



**Registrar**

**National Electric Power Regulatory Authority**  
**Islamic Republic of Pakistan**

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No. NEPRA/TRF-358/NPPMCL-2016/10963-10965  
August 9, 2016

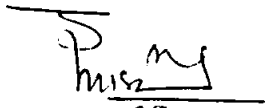
**Subject: Determination of the Authority in the matter of Tariff Petition filed by National Power Parks Management Company (Private) Limited for Determination of Generation Tariff for its 1230.54 MW Power Project on RLNG/HSD at Haveli Bahadar Shah (Case No. NEPRA/TRF-358/NPPMCL-2016)**

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II & III (63 pages) in Case No. NEPRA/TRF-358/NPPMCL-2016.

2. The Decision is being intimated to the Federal Government for the purpose of notification in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.
3. Order of the Authority along with 3 Annexes (Annex-I, II & III) of the Determination needs to be notified in the official Gazette.

Enclosure: As above

  
( Syed Safer Hussain )

Secretary  
Ministry of Water & Power  
'A' Block, Pak Secretariat  
Islamabad

CC:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

National Electric Power Regulatory Authority  
(NEPRA)

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**Determination of the Authority**

In the matter of Tariff Petition filed by National Power Parks Management Company (Private) Limited for determination of Generation Tariff for its 1,230.54 MW Power Project on RLNG/HSD at Haveli Bahadur Shah  
(Case No. NEPRA/TRF-358/NPPMCL-2016)

9<sup>th</sup> August , 2016

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**Intervener:**

Anwar Kamal Law Associates

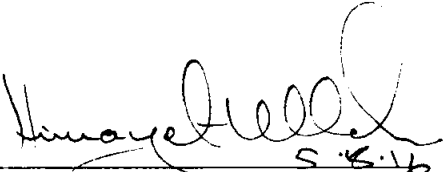
**Commentator:**


Government of Sindh (Energy Department)

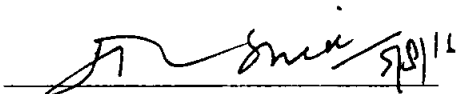


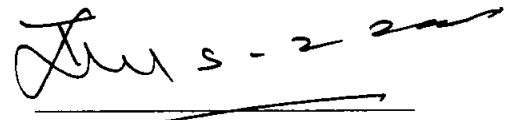
The Authority, in exercise of the powers conferred on it under Section 7(3) (a) read with Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, Tariff Standards and Procedure Rules, 1998 and all other powers enabling it in this behalf, and after taking into consideration all the submissions made by the parties, issues raised, evidence/record produced during hearings, and all other relevant material, hereby issues this determination.


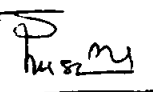
AUTHORITY

  
(Himayat Ullah Khan)  
Vice Chairman

  
(Masood-ul-Hassan Naqvi)  
Member

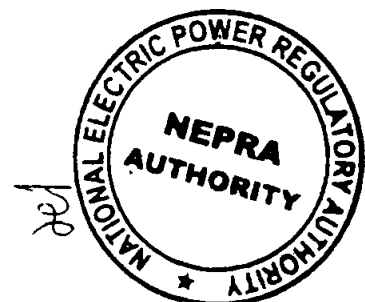
  
(Maj (R) Haroon Rashid)  
Member

  
(Brig (R) Tariq Saddozai)  
Chairman

  
  
09.08.16

## 1. INTRODUCTION

- 1.1. National Power Parks Management Company (Private) Limited (hereinafter "NPPMCL " or the "Company" or the "Petitioner") is a private limited company, wholly owned by Government of Pakistan and incorporated under the Companies Ordinance 1984 on 2nd March 2015 with an objective to set up two RLNG based power projects on fast track basis at Haveli Bahadur Shah, Jhang and at Balloki, Kasur in the Province of Punjab. The instant petition pertains to Haveli Bahadur Shah, Jhang. The Facility shall be a thermal IPP using Re-gasified Liquefied Natural Gas (RLNG) as the primary fuel and High-Speed Diesel (HSD) as back-up fuel. The proposed Project is based on the combined cycle technology with a capacity of 1230.54 MW at Reference Site Conditions (net 1207.90 MW). The project shall be set up on build, own and operate basis. Private Power and Infrastructure Board (PPIB) issued Letter of Intent (LOI) to the project on 12<sup>th</sup> April 2016.
- 1.2. According to the Petitioner, key features of the project are as under:
- a. Firm engineering, procurement and construction price with fixed and definitive commercial operations date (for combined cycle) by end of January 2018; as contractually agreed with globally reputable EPC contractors – a joint venture of Power Construction Corporation of China and Qavi Engineers (Pvt) Limited (PC-QE). The appointment of EPC contractor was carried out by NPPMCL through an International Competitive Bidding process in line with all applicable procurement rules, including the Punjab Procurement Rules, 2014. In pursuance of the same NPPMCL has signed the Engineering, Procurement and Construction Contract (the EPC Contract) with the successful bidder, PC-QE (the EPC contractor) on 13<sup>th</sup> October 2015 and established LCs amounting to USD 188,422,878 and PKR 4,816,221,952 in its favour , and made an advance payment equivalent to 15% of the EPC cost.
  - b. Long-Term Service Agreement: as part of the international competitive bidding process for the appointment of EPC Contractor in terms of all applicable public procurement laws, bids were also required to be submitted for maintenance and supply of initial spare parts and parts on a long term basis for scheduled and unscheduled maintenance of Gas Turbines, Gas Turbine Generators and associated Auxiliaries. NPPMCL is in the process of finalizing the LTSA with the successful bidder, GE.

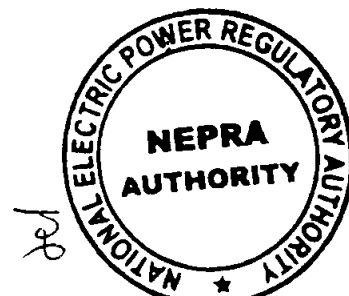


- c. Operation & Maintenance Contract: To outsource the O&M of the project to a globally-reputed specialized O&M Contractor, ICB process has been initiated and prequalification of bidders is underway. This will be followed by issuance of detailed RFPs for selection of the O&M Contractor – all in accordance with the Public Procurement Laws.
- d. Financing arrangements: In accordance with the approvals of Cabinet Committee on Energy (CCoE) and Executive Committee of National Economic Council (ECNEC), funds have currently been provided under Cash Development Loan (CDL), but a decision has been taken to finance the cost of the Project on a debt to equity ratio of 70:30 with loan provided at 3-month KIBOR plus 3% floating mark-up rate. The financing arrangement is in line with the GOP objective to sell down the project in due course to the private sector, which requires the Project to be commercially attractive and financially viable.
- e. Cutting-edge Technology: Two heavy-duty GE-manufactured air-cooled 9HA gas turbines, which are considered to be one of the largest and most efficient gas turbines commercially available today –capable of delivering greater than 60 percent efficiency when used in a combined cycle configuration with steam turbines.
- f. Environmental Safeguards through installation of Selective Catalytic Reduction (SCR) based NO<sub>x</sub> control system which has been made part of the EPC scope in order to control the NO<sub>x</sub> (and allow greater efficiency to be achieved).

## 2. FILING OF TARIFF PETITION

- 2.1. Pursuant to the relevant provisions of the NEPRA Act and the Rules and Regulations made there under; NPPMCL filed a tariff petition for approval of the reference generation tariff for Single Cycle and Combined Cycle Operation for the proposed project of 1,230.54 MW at Haveli Bahadur Shah, Jhang vide its letter dated 22<sup>nd</sup> April 2016. The company has also filed an application for issuance of generation license on 21<sup>st</sup> April 2016 which is under process.
- 2.2. According to the Petitioner, gas supply agreement with Sui Northern Gas Pipelines Limited (“SNGPL”) for the continuous supply of RLNG to the site of the power plant to ensure its base load operations is at an advance stage. The Gas

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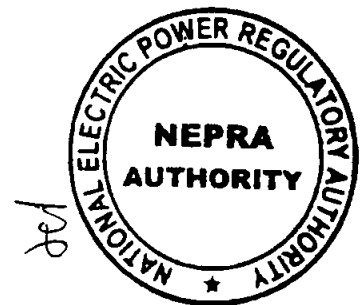


Supply Agreement has been approved by the board of directors of SNGPL and NPPMCL, as well as the Oil and Gas Regulatory Authority (OGRA). The RLNG shall be imported by Pakistan State Oil (PSO) under a sale and purchase agreement with international supplier(s) (including Government of Qatar) approved by the competent forum. Following re-gasification of RLNG, transportation of the RLNG will be done through Sui Southern Gas Company Limited and Sui Northern Gas Pipelines Limited.

- 2.3. According to the Petitioner, the electricity generated by the Facility will be sold to Central Power Purchasing Agency (Guarantee) Limited (the Power Purchaser), pursuant to the Power Purchase Agreement (the PPA). The PPA will be executed by and between NPPMCL and the Power Purchaser following NEPRA's approval of NPPMCL's 30 years Reference Generation Tariff.

### 3. SITE

- 3.1. According to the Petitioner, National Transmission and Dispatch Company (the NTDC) and the planning division of Water & Power Development Authority (WAPDA) after due consideration of load flow, availability of grid station, transmission lines and in view of the requirements and electricity demand of the area, has allocated NPPMCL a parcel of land measuring 757.9 Kanals situated in Haveli Bahadur Shah, District Jhang, Punjab for the Project (the Site).
- 3.2. According to the Petitioner, The Site is located about 25 km from Jhang (Jhang-Shorkot Road) and is adjacent to the Trimmu Sidhnai Link Canal. The Petitioner acquired the site and is being developed to serve the Project's land, logistical, water, and drainage requirements. An additional 269.1 Kanals of land has been rented for the period of construction for temporary works.
- 3.3. According to the Petitioner, the site is favourable in term of accessibility and water availability, power evacuation and spur gas pipeline's connectivity (about 38 km from the project site) with an Environmental Impact Assessment ("EIA") already completed and approved. The Project has no adverse impact on the environment because of the relatively low emissions of gas-based generation as compared to other fossil fuel based power generation.
- 3.4. According to the Petitioner, as per the current power evacuation plan the project will feed net generation of 1,207.90MW (at RSC) to the national grid. Detailed study to handle additional load by the grid station has already been carried out



and it has been confirmed by NTDC that said grid station can handle additional load of 1,200 MW to transport to national grid. According to NTDC, PC-I for the transmission line has been approved and tenders have already been called. NTDC has also confirmed to NPPMCL management in a meeting dated April 06, 2016 that back feed power would be available by December 2016 and system would be ready for the evacuation of power thereafter.

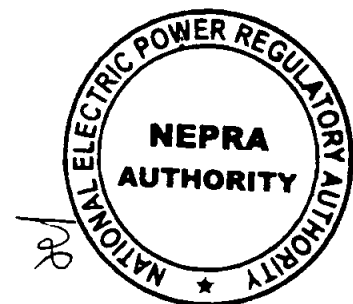
- 3.5. According to the Petitioner, NPPMCL will secure connection from the existing Sui Northern Gas Pipelines Limited (SNGPL) line passing through Shorkot. NPPMCL shall build about 38 km of spur gas pipeline from the off take point to the Site. The pipeline is scheduled to be commissioned by the last quarter of 2016.

#### 4. TECHNOLOGY

- 4.1. Accordingly to the Petitioner, the Facility configuration consists of two Gas Turbines, two HRSGs and one Steam Turbine. The multi shaft French/US Origin GE H Class – 9HA.01 Gas Turbines have been selected for the Project. The proposed technology has been selected by NPPMCL after detailed analyses of various power generation technologies available internationally.
- 4.2. The Petitioner submitted that these are heavy-duty gas turbines capable of achieving higher combined cycle efficiency. The H Class turbines have high reliability and are cost effective in conversion of fuel to electricity. The turbine technology used in the Project is air cooled H Class turbines which is an advance version of tradition H class steam cool turbines. The current 9HA.01 Gas Turbine in air cool technology has undergone full speed full load tests in GE's state of the art testing facility in Greenville, SC, USA. This facility provides full-scale validation of gas turbine systems with superior load response and full over/under frequency testing capability well beyond grid-connected installations. This in-house testing has proven the performance of the gas turbine at maximum load conditions as well as under irregular grid condition, which have been simulated to reflect unstable grid conditions.

#### 5. SALIENT FEATURES OF THE PETITION

- 5.1. The salient feature of the petition are as under:
- a. **Project Cost:** The petition proposed the following project cost:



DESCRIPTION	USD in Million
<b>EPC cost:</b>	<b>623.48</b>
Offshore EPC Cost	471.06
Onshore EPC Cost	118.39
Items not covered in the EPC contract scope	34.03
<b>Non EPC Cost:</b>	<b>83.31</b>
Engineering and related consultancy	14.40
Administrative Expenses during construction	13.74
O&M mobilization & training	6.00
Land Cost	2.53
Security Surveillance	13.58
Insurance during construction	8.41
Testing & Commissioning	24.65
Customs Duties & Cess	28.50
LTSA Initial Spare Parts	20.88
Gas Pipeline Cost	28.00
<b>CAPEX</b>	<b>784.20</b>
Financing Fees & Charges 4.06% of Debt	22.23
Interest During Construction 30 Months	68.97
One month LNG Escrow Account	38.04
<b>Total Project Cost</b>	<b>913.41</b>

b. Proposed Tariff: The petitioner proposed the following tariff:

Description	Combined Cycle	
	RLNG	HSD
<b>Energy Charge (Rs./kWh):</b>		
Fuel cost component	4.5929	8.1362
Variable O&M	0.5912	0.8531
<b>Total</b>	<b>5.1841</b>	<b>8.9893</b>
<b>Capacity Charge (Rs./kW/hour):</b>		
Fixed O&M (Local)	0.1200	0.1200
Fixed O&M (Foreign)	0.1507	0.1507
Cost of working capital	0.1102	0.1102
Insurance	0.0835	0.0835
Return on Equity	0.6346	0.6346
Debt servicing (1-10 years only)	0.9835	0.6411
<b>Total Capacity Charges 1-10 years</b>	<b>2.0826</b>	<b>2.0826</b>



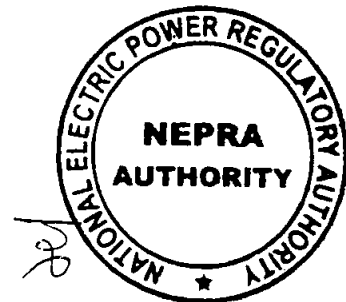



<b>Total Capacity Charges 11-30 years</b>	1.0990	1.0990
<b>Levelized capacity charges (Rs./kW/h)</b>	1.7401	1.7401
<b>Levelized capacity charges @ 92% (Rs./kW/h)</b>	1.8914	1.8914
<b>Levelized tariff (Rs./kWh)</b>	7.0755	10.8807
<b>Levelized tariff (Cents/kWh)</b>	6.7386	10.3626

Description	Simple Cycle	
	RLNG	HSD
Fuel cost component	7.0916	11.8345
Variable O&M	0.5912	0.8531
Fixed O&M (Local)	0.1200	0.1200
Fixed O&M (Foreign)	0.1507	0.1507
Cost of working capital	0.1102	0.1102
<b>Total levelized tariff Rs per kWh</b>	<b>8.0637</b>	<b>13.0685</b>

- c. **Assumptions:** The Petitioner has assumed the following:
- i) Capital Structure: The proposed debt equity ratio is 70:30.
  - ii) Interest Rate: The petitioner assumed interest rate of 3 month KIBOR + 3% with a tenure of 10 year plus 30 month grace period.
  - iii) Return on Equity: The return on Equity component of tariff has been calculated on the basis of 16% IRR on equity investment.
  - iv) Exchange Rate: Rs. 105/USD has been assumed.
  - v) Thermal Efficiency: The proposed combined cycle efficiencies are 60.48% and 52.96% on RLNG and HSD respectively and simple cycle efficiencies are 39.17% and 36.41% on RLNG and HSD respectively.
  - vi) Annual Availability: The proposed annual plant availability is 92%.
  - vii) Dependable Capacity: The proposed net capacity after auxiliary consumption is 1207.90 MW.
  - viii) Insurance cost: The petitioner proposed annual insurance cost @ 1.35% of the EPC Cost.
  - ix) Tariff Period: The petitioner proposed a tariff control period of 30 Years.

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- x) Reference Price: The Petitioner assumed reference fuel HHV prices (excluding GST) of USD 7 per MMBTU-HHV for gas and PKR 42.91 per Litre on HSD.
- xi) Proposed Tariff: The petitioner proposed the following tariff:

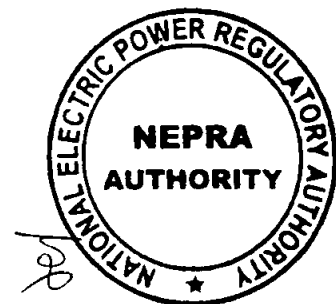
## 6. ADMISSION OF TARIFF PETITION

6.1. The Authority admitted the tariff petition on 10th May 2016. While admitting the petition, the Authority also decided to hold a hearing in the matter. The hearing was fixed for 31st May 2016. The notice of admission/hearing along with salient features and issues framed for the hearing was made public in national newspapers on 14th May 2016 inviting stakeholders to become party to the proceedings by filing intervention request within 14 days of the publication of the notice. Stakeholders were also invited to file comments in the matter for the assistance of the Authority. Individual notices were also sent to all concerned on 17th May 2016.

