93	18	127	3	340	100	283	0.3931	0.1492	0.5423
Average (1-25)	197	93	18	127	3	320	100	266	0.3701	0.1492	0.5193
Levelized (1-25)	133	93	18	127	4	375	100	312	0.4338	0.1492	0.5830
US cents											
Levelized (1-25)	131	91	18	125	4	368	98	307	0.4265	0.1467	0.5731

Submitted

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Tayyab Tareen
Chief Executive Officer – K-Electric Limited

Reference Generation Tariff

Year	Gas Charge (PKR/kWh)	Variable O&M (PKR/kWh)	Energy Charge (PKR/kWh)	O&M Foreign (PKR/kWh) *	O&M Local (PKR/kWh) *	Insurance (PKR/kWh) *	Return on Equity During Construction (PKR/kWh) *	Return on Equity (PKR/kWh) *	Withholding Tax (PKR/kWh) *	Financing Cost on Working Capital *	Debt (PKR/kWh) *	Capacity Charge (PKR/kWh) *	Total Tariff (PKR/kWh)
1	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
2	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
3	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
4	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
5	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
6	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
7	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
8	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
9	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
10	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
11	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
12	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
13	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
14	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
15	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
16	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
17	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
18	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
19	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
20	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
21	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
22	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
23	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
24	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
25	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
Average (1-10)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
Average (1-20)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	1.0142	2.2694	7.2438
Average (1-25)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	0.8114	2.0665	7.0409
Levelized (1-25)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	1.3731	2.6282	7.6026
US cents/kWh													
Levelized (1-25)	3.9340	0.9563	4.8903	0.1278	0.2813	0.1526	0.0678	0.4947	0.0422	0.0675	1.3499	2.5838	7.4741

* At 100% capacity factor

Submitted:

.....
Tayyab Taseen
Chief Executive Officer
K-Electric Limited

F/A - II

Annexure I: Information Required under IPPR 2005

Information about Generation Capacity Under Proposed Procurement Request	
Net Capacity (MW)	50
Technology	Gas Fired Power plant with Wartsila Reciprocating Engine
Fuel	Natural Gas
Whether Forms part of least cost plan	N/A
Availability of Power/Energy	92%
Year of Commissioning	2016
Expected rate of power to be acquired at 100% load factor (Levelized)	Rs. 7.6026 per kWh
KE Demand	3056 MW
Location	Nooriabad
Proposed Grid for interconnection	KDA Scheme 33 GS
Approximate Distance	3.5 km
Augmentation Required in Grid	none
Augmentation Required in transmission network	none
Estimated costs if augmentation required	none
Steps taken or required for transmission augmentation	none
Any other information	none

F/A - III

K-ELECTRIC

Peak Demand at Interconnection Points of KE Transmission and Distribution Network	
Interconnection Point # 1	BALDIA / NKI
Grid Identification:	BALDIA
Location	BALDIA
Voltage	220 kV
Capacity in MA	950 MVA
Peak Demand at # 1	455 MW
Interconnection Point # 2	KDA / NKI
Grid Identification:	KDA
Location	Scheme 33
Voltage	220 kV
Capacity in MA	950 MVA
Peak Demand at # 2	135 MW
Interconnection Point # 3	KDA / JAMSHORO
Grid Identification:	KDA
Location	Scheme 33
Voltage	220 kV
Capacity in MA	750 MVA
Peak Demand at # 3	60 MW

F/A-IV

KE (Distribution) Peak Demand		
2007-08	Peak Demand (MW) Actual Load shed in the evening peak demands	2,443 387 MW (10-06-2008)
2008-09	Peak Demand (MW) Actual Load shed in the evening peak demands	2,462 450 MW (27-05-2009)
2009-10	Peak Demand (MW) Actual Load shed in the evening peak demands	2,562 480 MW (29-06-2010)
2010-11	Peak Demand (MW) Actual Load shed in the evening peak demands	2,591 570 MW (08-06-2011)
2011-12	Peak Demand (MW) Actual Load shed in the evening peak demands	2,596 433 MW (22-05-2012)
2012-13	Peak Demand (MW) Actual Load shed in the evening peak demands	2,778 526 MW (19-06-2013)
2013-14	Peak Demand (MW) Actual Load shed in the evening peak demands	2,929 609 MW (18-06-2014)
2014-15	Peak Demand (MW) Actual Load shed in the evening peak demands	3,056 679 MW (18-06-2015)

F/A-I

Annexure II: Sale Proposal

SINDH
NOORIABAD
Power Company-Phase II
(Pvt) Limited

Our Reference: SECY/KE/2015/145

23 June 2015

Mr. Aamir Rizwan
Deputy Director
Business Development
K-Electric Limited
K-Electric House
Phase IV, DHA
KARACHI

Subject: FORWARDING POWER SALE PROPOSAL (SNPC II)

Dear Sir,

Subsequent to signing of the Term Sheet on 14 November 2014, we are pleased to forward, duly completed, Power Sale Proposal, along with supporting documents:

Regards.

NAJAM UL HASNAIN SI (M)
Commodore (Retd)
CEO

Encl. As in text

027

28, Army Housing Scheme, National Stadium Colony, Karachi 75260
Phone: +92 21 3483 8755-56; Fax +92 21 3483 8757, info@snpc.com.pk

SINDH
NOORIABAD
Power Company-Phase II
(Pvt) Limited

SINDH NOORIABAD POWER COMPANY PHASE II (PVT.) LIMITED

Power Sale Proposal

23 JUNE 2015

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THE PROJECT

Sindh Nooriabad Power Company Phase II intends to develop an approximately [fifty] ([50]) MW (net at Site Condition) Gas-fired electric power generation plant and K-Electric (the **Purchaser)** wishes to purchase the same.The Project shall be located at Nooriabad, Sind Province, Pakistan in public private partnership with the Government of Sindh;

SPONSOR OF THE PROJECT

Sindh Nooriabad Power Company Phase II (Pvt.) Limited (SNPC II) is jointly sponsored by Government of Sindh (GoS) and Technomen Kinetics (Pvt.) Limited (TKL). GoS has assumed 49% shareholding and TKL has subscribed to 51% shares in SNPC II.

Profile of the Directors of the Company

Directors of Sindh Nooriabad Power Company Phase II (Pvt.) Ltd.

NAME	DESIGNATION	REPRESENTATION
Syed Shahnawaz Nadir Shah	Director	GoS
Niaz Ali Sheikh	Director	GoS
Syed Arif Ali	Director	TKL
Khurshid Anwar Jamali	Director	GoS/TKL
Najam ul Hasnain	Chief Executive Officer/Director	TKL

Mr. Syed Shahnawaz Nadir Shah

Syed Shahnawaz Nadir is the Chief Investment Specialist with Sindh Fund Management House, Government of Sindh. He is qualified and experience in managing various funds of the Government of Sindh. He manages almost USD 1 billion in funds and assets on behalf of the various funds, viz.a viz. Government of Sindh Employee Pension Fund, Viability gap Fund, Coal Fund, to name the few.

Mr. Niaz Ali Shaikh

Mr. Niaz Ali Sheikh was a former Director Power Development, Energy Department, Government of Sindh. He is now holding a position in Energy Holding Company as Coordinator.

He has more than 35 years' experience in dealing with various projects at governmental level.

Mr. Saiyed Asif Mahmood

Saiyed Asif Mahmood is the Chief of Operations of Technomen Kinetics (Pvt.) Ltd. and its various sisters concerns and has 28 years of professional experience in the field of Engineering and Finance. During his years at Technomen, Mr. Saiyed Asif Mahmood has been involved, at the top level, with all major projects since his joining, where he has been responsible for Project Planning and their execution,

Mr. Asif, has a PhD in Artificial Intelligence. He has done his graduation in engineering from NED University of Engineering and Technology, Karachi, Pakistan and double Masters from US in the field of Operations Research & Engineering Management and Mechanical Engineering. His professional career includes:

- First President of Anvil International, a Joint venture between a US and a Pakistani Company.
- Worked on Reliability and Maintainability assignment with Raythion and NASA in the US.
- Treasurer of Operations Research Society of America for a number of years.
- Taught Master Level courses on Engineering Management and Operations Research at Florida Tech.
- Mr. Mahmood has also been the Chairman of Engineering Decision Management (EDM), Inc. USA until its acquisition by Harris Corporation.
- He was also the Senior Vice Chairman of a Students' body and Administrator of Individualized Learning Centre (ILC) at Florida Tech.

Mr. Syed Arif Ali

Syed Arif Ali, a Mechanical Engineer, is the Director Projects in Technomen Kinetics (Pvt.) Ltd. He has 35 years of experience to his credit in the disciplines of Engineering, Planning, Project management, Maintenance and Construction of Projects. He has supervisory experience of erection and transportation of world's largest Fertilizer Plant at Dharki.