## 7. ISSUES FRAMED

- 7.1. Based on the contents of the tariff petition, following issues have been framed for the hearing:
- i. Whether the EPC Cost is reasonable and justified?
  - ii. Whether the Non-EPC cost is reasonable and justified?
  - iii. Whether the cost of LTSA initial spares inventory is reasonable and justified?
  - iv. Whether the gas pipeline cost is justified?
  - v. Whether the financing fee and charges are justified?
  - vi. Whether the proposed construction period of 30 months and request for early commissioning bonus is justified?
  - vii. Whether the one month LNG Escrow Account is reasonable and justified?
  - viii. Whether the RLNG price of US\$ 7/MMBtu HHV is reasonable and justified?
  - ix. Whether the required efficiencies are reasonable and justified?

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- x. Whether the Net Dependable Capacity is justified?
- xi. Whether the Variable O&M cost including the canal water charges of Rs. 0.2359/kWh is reasonable and justified?
- xii. Whether the Fixed O&M cost is reasonable and justified?
- xiii. Whether the Insurance Cost is justified?
- xiv. Whether the requested cost of working capital is reasonable and justified?
- xv. Whether the requested cost of capital is reasonable and justified?

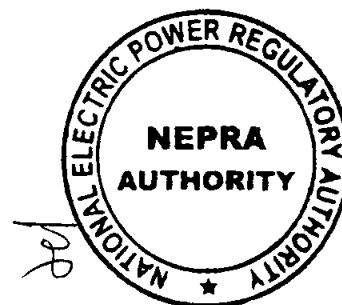
## 8. FILING OF COMMENTS/INTERVENTIONS

8.1. In response to the notice of admission/hearing, Anwar Kamal Law Associates filed intervention request. Government of Sindh filed comments in the matter. Both the intervention request and comments were forwarded to the Petitioner for reply.

8.2. The para wise comments of Anwar Kamal Associates (AKLA) are summarized as follows::

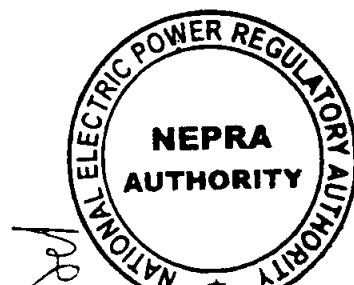
- Whether the subject Project is being set up by the Government of Punjab? If yes, the provision of law and terms and conditions under which, the project is being set up keeping in view that under the constitution electricity is a federal subject. Whether these Power Plants are being set up with some commercial objective or this is being done as a national service?
- What is and would be the funding source to set up this Power Project? The reason stated in various documents for the induction of private investment in the electricity Generation business was the avowed lack of funding with the Government but now at least the Government of the Punjab is actively engaged in it. Is this a two-step circuitous route to facilitate some chosen blue-eyed private persons/entities through the next stage of privatization?
- Whether this Power Plant will be an addition in the Generation basket of CPPA or it is a replacement of any existing Power Plant?
- What would be the alternate or secondary fuel for this project?
- The contract Agreement showing the rates and other terms and conditions for import of RLNG from Qatar and the GSA with Gas Supply Company are not available in the public domain. Prior to the grant of Generation License to the

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subject power project, the review of the GSA is essential and an absolute sine qua non.

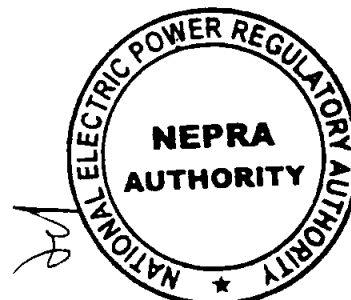
- In the past Generation Licenses were granted to Orient, Saif, Sapphire and Halmore power projects without having firm GSAs for the entire term of their Licenses. Subsequently, the required Gas to operate these power plants on full load could not be made available. As a result, people of Pakistan were not only deprived of electricity from these power plants, but were also burdened on account of making full Capacity payment to these Power Plants despite non-supply of electricity at their full capacity.
- The Plant's Technology, Location, Fuel, non-hazard to environment, whether it falls in least-cost-Generation plan, etc. are also important criteria to determine whether the addition of a Power Plant of this capacity is actually required by the System demand?
- AKLA has compiled data for 'Plant Under-Utilization Factor' for 'Take or Pay' based 50 power plants for 39 months starting January 2013 till March 2016 for the consideration of the Authority. Reviewing data, it has been noted that either there is 'Surplus Generation Capacity' available with CPPA or the power sector managers prefer load shedding and burdening the helpless consumers by paying capacity charges. Referring to a News item published on May 12, 2016 under the heading 'Power production capacity 'underutilized'', AKLA questions the financial losses of Rs. 4 – 5 billion per month and the rationale of adding more capacity when existing capacity remains underutilized.
- Despite the low oil prices, plants are being under-utilized and due to the nature of the executed PPA i.e., "Take or Pay", CCPA is making payment for idle capacity which is increasing the per unit cost. Induction of new capacity on 'Take or Pay' shall further increase burden on end-consumer. Therefore, the tariff of any new plant shall be on 'Take and Pay' basis through competitive market mode.
- Electricity Tariff in Pakistan is already higher in the region and even the benefit of the crash of the international oil prices has not been passed on to the consumers.
- In the past two years, inefficiencies of the generation, transmission and distribution companies have been allowed to be passed-on through increased electricity tariff resultantly the industries, specially the export goods manufacturing industries, are losing their market share. The poverty level is



increasing and the common man is facing serious issues due to increased cost of electricity in Pakistan.

- In addition to the payment for idle Capacity, CPPA is also paying 'Partial Load Adjustment Charges' (PLAC) to power plants for being not utilized to their full capacity.
- It is again clear from the above that the capacity in Pakistan is surplus to the demand of the country. Hence any new induction of electric Power Generation capacity, that too on 'Take or Pay' basis, is not justified.
- Due to decrease in oil prices from \$ 130/barrel \$ 30/barrel after 2013-14, the fuel cost component of some oil based power plants has come around Rs. 4-5/kWh. It is being predicted that oil prices will not reach the prices of 2012-13 in the next 5 to 7 years. Moreover, Pakistan has also entered into a long-term Agreement with Qatar for the import of RLNG. AKLA are not here entering the debate as to whether the price agreed to is beneficial for Pakistan or not and whether or not it is the lowest available price.
- With current oil prices, the cost of electricity generated from RFO is cheaper than the electricity generated from RLNG. It is also learnt that the RLNG is being supplied to power plants on 'take or pay' basis. Therefore, to ensure that imported RLNG is consumed, the Economic Merit Order Criteria has been revised by NTDC. This is causing huge financial losses to the electricity consumers, National exchequer, power sector and the country's economy.
- The transmission of RLNG from Karachi Port to the Project site is still an issue. Swapping arrangement of pipeline quality Gas in Punjab with imported RLNG has already been objected to by the Government of Sindh.
- Instead of setting up new Power Plant, that too in haste with terms and conditions set by the Investors and which Power Plants are comparatively costlier, efforts should be made to utilize the available Power Generation Capacity to its full first.
- AKLA have noted that as per existing mechanism, the Economic Merit Order (EMO) of Power Plants is based only on the Fuel Cost Component and there is no consideration of Capacity Component Payment. The existing mechanism of EMO may need to be reviewed after taking into consideration the effect of per Unit differential cost being paid to the Power Plants for idle Capacity.

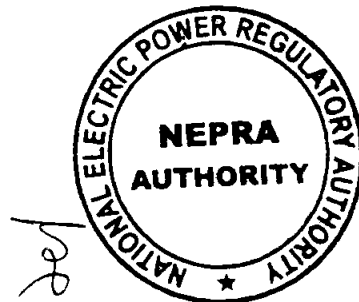
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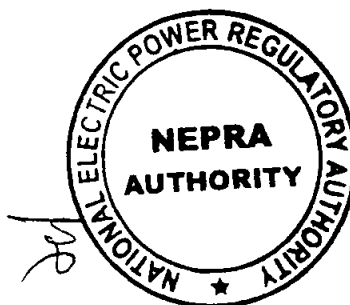
- NEPRA has already developed the Market Rules for the development of the Electric Power Market. Discontinuation of Long Term PPAs that too on 'Take or Pay' basis is a pre-requisite for a Competitive Electric Power Market.
- NEPRA may determine the Generation tariff for the subject Project but its Tariff should not be on 'Take or Pay' basis.

8.3 The Petitioner's para-wise reply to the comments made by AKLA is as follows:

- NPPMCL is a company wholly owned by the Federal Government and the project is not being setup by Government of the Punjab but by NPPMCL.
- The project is currently being financed by the Federal Government through PSDP as 30% equity and 70% loan. The plant may be privatized in future under the applicable laws of the country. The alleged apprehension of the intervener in this regard is completely wrong and baseless.
- This power plant will add to the capacity of national grid, which presently has less supply than demand and it may also be considered as replacement of decommissioned power plants of the public sector.
- The alternate / backup fuel is high speed diesel (HSD).
- Copy of the GSA has already been provided to NEPRA.
- The initial term of the GSA is fifteen years in the instant case and after the initial term, the parties will mutually extend the same for another fifteen years.
- The Plant is located near the load centre, and is based on the latest and most efficient state of the art technology and does not pose any environmental hazard.
- The result deduced by the intervener is lopsided and as such is not a true and correct reflection of the facts. Addition in the generation capacity is always an on-going process in any system. Under the grid code and PPA, it is the System Operator's prerogative to schedule and dispatch the plant by keeping in view many factors provided in the Grid Code. Hence the data compiled by the intervener in its entirety has no nexus on the instant matter. Since the instant plant is a base load plant and the most efficient one, therefore, there is every like hood that it will not be underutilized and its operation will save billions of rupees.



- Argument of the intervener is flawed and self-defeating. Under the current regime, per unit electricity cost is a sum of (i) Capacity Payment Price, and (ii) Energy Payment Price. Capacity payments are a smaller portion of the total per unit cost. Fuel cost, which is the larger portion, is completely passed through in the tariff. Simple cost of fuel does not determine the per unit electricity cost: it is a product of fuel cost with efficiency of the power plant. If the older generation plants with degraded efficiency ratings of 35% (majority IPPs) to 57% (few IPPs) are operated only in consideration of capacity payments, the consumer will be made worse-off as per unit electricity cost will go up, i.e. financial burden on end user will increase. New power plants of high efficiency, such as Haveli Bahadur Shah CCPP, having efficiency of 60.44% or more, when operated as base load power plant, will result in cheaper per unit electricity for the consumer while simultaneously reducing the power outages.
- Haveli Bahadur Shah power plant will operate on an efficiency of 60.44% or above hence the consumers at large will benefit. Moreover, the petitioner understands that NEPRA passes on the benefit of reduction in fuel prices to the consumers by way of monthly fuel charges adjustment.
- It may be noted that addition of high efficiency power plants like Haveli Bahadur Shah CCPP power plant shall drive the electricity tariff downwards.
- The objection raised by the intervener is not relevant to the petitioner. However, the petitioner feels that the allegation is misconceived and incorrect. In case the plant is not dispatched on full load, due to any of the factors given in the Grid Code, naturally the plant will utilize more fuel. PLAC is a compensation for consumption of higher fuel.
- The point is baseless. As already submitted above, installation of new high-efficiency generation facilities and thereby addition of cheaper electricity to the existing supply is an on-going process to keep pace with the ever growing demand of the consumers whilst reducing their financial burden.
- This allegation has no basis and is factually incorrect. The current oil price (crude) is approximately US\$ 50 per barrel and not US\$ 30 as mentioned by the intervener. It is unclear what the intervener's point is. What will happen after 5 years? Is the intervener proposing that all the planning in the power sector should be based on vague prediction(s) made by and relied upon by the intervener who habitually objects to each and every initiative in the power sector? As a matter of fact the average useful life of a power plant is 25 to 30

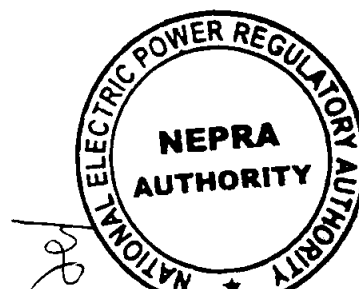


years and it takes 3 to 4 years to construct a thermal power plant while the complete period from planning and bidding to commissioning may stretch to 5 to 7 years. For the record, it may be considered that RLNG price is dictated by the fuel price and is fixed as a percentage of the Brent price in long-term contracts.

- The intervener is purposefully distorting facts to confuse the instant petition. The new RLNG-fired power plants like the instant one are expected to be cheaper to run than the existing RFO plants even at current prices due to their high-efficiency. Comparison with existing lower efficiency gas based power plants on RLNG fuel with RFO fuel plants is not relevant to the petition. Furthermore, it may be noted that while it is correct that presently the price of RFO is lower than RLNG but for how long will this situation remain same? The total dependable capacity of RFO based power plants is approximately 38% of the total capacity in the system and as such if all the RFO based power plants are dispatched on full load even then the system shall require more power to meet with the demand of consumers. The petitioner understands that the Haveli Bahadur Shah CCPP is a base load plant hence will rank at the top on merit order for base load plants running on RLNG and resultantly will benefit the end consumers.
- The project of independent pipeline for transportation of RLNG for the purpose has been initiated and is likely to be completed by December 2018.
- Keeping in view the existing market conditions, the take and pay regime seems far ahead yet and no investor will take risk of take and pay in such market conditions.
- The petitioner understands that as per the relevant provisions of the Grid Code, the No Load Price is taken into consideration by the System Operator while making the merit order.
- The petitioner understands that the current market design is 'single buyer' whereas the competitive market trading regime/design has to commence from 1st July, 2020 hence the point of intervener is completely irrelevant.

8.4. The Authority has examined the objections raised by the intervener and reply provided by the petitioner. The intervener mainly emphasized two points i) under-utilization of the existing power projects and ii) take and pay arrangement instead of take or pay arrangement. So far as under-utilization of the existing plants is concerned, demand phenomenon needs to be understood. Demand is not

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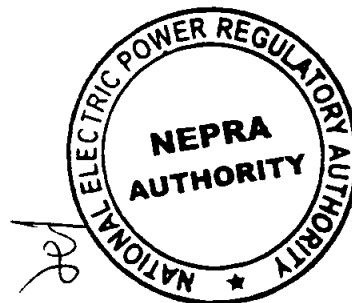


constant; rather it changes round the clock from peak to minimum. Load Shedding has to be carried out during the peak demand-supply gap. Similarly during the period of less demand, generation has to be curtailed. The available generation capacity is not sufficient to meet the peak demand and efforts are being made to build new power generation capacity. Non utilization of plants during the minimum demand time doesn't mean that plants are underutilized as all the plants cannot be operated when there is not enough demand. Regarding take or pay arrangement, it is observed that this arrangement is in accordance with the applicable Power Policy and unless there is a competitive power market in the country this regime will be hard to change.

8.5. The Intervener also stated that the issues framed in the instant matter were the same as in the case of Bhikki, hence, AKLA's letter in the matter of Bhikki project may be considered in this case also. Since the comments of the intervener, where applicable, has been addressed in the determination of Bhikki, therefore need not to be reproduced again.

8.6. Government of Sindh filed following comments:

- The Council of Common Interest (CCI) in its 28th meeting held on 29-02-2016 discussed the constitutional status of RLNG, its utilization, incidental and ancillary matters and constituted a "Working Level Technical Committee" assisted by lawyers under the aegis of Inter-provincial Coordination Committee (IPCC) whose report to be submitted to CCI. Minutes of the CCI meeting are enclosed.
- It is to reiterate that Government of Sindh has strong reservations on the fuel used for the generation of power by NPPMCL. It is believed that entire power plant is being constructed on illegally swapped natural gas from Sindh without the consent of Provincial Government and jeopardizing the energy security of the province. Moreover, it is a misnomer to call swapped locally produced natural gas as RLNG.
- It is further reiterated that in the absence of a dedicated RLNG pipeline from Karachi to upcountry, SNGPL has only been relying on the swapped locally produced natural gas molecules and not on RLNG molecule. Resultantly, the proposed power plant cannot be considered as running on RLNG.
- It is therefore, requested that the petition of NPPMCL for approval of generation tariff for RLNG based Power Project at Haveli Bahadur Shah and at Balloki in Punjab may please be deferred till RLNG, its incidental & ancillary

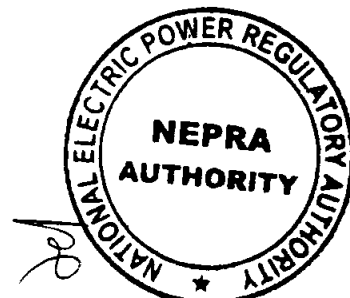


matters and swapping arrangement of locally produced gas with RLNG are decided by the CCI and Government of Sindh respectively.

8.7. The Petitioner's para-wise reply to the comments provided by the Government of Sindh is as follows:

- The objection is misleading, baseless and appears to be used as a delaying tactic. Import and export across customs frontiers and Inter-provincial trade and commerce are the exclusive domain of the Federal Government as enshrined in entry No. 27 of Part-1 of the Fourth Schedule of the Constitution of Islamic Republic of Pakistan, 1973. Under the said constitutional provision, the import of RLNG as well as the inter-provincial trade including gas is the exclusive power of Federal Government. It appears that the GoS is relying on the precedence, of a province in which wellhead of natural gas is situated in meeting the requirements from the wellhead, over other parts of Pakistan as given under Article 158 of the Constitution. In response to this comment it is submitted that such precedence is not unfettered but subject to commitments and obligations as on commencing day. Moreover, under Article 172(3) of the Constitution, the natural gas within the Province vests jointly and equally in that Province and the Federal Government. The arrangement of fuel for NPPMCL's plants has been designed in a manner that neither the province of Sindh will be deprived of natural gas to meet with the requirements of natural gas in the province nor any financial loss, in shape of royalty etc., if any, from the well-head of natural gas situated in Sindh, will accrue to the province.
- The argument given by GoS regarding swapping is completely unfounded and baseless. It is submitted that chemically there is no difference between natural gas and LNG as both are primarily Methane (CH<sub>4</sub>). The source (wellheads) of such Methane (CH<sub>4</sub>) may be different. Additionally, it is submitted that the subject power plants of NPPMCL have already got firm gas allocations from the competent authority on the basis of imported RLNG. In case of any delay/lack of import of LNG, the subject plants may be dispatched by the System Operator on secondary fuel. In case of shortage of imported LNG, SSGCL can't provide the natural gas produced from the wellheads situated in Sindh to SNGPL. As such neither there is any threat to the energy security of Sindh nor it has been jeopardized on account of import of LNG.
- It is submitted that the subject power plants will run on imported RLNG hence being an internal arrangement of the gas supply companies, the swapping, if any, will be against equivalent import of RLNG and energy security as apprehended will not be compromised. A molecule of locally produced natural

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gas and that of imported natural gas in the shape of RLNG same i.e. Methane (CH<sub>4</sub>). A segment of pipeline is being laid down, to be completed in December 2016, which will further enhance the present spare capacity to 600 MMCFD whereas the maximum gas required of the subject projects is 380 to 400 MMCFD.

- The objection is misleading. There is no requirement under any applicable provision of NEPRA Act as well as rules and regulations made there under to defer the determination of tariff on the grounds raised by GoS.

8.8. The Authority has considered the request of the GoS to defer the tariff petition till the time the RLNG, its utilization, incidental & ancillary matters and swapping arrangement of locally produced gas with RLNG are decided by the CCI and Government of Sindh respectively. The Authority has also considered the reply of the petitioner in the matter. The Authority is of the opinion that the objections raised by the GoS are generic in nature and are not specific to the subject project. These issues need to be raised before the relevant governmental agencies as these issues come under their domain. The Authority is confined to decide a tariff petition strictly in accordance with NEPRA Act, rules and regulations and the same is being done in the instant case.

## 9. HEARING

Hearing in the matter was held on 31<sup>st</sup> May 2016 at NEPRA Tower, G-5/1, Islamabad. The hearing was participated by the representatives of the Petitioner, CPPA, PPIB and other stakeholders.

## 10. CONSIDERATION OF THE VIEWS OF THE STAKEHOLDERS, ANALYSIS, FINDINGS AND RECOMMENDATIONS ON IMPORTANT ISSUES

The issue wise discussion, submissions of the Petitioner and stakeholders, analysis, findings and recommendations are provided in the succeeding paragraphs.

## 11. Whether the EPC Cost is reasonable and justified?

11.1. The Petitioner proposed EPC cost of US\$ 623.484 million comprising US\$ 589.45 million (offshore US\$ 471.06 million and onshore US\$ 118.39 million) for Engineering Procurement and Construction (EPC) Agreement and US\$ 34.03 million for additional costs expected to be incurred for system optimization not covered in the EPC contract scope.



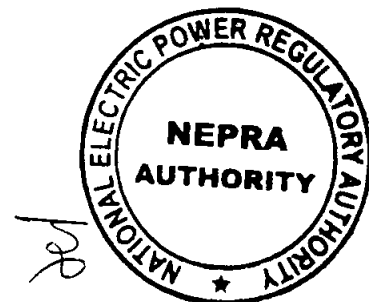
- 11.2. The Petitioner entered into an EPC Agreement with Joint Venture of Power Construction Corporation of China and Qavi Engineers (Pvt) Limited ("PC-QE" or "the Contractor") for the construction of 1,230.54 MW (Gross)/1207.9 MW (Net) gas based power generation facility to be located at Haveli Bahadur Shah, Jhang in the Province of Punjab, Pakistan. According to the Petitioner an international competitive bidding process was carried out to select the EPC contractor. The EPC cost includes power generation sets together with all the necessary auxiliary machinery, equipment and systems and includes, inter alia, the erection, testing, commissioning and completion of the equipment and construction of the Facility.
- 11.3. The Authority considered the EPC Agreement Price, agreements, information and evidence available on record, objections of the intervener and reply of the petitioner and is of view that all information and documents show that international competitive bidding was done by the petitioner to arrive at the lowest EPC price. The EPC Agreement price translates into approximately US\$ 0.48 million/MW which is the lowest among all the gas based projects already commissioned and one of its kind. By all standards, the EPC Agreement price is the most efficient, therefore, is approved as such.
- 11.4. Regarding US\$ 34.03 million for the items not covered in the EPC cost, the Petitioner submitted that these are contingent items/design improvements and have not been covered in the EPC Agreement. The cost breakup of these items are as under:

Sr. #	Description	US\$ Million
1	BOP Spares	6.00
2	Buffer Vessel	4.46
3	Fuel gas Treatment Plant	2.10
4	Combustion Monitoring System of Gas Turbine	0.50
5	Plant Simulator System & Training Centre	2.30
6	Housing Complex	16.50
8	Land Acquisition for housing complex and training centre	2.17
	<b>Total</b>	<b>34.03</b>

**Combustion Monitoring System of Gas Turbine**

- 11.5. The Petitioner requested US\$ 0.5 million on account of combustion monitoring system which monitors the condition and status of the combustion parts of the gas turbine. According to the Petitioner, it is not part of the GE standard package and

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has to be ordered separately. It keeps record of the out of flame fuel injectors and calculates the exhaust spread (the temperature difference between the two combustors with maximum and minimum temperatures). It generates alarm and trips the GT if the spread is above the set points.

- 11.6. The Authority considered the request of the Petitioner and decided to allow maximum cap of US\$ 0.5 million for the installation of the combustion monitoring system subject to its verification at the time of COD on account of actual spending based on verifiable documentary evidence.

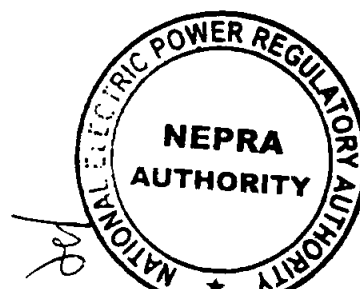
### **BOP Spares**

- 11.7. The Petitioner requested US\$ 6 million on account of balance of plant spares. According to the Petitioner, in addition to the spares covered under the EPC, additional spares could be procured to ensure that in case of a breakdown, parts would be readily available. This will be based on the list of recommended spare parts of the EPC contractor; Employer will purchase these and hand them over to the O&M Contractor who will keep replenishing it regularly. These will be in the ownership of the Employer.
- 11.8. The request of the Petitioner was examined keeping in view the high initial spares inventory cost of US\$ 20.88 million as per the LTSA bid. Since the requested additional inventory cost is without any documentary evidence therefore in order to make fair assessment, the Authority has relied on the regional benchmarks. The Authority has seen that the Regulatory Commission in the neighbouring country established a benchmark of 4% of the capital cost as maximum spares inventory for combined cycle power projects. In case of identical Bhikki project, the Authority has adopted the same benchmark and accordingly the maximum spares inventory was assessed as US\$ 22.59 million. The same has been adopted in the instant case. After reducing the LTSA spares inventory of US\$ 20.88 million, BOP spares works out US\$ 1.71 million and the same is being approved.

### **Housing Complex**

- 11.9. The Petitioner requested US\$ 16.5 million on account of housing complex including auditorium. The Petitioner submitted that the plant staff and reputable international O&M companies would require safe and quality on-site accommodation for themselves and for their families. Such accommodation is necessary as travelling back and forth to Plant Site from another location shall expose them to security threats. It is anticipated that 150 staff shall be on site, comprising 25 expatriate managers, 25 local manager, 50 staff (with family) and 50

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staff (single). Cost is based on 275,000 ft<sup>2</sup> covered area @ USD 60/sft. The details of the housing complex is as under:

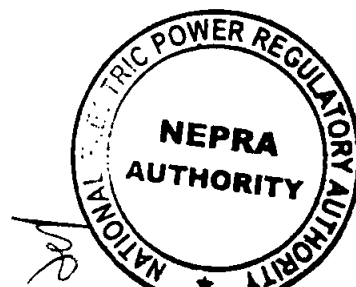
Building Description	Nos.	Covered Area (ft <sup>2</sup> )
Executive Housing (Expat)	25	25,000
Executive Housing (Local)	25	62,500
Staff Housing (Family)	50	75,000
Staff Housing (Single)	50	37,500
Sports Facilities	1	50,000
Auditorium	1	25,000
<b>Total</b>		<b>275,000</b>

- 11.10. The Authority has considered the request of the Petitioner for housing complex. Being the remote area, the need for a housing complex seems justified. For the purpose of the housing complex, the Authority has also considered the information relating to the housing colony provided by Lalpir/Pakgen Power to their staff which is much more extensive than the one proposed by the Petitioner. However, the proposed covered area for Auditorium seems on the higher side and has been rationalized to 5,000 ft<sup>2</sup>. Similarly, instead of standalone houses for single staff, a hostel having studio apartments (one bed, kitchen and bath) is being allowed with covered area of approximately 29,000 ft<sup>2</sup>. In the opinion of the Authority, the cost of US\$ 60/ft<sup>2</sup> is also on the higher side and has been rationalized to Rs. 5,000/ft<sup>2</sup>. After incorporating the aforementioned changes, the covered area works out 246,500ft<sup>2</sup> and the cost works out US\$ 11.738 million and the same is being approved for housing complex including the auditorium with maximum cap subject to adjustment on actual at COD on the basis of verifiable documentary evidence. This cost shall be in addition to the staff accommodation/hostel required to be built by EPC contractor free of cost under Section 6.5.4 of the Employer's Requirements.

#### Plant Simulator System & Training Centre

- 11.11. The Petitioner requested US\$ 2.3 million for plant simulator system & training centre. According to the Petitioner, plant simulator for the training of Operations and Maintenance Engineers and Staff would add to the plant performance and lessen the human error in both fields. The Petitioner also submitted that in future Universities could use this facility for training of engineers, since the technology at this plant would be cutting edge. According to the Petitioner, this is normally

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practiced all over the world in form of work placements, where credit is given to students for taking these courses. The Petitioner further submitted that a training centre would be constructed at site to house the Plant Simulator System and other training facilities.

- 11.12. Considering the importance of training on latest technology machines, the Authority has already allowed US\$ 2.3 million for Simulator System & Training Centre to Bhikki power project. The synergies drawn from implementing three large RLNG based H-type gas turbine projects needs to be taken into account. One plant simulator system and training centre is sufficient for the purpose which has already been allowed, therefore, the Authority has decided to disallow the cost under this head in the instant case.

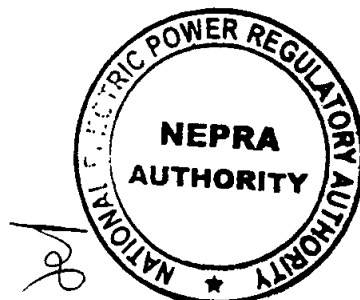
### Fuel Gas Treatment Plant

- 11.13. The Petitioner requested US\$ 2.1 million for fuel gas treatment plant. According to the Petitioner, if certain metal contaminants i.e. Pb, Va, Na, K, Ca, Mg are present in the fuel gas above the permitted range then gas is to be analyzed and treated before feeding to the Gas Turbines and for this, trace Metal Contaminant Plant is required to analyze& treat the fuel gas as per required specification of Gas Turbine OEM.
- 11.14. The Authority has considered the request of the Petitioner for fuel gas treatment plant. As per GE specifications, allowable contaminant levels are fixed. In case contaminants are above the GE level, treatment plant may be required. Accordingly, the Authority has decided to allow the requested cost of US\$ 2.1 million with maximum cap subject to adjustment as per actual at COD on the basis of verifiable documentary evidence.

### Buffer Vessel

- 11.15. The Petitioner requested US\$ 4.463 million for buffer vessel. According to the Petitioner, it was kept optional in the EPC contract and is required for the bump-less fuel-changeover to liquid fuel, in case the in service compressor trips. It would regulate the differential pressure between Gas Compressor and Filtering Skid, accounting for the discharge flow rate of Gas Compressor and consumption flow rate of GTs.
- 11.16. The Authority has considered the request of the petitioner and decided to allow US\$ 4.463 with maximum cap for buffer vessel subject to adjustment as per actual on the basis of verifiable documentary evidence at COD.

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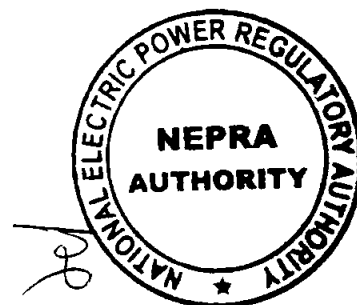
### Land Cost

- 11.17. The Petitioner requested US\$ 2.17 million for acquisition of land of 38 acres for construction of Site Housing Complex with additional recreational facilities, 4 acres for plant simulator system & training centre and 34 acres of temporary land @ actual land cost of 3.00 Million Rupees per acre. The Petitioner requested its adjustment as per actual at COD as actual rate may escalate due to power plant construction. The requested land under this head is in addition to the land acquisition for power complex.
- 11.18. The Authority has considered the request of the Petitioner for purchase of land for the residential complex and plant simulator system. Since the Authority did not allow the construction of plant simulator system, therefore, 4 acres of land for the purpose has not been considered. Similarly, the full payment against the temporary land is not justified and has not been considered. The Authority has decided to allow US\$ 1.086 million with maximum cap for additional purchase of 38 acres of land for construction of housing complex including auditorium with maximum cap subject to adjustment as per actual on the basis of verifiable documentary evidence at COD. This cost of land shall only be allowed if purchased in addition to the land allowed for power complex.

### 12. Whether the Non-EPC cost is reasonable and justified?

- 12.1. The Petitioner requested US\$ 83.31 million for non-EPC and project Development costs. According to the Petitioner, non-EPC and project development costs have been budgeted on the recommendation of consortium of consultants with strong power sector experience, company's estimates and industry trend. The breakup of the cost is as under:

Description	US\$ Million
Engineering consultancy	14.40
O&M mobilization & training	6.00
Land Cost	2.53
Insurance during construction	8.42
Testing & Commissioning	24.65
Security Surveillance	13.58
Administrative Expenses during construction	13.74
<b>Total</b>	<b>83.31</b>





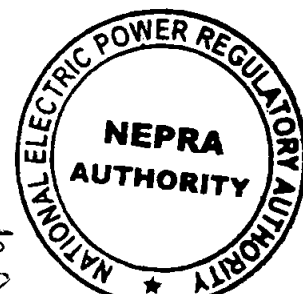
### Engineering Consultancy

- 12.2. The Petitioner requested US\$ 14.4 million on account of Engineering consultancy services comprising US\$ 9 million for Consultancy Contract cost and US\$ 5.4 million for Design Review Meetings (DRM), Factory Acceptance Testing (FAT) and Third Party Inspections cost. Copy of the Consultancy Contract was also provided by the Petitioner. According to the Petitioner, the company has signed a consultancy contract with NESPAK covering project procurement, design review and implementation advisory services. The Petitioner further submitted that additional services including but not limited to pre – shipment inspections, foreign travelling, extra design review meetings in China, extra trips by foreign consultants, FAT inspections and third party manufacturing surveillance quality assurance services which are envisaged to be paid mainly to foreign consultants is estimated at US\$ 5.4 million. The Petitioner assumed that against each of the FATs, 3 to 4 inspections will be performed at a minimum, i.e. during manufacturing, post manufacturing and pre shipment which have been calculated to be approximately 198.
- 12.3. According to the consultancy contract, the price in foreign currency is Euro 1,755,596 and US\$ 88,161 and in local currency Rs. 666,569,295 all amounts inclusive of provincial sales tax @ 16%. Beyond 1<sup>st</sup> July 2016, price shall be subject to escalation @ 4% for foreign component and 10% for local component. After applying the escalations and the respective exchange rates of Rs. 120/Euro and Rs. 105/US\$, the total contract price works out US\$ 7.77 million excluding provincial sales tax.
- 12.4. The Petitioner provided following details for the cost of US\$ 5.4 million on account of DRM, FAT and Inspections:

Description	US\$
DRM, FAT & 3rd Party Inspection Charges	3,085,887
Contingency	1,125,766
Air Fare, Boarding, Lodging	1,116,000
Boarding/Lodging	74,200
<b>Total</b>	<b>5,401,853</b>

- 12.5. The Authority has examined the details of the cost of DRM, FAT & 3<sup>rd</sup> Party inspection. In the opinion of the Authority, both Lahmeyer International and NESPAK are well reputed and experienced firms therefore it is expected that they must be in the knowledge about the fast track nature of the project. Therefore they

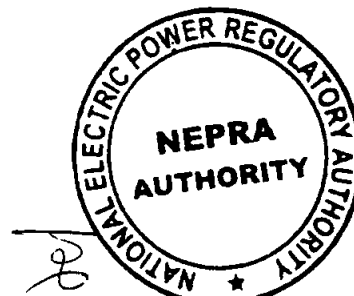
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should have taken care of the specific requirements in their consultancy agreement. The argument on the Factory Inspection forwarded by the Petitioner is contradictory to its position on design review. As proposed Lahmeyer-NESPAK are competent to review the design of a project which is based on latest technology but on the other hand they require third party to carry out factory inspections. The Petitioner has proposed 198 trips for inspections. It is also noted that in addition to main plant components, the balance of plant also consists of large number of components for which inspections are routinely done by Lahmeyer and NESPAK based on their experience profile. It is also a normal practice that factory testing is the responsibility of the equipment supplier. Similarly, the 30% contingency expenses over and above the very high estimated cost are not justified. Keeping in view the above observations, the requested cost seems on the higher side and need to be rationalized. Accordingly, the Authority considers that an amount of US\$ 2 million shall be a fair estimate under this head. Accordingly the total consultancy charges works out US\$ 9.77 million and are being approved.