He has experience in the construction of the following Power Projects:

- 2 x 210 MW Bin Qasim Power Plant (ANSALDO)
- 3x210 MW Muzzafargarh Power Plant (TECHNOPROMEXPORT)
- 432 MW TerbellaHydel Power Project.
- 160 MW Attock Gen Power project
- 108 MW Kamoki Power Project.

Mr. Khurshid Anwar Jamali

Over Thirty years of experience in providing services in management issues and negotiations for major consulting services to a diverse clientele base. At present providing key management and technical inputs for multi- technology power generation projects and other major projects for Government of Sindh and renowned groups in Pakistan.

Current responsibilities include Chairmanship of Sindh Engro Coal Mining Company Limited and Thar Power Company Limited.

Sindh Nooriabad Power Company is developing 100 MW gas based project and is involved from the conceptual stage to the completion.

Sindh Renewable Energy Company Limited is a wholly owned company of Government of Sindh and currently developing 100 MW wind power project. Has been instrumental in the development of the project.

Until June 2010, worked as Chief Executive Officer for a German public limited company, Innovative Windpower, AG, based in Bremerhaven, Germany. The company was engaged in designing, development and manufacturing of wind turbines. The company raised Euro 25 million in convertible debt and got it listed on Frankfurt Stock Exchange.

During the same term was also Chief Executive Officer of two Italian companies, Innovative Energy, s.r.l and Green Future, s.r.l. The companies were developing 3x65 MW Biofuel power projects. The power plants are integrated plants generating biomass, biofuel and electricity.

Current responsibilities relate to management of corporate and technical affairs of Management & Engineering Consultants in the capacity of CEO and Director. MEConsult was established in 1990 and is a broad-based engineering organisation providing Consultancy services in the industrial (private power generation projects in particular), building, and transport sectors, and more recently in providing technical services for a number of private sector power generation projects in Pakistan. The position requires a pivotal role in the intensive analysis of market constraints confronting the conceptual inputs from clients for developing systems amenable to variations in input or output conditions.

Mr. Najamul Hasnain

Mr. Najam ul Hasnain is a graduate in Mechanical Engineering from NED University of Engineering Technology, Karachi, Pakistan. He has more than 35 years of experience in the engineering field as well as in planning and management functions. Mr. Hasnain has a vast experience of project implementation and project management. He is Diploma in French from the National Institute of Modern Languages, Islamabad and is conversant with French Language. His professional carrier includes:

- Involvement in the operation and maintenance of marine main propulsion and auxiliary plants. Subsequently, he worked on the operation and maintenance of diesel electric plants.

- He was actively involved in a number of major government projects, which ranged from an outlay of US 50.00 Million to US $ 1.00 Billion. During these projects, he was involved at the field level, and then at the project management level.

- In the later part of his career, he was involved in a Research and Development organization at the national level where he was Director Projects in the pioneer team, which was formed to set up a dedicated R & D facility for maritime technologies. He served in this organization for 10 years and rose to become the Deputy Director General of the set up.

- During the said phase, he was actively involved in multi-disciplined projects at all stages i.e. from the concept stage to the commissioning and acceptance by the user.

REASONS FOR PROPOSED SUPPLY OF POWER TO K-ELECTRIC

The Project is ideally located to provide electricity to either HESCO or K-Electric. Considering location near K-Electric jurisdiction and understanding reached between SNPC II and K-Electric for a reliable base load operation on cheaper fuel, i.e. gas for the mega city, which is an industrial and economic hub of the country. Quick response time and affirmative actions are also being anticipated in this regard.SNPC II and K-Electric intend to enter into a Power Acquisition Contract as may be negotiated and mutually agreed between the parties.

The tariff is based on standard tariff parameters applicable for Gas power projects

The role of STDC to transmit the power from the power plant site to the K-Electric designated grid station through wheeling mechanism from a dedicated transmission line is a key factor to execute this proposal.

DESCRIPTION OF THE PLANT AND MACHINERY

The Complex comprises plant and machinery of following specifications:

1. Gas engine:

Type of Technology	Reciprocating Engine
Number of units/size	5 units of 9.7 MW each
Unit Make/Model	Wartsila, V20 34 SG
Expected life of the generation facility	**Over 30 years**

2. Specification of 11kV switchgear

GENERATOR

Generator: 11,000 Volt; 50 Hz

Generator type

The generator is of the synchronous, three-phase, brushless, salient pole type.

Generator main data

Generator apparent power	12,163	kVA
Rated power factor	0.80	
Nominal voltage	11,000	V
Rated current (In)	639	A
Voltage adjustment range	±5	%
Frequency	50	Hz
Speed	750	rpm
Overspeed	900	rpm
Continuous short circuit current	>2.5 x In	
Insulation class	F	

Temperature rise	F	
Cooling method	Air cooled	
Enclosure	IP23	
Standard	IEC60034	

Generator construction

The generator is designed to operate together with reciprocating engines. The stator frame is constructed with a rigid welded steel structure. The stator core is built of thin electric steel sheet laminations. The rotor consists of a shaft and salient pole type main revolving field.
The generator achieves very high efficiency because of the exceptional thermal conductivity created by the tight fit between the coils and the stator core.

Terminals

The six stator winding ends are brought to the terminal boxes on the generator sides. Terminals for monitoring and auxiliary equipment have separate terminal boxes.

Damper winding

The generator is provided with a damper winding for parallel operation with other generators and with a separate power grid.

Shaft and bearing

The generator is horizontally mounted and provided with two sleeve bearings. The generator rotor is designed to minimize the effect of torsion rotor oscillations due to system disturbances and rapid load changes.

Excitation

The exciter is of the brushless type with a rotating armature/rectifier assembled on the same shaft as the main generator rotating armature. The exciter field is controlled by the automatic voltage regulator (AVR). The rectifiers are of the silicon diode type in a full wave bridge arrangement. The rotating armature and stationary field of the exciter are insulated with Class F materials.

Cooling (air cooled)

The generator is air cooled. A fan mounted on the generator shaft takes cooling air from the engine hall, through washable filters, and passes it through the generator.

Automatic voltage regulator

The voltage regulator is of a completely solid state type for control of generator voltage by means of controlling the exciter field. The regulator controls the generator exciter field as required to maintain a constant and stable generator output voltage. (The AVR is installed in the engine generator set control panel).

Voltage regulation accuracy	± 0.5	%
- within power range	0 – 100	%
- within speed range	95 – 105	%
Voltage setting range	90 – 110	%

Accessories

The following accessories are included with the generator:

6	PT-100 elements in stator windings
2	PT-100 elements for bearings
1	Anti-condensation heater
1	Voltage transformer for excitation power and measurement
1	Current transformer for measurement
3	Current transforms for protection

Flexible coupling

A flexible coupling between the engine flywheel and the generator transmits the torque from the engine to the generator. By using a flexible coupling the crankshaft is not loaded by any external bending forces. The elements in the coupling are made of rubber.

ELECTRICAL SYSTEMS

MAIN SWITCHGEAR (MV SYSTEM)

Main bus bar

The main switchgear is of three-phase, metal enclosed and air insulated type and provided with withdrawable circuit breakers.
The switchgear is designed, manufactured and tested according to IEC 62271-200 and IEC 62271 standards.
The circuit breaker is mounted on a truck, incorporating all electrical and mechanical interlocks.
Operating and indicating devices are visible on the front panel of the truck.
The switchgear is dimensioned with the following ratings:

Rated voltage	12.0	kV
Service voltage	11,000	V
Rated current for bus bars	3,600.0	A
Rated short circuit withstand current I_{th}/1 sec.	31.50	kA/s
Enclosure protection class according to IEC 60529	IP4x	
Switchgear standards	IEC 62271-200/ 62271	
Circuit breaker standards	IEC 62271-100	
Circuit breaker type	SF6	
Installation	Indoor	

The circuit breakers are equipped with auxiliary contacts, charging motors, closing and shunt tripping coils.
The current and voltage transformers have a rated burden to suit the connected measuring and protection devices and have accuracy classes as follows:

Current transformers:

Accuracy class phase current protection transformers	5P10

Accuracy class earth fault current transformers	10P10
Accuracy class measuring transformers	Class 0.5

Voltage transformers:

Accuracy class measuring transformers	Class 0.5
Accuracy class earth fault voltage transformers	6P

The main switchgear consists of the following equipment:

Generator cubicle

Consisting of:

	Main circuit, consisting of		
1	Circuit-breaker		
	Rated current	1250	A
3	Current transformers for measuring and protection		
3	Voltage transformers for measuring and protection		
1	Earthing switch		
1	Cable transformer for earth fault		
	Secondary circuit, consisting of:		
3	Ammeter		
1	Set of miniature circuit-breaker		
1	Breaker control switch		
1	Set of auxiliary relay		

Neutral point cubicle

Consisting of:

1 Neutral grounding resistor 5A, 10s
1 Single pole dis-connector switch
2 Current transformer (single phase) for earth fault

Bustie cubicle

Consisting of:

	Main circuit, consisting of:		
1	Circuit-breaker		
	Rated current	3,600	A
3	Current transformers for measuring and protection		
	Secondary circuit, consisting of:		
3	Ammeter		
1	Two stage over current protection relay		
1	Breaker control switch		
1	Set of miniature circuit breakers		
1	Set of auxiliary relays		

Steam Turbine cubicle

Consisting of:

	Main circuit, consisting of		
1	Circuit-breaker		
	Rated current	630	A
3	Current transformers for measuring and protection		
3	Voltage transformers for measuring and protection		
1	Earthing switch		
1	Cable transformer for earth fault		
	Secondary circuit, consisting of:		
3	Ammeter		
1	Set of miniature circuit-breaker		
1	Breaker control switch		
1	Set of auxiliary relay		

Outgoing feeder cubicle

Consisting of:

	Main circuit, consisting of:		
1	Circuit-breaker		
	Rated current	3600	A
3	Current transformers for measuring and protection		
2	Voltage transformers for measuring and protection		
1	Earthing switch		
1	Cable transformer for earth fault		
	Secondary circuit, consisting of:		
3	Ammeters		
1	Voltmeter + selector switch		
1	Two stage over current protection relay		
1	Two stage earth fault protection relay		
1	Breaker control switch		
1	Set of miniature circuit-breaker		
1	Set of auxiliary relay		

Station auxiliary transformer feeder cubicle

Consisting of:

	Main circuit, consisting of		
1	Circuit-breaker		
	Rated current	630	A
3	Current transformers for measuring and protection		
1	Earthing switch		
1	Cable transformer for earth fault		
	Secondary circuit, consisting of:		

3	Ammeters
1	Two stage over current protection relay
1	Two stage earth fault protection relay
1	Breaker control switch
1	Set of miniature circuit-breaker
1	Set of auxiliary relay

Measuring cubicle

Consisting of:

	Main circuit, consisting of:
3	Voltage transformers
	Secondary circuit, consisting of:
1	Voltmeter + selector switch
1	Under and over frequency protection relay
1	Under and over voltage protection relay
1	Neutral voltage relay
1	Set of miniature circuit-breaker
1	Set of auxiliary relay

The above mentioned equipment can be integrated into some of the other cubicles, subject to space limitations.

STATION SERVICE SYSTEM (LV SYSTEM)

The station service system distributes low voltage electricity to electrical consumers included in Wärtsilä's scope of supply.

The station service system consists of the following equipment:

Low voltage switchboard

The low voltage switchboard is a steel sheet enclosed, cubicle-type switchboard that feeds motor control centres, motors and other apparatus of the power plant delivered by Wärtsilä.

The switchboard consists of the following equipment:

3 Incoming feeder(s) with
- 1 Main switch
- 1 Voltage meter with selector switch
- 3 Ammeters

Fused outgoing feeders for local control panels
Motor starters direct on line for supplied electrical motors
External protection class: IP3x

Frequency converter (for engine hall inlet ventilation, generator side)

The frequency converter controls the rotation speed of the ventilation fan units which are installed at the generator side wall of the engine hall. The frequency converters minimize power consumption and noise level of the ventilation fan units.

Frequency converter (for engine hall inlet ventilation, auxiliary side)

The frequency converter controls the rotation speed of the ventilation fan units which are installed at the auxiliary side wall of the engine hall. The frequency converters minimize power consumption and noise level of the ventilation fan units.

DC SYSTEM

The DC-system is used in the power plant to supply DC-power to devices and systems that need to have ensured power supply to maintain safe operation and shutdown of the plant, in case of failure in main power supply (AC). Normal DC-consumers of the power plant are:

- Control, automation and protection systems (plant and engine):
  - W34SG, 24VDC (-grounded)
- Switchyard and MV system control: 110VDC (floating)

DC-system specifications are given based our standard system and may vary slightly depending of DC-system manufacturer. Battery capacity is given C5 on 24VDC and C10 on 110VDC system (Cell end voltage 1,8V and 20°C).

DC system - 24 VDC (grounded)

The DC supply unit consists of:

1	Battery set		
	Type	Lead Acid	
	Capacity	320	Ah
	Voltage (DC)	24	V
3	Charger(s)		
	Charging current each	40	A
1	Distribution switchboard containing:		
	Battery main switch		
	DC system monitoring unit		
	Miniature circuit breakers for DC feeders		

DC system - 110 VDC (floating)

The DC supply unit consists of:

1	Battery set		
	Type	Lead Acid	
	Capacity	90	Ah
	Voltage (DC)	110	V

2	Charger(s)		
	Charging current each	15	A
1	Distribution switchboard containing:		
	Battery main switch		
	DC system monitoring unit		
	Miniature circuit breakers for DC feeders		

3. Gas Engine auxiliaries:

- Heat Rate (Net): 8196 Btu/kWh (HHV)
- Heating Value: 32040 MJ/cuM LHV at 0°C and 101,325 kPa
- Gross output at generator terminal: 52,094 kW
- Auxiliary consumption: 2,114 kW
- Net Efficiency of the plant at metering point: LHV 46.12%, HHV 41.64%

4. Cooling System

The main task of the cooling system is to provide adequate cooling of critical engine components such as cylinder jackets, cylinder heads and turbochargers as well as to cool the lubrication oil and charge air entering the cylinders after it has been compressed by the turbocharger.

The engine cooling water cools the low temperature charge air cooler, lubricating oil cooler, high temperature charge air cooler and engine jackets in a common central heat exchanger.

In the central heat exchanger the heat energy is transferred to the cooling tower water circuit.
The cooling system consists of the following main equipment:

Central heat exchanger
The central heat exchanger is of plate and frame heat exchanger type, with plate material AISI-316. The heat exchanger is common for both LT- and HT- water circuit.

Preheating unit low temperature circuit
Engine cooling water in low temperature circuit is heated prior to engine start by the preheating unit, which allows faster engine loading and easier starting as compared to a non-preheated engine.

The following components are built on a steel frame, which forms a compact skid unit.

1	Heating coil Electric		
	Capacity	54	kW
1	Alarm switch for too high heating temperature		
1	Circulation pump		
1	Steel frame		
1	Set of interconnection pipes and flanges		

Cooling tower circulation pump
The cooling tower circulation pump is of the centrifugal type driven by an electrical motor.

Pump capacity	260	m3/h
Electrical motor	27	kW

Cooling tower

The cooling towers dissipate heat from the cooling system through evaporation of water. Hot water from the central cooler is pumped to the cooling tower, where it is sprayed down through the nozzles at the top. The water flows down along the fill plates in the cooling tower and is cooled by the air flow generated by the cooling tower fan. The water is collected in a basin at the base of the cooling tower, from where it is pumped back to the central cooler.

1	Mist eliminator
1	Float valve
1	Bleed off valve

5. POWER GENERATION EQUIPMENT

GENERATING SET

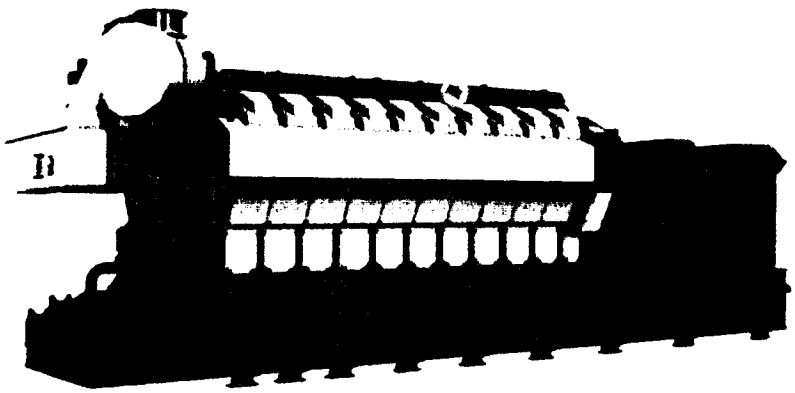

Figure - Example of a Wärtsilä 20V34SG generating set arrangement

The Wärtsilä 20V34SG engine and the generator are mounted on a common base frame. The common base frame is flexibly mounted on a concrete foundation by means of steel springs.

The Wärtsilä 20V34SG generating set main dimensions are[1]:

Length	13.243	m
Width	3.345	m
Height	4.251	m
Weight (dry)	135,130	kg
Weight (wet)	141,130	kg

ENGINE

Wärtsilä 20V34SG engine

General engine description

The Wärtsilä 34SG engine is a spark ignited lean burn engine. The engine works according to the Otto-cycle. In this process the gas is mixed with air before the inlet valves, and the gas-air mixture is compressed during the compression phase. Gas is also fed into a small pre-chamber, where the gas mixture is rich compared to the gas in the cylinder. At the end of the compression phase, the gas-air mixture in the pre-chamber is ignited by a spark plug. The flames from the nozzle of the prechamber ignite the gas-air mixture in the whole cylinder. The intake air is turbocharged and intercooled.

Due to a high degree of integrated functions on the engine, only a minimum amount of support from external systems is needed, thus minimizing the interconnections to external systems.

[1] The dimensions and weight may vary depending on the generator make and type.

An embedded engine control system controls the combustion process, individually in each cylinder.

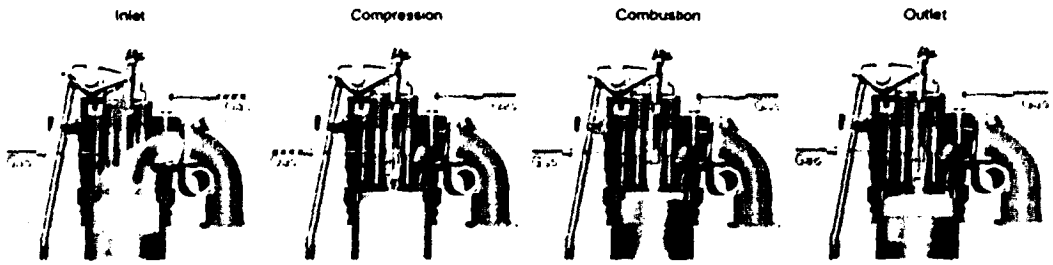

Figure - The combustion process

The engine is designed for continuous operation at any load between 10-100% of the nominal power. The engine can be operated below 10 % load for a continuous period of maximum 100 hours, after this the load should be increased to above 70 %.

Engine main data

Configuration	V	engine form
Number of cylinders	20	
Cylinder bore	340	mm
Stroke	400	mm
Speed	750	rpm
Mean piston speed	10.00	m/s
Mean effective pressure	22.03	bar
Swept volume per cylinder	36.3	dm3
Compression ratio	12:1	
Number of inlet valves	2	
Number of outlet valves	2	
Direction of rotation faced towards flywheel	Clockwise	

Engine block

The engine block is made of nodular cast iron, and is cast in one piece. It incorporates the jacket water manifold, the camshaft bearing housings and the charge air receiver. The crankshaft is mounted in the engine block in an underslung way.

The bearing caps, also made of nodular cast iron are fixed from below by hydraulically tightened screws, and are laterally guided by the engine block both at bottom and top. The horizontal side screws at the lower guiding are hydraulically tightened. Together this provides a very rigid crankshaft bearing.

A hydraulic jack which is supported in the oil sump, makes it possible to lower and lift the main bearing caps, e.g. when inspecting the bearings. Lubricating oil is led to the bearings and piston trough this jack. A combined flywheel/trust bearing is located at the driving end of the engine.

The oil sump is of light welded design, and mounted below the engine block. It is sealed by O-rings.

Crankshaft

The crankshaft is made of high tensile steel, and forged in one piece. It is fully balanced to counteract bearing loads from eccentric masses.

Connecting rod

The connecting rod is made of forged alloy steel and partially machined to get round sections. All connecting rod studs are hydraulically tightened. The gudgeon pin bearing is of tri-metal type. Oil is led to the gudgeon pin bearing and piston trough the connecting rod. The connecting rod is of three-piece design, which gives a minimum dismantling height and makes it possible to dismount the piston without opening the big end bearing.

Main bearings and big end bearings

The main bearings and the big end bearings are of tri-metal design with a soft running layer.

Cylinder liner

The cylinder liners are centrifugally cast of a special alloyed iron to create wear resistance and high strength. The top collar of the cylinder liner is provided with bore cooling for efficient control of the liner temperature. The liner is equipped with an anti-polishing ring at the top, to prevent bore polishing.

Piston

The piston is of composite type with a steel crown and nodular cast skirt. A piston skirt lubricating system lubricates the piston skirt/cylinder liner. The piston top is oil cooled by "the shaker effect". The piston ring grooves are hardened. The piston ring set consists of two compression rings and one spring-loaded oil scraper ring with a running face. The piston rings are located in the piston crown.

Cylinder head

The cylinder head is made of nodular cast iron, and fixed to the cylinder block/liner with hydraulically tightened bolts. Each cylinder head has two inlet and two exhaust valves, all valves are equipped with rotators. The exhaust valve seats are directly water cooled. The valve seat rings are made of specially alloyed cast iron with good wear resistance.

A "multi-duct" casting is fitted to the cylinder head. It connects the following media to the cylinder head:

- Charge air from the air receiver
- Exhaust gas to exhaust system
- Cooling water from cylinder head to the return pipe
- Gas admission from gas manifold to air inlet port

Camshaft and valve mechanism

The cams are integrated in the drop forged shaft material. The bearing journals consist of separate pieces, which are fitted to the camshaft pieces by flange connections. This solution makes it

possible to remove the camshaft pieces sideways. The camshaft bearing housings are integrated in the engine block casting. The camshaft is driven from the crankshaft through a fully integrated gear train.

Gas fuel admission system

On the engine, the gas is supplied through common pipes along the engine, continuing with individual feed pipes to each main gas admission valve located on each multi-duct. There are two common pipes per bank, one for the main gas, and one for the prechamber gas supply. The gas pressure in both lines is controlled separately. There is a filter before every gas admission valve.

The main gas is mixed with the intake air before the inlet valve in the cylinder head. Since the gas valve is timed independently of the inlet valve, scavenging of the cylinder takes place without a risk that unburned gas is escapes directly from the inlet side to the exhaust side.

The **main gas admission valves** are working as the engine speed regulator, and the valves are controlling the amount of gas fed to each cylinder of the engine. The valve is located on the cylinder head and the gas is fed into the inlet channel of the cylinder head. The main gas valve is a direct actuated solenoid valve. With the engine automation control system, it is possible to adjust the amount of gas fed to individual cylinders, even when the engine is running.

The **prechamber gas control valve**, which is a mechanical camshaft driven valve, takes care of the gas admission to the prechamber. The valve is located in the prechamber, and the amount of injected gas is controlled by gas the pressure.

The **prechamber** is the ignition source for the main fuel charge. The prechamber is optimised to give the best possible ignition with a rapid and repeatable combustion.

Ignition system

An ignition module located on top of each cylinder head cover contains the ignition coil. The module is connected to the spark plug with a high voltage extension. The spark plug is of high energy type, specially manufactured for use in gas engines. The spark plug is located in the pre-chamber and the timing for the spark is controlled by the engine control system.

Lubricating oil system

The engine has a wet oil sump system. The system is lubricating the main bearings and the cylinder liners in the engine. Oil is led through bores to other lubricating points, like the camshaft bearings, the injection pump tappets and valves, the rocker arm bearings and the valve mechanism gear wheel bearings. The turbochargers are also connected to the engine lubricating system. Furthermore, the lubricating oil is also cooling the piston crowns.

The lubricating oil system built on the engine comprises the following equipment:

- Pipes made of steel
- Non return valves in the oil supply pipes
- Oil sump of wet type, equipped with a low-level switch connected to the engine automation system
- Main lubricating pump equipped with an overflow valve. The pump is of screw type

- Pre-lubricating oil pump, an electric motor driven gear pump for filling the engine lubricating oil system before starting. The pump is equipped with a safety overflow valve
- Running in filters in the oil inlet line to each main bearing. These are removed after the commissioning
- Lubricating oil fine filter with an automatic continuous back-flushing filter
- Centrifugal filter which cleans the back-flushing oil from the automatic filter
- Lubricating oil cooler of fin tube type
- Lubricating oil thermostatic valve of direct acting type

Starting Air System

The engine is started with compressed air, with a nominal pressure of 30 bar. The start is performed by directing air into the cylinders through the starting air valves in the cylinder heads. The starting system includes a slow turning system, a few revolutions in the beginning of the starting sequence, as a safety check.

The starting air system built on the engine comprises the following equipment:

- Pipes made of steel
- Starting air master valve, electrically and manually operated
- Start blocking valve to prevent starting when turning gear is engaged
- Starting air distributor
- Starting air valves in A-bank cylinder heads
- Slow turning device
- Flame arrestors

Cooling water system description

The engine is cooled by a closed circuit cooling water system divided into a high temperature circuit (HT) and a low temperature circuit (LT) The cooling water is cooled in a separate cooler in the external cooling water system.

The HT-circuit is cooling the cylinders, and the first stage charge air cooler. A thermostatic valve controls the outlet temperature of the circuit.

The LT-circuit is cooling the second stage of the charge air cooler and the lubricating oil cooler. A thermostatic valve controls the outlet temperature of the circuit.