#### O&M Mobilization & Training

- 12.6. The Petitioner requested US\$ 6 million on account of O&M mobilization cost during the construction phase. According to the Petitioner, O&M contractor shall need to be mobilized before the COD of first gas turbine. The Petitioner submitted that the O&M contractor selection and bidding process has recently been initiated and there are no specific comparable benchmarks available for estimation of this cost. Accordingly, based on the recommendations of the advisors, company's estimates and industry trend, the Petitioner budgeted O&M mobilization cost at USD 6 million. The Petitioner also referred the determination of UCH – II power plant, where the O&M mobilization cost of USD 4 million was allowed for 404 MW capacity wherein the O&M costs were on a sharing basis. Accordingly, the facility being a standalone plant with no cost sharing and a much higher capacity and scale will entail a much higher O&M mobilization cost.
- 12.7. According to the financial bid, no mobilization cost is required by the LTSA contractor (GE). As submitted by the Petitioner, bidding for the O&M contractor is in process. The requirement of O&M mobilization cost depends on the O&M contract. The Authority allowed O&M mobilization cost to other power projects and one such project is UCH II as referred by the Petitioner. Having considered the petitioner's request and Authority's assessment in other projects the Authority considers that US\$ 6 million is a reasonable assessment in the instant case; therefore is being allowed subject to adjustment on actual at the time of COD on the basis of O&M contract with maximum cap of US\$ 6 million.

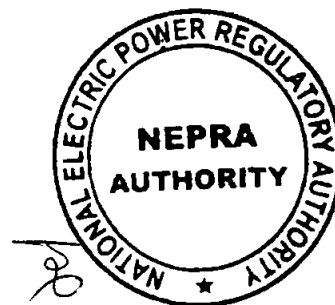


### Land Cost

- 12.8. The Petitioner requested US\$ 2.53 million for purchase of land for the project. According to the Petitioner, land area measuring 757.9kanalshas been acquired for the power complex. The petitioner also rented additional land of 269.1 kanals during the construction phase. The Petitioner in support of its claim also provided the documentary evidence including the Notification u/s 4 of the Land Acquisition Act 1894, demand of funds by the office of Assistant Commissioner/Land Acquisition Collector and payment of the land cost of Rs. 253 million. The Petitioner also informed that Rs. 12.6 million for compensation to farmers is still outstanding.
- 12.9. The documentary evidence provided by the Petitioner has been examined. Considering the size of the project, US\$ 2.53 million for cost of land seems reasonable and approved as such.

### Insurance During Construction

- 12.10. The Petitioner requested US\$ 8.417 million on account of insurance during construction period. According to the Petitioner, being the most advanced and state of the art technology, insurance cost is expected to be much higher and hence assumed at 1.35% of the total EPC cost. According to the Petitioner, insurance cover is also expected to cover additional risks of political violence such as strike, terrorism, sabotage etc. and therefore the insurance premium cost is expected to be relatively higher than the normal. The Petitioner further submitted that since the turbines are not in commercial operation anywhere in the world, thus lacking any prior insurance coverage precedents, is likely to result in higher insurance premium. The Petitioner also submitted that due to the phased COD the combined cycle construction will be exposed to higher risks due to the parallel simple cycle operations.
- 12.11. All of the factors mentioned by the Petitioner are duly taken care of while insuring the plant assets by the insurer, re-insurer and the client. After examining the actual insurance cost of more than 12 projects, the Authority revisited the earlier benchmark of 1.35% of the EPC cost and re-established it at 1% of the EPC cost which has been accepted by all the stakeholders who are in the process of setting up of new power plants. Therefore, the Authority has decided to allow 1% of the EPC cost i.e. US\$ 6.021 million as insurance cost during construction.



### Testing & Commissioning

12.12. The Petitioner requested US\$ 24.651 million on account of Testing and commissioning cost based on a technical assessment carried out by the advisors. The Petitioner provided the following breakup of the testing and commissioning costs:

Description	USD
Fuel during testing	15,112,223
Electricity cost for back feed from National grid	857,143
Canal Water Charges	1,953,748
O&M cost during the shutdown period:	2,552,000
LTSA Fixed Fee 2 months Shutdown for SC to CC	1,392,000
O&M Fixed Fee 2 months Shutdown for SC to CC	1,160,000
LTSA Mobilization 1 month	696,000
O&M Mobilization 6 months prior to COD	3,480,000
<b>Total</b>	<b>24,651,114</b>

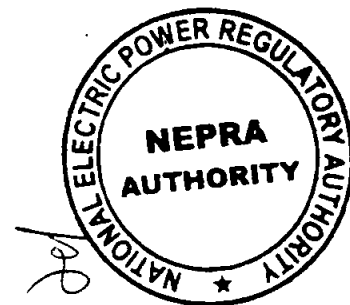
12.13. According to the Petitioner, the RLNG and HSD price has been assumed at USD 7 / MMBTU (HHV) and PKR 42.91 / litre (HHV excluding GST) and the same will be indexed to prices as notified by the competent authority from time to time and allowed to the petitioner at COD.

12.14. The Petitioner submitted that the O&M contractor and LTSA contractor are required to be deployed at least six months and one month prior to the COD of first gas turbine respectively and Accordingly, O&M fixed cost equivalent to six months and LTSA fixed cost for one month prior engagement has been requested. The Petitioner also submitted that the project will have a phased COD (i.e. single cycle followed by combined cycle), therefore according to the recommendations from the technical advisors and industry norms, it is anticipated that the plant would require a shutdown period of at least two months and accordingly two months' fixed O&M operator's fee and LTSA fee has been budgeted for the shutdown period.

12.15. The details of the testing & commissioning costs have been examined and following observations have been recorded:

- The Petitioner requested 1 month LTSA mobilization cost of US\$ 696,000 whereas draft LTSA contract do not provide any such provision. Even if it is required, it should be covered in the mobilization cost allowed separately.

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- The Petitioner requested O&M mobilization 6 months prior to COD of US\$ 3,480,000 which seems duplication of O&M mobilization cost as separate cost of US\$ 6,000,000 has been requested by the Petitioner under the O&M mobilization prior to COD.
- The maximum shutdown period allowed to EPC contractor is 5 weeks as against the 2 months requested by the Petitioner. The requested fixed LTSA & O&M costs during the shutdown period are over estimated by US\$ 1.06 million.

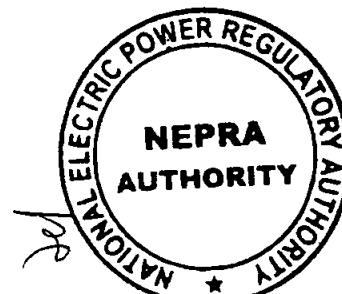
12.16. Apart from the above analysis of the testing & commissioning cost, the Authority considers that the supply of electricity and water falls within the scope of work of the EPC contractor, therefore, cannot be allowed. Similarly, the Authority considers that pre & post synchronization tests on HSD shall not be required. After adjusting for the guaranteed efficiencies, the cost of RLNG fuel during testing works out US\$ 9.555 million. On the basis of maximum shutdown period allowed to EPC contractor of 5 weeks for conversion of simple cycle to combined cycle, US\$ 1.49 million for fixed LTSA and Fixed O&M cost is justified. Accordingly total testing & commissioning cost of US\$ 11.044 million is being approved.

**Security & Surveillance Cost**

12.17. The Petitioner requested US\$ 13.576 million on account of security & surveillance cost. These mainly include but not limited to watch towers, police barracks, security staff cost, surveillance equipment, special protection unit cost, secondary wall with associated land acquisition etc. The breakup of security & surveillance cost as provided by the Petitioner is as under:

Description	Annual	33 Months	
	Rs.	Rs.	US\$
Security Personnel costs	331,474,176	911,553,984	8,681,467
Vehicles Running & Maintenance	27,348,750	75,209,063	716,277
Security Staff Food	50,370,000	138,517,500	1,319,214
<b>One time nature cost:</b>			
Arms & Ammunition	25,300,000	25,300,000	240,952
Costs of Security Barracks, bunkers, cameras etc.	50,000,000	50,000,000	476,190
Security Equipment Purchase & Service	41,400,000	41,400,000	394,286
Secondary wall	183,520,000	183,520,000	1,747,810
<b>Total</b>	<b>709,412,926</b>	<b>1,425,500,547</b>	<b>13,576,196</b>
<b>Rounded off</b>			<b>13,576,000</b>

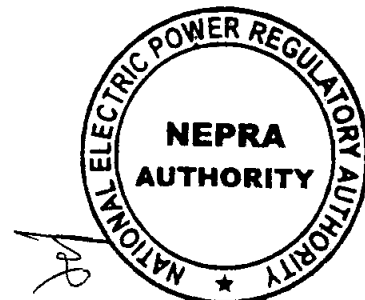
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- 12.18. According to the Petitioner, Govt. of Punjab has established a Special Protection Unit (SPU) for providing security to expatriates especially Chinese working on different development projects in Pakistan as part of its commitment for security of the foreign nationals. According to the Petitioner, although the project is not part of CPEC (China Pakistan Economic Corridor) but the level of the security being provided to the Chinese and other expats working on the project is upto the level of CPEC. The Petitioner submitted that SPU not only provides security to expats working at site but also at their residences, offices and during their movements.
- 12.19. The details provided by the Petitioner has been examined and it has been found that provincial GST is adjustable/refundable item, however it has been claimed as an expense which has an impact of US\$ 1.2 million. After adjusting the sales tax, the security & surveillance cost claim works out US\$ 12.376 million. Since the construction period of the facility is 27 months, the Petitioner's request of security and surveillance cost for 33 months is also not justifiable and need to be adjusted further and accordingly, the revised security & surveillance cost claim works out US\$ 10.647 million.
- 12.20. Due to the prevailing security situation and threat of terrorism and sabotage, special security arrangements for foreign expats are unavoidable. Security personnel cost include the salaries of 460 security persons and some support staff. The breakup is as under:

Description	No. of Positions
SP	1
Inspector	2
Sub Inspector	8
Asst. Sub Inspector	12
Head Constable	20
Constables	265
Office Boy	6
Drivers	12
Cook	7
Janitor	8
Rangers	77
SSG Commandos	42
<b>Total</b>	<b>460</b>

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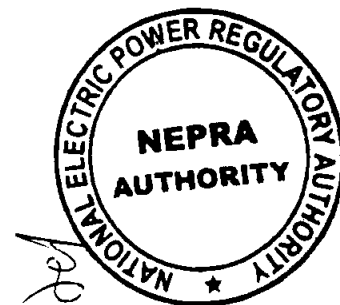


- 12.21. The Petitioner was directed to provide information regarding last six months actual expense on Security Personnel Cost supported by agreement/payment to police/rangers and security staff food expenses. The Petitioner, however, did not submit the requisite information till date.
- 12.22. The requested Security & Surveillance cost also included cost of secondary security wall. The cost of the proposed secondary security wall comprised cost of additional land of Rs. 12 million and construction cost of Rs. 171.52 million @ Rs. 61,370/meter for a perimeter of 2,794.8 m, height of wall of 2.43 m (8 feet) and height of razor wire on top of secondary security wall of 1.22 m (4 feet).
- 12.23. The costs allowed to other projects except for Bhikki Project do not include special head of Security and Surveillance related costs and these are covered in the administration expenses. In the similar case of Bhikki RLNG power project, the Authority allowed US\$ 8.257 million on account of Security & Surveillance cost. Considering the request of the Petitioner, identical project, security requirements of foreign expats on ground and size of the project, the Authority has decided to allow US\$ 8.257 million on account of Security & Surveillance cost during the construction period with maximum cap subject to adjustment as per actual on the basis of verifiable documentary evidence at COD. The Authority has also decided to allow secondary security cost of US\$ 1.748 million with maximum cap subject to adjustment as per actual on the basis of verifiable documentary evidence at COD. Accordingly total of US\$ 10 million is being approved on account of Security & Surveillance cost.

#### Administrative Expenses during Construction

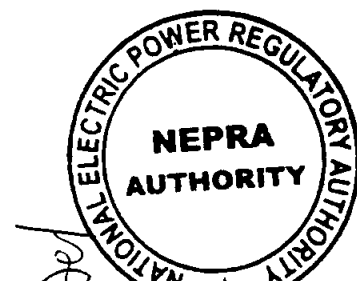
- 12.24. The Petitioner requested US\$ 13.736 million on account of administrative expenses during construction. According to the Petitioner administrative expenses have been budgeted on the recommendations of the advisors, company's estimates and industry trend. According to the Petitioner, administrative expenses cover the administrative and management expenses of NPPMCL for a period of 33 months (3 months from date of incorporation to Notice to Proceed, 27 months for the construction period and 3 months contingency for potential delays). These include but not limited to company incorporation and set up costs, Pre-bid overseas conferences, insurance, overseas road shows, payroll, utilities, rent rates and taxes, vehicles, training, travelling and communication costs, regulatory expenses, advertising and publicity / public relations, inauguration and foundation stone laying ceremonies, office equipment and supplies etc. The breakup of administrative expenses as provided by the Petitioner is as under:

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Description	Annual	33 Months	
	Rs.	Rs.	US\$
Employees Cost	306,825,120	843,769,080	8,035,896
Rental Agreements	9,149,338	25,160,678	239,626
Entertainment	4,200,000	11,550,000	110,000
Printing & Stationary	7,200,000	19,800,000	188,571
Communication Cost	4,800,000	13,200,000	125,714
Electricity & Generator	8,625,000	23,718,750	225,893
Vehicles running & maintenance	13,013,280	35,786,520	340,824
Travelling, boarding & lodging	14,977,920	41,189,280	392,279
Auditor's remuneration	2,500,000	6,875,000	65,476
Training Cost	31,240,032	85,910,088	818,191
Fee	19,200,000	52,800,000	502,857
Computer Software/Hardware	5,400,000	14,850,000	141,429
Repairs & maintenance	2,400,000	6,600,000	62,857
Group life insurance	8,000,000	22,000,000	209,524
Security & surveillance	1,868,750	5,139,063	48,943
PR Campaign, Foundation Stone Ceremony	30,000,000	82,500,000	785,714
Miscellaneous Expenses	12,000,000	33,000,000	314,286
<b>Sub-Total</b>	<b>481,399,440</b>	<b>1,323,848,459</b>	<b>12,608,081</b>
<b>Purchase of Vehicles, Computers, ERP etc:</b>			
Automobiles & Motor Cycles		53,652,000	510,971.43
Computerization Software/Hardware/Networking		8,510,000	81,047.62
ERP		30,000,000	285,714.29
Communication Equipment		5,500,000	52,380.95
Printers & Fax		4,600,000	43,809.52
Office Furniture		9,000,000	85,714.29
Office & Safety Equipment		6,200,000	59,047.62
Kitchen Appliances		1,000,000	9,523.81
<b>Sub-Total</b>		<b>118,462,000</b>	<b>1,128,210</b>
<b>Total</b>		<b>1,442,310,459</b>	<b>13,736,290</b>
<b>Rounded off</b>			<b>13,736,000</b>

12.25. The cost breakup submitted by the Petitioner was examined and was found substantially on the higher side. Since the construction period of the facility is 27 months, the Petitioner's request of administrative cost for 33 months is not



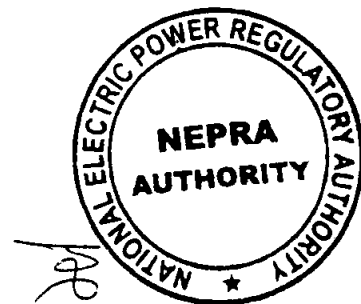
justifiable and need to be adjusted and accordingly, the revised administrative cost claim works out US\$ 11.44 million. The Petitioner was directed to provide the details of current employees along with actual expense of all heads under the administrative expenses. The Petitioner was also directed to provide the Justification of having 80 employees in the presence of full scope consultancy agreement with NESPAK covering feasibility study, preparation of tender documents, bid evaluations/award of contracts, design review, construction supervision and support during Defects Liability Period, project cost and financing plan, financial analysis, tariff calculations and risk analysis.