The engines are equipped with a two-stage charge air cooling system for increased heat recovery from the cooling circuits. The cooler is of self-supporting type

The engine cooling water system comprises the following equipment:

- Pipes made of steel
- Engine driven circulating water pump for the low temperature cooling circuit
- Engine driven circulating water pump for the high temperature cooling circuit
- Non-return valves after the circulating pumps

Charge air system

The compressor side of the turbocharger feeds air into the cylinders through the charge air cooler. The engine is equipped with one turbocharger per cylinder bank. The turbocharger is of axial turbine type.

The engine combustion air system comprises the following equipment:

- Compressor on the turbocharger
- First stage charge air cooler
- Second stage charge air cooler
- Fresh water cleaning device for the compressor

Exhaust gas system

The exhaust gas pipes are made of cast iron, with separate sections for each cylinder. Stainless steel bellows are installed between the sections to absorb heat expansion. The pipes are fixed by brackets, but are free to move axially. The engine exhaust gas pipes are fully covered by an insulation box. Sensors for remote measuring of the temperature are mounted after each cylinder and after the turbocharger

The exhaust gas system comprises the following equipment:

- Exhaust pipe system manifold with bellows
- Flexibly mounted insulation box
- Turbine on the turbocharger

Turbocharger and Air to Fuel Ratio Control System

To maintain a correct air-fuel ratio, the engine is equipped with an **exhaust gas wastegate** to keep the air pressure in the receiver at an optimal level all over the power output range.

The exhaust gas wastegate valve by-passes the exhaust gases past the turbocharger. The wastegate valve works as a regulator and adjusts the air-fuel ratio to the correct value regardless of variations in site conditions, such as ambient temperature and humidity.

The engine automation system is monitoring the average exhaust gas temperature after the cylinders. If the average exhaust gas temperature is higher than the set-point, the engine control system will close the wastegate gradually, until the correct value is reached.

The waste gate valve is actuated by compressed air and controlled by the engine control system.

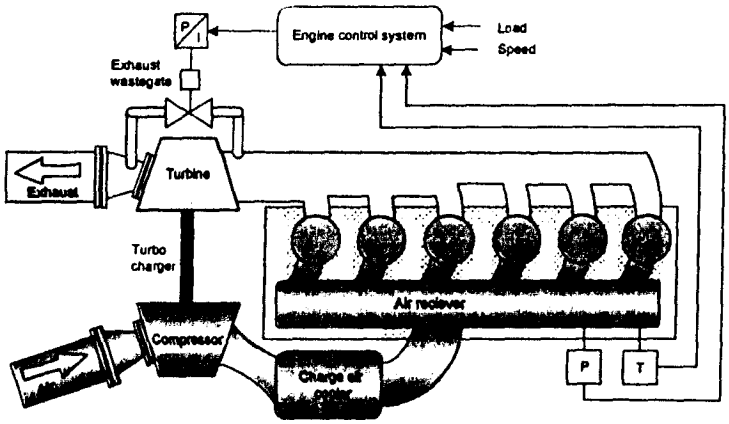

Figure - Illustration showing the charge air and exhaust gas system

Wärtsilä Engine Automation

The engine automation system is a complete embedded management system, integrated with an engine control system for electronically controlled fuel injection. The engine control system is a distributed and bus based system where the monitoring and control function is placed close to the point of measurement and control. In this way, both the on- and off-engine wiring is significantly simplified. Advanced diagnostics and control functions provide an outstanding performance, and the need for systems outside the engine is significantly reduced.

For the field bus interconnection, Wärtsilä is committed to open standards. The physical interface of the engine control system is a standard Ethernet connection for general process data, to both the WOIS and the PLC systems. The system meets even the highest requirements on reliability, with selective redundancy and fault tolerant design.

Hardware of the engine automation system

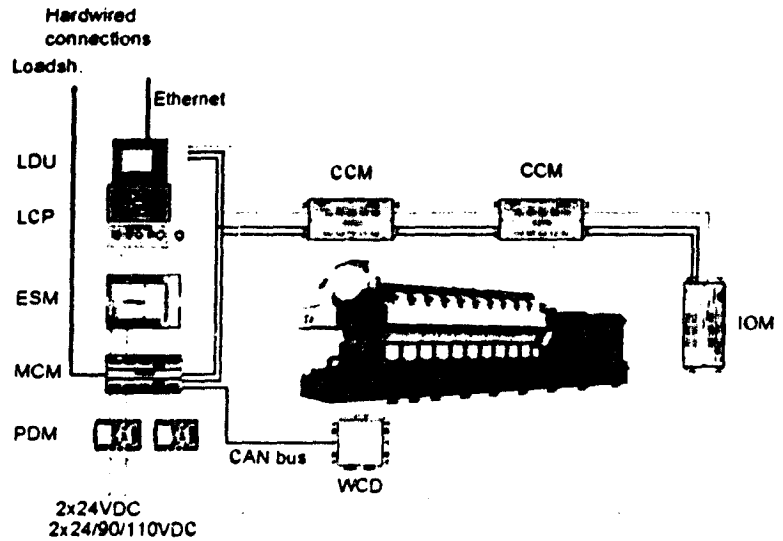

Figure - Hardware of the engine automation system

The engine automation system comprises the following main equipment::

- ESM safety module
- LCP+LDU graphical display for complete on-engine monitoring and communication interface to the plant automation system
- MCM main controller for speed governing, start/stop sequencing and overall engine management
- IOM I/O modules for distributed data acquisition
- CCM cylinder control modules for injector/gas valve control and real-time diagnostics
- PDM distributes, filters and handles fusing of power supply
- WCD ignition system module
- Sensors
- Actuators & valves/injectors

The automation system takes care of the following major tasks and functions:

- Local interface to the operator, including a local display which indicates all important engine measurements, an hour-counter, and a local control panel.
- Engine start/stop management, including start block handling and slow-turning, load reduction, waste-gate control, and the LT/HT-thermostatic valve control.
- Engine safety (alarms, shutdowns, emergency stops, load reductions) including hard wired safety for engine overspeed, lube oil pressure, cooling water temperature, and external shutdowns.
- Electronic speed/load control with various operation modes.

Sensors for alarm and monitoring

One set of sensors fitted on the engine connected to the engine control system.

Other Included Items

- Flywheel with fixing bolts
- Electrical motor driven turning device
- Counter flanges for pipe connection
- Crankcase safety valves with a flame trap

The engine has one coat of priming paint and one coat of finishing paint

DESCRIPTION OF PRIMARY FUEL

Following Gas specifications have been used to calculate Reference GAS Price per MMBtu:

Gas fuel

Name of gas		Minimum	Report	Maximum
Composition unit		mol %	mol %	mol %
Composition type		2	2	2
Methane (CH4)		73.724	85.121	91.033
Ethane (C2H6)		1.451	1.157	1.443
Propane (C3H8)		0.354	0.321	0.367
i-Butane (i-C4H10)		0.111	0.153	0.107
n-Butane (n-C4H10)		0.103	0.153	0.098
i-Pentane (i-C5H12)		0.059	0.036	0.053
n-Pentane (n-C5H12)		0.046	0.025	0.036
n-Hexane (n-C6H14)		0.161	0.000	0.047
n-Heptane (n-C7H16)		0.000	0.000	0.000
Sum of C5+ hydrocarbons		0.266	0.091	0.175
Water vapour (H2O)		0.000	0.000	0.000
Carbon monoxide (CO)		0.000	0.000	0.000
Carbon dioxide (CO2)		2.773	1.042	0.282
Hydrogen sulphide (H2S)		0.000	0.000	0.000
Hydrogen (H2)		0.000	0.000	0.000
Nitrogen (N2)		21.206	11.987	6.492
Oxygen (O2)		0.000	0.000	0.000
Argon (Ar)		0.000	0.000	0.000
Helium (He)		0.000	0.000	0.000
Total		99.993	100.000	99.996
Methane number - calculated		83.3	92.7	88.2
Lower heating value LHV, mass	kJ/kg	31 809	39 366	44 283
Higher heating value HHV, mass	kJ/kg	36 316	43 664	49 066
Normal condition fuel gas, temperature	F	60.0	60.0	60.0
Normal condition fuel gas, pressure	kPa	101.325	101.325	101.325
Lower heating value LHV, vol	Btu*ft^3	721.2	813.5	874.9
Higher heating value HHV vol	Btu*ft^3	799.2	901.9	966.9
Density	kg/m^3	0.8410	0.7677	0.7345

Gas Procurement:

Natural Gas is the prime fuel for the power plant for which gas allocation and other approvals have been obtained from SSGC.

Expected Plant Performance Parameters

Following are the expected performance parameters in terms of net output to be supplied to K-Electric, auxiliary power consumption and net heat rates for the gas-fired power plant. Following numbers are based on the basis of the EPC Contract negotiated between SNPC II and the EPC Contractor. The Authority is requested to allow a review of these parameters at Post Synchronization test at COD based on actuals.

1	Gross Capacity	MW	52.094
2	Auxiliary load	MW	2.114
3	Net capacity	MW	49.98
4	Plant heat rate - Net HHV	%	41.63%
5	Plant availability factor	%	92

PROJECT COST

Total Cost of the Complex

The estimated total cost for the Complex is equivalent to USD 60.169 million (including Interest during Construction). This includes all the costs of EPCM including equipment, as well as the Non-EPCM costs and other related costs such as project management, financing fees & charges, insurance during construction and power & fuel during testing.

Project Cost		US$
EPC - OFFSHORE		**40,334,574**
EPC - ONSHORE		**7,089,800**
Total EPC Cost		**47,424,374**
Intentionally Left Blank		-
Gas Supply Pipeline & CMS-Non-EPC		**1,800,000**
Residential Colony-Non-EPC		**235,000**
Landscaping etc.-Non-EPC		**50,000**
Custom Duties	**6.0%**	2,420,074
Land/Expenses		**50,000**
Fuel for Test/First Fill, days	**15**	**707,894**
Insurance	**1.35%**	**701,048**
Mobilization Advance for O & M	**7.50%**	**135,774**
Project Development & Mgmt. Cost		**600,000**
Technical/Legal/Financial Advisory		**250,000**
Financing Fee & LC Charges	**1.00%**	**481,353**
Other Fee & Charges	**1.00%**	**481,353**
Project Cost Excluding IDC		**55,336,870**
Interest During Construction		**4,832,265**
Project Cost Including IDC		**60,169,135**
Cost Overrun-Equity Induction		-
Note: The Project Cost does not envisage any GST		

FIRM CAPACITY

The firm capacity or net power of the project delivered to STDC at entry metering point per hour will be 49,980kW. The firm capacity or net power delivered to K-Electric at exit meter is 48,480 kW after accounting for transmission loss of 3%.

ANNUAL PLANT AVAILABILITY

The guaranteed annual plant availability is 335 days or 92% per annum for despatch of electrical energy to K-Electric after accounting for the outages comprising of scheduled outage, forced outage and partial forced outage.

DESCRIPTION OF CONNECTION POINT AND METERING SYSTEM

Power evacuation to K-Electric network from SNPC II, which is located at Nooriabad, will be done by Sindh Transmission and Despatch Company (STDC), an entity wholly owned by Government of Sindh. STDC is in the process of constructing 85 KM long 132 kV transmission line, double circuit, which will originate from SNPC II and culminate at K-Electric's interconnection point, i.e., Grid Station located at KDA Scheme No. 33, Karachi.

STDC is currently in the process of construction of the 132kV transmission line to connect SNPC II Complex with K-Electric's GS at KDA. The construction schedule is in accordance with the coming online of the SNPC II on simple cycle mode. Upon commissioning of the 132kV transmission line, STDC will operate the same.

Keeping in view legal status of STDC and the regulatory requirements, the structure has been decided as follows:

1. SNPC II shall enter into a long term wheeling agreement with STDC. K-Electric shall also be a signatory of this agreement in capacity of receiver of energy.
    a. Rights and obligations of Parties to be defined in the wheeling agreement.
    b. STDC to receive energy at entry point (SNPC II interconnection point) and deliver energy at exit point (K-Electric interconnection point).
    c. STDC to invoice SNPC II for the wheeling charges as per the wheeling agreement and SNPC II to make payments to STDC.
    d. Transmission loss to be fixed at 3% of energy transmitted through 132kV line. SNPC II to deal directly with STDC for any matters leading to liquidated damages.
2. At the time of raising EPP invoice, SNPC II shall invoice the cost of wheeling (in accordance with the wheeling agreement) to K-Electric based on:
    a. Capacity Price (i.e., recovery with returns of capital costs and operating costs).
    b. Energy Price (i.e., the approved % of transmission loss times prevailing Energy Price times LAL factor).
3. K-Electric shall pay wheeling charges to SNPC II on due date and pass through the wheeling cost together with EPP and CPP costs paid to SNPC II.

Tariff for Transmission Line

A) Project Cost

STDC through open competitive bidding selected an EPC Contractor for laying the 85 km (circa) Transmission Line from Nooriabad to KDA Scheme 33, Karachi. The total project cost for the transmission line and its connectivity with the KDA grid is estimated at PKR 1,549 million; this also includes other costs such as interest during construction (IDC), insurance and development and management. The Project Costs are summarized as follows:

Project Costs

EPC Cost	1,475	Rs. Million
Interest During Construction	46	Rs Million
Insurance	17	Rs. Million
Development & Management	10	Rs. Million
Total Project Cost	1,549	Rs. Million

Interest during Construction has been calculated on the basis of 7 month loan drawn by STDC.

Insurance cost during construction and operations has been calculated on the basis of 1.35% per year.

B) Project Capital Structure

STDC plans to develop this Transmission Line based on 70:30 debt to equity ratio.

Total Project Cost	Rs. 1,549 Million
Debt (70%)	Rs. 1,084 Million
Equity (30%)	Rs. 465 Million

C) Debt Servicing

The terms of the loans are as follows:

KIBOR	10.18%
Margin	3.00%
Total Interest Rate	13.18%
Term of Loan	10 years
Grace Period	1 year

Summary of Debt Servicing

1	0.0654	0.1622	0.2276
2	0.0847	0.1429	0.2276
3	0.0847	0.1429	0.2276
4	0.0965	0.1311	0.2276
5	0.1098	0.1178	0.2276
6	0.1250	0.1026	0.2276
7	0.1423	0.0853	0.2276
8	0.1620	0.0656	0.2276
9	0.1845	0.0431	0.2276
10	0.2100	0.0176	0.2276

D) Return on Equity

As per the proposed Transmission Line Policy, ROE of 20% has been assumed.

E) O&M

The O&M is divided into Owners' (STDC) management cost, Contractors Operation Cost and cost of Spares & Consumables.

Owner's management cost	9,6876,00
Contractors Operation Cost	77,787,840
Spares & Consumables	39,551,200
Total	**127,026,640**

F) Variable Charge due to Transmission Loss

As per NEPRA Guidelines, 220/500 kV Transmission Lines currently being operated by NTDC have been allowed to charge 3% as Transmission Line loss. SNPC II is also charging the same for STDC operated Transmission Line. The calculations are as under:

Reference EPP for SNPC II	4.9744	Rs/kWh
Transmission Losses	3%	
EPP Adjusted for Transmission Losses	0.1492	Rs/kWh
LAL Factor (until it is determined by NEPRA)	1.00	
Variable Charge	0.1492	Rs/kWh

The SNPC II shall invoice the wheeling charges along with their EPP invoice. Upon receipt of this charge from the Power Purchaser (KE), SNPC II shall pay wheeling cost to STDC according to the wheeling agreement.

Year	Debt Repayment	Return on Equity	Insurance	O&M	Working Capital	Total	MDI	Fixed Charge		Variable Charge	Total
	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	Rs. Mill./yr	MW	Rs./kW/ Month	Rs./kWh	T. Losses Rs/kWh	Rs/k Wh
1	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
2	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
3	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
4	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
5	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
6	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
7	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
8	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
9	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
10	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
11		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
12		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
13		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
14		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
15		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
16		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
17		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
18		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
19		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
20		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
21		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
22		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
23		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
24		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
25		93	18	127	2	240	100	200	0.2782	0.1492	0.4274
Average (1-10)	197	93	18	127	4	439	100	366	0.5081	0.1492	0.6573
Average (1-20)	197	93	18	127	3	340	100	283	0.3931	0.1492	0.5423
Average (1-25)	197	93	18	127	3	320	100	266	0.3701	0.1492	0.5193
Levelized (1-25)	133	93	18	127	4	375	100	312	0.4336	0.1492	0.5830
US cents											
Levelized (1-25)	131	91	18	125	3	368	98	307	0.4265	0.1467	0.5731

The variable charge due to transmission losses shall be calculated by applying the Transmission Loss Ratio to Energy Purchase Price and shall be paid to SNPC II.

Adjustments at COD of Wheeling Tariff

Following adjustments are requested from NEPRA:

- EPC Cost (only Variation Orders)
- Non-EPC Cost
- Interest During Construction
- Taxes and Duties

Tariff Indexation Mechanism for Wheeling Tariff

- Fixed O&M Costs with Pakistan CPI
- Transmission Losses and Load Adjustments
- Working Capital KIBOR Rate
- KIBOR Rates for Debt Servicing
- Insurance
- ROE with US$

EXPECTED COMMERCIAL OPERATION DATE OF THE PROJECT

SNPC II has already achieved financial close and LC for import of equipment and services have been established on July 29, 2014. Total construction time of the Complex for Simple Cycle Operation is around 12months from the financial close. SNPC II is targeting to achieve Simple Cycle Commercial Operation Date October 2015 and Combined Cycle Commercial Operation Date by the end of January 2016.