- 12.26. The Petitioner did not provide the actual details of employees currently employed. The Petitioner during the hearing admitted that many positions are vacant and hiring of suitable candidates is in process.
- 12.27. The Petitioner in support of training cost explained in the petition that this cost is meant for advanced OEM trainings (local and foreign) not covered under EPC contract for technical staff and top management for O&M readiness and that foreign trainings will be carried out at Belfort, France and Kazan, Russia which are the only sites in the world where 9HA.01 are installed.
- 12.28. Section 4.28 of the Employer's Requirements deals with the Training and is included in the scope of supply of plant and services. The EPC contractor is required to arrange comprehensive training program for the employer's management and operations & maintenance staff. The introduction of the training program is reproduced hereunder:

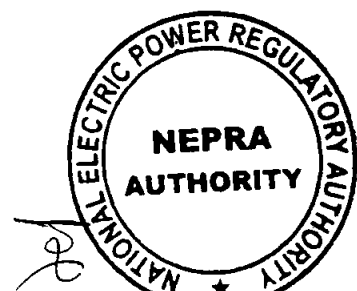
"the contractor shall provide a comprehensive training program for employer's management, operation and maintenance staff that covers the entire scope of the works, which as a minimum complies with the following requirements.

The raining program shall provide a basic understanding of the equipment and associated auxiliary systems of the Contractors' scope of supply, and shall support the installation, start-up and operations of the individual components.

The contractor shall arrange both On-Site and Off-Site training program."



- 12.29. Section 5.5 of the EPC contract provides "The Contractor shall carry out the training of Employer's Personnel in the operation and maintenance of the Works to the extent specified in the Employer's Requirements."
- 12.30. The relevant extracts from Employer's Requirements and EPC contract clearly indicate that the proposed trainings have already been covered in the scope of the EPC contract. Moreover, the Petitioner did not spend any amount on trainings from November 15 to May 16 against the requested Rs. 25 million for the same period. Therefore, the requested training costs are not justified. However, in order to provide for management trainings which are not covered in the EPC scope, US\$ 0.15 million is being approved during the construction period.
- 12.31. Likewise the PR campaign and foundation stone ceremony cost is also not justified and consumers cannot be burdened for such costs, if required, such costs can be offset against the profits. The annual printing & stationary cost of Rs. 7.2 million caters for paper rims, toners, cartridges, box files, stationary items etc. which is very much on the higher side and has been rationalized to 1/3. The average cost of vehicles running & maintenance for 14 office cars works out Rs. 0.929 million/annum which is on higher side and reduced to 50%. Likewise, the travelling boarding & lodging cost seems on higher side and has also been reduced to 50%. Miscellaneous expenses also lack justification when all heads of possible expenses have been taken care of. Keeping in view the rate of insurance for health (hospitalization only) and group life insurance, the insurance cost in salaries & wages is sufficient to cater for both type of insurances when separate OPD allowance is also provided, therefore, separate group life insurance is also not justified.
- 12.32. The Petitioner also requested US\$ 0.847million on account of vehicles, computers and ERP etc. During the operation period of the plant, the Petitioner requested only the depreciation cost of vehicles, computers and ERP etc on the basis of useful life which is more appropriate cost instead of the purchase cost as requested during the construction phase. Accordingly depreciation expense of US\$ 0.578 million for vehicles, computers and ERP etc. is being approved during the construction phase.
- 12.33. After incorporating all the above adjustments, the administrative cost during construction period of 27 months works out US\$ 8.9 million. The administrative cost during construction shall be adjusted as per actual at the time of COD on the basis of verifiable documentary evidence with maximum cap.

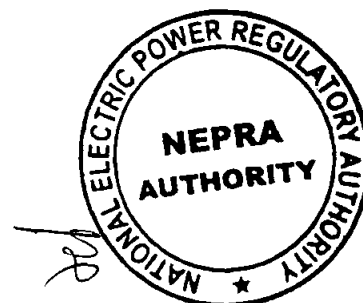


**13. Whether the cost of LTSA initial spares inventory is reasonable and justified?**

- 13.1. The Petitioner requested US\$ 20.88 million on account of LTSA initial spares inventory in the petition. According to the Petitioner, the LTSA bids were also invited as part of the highly competitive EPC bidding process and cost of LTSA was included in the evaluation criteria. GE, as the Original Equipment Manufacturer (OEM) of the gas turbines and gas turbine generators, was selected as the LTSA contractor of the Facility against a firm offer received as part of the ICB. NPPMCL is presently in advanced negotiations with GE for finalizing the LTSA for the Project.
- 13.2. LTSA initial spares inventory is a mandatory requirement of the LTSA Agreement and was arrived at through competitive bidding. The Authority has allowed the spares inventory in almost all the power projects. In the similar case of Bhikki RLNG project, the Authority allowed similar cost on account of LTSA initial spares inventory and the same is being approved in the instant case.

**14. Whether the gas pipeline cost is justified?**

- 14.1. The Petitioner requested cost of US\$ 28 million for 30" dia spur gas pipeline of 38 Km to connect main SNGPL line passing through Shorkot to the Site. According to the Petitioner OGRA has accorded approval to SNGPL to construct the said spur gas pipeline on 100% cost sharing basis, i.e. full cost is to be borne by NPPMCL. SNGPL shall however be responsible for the operations and maintenance of the spur gas pipeline. According to the Petitioner, the cost estimate, which has been communicated by SNGPL is based on its historical prices, and the price to be charged shall be based on actual rates of materials, therefore, cost of spur gas pipeline may be adjusted as per actual at COD, based on SNGPL communicated incurred cost.
- 14.2. The Petitioner has provided the copy of the approval of OGRA for construction of the spur gas pipeline. OGRA vide its letter No. No. OGRA-9 (404)/2015 dated 8<sup>th</sup> April 2016 provided the following:
- i. Accorded approval of 30" dia x 38 KM Pipeline for Haveli Bahadur Shah Power Plant on 100% cost sharing basis.
  - ii. The cost of the assets which have been approved shall be based on the actual cost of bids and certified by the company's external auditors and



material be procured in a competitive and transparent manner in line with PPRA rules.

iii. SNGPL shall be responsible to undertake operation and maintenance activity of the said pipeline.

14.3. The Authority in the similar case of Bhikki RLNG power project has allowed the gas pipeline cost subject to its verification at the time of COD. Being identical case, the Authority has decided to approve US\$ 28 million on account of gas pipeline cost for Haveli Bahadur Shah project subject to its verification at the time of COD. The Petitioner shall submit verifiable documentary evidence of actual cost incurred on gas pipeline, duly verified by SNGPL. In case, the petitioner fails to justify this cost at COD, the cost of gas pipeline shall be set aside.

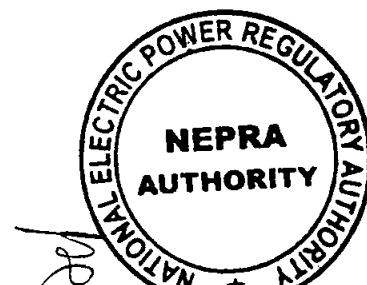
**15. Whether the financing fee and charges are justified?**

15.1. The Petitioner requested financing fees & charges of US\$ 22.23 million at 4.06% (including provincial sales tax on services @ of 16%) of the loan amount. According to the Petitioner, financing fees & charges have been assumed in line with earlier determinations of NEPRA and industry norms and provincial services sales tax/FED has also been included in the aforesaid rate.

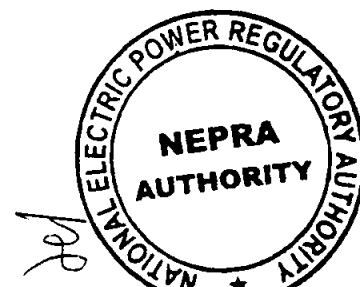
15.2. Since the project is being financed under the PSDP, there shall be no financing fees & charges involve. However, as submitted by the Petitioner, if an alternative financing arrangement is made through supplier credit or ECA financing, then the financing cost shall involve. In such case, there may also be insurance fee which shall be pass through as is allowed under other technologies. Keeping in view the foreign/local financing options, the request of the Petitioner is in line with the previous decisions of the Authority, therefore, is being approved as such. Accordingly the financing fees & charges have been worked out US\$ 19.101 million subject to adjustment at COD on actual with maximum cap of 3.5% on the basis of verifiable documentary evidence.

15.3. The provincial sales tax on services/FED is adjustable/refundable and cannot be considered as expense item. Even if it is the final liability of the Petitioner, it can be added to the duties & taxes which is a pass-through item. Therefore, the provincial sales tax/FED has not been approved to be added to the financing fees & charges.

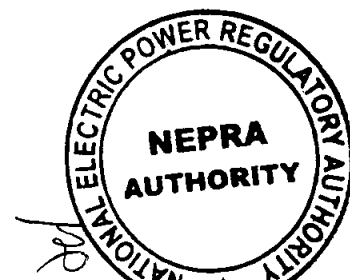
**16. Whether the proposed construction period of 30 months and request for early commissioning bonus is justified?**



- 16.1. The Petitioner requested to allow construction period of 30 months which includes 27-month EPC contract commitment plus 3 months for unforeseen delays such as force majeure, non-Project events, etc. According to the Petitioner, commissioning date is sensitive to non-EPC Contractor delays such as force majeure delays, or non-Project delays related to gas pipeline, power evacuation, etc. that are attributable to other agencies and such delays are not protected by liquidated damages. The Petitioner requested to establish construction period as per actual with one-time adjustment for construction-period related costs at COD based on non-EPC Contractor delays and non-Project delays due to other agreements.
- 16.2. The Petitioner also requested to allow early commissioning bonus as pass-through item. According to the Petitioner, in order to incentivize the EPC contractor to achieve early completion of the project (as per clause 14.16 of EPC contract), a provision of early completion bonus at the rate of 5% of EPC price has been assumed to be a Pass Through item as per actual at the time of COD.
- 16.3. The request of the Petitioner for 3 months extension in construction period beyond the 27 months agreed by the EPC contractor has been examined. According to the EPC Agreement, the maximum construction period allowed is 27 months and the delay shall attract liquidated damages. In case of force majeure event, construction period shall automatically extend and in case of delay due to power evacuation or gas pipeline, appropriate remedy shall be provided in the PPA/GSA. Early commissioning of the project has been incentivised through payment of bonus. There is no reason to allow delay in construction period with the provision of early commissioning bonus. One out of the two, however, can be considered. Since the delay in commissioning is also protected through LDs, extended construction period has no justification and cannot be considered. Therefore, the only possibility left is the early commissioning bonus which may have financial implications both in terms of savings and extra cost. The Section 4 of Schedule 10 to the EPC contract provides following for the payment of early commissioning bonus:
- i. For each GT,  $0.02\% \times \text{AP/day}$  for max 50 days. Max limit 1%.
  - ii. For Complex on combined cycle,  $0.05\% \times \text{AP/day}$ . Max limit 3%.
  - iii. No bonus would be payable on early completion of GT1 or GT2 if the Taking-Over Certificate for the Facility is issued after expiry of the Time for Completion for the Facility



- iv. In case of non-performance of net output or heat rate, the bonus shall not be payable.
  - v. Max cap of bonus is 5% of the AP.
- 16.4. The completion of the project before the agreed time shall result in savings in IDC and ROEDC which shall be adjusted on actual basis. Considering the agreed terms of the EPC contract, savings in IDC and ROEDC due to early commissioning, the Authority has decided to fix the construction period as 27 months and to make the early commissioning bonus as pass through strictly in accordance with the terms of the Schedule 10 to the EPC Agreement. Accordingly on the basis of 27 months construction period interest during construction works out US\$ 55.044 million on the basis of loan drawdown of 32.28%, 59.71% and 8.1% in 1st year, 2nd year and last 3 months respectively. The IDC shall be re-established on the basis of actual loan and its drawdown at the time of COD.
17. **Whether the one month LNG Escrow Account is reasonable and justified?**
- 17.1. The Petitioner requested US\$ 38.04 million on account of one month's escrow account. According to the Petitioner, the request is in line with the earlier determinations by the Authority and gas supplier's requirements as finalized in approved GSA. The Petitioner also requested a one time adjustment on the basis of price at COD.
- 17.2. The Petitioner's request has been examined. The Authority in the matter of upfront tariff for new power generation projects on RLNG, on the request of PPIB, allowed cost of one month consumption of LNG at 100% load to be placed in an Escrow Account to be arranged by the project company and that it would be exclusively utilized upon payment default by the power purchaser under the PPA in respect of fuel cost component. Further this cash margin account would be adjusted in the tariff in the last agreement year of the project. In case of any earlier termination of the project agreement, this amount would be adjusted in the payment if required for which a mechanism/protocol would be included in the project agreements.
- 17.3. The Authority has allowed cost of one month consumption of LNG at 100% load to be placed in an Escrow Account in case of Bhikki RLNG power project of approximately similar size. Being identical case, the Authority has decided to allow the cost of one month RLNG. Accordingly, on the basis of revised fuel cost due to higher efficiency, cost of one month RLNG works out US\$ 36.844 million



and is being approved. Interest income, if any, on Escrow Account would be credited to the power purchaser through adjustment against the outstanding payments.

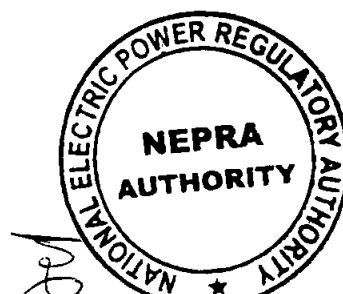
**18. Whether the RLNG price of US\$ 7/MMBtu HHV is reasonable and justified?**

18.1. The Petitioner assumed RLNG price of US\$ 7/MMBtu HHV for the purposes of calculation of fuel cost component and the same will be indexed to prices as notified by the competent authority from time to time. According to the Petitioner, Gas Supply Agreement (GSA) with Sui Northern Gas Pipelines Limited(SNGPL) is at an advance stage for the continuous supply of RLNG to the site of the power plant to ensure base load operations. The LNG will be imported by Pakistan State Oil (PSO) under a sale and purchase agreement with international supplier(s) (including Government of Qatar) approved by the competent forum. Following re-gasification of LNG, transportation of the RLNG will be done through Sui Southern Gas Company Limited and Sui Northern Gas Pipelines Limited.

18.2. RLNG price has been estimated keeping in view the RLNG Supply Agreement with Qatar and decline in the Oil and RLNG prices in the international market. Keeping in view the current international oil and RLNG prices, the assumption taken by the Petitioner seems reasonable and accepted as such. The actual variation in RLNG price, as determined by competent authority, shall be pass-through as per the fuel price adjustment mechanism provided in the order part of this determination.

**19. Whether the required efficiencies are reasonable and justified?**

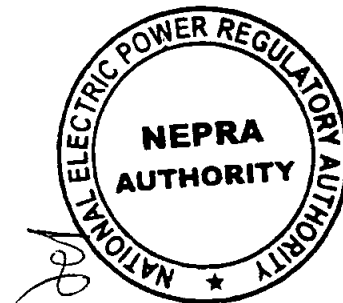
19.1. The Petitioner proposed combined cycle efficiencies of 60.48% and 52.96% on RLNG and HSD respectively and Simple Cycle efficiencies of 39.17% and 36.41% on RLNG and HSD respectively. The Petitioner requested that Plant degradation i.e. degradation in net output and heat rate will need to be determined/considered from the COD for the first year of operation, since plant especially the Gas Turbines degradation start very rapidly during the first few thousand hours of GT operation and keep on degrading. The Petitioner also requested that Degradation in Performance due to under frequency operation of the units, due to the low grid system frequency also needs to be compensated. The Petitioner also requested that during the plant performance testing all blow downs are closed 100%, which is not the case in actual operation of the plant and this loss must be compensated while determining the base line performance of the plant. The Petitioner also requested



that any variation in the plant performance i.e. efficiency and output of the Gas Turbines and Plant due to change of Fuel Specifications is also requested to be allowed.