Subject to the approval of the regulator, KE has agreed to start purchasing capacity and energy from the Company in Simple Cycle mode once the same is available up to end of January 2016 when combined cycle tariff would become applicable.

DESCRIPTION OF HUMAN RESOURCE ENGAGEMENT

Scope of Operations and Management of the Plant:

SNPC II will depute its existing manpower for the Key Operating positions along with engaging/hiring additional well trained & experienced man power from local market. Moreover, proper training of Operation personnel's will be ensured through both on-site & off-site training arrangements in coordination with package suppliers.

Scope of Maintenance of the Power Plant over Its Life Cycle:

SNPC II existing manpower will be deputed for key maintenance positions along with engaging/hiring additional well trained & experienced manpower from local market. Moreover, proper training of Maintenance personnel will be ensured through both on-site& off-site training arrangements in coordination with package suppliers. For technical services, procurement, workshop and other services, personnel or services will be hired from SNPC II as per requirements.

SNPC II anticipate to engage experienced Operator to carry out O&M services, for which an O&M Agreement will be executed. SNPC II also intend to enter into a Material Supply Agreement (MSA) with Wartsila to secure parts for routine and scheduled maintenances.

DESCRIPTION OF NATURE OF POWER ACQUISITION CONTRACT

The Power Purchase Agreement (PPA) shall be based on broadly the same terms as those applicable in PPAs executed under the 2002 Power Policy. Capacity Payments shall be based on availability of the plant whereas Energy Payments will be based on energy dispatched to the KE and SNPCII grid.

CAPITAL STRUCTURE

The Total cost allocated for the Project to supply power to K-Electric is equivalent to 60.169million USD (based on USD/Euro parity of 1.0572 and PKR/USD Parity of 101.72), which will be financed with a debt to equity ratio of 80:20. The Equity for the project amounting USD 12.034 million would be injected into SNPC II by its Sponsors whereas the Debt for the project amounting to USD 48.135million is being obtained from local financial institutions. The table below shows the proposed financing structure of the project portion being allocated to K-Electric.

Project Financing	Percentage	USD
Debt	80%	48.135 million
Equity	20%	12.034 million
Total Financing	100%	60.169million

The Financial Close has been achieved. The details are as under:

- **National Bank of Pakistan** **Rs. 3,000 Million**
- **Sindh Bank Limited** **Rs. 1,000 Million**
- **Privately Placed Term Finance Certificate (PPTF) subscribed by GoSRs. 814 Million**

REFERENCE TARIFF

[illegible]	Gas Charge (PKR/kWh)	Variable O&M (PKR/kWh)	Energy Charge (PKR/kWh)	O&M Foreign (PKR/kWh) *	O&M Local (PKR/kWh) *	Insurance (PKR/kWh) *	Return on Equity During Construction (PKR/kWh) *	Return on Equity (PKR/kWh) *	Withholding Tax (PKR/kWh) *	Financing Cost on Working Capital *	Debt (PKR/kWh) *	Capacity Charge (PKR/kWh) *	[illegible]
1	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
2	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
3	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
4	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
5	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
6	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
7	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
8	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
9	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
10	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
11	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
12	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
13	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
14	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
15	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
16	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
17	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
18	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
19	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
20	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
21	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296

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22	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
23	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
24	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296
25	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	-	1.2552	6.2296

Average (1-10)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	2.0284	3.2835	8.2580
Average (1-20)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	1.0142	2.2694	7.2438
Average (1-25)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	0.8114	2.0665	7.0409
Levelized (1-25)	4.0017	0.9728	4.9744	0.1300	0.2861	0.1553	0.0690	0.5032	0.0429	0.0687	1.3731	2.6282	7.6026
US cents/kWh													
Levelized (1-25)	3.9340	0.9563	4.8903	0.1278	0.2813	0.1526	0.0678	0.4947	0.0422	0.0675	1.3499	2.5838	7.4741

The Tariff is based on Combined Cycle Operation. The Simple Cycle Operation will have the following changes:

- **Gas Cost Component** **Rs. 4.2017/kWh**
- **Dependable Capacity** **47.6 MW**

TARIFF ASSUMPTIONS

The following have been assumed while calculating the Reference Generation Tariff and changes in any of these assumptions will result in changes in the Reference Generation Tariff.

- Main Economic assumptions include:

PKR – USD Exchange Rate	**101.72. PKR/USD (Transaction Date: March 17, 2015, Settlement Data: March 19, 2015. Source SBP**
Gas Price HHV Basis	Base fuel price is PKR 488.23/mmbtu on HHV basis OGRA price as notified on 1st January 2013
3 Month KIBOR	**10.18%** 3 Month offer side KIBOR (according to Oct 2014) notified by Reuters and published by State Bank of Pakistan or as amended from time to time
Pakistani Wholesale Price Index	**214.73** According to August 2014
US Consumer Price Index	**237.85** According to August 2014

- Total cost allocated for the entire Complex is 60.169 million USD (including Interest during Construction) based on USD/Euro Parity of 1.0572 (March 13, 2015. Source: European Central Bank) and PKR/USD Parity of 101.72.
- Total Gross EPCM cost allocated for the Project is USD 47.474 Million based on USD/Euro Parity of 1.0572 (March 13, 2015. Source: European Central Bank) and PKR/USD Parity of 101.72.
- Estimated committed capacity for K-Electric is 49.98 MW (net) at mean site conditions with the following degradation over the term of the PPA:

▪ **Heat Rate and Output Degradation Tables**		
Contract Year	Heat Rate %	Output %
1	0.00%	0.00%
2	2.25%	2.60%
3	3.30%	3.70%

4	3.90%	4.25%
5	4.30%	4.80%
6	4.50%	5.00%
7	2.00%	2.50%
8	3.50%	4.10%
9	4.10%	4.60%
10	4.40%	4.75%
11	4.50%	5.00%
12	4.50%	5.00%
13	2.00%	2.50%
14	3.55%	4.10%
15	4.10%	4.60%
16	4.40%	4.75%
17	4.50%	5.00%
18	4.50%	5.00%
19	2.00%	2.50%
20	3.55%	4.10%
21	4.10%	4.60%
22	4.40%	4.75%
23	4.50%	5.00%
24	4.50%	5.00%
25	2.00%	2.50%

- Debt to equity ratio is assumed to be 80:20
- The debt repayment period is assumed to be 10 Years after COD
- Debt repayments are assumed to be on a quarterly basis with an interest rate of KIBOR + 3.0%
- Plant availability factor of 92% (approximately 335 days per annum) has been assumed.
- ROE of 18% is assumed over 25 years
- ROEDC is assumed to be 18% with a construction period of 1.5years
- Insurance cost is calculated on the basis of 1.35% of EPC cost
- Plant efficiency is assumed to be 46.15% LHV & 41.63% HHV

- Base fuel price is PKR 488.23/mmbtu on HHV basis. This price does not include Gas Infrastructure Development Cess (GIDC)
- SNPC II will have an agreement with STDC for wheeling power from SNPC II to K-Electric interconnection point. SNPC II shall bill KE for the wheeling charges along with the EPP and CPP, and SNPC II shall pay the wheeling charges to STDC.
- Assumptions for working capital requirement 30 days for Trade Debts and 30 days for Sales Tax Receivables.
- Project Cost shall be finalized based on actual transactions on exchange rate parity and interest rates.
- 7.5% withholding tax on dividend is assumed. Any changes in the aforesaid withholding tax regime will be "pass through" to the Power Purchaser. General Sales Tax and all other taxes on the IPP, EPC Contract as well as on the fuel, if applicable, will also be treated as a "pass through".
- WWF/WPPF shall be treated as "pass through" items.
- Any other assumptions that are not expressly stated herein but are based on the PAC draft negotiated by the Project Company with K-Eclectic. Consequently any change in any such assumptions may lead to change in the Reference Generation Tariff

NEPRA to be requested to allow the adjustments to the Reference Generation Tariff components at the time of COD.
Authority is requested for following adjustments in the reference tariff at COD:

- EPC Cost (only Variation Orders)
- Non-EPC Cost
- Pre COD Insurance (only Surrounding property and Reversal insurance)
- Financing Fee and Charges
- Interest During Construction
- Debt Service Reserve Account
- Taxes and Duties
- Net Plant Heat Rate
- Net Dependable Capacity
- Heat Rate and Capacity Correction Factors
- Fixed and Variable O&M Costs
- ROEDC
- Working Capital
- Interest Rates
- Exchange Rates

TARIFF COMPONENTS

Fuel Cost Component

The cost of fuel is a pass through item and is variable with dispatch. The Fuel Cost Component ("FCC") is calculated using the following specifications:

Gas Price per mmbtu:

Rs. 488.23 per mmbtu on HHV basis. The price does not include gas infrastructure development cess (GIDC). GIDC if applicable, shall be incorporated in the fuel price. GIDC is Rs 100/mmbtu as per the GIDC Act, 2015.