- 19.2. The Petitioner submitted the following for consideration of the Authority regarding plant efficiency:
- High risk of maintaining highest efficiency regimes that are yet to be validated globally in commercial production. The actual efficiency levels shall be adjusted at the time of COD.
  - The technology being employed for the project is state of the art and accordingly in order to achieve an optimal risk adjusted return (for any possible downward revision in efficiency levels) it should retain the part of the benefit of higher than threshold realized efficiency.
  - Another problem with ascertaining a minimum efficiency threshold is that it will lead to OEM specific efficiency levels and will give rise to monopoly of a specific OEM in the power market and hence will discourage healthy competition.
  - Furthermore, if the efficiency levels are actualized, it would deter future investors from seeking to optimize plant's efficiency level (which would not be in accordance with the stated objectives under the Power Policy of 2015) and instead opt for least Capex driven bidding and still able to achieve tariff adjustments at actual established efficiency levels at COD.
  - The bidding process was structured keeping in view the upfront tariff determination which had an incentive for achieving higher efficiency. As a result, the Company achieved a much higher efficiency contract. Similarly, by maintaining an incentive to improve efficiency, the company will keep trying its best in the future to achieve maximum efficiency.
  - Efficiency guaranteed by the EPC Contractor is based on once-through water cooling using canal water. In case canal water is not available, or disallowed due to high O&M cost as currently assessed by Punjab Irrigation Department, and use of only cooling towers is required, the stated efficiency shall not be achieved.

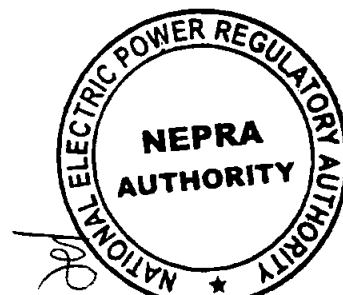
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- 19.3. The Petitioner proposed (a) the efficiency may be based on the overall Pakistan market and previous upfront determination; or (b) H Class plant efficiencies existing in the world may be made the benchmark. According to the Petitioner, this tariff petition has been submitted assuming option (b) and the net thermal efficiencies for the LNG combined cycle and single cycle operations has been assumed at 60.48% and 39.17% respectively as quoted by Siemens (OEM) during the bidding process. It is proposed that any excess efficiency over and above 60.48% established at the time of COD after applying all applicable/permissible corrections / degradations shall be shared between the power purchaser and the Petitioner in a ratio of 60:40 respectively. The Petitioner also proposed that non-recoverable adjustments are to be allowed on monthly intervals based on agreed OEM degradation curves. According to the Petitioner, the sharing formula will provide due incentive to the Petitioner to achieve high efficiency. In addition, the Petitioner also submitted that it is expected that NEPRA will allow downward revision, if any, to the efficiency levels after testing at COD.
- 19.4. The Petitioner, vide letter No. NPPMCL/CS/430, dated June 7, 2016, provided the following additional submissions in support of the requested efficiency level of 60.04%:
- In order to benefit from the incentives given in RLNG Upfront Tariff, the Petitioner opted for the most efficient gas turbines and locked net combined cycle efficiency of 61.63% on RLNG as a result of an EPC Agreement through an international competitive bidding process. However, the Authority withdrew its Upfront Tariff and communicated the Petitioner to file tariff petition on cost-plus basis which was filed later.
  - The Petitioner believes it is unjustified to be exposed to the risk of selecting the latest technology given the aforementioned background as the risk of adopting new technology is always mathematically higher than the risk of adopting older technology. Comparing the technology of IPPs in place, the Petitioner believes prays that it cannot be the intend of the Regulator to keep the power sector of Pakistan consistently lag behind the technology frontier.
  - According to the Petitioner, an efficiency loss of as low as 1.15% below the guaranteed level can offset the entire investment. The Petitioner further elaborates that 'true' efficiency is a probabilistic function of degradation, blow down, temperature, grid frequency, cooling water temperature calorific value of the commingled gas and exhausted system back pressure & inlet system and

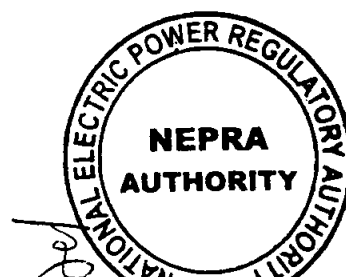
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other variables and that it cannot be derived from observe efficiency with 100% certainty. Therefore, the older the technology, the more operationally complied data is available and as a result the expected variation in efficiency within any confidence interval is lower for older technology than newer. Therefore, according to the Petitioner the probability of the turbine performance falling behind the predicted efficiency over 30 years against which the tariff is determined is substantially higher for new technology.

- Whilst allowing a 60:40 upside sharing of efficiency, and true-downside adjustment for downside in the Bhikki tariff is a step the right direction, fixing of efficiency at EPC guaranteed level defeats the whole rationale of this device as an incentive. While GE guaranteed 61.63%, Siemens, the largest commercial deployment of H-class generation turbine committed to only 60.04% which was opted as a benchmark for the Petition.
- The Petitioner prays that the Authority allows the incentive in the tariff for the Petitioner to benefit from efficiency improvement in the form of 60:40 sharing above the H-class generation efficiency benchmark (60.04%).
- The Petitioner further believes that setting minimum threshold of the winning bidder by the Authority shall have an added undesirable effect of establishing monopoly of the specific OEM in the power market and shall subsequently discourage healthy competition. Therefore, the Petitioner has desired the Authority may pass maximum benefit of the latest technology compared to the Upfront Tariff benchmarks (i.e., between 57% and 60.04% all efficiency gains are being passed on the consumer) whereas anything above 60.0% should be shared with the consumer on a preferential 60:40 basis. Accordingly, the Petitioner has requested the net thermal efficiency of 60.04% and 39.17% to be determined for the RLNG and combined cycle and single cycle operations, respectively. Any excess efficiency over and above 60.04% established at the time of COD shall be shared between the Power Purchaser and the Petitioner on 60:40 basis, respectively.

19.5. According to the guaranteed performance levels agreed between the Petitioner and the EPC Contractor, net LHV combined cycle efficiencies are 62.445% for RLNG, 54.054% for HSD and simple cycle efficiency of 40.964% for RLNG operation of the plant. Since the Authority did not allow simple cycle operation on HSD, efficiency on HSD in simple cycle has not been considered. The EPC contractor has provided guaranteed efficiency levels and the failure of which shall



attract penalties. As per the Schedule 10 to the EPC Agreement, each 1% deviation in heat rate shall attract 5% of the Agreement Price (AP) with the maximum cap of 15% as liquidated damages (LDs) in combined cycle mode and (5/3)% of AP for either of the gas turbines provided that LDs under combined cycle shall be calculated after reducing LDs for the gas turbines, if any. In case the net heat rate exceeds 103% of the guaranteed net heat rates, the Petitioner would have the right to reject the facility.

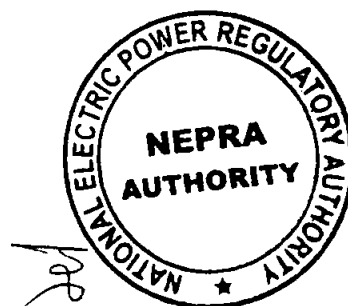
- 19.6. Since the Petitioner has binding EPC contract and guaranteed efficiency levels, therefore, the request of the Petitioner to fix net efficiency below the guaranteed efficiency levels is not justified. However, there is a possibility under the EPC contract, that net efficiency may establish lower than the guaranteed levels. In such a case, the Petitioner is required to be protected against the permanent efficiency loss over the life of the project of 30 years otherwise the project cannot survive and will not be in the interest of the stakeholders. Therefore, the Authority has decided to approve the guaranteed efficiency levels subject to its adjustment on the basis of heat rate test. In case the efficiencies on either fuel establish lower than the guaranteed levels, the fuel cost components shall be adjusted accordingly and the LDs imposed on the EPC contractor for deviations in the heat rates under the terms of the EPC contract shall be adjusted against the project cost at the time of COD. In case the efficiencies on either fuel establish higher than the guaranteed levels, the gain shall be shared in the ratio of 60:40 between the power purchaser and power producer and fuel cost components shall be adjusted accordingly.
- 19.7. On the basis of RLNG HHV price of US\$ 7/MMBTU, HHV ex-GST HSD price of Rs. 46.2134/litre, net LHV combined cycle efficiencies of 62.445% for RLNG, 54.054% for HSD and simple cycle efficiency of 40.964% for RLNG operation of the plant. Accordingly the fuel cost components are as under:

Operation	Fuel	Rs./kWh
Combined Cycle	RLNG	4.4483
Simple Cycle	RLNG	6.7810
Combined Cycle	HSD	7.9715

20. **Whether the Net Dependable Capacity is justified?**

- 20.1. The Petitioner proposed following gross and net capacities and auxiliary consumption for the proposed plant:

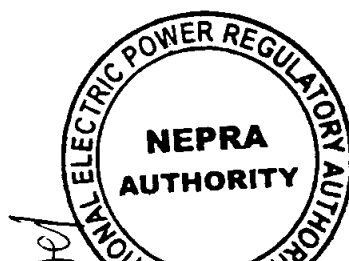
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Description	Combined cycle (2GTsx1ST)		Single cycle (1 GT)	
	LNG	HSD	LNG	HSD
Gross Capacity	1,230,540 kW	1,085,400 kW	385,850 kW	355,800 kW
Net Capacity	1,207,900 kW	1,046,000 kW	380,200 kW	342,000 kW
Auxiliary load	22,640 kW	39,400 kW	5,650 kW	13,800 kW
Auxiliary load	1.84%	3.63%	1.46%	3.88%

- 20.2. According to the Petitioner, the capacity purchase price component of the reference generation tariff is payable on the basis of the contract capacity established at the COD and annually thereafter. The Petitioner proposed that all the tariff components of capacity purchase price shall be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) tests to be carried out for determination of Contract Capacity. The Petitioner requested that its tariff components are to be adjusted at COD based on IDC tests subject to a 3% cap of Auxiliary Consumption.
- 20.3. For the purposes of the instant petition, the Petitioner proposed the same capacity charge both for LNG and HSD fuel which is in line with the decisions of the Authority in gas based projects with HSD as backup fuel. The auxiliary consumption of 1.84% is the lowest as compared to auxiliary consumption allowed by the Authority to other gas based plants. In the upfront tariff for LNG based power projects, the Authority allowed 3% auxiliary consumption for 800 MW & above projects.
- 20.4. As per the Schedule 10 to the EPC Agreement, for each 1% deviation in net output, 3% of Agreement Price (AP) shall be charged as liquidated damages (LDs) with the aggregate cap of 15% and if the net output is less than 95% of the guaranteed output on either fuel, the Petitioner would have the right to reject the facility.
- 20.5. Keeping in view the auxiliary consumption allowed in various other projects, the Authority has decided to accept the proposed net capacity with the provision that if the net capacity is established higher as a result of Initial Dependable Capacity Test at the time of COD, all the capacity components shall be adjusted downward. In case the net capacity established lower than the contracted capacity subject to maximum of 3% of the auxiliary consumption, the tariff components shall be adjusted upward after adjusting the LDs against the project cost.
- 21. Whether the Variable O&M cost and Fixed O&M Cost is reasonable and justified?**
- 21.1. The Petitioner requested Variable O&M cost of Rs.0.5912/kWh on gas and Rs.0.8531/kWh on HSD (100% foreign) and Fixed O&M cost of Rs. 0.2707/kWh

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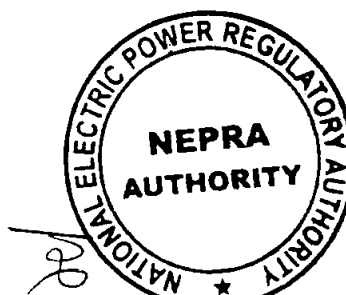
comprising local O&M of Rs. 0.1200/kW/h and foreign O&M of Rs. 0.1507/kW/h. The Petitioner calculated the O&M components on the basis of following cost assumptions:

Description	V O&M	F O&M	Total
	US\$	US\$	US\$
Long Term, Service Agreement (LTSA) cost	7,419,048	6,960,000	14,379,048
LTSA cost not covered in Agreement Scope	3,770,952	1,392,000	5,162,952
O&M Operator Fee – Foreign	19,150,766	6,837,699	25,988,465
O&M Operator Fee – Local	-	1,206,653	1,206,653
Cost related to NOx Control SCR	2,595,922	-	2,595,922
Canal Water Usage	21,868,953	-	21,868,953
Company's OH cost	-	10,883,000	10,883,000
<b>Total</b>	<b>54,805,641</b>	<b>27,279,352</b>	<b>82,084,993</b>

- 21.2. The Petitioner incorrectly increased the variable O&M on HSD in direct proportion to variable O&M on Gas which also include canal water usage charges of Rs. 0.2359/kWh. If applicable, canal water usage charge has nothing to do whether the plant is dispatched on RLNG or HSD and will remain the same on either fuel.
- 21.3. The Petitioner has derived the LTSA costs from the LTSA bid @ US\$ 441.6/FFH for variable and annual US\$ 6.9 million for fixed cost, however, the remaining costs are mere estimates arrived at through comparison of O&M components of other power plants which is as under:

Name	Variable O&M	Fixed O&M	NOx Control SCR	Canal Water Charges	Total
	Rs./kWh	Rs./kW/h	Rs./kW/h	Rs./kW/h	Rs./kWh
Uch-II Power Limited	0.2151	0.3113	-	-	0.5264
Fondation Dharki Power	0.3710	0.3125	-	-	0.6835
Engro PowerGen	0.3274	0.2502	-	-	0.5776
Halmore Power Gen.	0.3622	0.2368	-	-	0.5990
Saif Power	0.3606	0.2427	-	-	0.6033
Average	0.3273	0.2707	0.0280	0.2359	0.8618

- 21.4. According to the Petitioner, negotiations with GE for finalizing the LTSA for the Project are at an advance stage. The Petitioner further submitted that to outsource the O&M of the Project to a globally-reputed specialized O&M Contractor, ICB process for the appointment of O&M Contractor has been initiated and

prequalification of bidders is underway. This will be followed by issuance of detailed RFPs for selection of the O&M Contractor – all in accordance with the Public Procurement Laws.

- 21.5. According to the Petitioner, in addition, to the foreign variable O&M cost, the Project employs a unique feature in the form of SCR for NO<sub>x</sub> control which is not available in other CCPPs in operation or being installed in Pakistan, that allows higher efficiency and higher output. The aforesaid unique feature of the project is expected to require additional O&M cost estimated at Rs. 0.0280/kWh. This additional cost is estimated based on inputs provided by the technical advisors of the Company.
- 21.6. The Petitioner has requested US\$ 370,952 for Till Implementation not covered in the LTSA proposal. According to the Petitioner, "TIL" is Technical Information Letter or Service Bulletin issued to Employer by GT OEM GE, from time to time recommending technical improvements, adding / replacing hardware etc. The cost to be incurred on this account is not responsibility of GT OEM and is not covered in LTSA proposal of GE. The cost to be incurred on account of TIL Implementation has been estimated @5% of variable component of LTSA cost.
- 21.7. The Petitioner has also requested US\$ 3.4 million for unscheduled maintenance not covered in the LTSA proposal. According to the Petitioner, as per LTSA Proposal, GE will bear the first US\$ 250,000 per covered equipment of the cost of unscheduled maintenance services at an outage, up to a maximum total for all covered equipments of US\$ 1,000,000 in any one calendar year. However, the deductibles allowed under the insurance arrangements start from USD 1 million per event. Accordingly, the gap of USD 750,000 per event (USD 3 million per year) is required to be borne by the Employer and the same is being requested under the tariff petition. The Petitioner also submitted that as per LTSA proposal of GE, cost to be incurred on Unscheduled Maintenance Services exceeding the limits specified in LTSA proposal will be borne by the Employer. Further, costs to be incurred on additional required maintenance and extra work will be paid by the Employer to GE. [Estimated additional input: 100 Person Days per Year, Average Rate per Person per Day: USD 4,000].
- 21.8. According to the Petitioner, the Facility shall employ once-through water cooling technique for steam condenser. This shall require canal water usage of 791 cusecs (returned to the canal with minor losses) at full load. Irrigation Department, Government of Punjab has assessed a water usage charge of Rs. 100/cft, irrespective of end-consumption. Based on the current rate notified by the component authority, cost of water usage at full load is PKR 0.2359/kWh on RLNG.