Calorific Value of Gas:

32040 MJ/cuM LHV at 0°C and 101,325 kPa equivalent to 860 BTU/SCF.

Plant Efficiency:

LHV 46.12%, HHV 41.64(Efficiency is guaranteed by the Project Company/EPC Contractor.

Variable Operations and Maintenance Cost:

Cost: **PKR 0.9728/kWh** The Calculations are as under:

The Variable O&M Cost component is bifurcated into local and foreign currency components and will be a part of the Energy Purchase Component.

Local Variable O&M		
Lube Oil Consumption	**Values**	**Units**
Lube Oil Replacement Cycle Hours	4000	Hours
Engine Oil Consumption Rate	0.20	g/kWh
Engine Oil Specific Gravity	0.85	kg/lit
Oil Change after 4000 hours	5,200	Liters
Make up consumption	9,157.65	Liters
Total Consumption	**14,357.65**	Liters
Lube Oil Price	650	Rs/Liters
Lube Oil Cost per Replacement Cycle	9,332,471	Rs
Tariff for Lube Oil Consumption	0.2398	Rs/kWh
Load Factor	85%	
Tariff Rate for Lube Oil Consumption	**0.2821**	Rs/kWh
Tariff Rate for Chemicals (Boilers, Turbine Condenser, Cooling Towers), Turbine Oil and other Supplies	**0.15**	Rs/kWh
Total Local Variable O&M	**0.4321**	Rs./kWh

The Foreign Variable O&M represents consumption of imported spare parts as well as necessary foreign technical services during normal scheduled maintenance, unscheduled maintenance and major overhauls. The generator sets and associated equipment have manufacturer-recommended overhauling schedules that are based on actual running hours. The consumption of spare parts and the intervals between major overhauls are also directly related to the plant dispatch and electricity production of the plant.

A long term Material Supply Agreement (MSA) for the supply of consumable, preventive and overhaul parts have been agreed with the manufacturer. The details are presented in the following:

Foreign Variable O&M	Values	Units
Spares	4.1	Euro per MWh
Plant Capacity Gross	52.10	MW
Annual Spares Cost at 100%	201,221,383	Rs
Tariff rate for Spare Parts	0.4596	Rs/kWh
Load Factor	85%	
Tariff rate for Spare Parts	0.541	Rs/kWh

Fixed Operations and Maintenance Costs

The fixed O&M charge consists of O&M Contract Fee, remuneration of staff and executives of plant operations, administration expenses including rent, utilities, local taxes, security, transportation, tax and legal fees, audit, environmental monitoring and company overheads.

Fixed O&M		
Parameter	**Units**	**Values**
O&M Contract Fee (Rs. 7.75 Million/Month)	Rs. Million/year	93
Management Fee	Rs. Million/year	70.16
Overheads and Misc.	Rs. Million/year	19.06
Total Fixed O&M Cost	Rs. Million/year	182.22
Total sellable electricity	Million kWh	437.860
Fixed O&M/kWh	Rs./kWh	0.4161

Insurance

The Insurance expense include the cost of insurance for plant/machinery/inventory/stock. It includes all- risk, machinery breakdown and third party liability insurance such as business interruption and consequential loss

The annual cost of the insurance has been currently assumed at 1.35% of the engineering, procurement and construction cost of the project

The Company shall provide copies of the insurance premium paid receipts to KE

Cost of Working Capital

The working capital consists of:

Working Capital Assumptions		
Stores and Spares	% of WDV	0
Trade Debtors	Days	30
Sales Tax Receivable	Days	30

Creditors, Accrued and Other Liabilities	Days	**0**
Minimum Cash at the End of the Period	Days	**0**
Debt Service Reserve Size, Quarters	# of Quarters	**0**
Debt Service Reserve Account	Financed through	**Cash**

Return on Equity

A return on equity of 18% (USD basis) has been assumed for the equity portion with an accruing return on equity at the same rate during construction as well payable through a separate component of tariff.

Return on Equity during Construction

As a component allowed by NEPRA, return on equity during construction has been assumed. The rate is at18%.

With-holding Tax

A withholding tax of 7.5 % has been assumed on dividends

Debt Payments

The terms of the project loan are assumed as follows. These rates/terms are subject to finalization and adjustment in accordance to negotiations with the project lenders.

Loan period: 10 years

Repayment: Quarterly

Interest Rate: KIBOR + 3% p.a.

KIBOR: 10.18% p.a.

INDEXATION, ESCALATIONS & COST ADJUSTMENTS

Indexation and Adjustment

NEPRA is requested to allow indexation for the components in the following manner.

Fuel Cost:

The Fuel Cost Component shall be adjusted on account of Fuel Price variation of fuel consumed during operational period. Pass through with the following indexation for degradation over the term of PPA:

Heat Rate and Output Degradation Tables		
Contract Year	Heat Rate %	Output %
1	0.00%	0.00%
2	2.25%	2.60%
3	3.30%	3.70%
4	3.90%	4.25%
5	4.30%	4.80%
6	4.50%	5.00%
7	2.00%	2.50%
8	3.50%	4.10%
9	4.10%	4.60%
10	4.40%	4.75%
11	4.50%	5.00%
12	4.50%	5.00%
13	2.00%	2.50%
14	3.55%	4.10%
15	4.10%	4.60%
16	4.40%	4.75%
17	4.50%	5.00%
18	4.50%	5.00%
19	2.00%	2.50%
20	3.55%	4.10%
21	4.10%	4.60%
22	4.40%	4.75%
23	4.50%	5.00%
24	4.50%	5.00%
25	2.00%	2.50%

Variable Operations and Maintenance Cost:

Indexation & Adjustment

The Variable O&M Cost of the Project comprises of local component and foreign components. Therefore, the local components shall be indexed to the WPI in Pakistan, as notified by the Pakistan

Bureau of Statistics, and foreign components shall be indexed with foreign exchange variation and inflation. The Variable O&M cost shall be indexed quarterly based on the NEPRA Guidelines.

Fixed Operations and Maintenance Cost:

Indexation & Adjustment

The Fixed O&M Cost of the Project also comprises of local and foreign components. Therefore, the local component shall also be indexed to the WPI in Pakistan, as notified by the Pakistan Bureau of Statistics and foreign components shall be indexed with foreign exchange variation and inflation. The Fixed O&M cost shall be indexed quarterly based on the NEPRA guidelines.

Insurance

Indexation &Adjustment

The Reference Insurance Cost Component shall be indexed to actual premium and PKR/USD exchange rate, based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

The Insurance cost component shall be indexed annually based on NEPRA Guidelines

Cost of Working Capital

Indexation & Adjustment

The cost of working capital facility shall be indexed to quarterly changes in the 3- month KIBOR and in the working capital price variations,

Return on Equity and Return on Equity During Construction

Indexation & Adjustment

In line with NEPRA's previous determinations for thermal IPPs, the ROE and ROEDC Component of the Reference Generation Tariff shall be indexed to the PKR/USD exchange rate, on a quarterly basis based on the revised TT & OD selling rate of USD notified by the National Bank of Pakistan. The applicable formula shall be as per NEPRA guidelines:

Debt Payments

Indexation & Adjustment
The Interest Charges part of the Reference local bank Debt Service Component shall be quarterly adjusted for variations in interest rate as a result of variation in 3 months KIBOR.

.....Concluded

F/14

Certified True Copy (CTC) of Resolutions

Passed by KE Board of Directors at its meeting no. 1180

held on Tuesday 25th February 2014 at 3:00 pm in KE's Board room,

3rd Floor, KE House, 39-B, Sunset Boulevard, Phase -11, DHA, Karachi

Modification in Generation License (GL/04/2002) - Decommissioning of 175 MW of Installed capacity of KTPS (Unit 3), STGPS (Unit 2) and KGPTS (Unit 3)

Furthermore, in order to have clarity on NEPRA's part and to avoid future complications, the Board also passed the following resolution:-

RESOLVED FURTHER THAT powers vested through clause 14 of General Power of Attorney (GPA) dated 12 February 2013 given by the Board to Nayyer Hussain, CEO shall be deemed to include filing of any and all applications, petition with NEPRA which include Licensee Proposed Modifications (LPM) and others

(Revised Clause 14 of General Power of Attorney of CEO)

14. To make and sign applications to appropriate Federal, Provincial or Local Government departments, authorities or other competent authority for all and any licenses, filing of any and all application, petitions with NEPRA which include Licensee Proposed Modifications (LPM) and others, permissions and consent required by any order, statutory instrument, regulation, byelaw or otherwise in connection with the business, management and affairs of the Company;)

MUHAMMAD RIZWAN DALIA
Company Secretary
K-ELECTRIC LIMITED

K-ELECTRIC LIMITED