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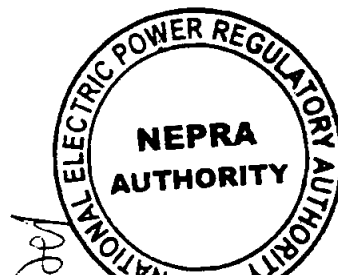


21.9. The Petitioner provided the breakup of the company's annual overhead cost which is as under:

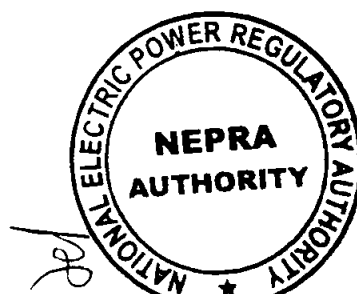
Description	Annual	
	Rs.	US\$
Employees Cost	428,541,600	4,081,349
Rental Agreements	18,298,675	174,273
Entertainment	4,200,000	40,000
Printing & Stationary	7,200,000	68,571
Communication Cost	4,800,000	45,714
Electricity & Generator	9,000,000	85,714
Vehicles running & maintenance	13,013,280	123,936
Travelling, boarding & lodging	14,977,920	142,647
Auditor's remuneration	3,500,000	33,333
Training	35,440,032	337,524
Fee	15,000,000	142,857
Computer Software/Hardware	5,400,000	51,429
Repairs & maintenance	44,400,000	422,857
Group life & Health insurance	8,000,000	76,190
Security & surveillance Head Office	1,949,500	18,567
CSR activity, annual events	40,000,000	380,952
Infrastructure Cost	30,000,000	285,714
Unforeseen Expenses	12,000,000	114,286
<b>Sub-Total</b>	<b>695,721,007</b>	<b>6,625,914</b>
<b>Depreciation Vehicles, Computers, ERP etc:</b>		
Automobiles & Motor Cycles	10,730,400	102,194
Computerization Software/Hardware/Networking	255,326	2,432
ERP	9,009,009	85,800
Communication Equipment	1,651,652	15,730
Printers & Fax	1,381,381	13,156
Office Furniture	1,800,000	17,143
Office & Safety Equipment	1,861,862	17,732
Kitchen appliances	300,300	2,860
<b>Sub-Total</b>	<b>26,989,930</b>	<b>257,047</b>
Security & Surveillance during Operations	428,500,524	4,000,000
<b>Total</b>	<b>1,271,263,500</b>	<b>10,882,961</b>
<b>Rounded off</b>		<b>10,883,000</b>

21.10. The Authority examined the request of the Petitioner for annual operations and maintenance cost. The decision of the Authority regarding the O&M is as under:

*M*



- The Petitioner requested US\$ 27.195 million on account of variable and fixed O&M and US\$ 2.595 million on account of variable O&M for NOx Control SCR. According to the Petitioner, bidding process for selection of O&M contractor has been initiated which has yet to be finalized. Considering the material amount of the O&M cost, absence of the O&M Agreement and competitive bidding in progress for the O&M contractor, the Authority has decided to accept the request of the Petitioner for Operations & Maintenance cost. The Authority has also decided to include the cost of NOx control SCR in the scope of O&M contractor. Accordingly the Authority has decided to approve O&M cost of US\$ 29.79 million with maximum cap subject to adjustment at COD as per the signed O&M Contract.
- The Petitioner requested annual US\$ 14.379 million on account of variable and fixed Long Term Service Agreement cost. The LTSA cost was part of the evaluation criteria of competitive bidding process for selection of the EPC contractor; however, the LTSA contract has not been signed so far. Accordingly the Authority has decided to approve LTSA cost of US\$ 14.379 million with maximum cap subject to adjustment at COD as per the signed LTSA Agreement.
- The Petitioner requested US\$ 5.163 million on account of variable and fixed LTSA costs not covered in the LTSA Agreement scope. The requested costs lack justification and cannot be included in the O&M budget. In the identical case of Bhikki project, costs under this head were also not allowed. Accordingly the Authority has decided to set aside the LTSA costs not covered in the LTSA scope.
- The requested annual overhead cost of US\$ 10.883 has been examined and found substantially on higher side. Being similar, some of the items have already been discussed under administrative cost during construction. The Petitioner has requested the same 460 security personnel from Police, SSG and Ranges as has been requested in the construction phase which is unjustified as most of the expats will go back after the construction phase. Moreover, Police, Rangers and SSG will not be able to secure the plant for 30 years and some alternative arrangement with substantially reduced security personnel shall be made. In the identical case of Bhikki Project, the Authority has allowed annual US\$ 5 million including the security cost and same is being approved in the instant case.
- The Petitioner requested US\$ 21.87 million/annum for canal water usage charges which translates into Rs. 0.2359/kWh. The Petitioner also provided copy of the Notification of the Irrigation Department, Government of Punjab.





The said Notification pertains to water uses for commercial and industrial purposes. In the instant case, there is no consumption of water is involved and the water shall be returned to the canal with minor loss. Since there is no consumption of water is involved in the process, the requested cost is not justified. The Petitioner during the hearing admitted that there is no justification of this cost and the matter has been taken to the Irrigation Department, Government of Punjab for appropriate resolution. In similar case of Bhikki Project, this cost was not requested even though the plant will use the same water technique as is proposed in the instant case. Being identical case, the Authority has decided to set aside the requested canal water usage charges.

21.11. In the light of decisions taken above regarding O&M, summary of the approved O&M budget is provided hereunder:

Description	V O&M	F O&M	Total
	US\$	US\$	US\$
Long Term, Service Agreement cost	7,419,048	6,960,000	14,379,048
O&M Operator Fee – Foreign	19,150,766	6,837,699	25,988,465
O&M Operator Fee – Local	-	1,206,653	1,206,653
Cost related to NOx Control SCR	2,595,922	-	2,595,922
Company's OH cost	-	5,000,000	5,000,000
<b>Total</b>	<b>29,165,736</b>	<b>20,004,352</b>	<b>49,170,087</b>

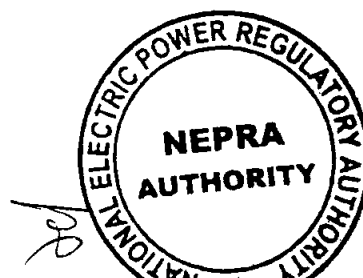
21.12. Accordingly, Variable O&M component of Rs. 0.3146/kWh on gas and Rs. 0.4540/kWh on HSD (100% foreign) and Fixed O&M component of Rs. 0.1985/kW/h comprising local O&M component of Rs. 0.0616/kW/h and foreign O&M component of Rs. 0.1369/kW/h have been determined for the proposed project.

## 22. Whether the Insurance Cost is justified?

22.1. The Petitioner requested insurance cost component of Rs. 0.0835/kW/h after considering the risk exposure on the basis of annual insurance expense @1.35% of the EPC cost. According to the Petitioner, the insurance cost shall cover all risk insurance/reinsurance for the Project, as well as business- interruption insurance which is a lender-stipulated requirement.

22.2. In case of IPPs under 2002 Policy, separate insurance cost component has been provided subject to annual adjustment on actual. As per the information submitted by IPPs, the actual insurance expense is approximately 1% or below. Initially the Authority established benchmark insurance cost @ 1.35% of the EPC

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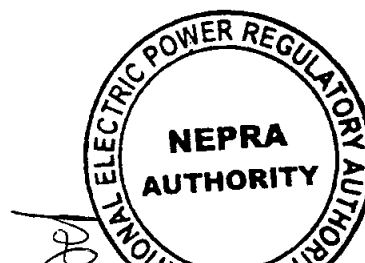
cost, however, in view of the actual information available, the benchmark was revisited and established at 1% of the EPC for all type of new projects including coal, solar, wind and hydro. In line with the decisions for other technologies, the Authority has decided to allow 1% of EPC cost as annual insurance cost for the instant project. Accordingly the insurance cost component of tariff is worked out Rs.0.0606/kW/h and approved as such. The insurance cost component shall be adjusted annually on actual subject to maximum of 1% of the EPC cost and prevailing exchange rate on the first day of the insurance coverage period.

**23. Whether the requested cost of working capital is reasonable and justified?**

- 23.1. The Petitioner requested working capital cost component of Rs. 0.1102/kW/h. According to the Petitioner working capital requirement has been estimated equivalent to 60 days of cash cycle taking into account the normal payment cycle of the PPA applicable to energy payments receivable from the Power Purchaser. Cost of short term borrowing has been assumed at 3 month KIBOR + 2%. Further, cost of 60 days SBLC at the rate of 2% per annum and HSD inventory cost for 7 days at 100% load has been assumed as part of the working capital cost. The Petitioner also proposed that the cost of working capital be adjusted for variation in KIBOR and fuel prices.
- 23.2. In accordance with the request of the Petitioner, payment cycle of 60 days has been used in the calculation of cost of working capital. However, it will be subject to adjustment at the time of COD on the basis of actual payment terms finalized in the GSA and PPA. Similarly as a back to back arrangement, the cost of SBLC @ 1.5% is being approved subject to adjustment as per actual arrangement finalized in the GSA. The Authority in the similar case allowed 7 days HSD inventory at 60% load and the same is approved in the instant case. Accordingly, on the basis of 3 months KIPBOR 6.35% +2% premium, cost of working capital works out Rs. 0.0954/kWh/h and the same is being approved.

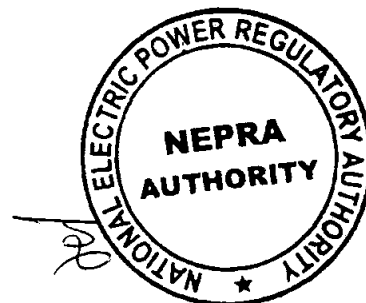
**24. Whether the requested cost of capital is reasonable and justified?**

- 24.1. The Petitioner requested the return on equity (ROE) component of Rs. 0.6346/kW/h on the basis equity financing of US\$ 274.02 million which is 30% of the total project cost. The equity contribution of the project shall be provided by the Federal Government. According to the Petitioner, the ROE component of tariff (including Return on Equity During Construction) has been based on an internal rate of return of 16% which is in line with the Power Policy 2015 and previous rulings of the Authority on the matters related to RLNG generation. The Petitioner further submitted that the calculations are based on actual timings of funds draw down. The corporate income tax and Withholding tax payable on income and dividends are assumed to be pass-through and are not included in the Tariff. The



Petitioner also proposed quarterly indexation of ROE component of tariff on the basis of revised TT & OD selling rate of USD notified by the National Bank of Pakistan.

- 24.2. The Petitioner requested the debt servicing component of Rs. 0.9835/kW/h on the basis of debt amount of US\$ 639.39 million. According to the Petitioner, the project is being financed from Public Sector Development Program (PSDP) on commercial Terms in accordance with the approvals of CCoE and ECNEC and funds have currently been provided under Cash Development Loan (CDL) but a decision has been taken to finance the costs of the Project on a debt to equity ratio of 70:30 with loan provided at 3-month KIBOR plus 3% floating mark-up rate. The financing arrangement is in line with the GOP objective to sell down the project in due course to the private sector, which requires the Project to be commercially attractive and financially viable. The assumed term of the loan is 10 years plus 30 months grace period. The loan shall be repaid in equal quarterly instalments. The assumed cost of debt is 3 month's KIBOR 6.35% plus a premium of 3%. According to the Petitioner, The Project drawdown schedule and related Interest during Construction (IDC) is based on expected cost utilization up to COD and will be adjusted on account of actual variation in interest on the basis of actual drawdown at COD. In case the project is financed through foreign Debt financing, the interest part of the Debt Service Component shall be quarterly indexed to the 3-month LIBOR, or any other international benchmark such as US Treasury Rate, etc.
- 24.3. The Petitioner further submitted that in case GOP avails foreign financing for the Project (supplier credit, ECAs, G2G loan, etc.), any additional financing cost including insurance fee shall be a pass through item as per actual. The Petitioner, vide letter No. MoWP/NPPMCL/2016/CEO/532, dated July 1, 2016, submitted that the Government may avail partial foreign financing for the project and requested the following;
- a. Mix of local and foreign financing, if applicable.
  - b. Coverage of exposure fee as per actual negotiated with foreign financiers.
- 24.4. The request of the petitioner is in line with the decision of the Authority in similar cases and has been accepted as such. Accordingly ROE component of Rs. 0.5710 /kW/h and debt servicing component of Rs. 0.9193 /kW/h have been worked out on the basis of revised project cost of US\$ 853.774 million and debt equity ratio of 70:30. The Petitioner assumed 100% equity injection from the start of the construction period. The equity component shall be adjusted on the basis of actual equity and actual drawdown at the time of COD.





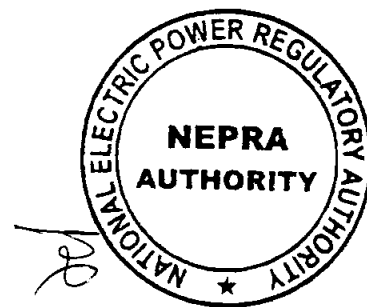
24.5. In case the project is finance through foreign financing or mix of local and foreign financing LIBOR+ a premium of 4.5% shall be allowed for calculation of interest of the foreign financing portion and saving, in any, in the allowed premium shall be shared between the power purchaser and the power producer in the ratio of 60:40. In case of foreign financing, Sinasure fee/ECA exposure fee/credit insurance fee shall also be applicable with maximum of 7% of debt service amount in accordance with the bench mark established in the coal upfront tariff.

25. **SUMMARY OF PROJECT COST & TARIFF**

25.1. On the basis of the decisions taken in the preceding paragraphs, summary of the approved project cost and tariff is provided hereunder:

Description	USD Millions
<b>EPC cost:</b>	
Offshore EPC Cost	471.057
Onshore EPC Cost	118.393
Items not covered in the EPC contract scope:	21.601
Combustion Monitoring System	0.500
BOP Spares	1.714
Site Housing Complex with recreational facilities	11.738
Fuel Gas Treatment Plant	2.100
Buffer Vessel	4.463
Acquisition of Land	1.086
<b>Non EPC Cost:</b>	<b>54.355</b>
Engineering consultancy	9.770
O&M mobilization	6.000
Land Cost	2.530
Insurance during construction	6.111
Security Surveillance	10.000
Administrative Expenses during construction	8.900
Testing & Commissioning	11.044
Customs Duties & Cess	28.499
LTSA Initial Spare Parts	20.880
Gas Pipeline Cost	28.000
One month LNG Escrow Account	36.844
<b>CAPEX</b>	<b>779.629</b>
Financing Fees & Charges	19.101
Interest During Construction	55.044
<b>Total Project Cost</b>	<b>853.774</b>

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**TARIFF ON COMBINED CYCLE**

Description	RLNG	HSD
<b>Energy Charge (Rs./kWh):</b>		
Fuel cost component	4.4483	7.9715
Variable O&M	0.3146	0.4540
<b>Total</b>	<b>4.7629</b>	<b>8.4255</b>
<b>Capacity Charge (Rs./kW/hour):</b>		
Fixed O&M (Local)	0.0616	0.0616
Fixed O&M (Foreign)	0.1369	0.1369
Cost of working capital	0.0954	0.0954
Insurance	0.0606	0.0606
Return on Equity	0.5710	0.5710
Debt servicing (1-10 years only)	0.9193	0.9193
Total 1-10 years	1.8448	1.8448
Total 11-30 years	0.9255	0.9255
Avg. Tariff 1-10 years @ 92% (Rs./kWh)	6.7681	10.4308
Avg. Tariff 11-30 years @ 92% (Rs./kWh)	5.7689	9.4315
<b>Levelized tariff (Rs./kWh)</b>	<b>6.4202</b>	<b>10.0829</b>
<b>Levelized tariff (Cents/kWh)</b>	<b>6.1145</b>	<b>9.6027</b>

**TARIFF ON SIMPLE CYCLE RLNG**

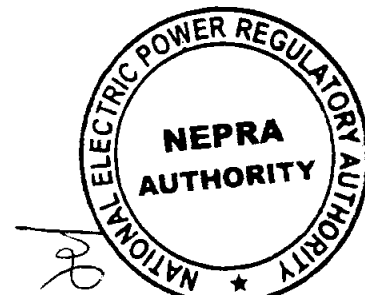
Description	Rs./kWh
Fuel cost component	6.7810
Variable O&M	0.3146
Fixed O&M (Local)	0.0616
Fixed O&M (Foreign)	0.1369
Cost of working capital	0.0954
<b>Total</b>	<b>7.3895</b>

**26. ADJUSTMENT/INDEXATIONS**

26.1. Following adjustments/indexations shall apply to the determined tariff.

Tariff Components	Indexation
Fixed O&M (Local)	CPI (General)
Fixed O&M (Foreign)	US CPI &Rs./US\$
Insurance	Actual subject to maximum limit
Cost of working capital	KIBOR and Fuel Price
ROE	Rs./US\$
Debt Servicing	KIBOR
Fuel cost Component	Fuel Price
Variable O&M (Foreign)	US CPI &Rs./US\$

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27. **ORDER**

- I. The Authority hereby determines and approves the following generation tariff for National Power Park Management Company (Private) Limited for its 1,207.90 MW (net) Power Project on RLNG/HSD at Haveli Bahadur Shah for combined cycle and simple cycle operation and adjustments/indexations for delivery of electricity to the power purchaser:

**Combined Cycle Operation**

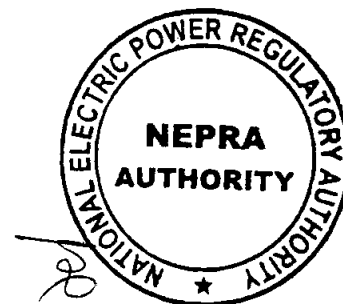
Tariff Components	1-10 Years	11-30 Years	Indexation/Adjustment
<b>Capacity Charges (Rs./kW/hr):</b>			
Fixed O&M (Local)	0.0616	0.0616	CPI (General)
Fixed O&M (Foreign)	0.1369	0.1369	US CPI &Rs./US\$
Cost of working capital	0.0954	0.0954	KIBOR and Fuel Price
Insurance	0.0606	0.0606	Actual subject to maximum limit
ROE	0.5710	0.5710	Rs./US\$
Debt Servicing	0.9193	-	KIBOR
<b>Total</b>	<b>1.8448</b>	<b>0.9255</b>	
<b>Energy Charge RLNG (Rs./kWh):</b>			
Fuel cost Component	4.4483	4.4483	Fuel Price
Variable O&M (Foreign)	0.3146	0.3146	US CPI &Rs./US\$
<b>Total</b>	<b>4.7629</b>	<b>4.7629</b>	
<b>Energy Charge HSD (Rs./kWh):</b>			
Fuel cost Component	7.9715	7.9715	Fuel Price
Variable O&M (Foreign)	0.4540	0.4540	US CPI &Rs./US\$
<b>Total</b>	<b>8.4255</b>	<b>8.4255</b>	

The Reference Tariff Tables and Debt Service Schedule are attached as Annex-I, Annex-II and Annex-III to this determination

**Simple Cycle Operation RLNG**

Description	Rs./kWh	Adjustment/Indexation
Fuel cost component	6.7810	Fuel Price
Variable O&M (Foreign)	0.3146	US CPI &Rs./US\$
Fixed O&M (Local)	0.0616	CPI (General)
Fixed O&M (Foreign)	0.1369	US CPI &Rs./US\$
Cost of working capital	0.0954	KIBOR and Fuel Price
<b>Total</b>	<b>7.3895</b>	

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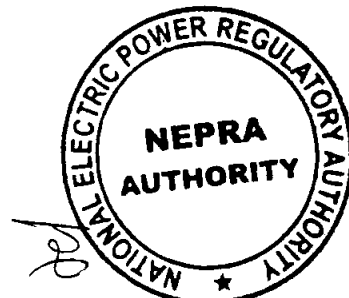


## II. One Time Adjustment of at COD

- i) Since the exact timing of payment to EPC contractor is not known at this point of time, therefore, an adjustment for relevant foreign currency fluctuation for the US\$ 471.057 million of the EPC portion of payment in the foreign currency shall be made against the reference exchange rate of Rs. 105/US\$ on the basis of actual payment. The adjustment shall be made only for the currency fluctuation against the reference parity values.
- ii) Adjustment as per actual with maximum of US\$ 21.601 million for items outside the scope of the EPC contract along with currency fluctuation for dollar portion, if any.
- iii) The Customs Duties and Cess of US\$ 28.499 million shall be adjusted as per actual.
- iv) Adjustment as per actual with maximum of US\$ 6 million for O&M mobilization cost.
- v) Adjustment as per actual with maximum of US\$ 10 million for Security & Surveillance cost.
- vi) Adjustment as per actual with maximum of US\$ 8.9 million for Administrative cost.
- vii) Adjustment as per actual with maximum of US\$ 28 million for gas pipeline cost.
- viii) Adjustment as per actual of US\$ 19.101 million for Financing Fees & Charges subject to maximum of 3.5% of the debt amount.
- ix) The IDC shall be re-established at the time of COD on the basis of applicable KIBOR, actual premium, actual loan and actual loan drawdown.
- x) ROE component of tariff shall be adjusted for variation in actual equity investment and actual equity drawdown.
- xi) O&M components shall be adjusted as per the signed O&M Agreement, LTSA Agreement.

## III. Adjustment due to Variation in Net Capacity

The reference tariff has been determined on the basis of guaranteed net capacity of 1,207.90 MW with auxiliary consumption of 1.84% (22.64 MW). All the tariff components of capacity charge shall be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) tests to be carried out for determination of



net contracted capacity. In case net capacity is established lower than the guaranteed level, maximum 3% of the auxiliary consumption shall be allowed and appropriate adjustment in the tariff components shall be made after adjusting LDs as per Schedule 10 to the EPC contract against the project cost.

**IV. Heat Rate Test**

The energy charge part of the tariff relating to fuel cost shall be adjusted subsequent to the heat rate test carried out by the independent engineer in the presence of representatives of power purchaser in accordance with the established benchmarks. Subsequent to the submission of the test report to the satisfaction of the Authority, onetime adjustment shall be made in the fuel cost components.

In case the efficiencies on either fuel establish lower than the guaranteed levels, appropriate adjustment in the fuel cost components shall be made after adjusting LDs as per Schedule 10 to the EPC contract against the project cost. In case the efficiencies on either fuel establish higher than the guaranteed levels, the gain shall be shared in the ratio of 60:40 between the power purchaser and power producer and fuel cost components shall be adjusted accordingly.

**V. Adjustment in Insurance as per actual**

The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser not exceeding 1% of the EPC cost shall be treated as pass-through. Insurance component of reference tariff shall be adjusted annually as per actual upon production of authentic documentary evidence according to the following formula:

AIC	=	$Ins_{(Ref)} / P_{(Ref)} * P_{(Act)}$
Where		
AIC	=	Adjusted Insurance Component of Tariff
$Ins_{(Ref)}$	=	Reference Insurance Component of Tariff
$P_{(Ref)}$	=	Reference Premium US\$ 6.111 million at Rs. 105/US\$.
$P_{(Act)}$	=	Actual Premium or 1% of the EPC cost at exchange rate prevailing on the 1st day of the insurance coverage period whichever is lower






**VI. Indexations:**

The following indexations shall be applicable to the reference tariff;

**i) Indexation of Return on Equity (ROE)**

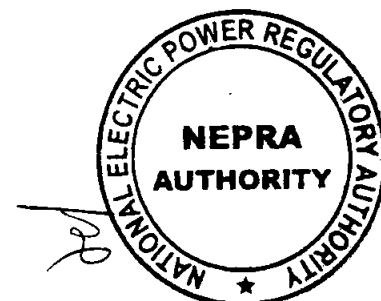
ROE component of tariff shall be quarterly indexed on account of variation in Rs./US\$ parity according to the following formula:

$ROE_{(Rev)}$	=	$ROE_{(Ref)} * ER_{(Rev)} / ER_{(Ref)}$
Where;		
$ROE_{(Rev)}$	=	Revised ROE Component of Tariff
$ROE_{(Ref)}$	=	Reference ROE Component of Tariff
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference exchange rate of Rs. 105/US\$

**ii) Indexation applicable to O&M**

At COD, O&M components shall be adjusted as per the signed O&M Agreement, LTSA Agreement and actual recurring administrative expenses. Thereafter, O&M components of tariff shall be adjusted on account of local Inflation (CPI), foreign inflation (US CPI) and exchange rate quarterly on 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April based on the latest available information with respect to CPI notified by the Pakistan Bureau of Statistics (PBS), US CPI (All Urban Consumers) issued by US Bureau of Labor Statistics and revised TT & OD selling rate of US Dollar notified by the National Bank of Pakistan as per the following mechanism:

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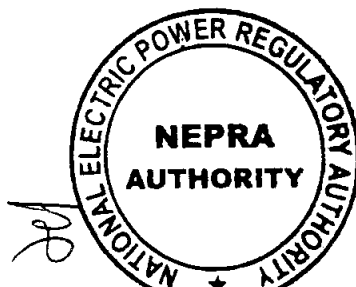
$F V. O\&M_{(REV)}$	=	$F V. O\&M_{(REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$
$L F. O\&M_{(REV)}$	=	$L F. O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
$F F. O\&M_{(REV)}$	=	$F F. O\&M_{(REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$
Where:		
$F V. O\&M_{(REV)}$	=	The revised Variable O&M Foreign Component of Tariff
$L F. O\&M_{(REV)}$	=	The revised Fixed O&M Local Component of Tariff
$F F. O\&M_{(REV)}$	=	The revised Fixed O&M Foreign Component of Tariff
$F V. O\&M_{(REF)}$	=	The reference Variable O&M Foreign Component of Tariff
$L F. O\&M_{(REF)}$	=	The reference Fixed O&M Local Component of Tariff
$F F. O\&M_{(REF)}$	=	The reference Fixed O&M Foreign Component of Tariff
$CPI_{(REV)}$	=	The revised CPI (General)
$CPI_{(REF)}$	=	The reference CPI (General) of 202.98 for February 2016
$US CPI_{(REV)}$	=	The revised US CPI (All Urban Consumers)
$US CPI_{(REF)}$	=	The reference US CPI of 237.111 for February 2016
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar
$ER_{(REF)}$	=	The reference exchange rate of RS. 105/US\$

iii) Indexation for KIBOR Variation

The interest part of capacity charge component will remain unchanged throughout the term except for the adjustment due to variation in interest rate as a result of variation in 3 months KIBOR according to the following formula;

$\Delta I$	=	$P_{(REV)} * (KIBOR_{(REV)} - 6.35\%) / 4$
Where:		
$\Delta I$	=	The variation in interest charges applicable corresponding to variation in 3 months KIBOR. $\Delta I$ can be positive or negative depending upon whether $KIBOR_{(REV)}$ is $>$ or $<$ 6.35%. The interest payment obligation will be enhanced or reduced to the extent of $\Delta I$ for each quarter under adjustment applicable on quarterly basis.
$P_{(REV)}$	=	The outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculation date. Period 1 shall commence on the date on which the 1 <sup>st</sup> installment is due after availing the grace period.

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**iv) Cost of Working Capital**

At the time of COD, cost of working capital shall be adjusted for actual payment terms agreed in the PPA and GSA and fuel prices. Thereafter, the cost of working capital shall be adjusted quarterly for variation in KIBOR and fuel prices only.

**VII. Fuel Price Adjustment**

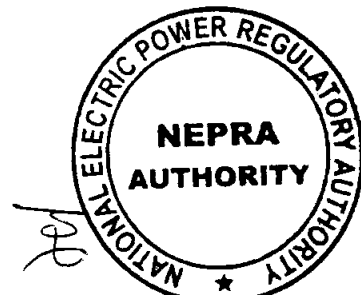
The fuel cost component of tariff subsequent to adjustment of heat rate test at COD shall be adjusted on account of fuel price variation as and when notified by the relevant authority as per the following mechanism:

$FCC_{RLNG(Rev)}$	=	$FCC_{RLNG(Ref)} * P_{RLNG(Rev)} / P_{RLNG(Ref)}$
Where:		
$FCC_{RLNG(Rev)}$	=	The revised fuel cost component on RLNG
$FCC_{RLNG(Ref)}$		The reference fuel cost component on RLNG
$P_{RLNG(Rev)}$	=	The revised HHV RLNG price notified by the relevant Authority
$P_{RLNG(Ref)}$	=	The reference HHV RLNG price of US\$ 7/MMBtu
$FCC_{HSD(Rev)}$	=	$FCC_{HSD(Ref)} * P_{HSD(Rev)} / P_{HSD(Ref)}$
Where:		
$FCC_{HSD(Rev)}$	=	The revised fuel cost component on HSD
$FCC_{HSD(Ref)}$		The reference fuel cost component on HSD
$P_{HSD(Rev)}$	=	The revised HHV HSD price notified by the relevant Authority
$P_{HSD(Ref)}$	=	The reference HHV HSD price of Rs. 42.9112/litre.

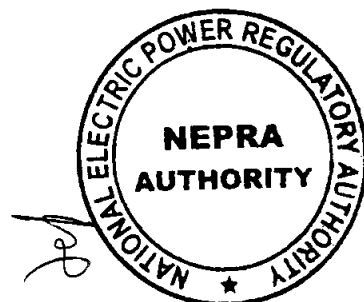
**VIII. Terms & Conditions**

The following terms and conditions shall apply to the determined tariff:

- i. All plant and equipment shall be new and shall be designed, manufactured and tested in accordance with the acceptable standards.
- ii. The verification of the new machinery will be done by the independent engineer at the time of the commissioning of the plant duly verified by the power purchaser.
- iii. The tariff has been determined on the basis of debt equity ratio of 70:30. Minimum equity requirement is 20%. There will be no limit on the maximum amount of equity; however, equity exceeding 30% of the total project cost will be treated as debt.

- iv. The debt part of the project can also be financed through foreign financing or mix of local and foreign financing and the debt servicing component shall be adjusted accordingly.
- v. In case of foreign financing LIBOR+ a premium of 4.5% shall be applicable. In case of actual premium is negotiated less than 4.5%, the saving shall be shared between the power purchaser and the power producer in the ratio of 60:40.
- vi. In case of foreign financing, Sinasure fee/ECA exposure fee/credit insurance fee shall also be applicable with maximum of 7% of debt service amount in accordance with the bench mark established in the coal upfront tariff.
- vii. The sponsor of the project can arrange foreign financing in American Dollar (\$), British Pound Sterling (£), Euro (€) and Japanese Yen (¥) or in any currency as the Government of Pakistan may allow.
- viii. Interest income, if any, on Escrow Account shall be credited to the power purchaser through adjustment against the outstanding payments.
- ix. The plant availability shall be 92%.
- x. The tariff control period shall be 30 years from the date of commercial operation.
- xi. The simple cycle tariff on unit delivered basis on RLNG fuel shall only be applicable during the availability of the gas turbines for simple cycle operation for 8-9 months before the COD of the complex on combined cycle operation.
- xii. The construction period is 27 month. In case of early commissioning of the project, bonus shall be calculated strictly in accordance with the terms of the Schedule 10 to the EPC Agreement and shall be included in the project cost at the time of COD.
- xiii. The dispatch will be at appropriate voltage level mutually agreed between the power purchaser and the power producer.
- xiv. The dispatch shall be in accordance with economic merit order.
- xv. In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on production of original receipts. This payment shall be considered as a pass-through payment spread over a period of twelve months. However, withholding tax on dividend shall not be passed through.



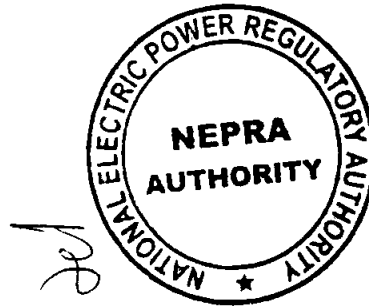


- xvi. Taxes and duties on the import of plant & machinery during the construction period have been included in the project cost and shall be adjusted on actual at the time of COD on the basis of verifiable documentary evidence.
- xvii. General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the Power Purchase Agreement.

28. NOTIFICATION

The above Order of the Authority along with 3 Annexes shall be notified in the Official Gazette in terms of Section 31(4) of the Regulations of Generation, Transmission and Distribution of Electric Power Act, 1997.

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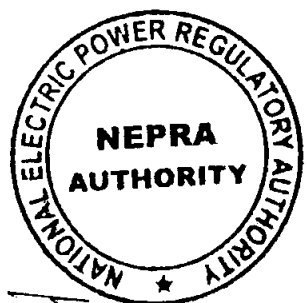


**National Power Parks Management Company (Private) Limited**  
**Haveli Bahadur Shah Project**  
**Reference Tariff Table RLNG**

Year	Energy Purchase Price (Rs./kWh)			Capacity Purchase Price (PKR/kWh/Hour)									Total Tariff	
	Fuel component	Var. O&M	Total EPP	Fixed O&M local	Fixed O&M foreign	Cost of W/C	Insurance	ROE	Debt Repayment	Interest Charges	Total CPP	Capacity charge@ 92%	Rs. / kWh	Cents / kWh
1	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.3778	0.5415	1.8448	2.0052	6.7681	6.4459
2	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.4144	0.5049	1.8448	2.0052	6.7681	6.4459
3	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.4545	0.4648	1.8448	2.0052	6.7681	6.4459
4	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.4985	0.4208	1.8448	2.0052	6.7681	6.4459
5	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.5468	0.3725	1.8448	2.0052	6.7681	6.4459
6	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.5998	0.3196	1.8448	2.0052	6.7681	6.4459
7	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.6578	0.2615	1.8448	2.0052	6.7681	6.4459
8	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.7215	0.1978	1.8448	2.0052	6.7681	6.4459
9	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.7914	0.1279	1.8448	2.0052	6.7681	6.4459
10	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.8680	0.0513	1.8448	2.0052	6.7681	6.4459
11	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
12	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
13	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
14	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
15	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
16	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
17	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
18	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
19	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
20	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
21	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
22	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
23	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
24	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
25	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
26	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
27	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
28	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
29	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
30	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
<b>Average</b>														
1-10	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.5931	0.3263	1.8448	2.0052	6.7681	6.4459
11-30	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	5.7689	5.4942
1-30	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.1977	0.1088	1.2319	1.3391	6.1020	5.8114
<b>Levelized</b>														
1-30	4.4483	0.3146	4.7629	0.0616	0.1369	0.0954	0.0606	0.5710	0.3597	0.2396	1.5247	1.6573	6.4202	6.1145

6.4202 Rs./kWh

6.1145 US Cents/kWh

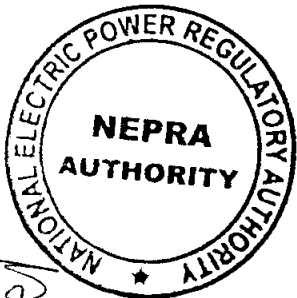


National Power Parks Management Company (Private) Limited  
Haveli Bahadur Shah Project  
Reference Tariff Table HSD

Year	Energy Purchase Price (Rs./kWh)			Capacity Purchase Price (PKR/kW/Hour)									Total Tariff	
	Fuel component	Var. O&M	Total EPP	Fixed O&M local	Fixed O&M foreign	Cost of W/C	Insurance	ROE	Debt Repayment	Interest Charges	Total CPP	Capacity charge@ 92%	Rs. / kWh	Cents / kWh
1	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.3778	0.5415	1.8448	2.0052	10.4308	9.9341
2	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.4144	0.5049	1.8448	2.0052	10.4308	9.9341
3	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.4545	0.4648	1.8448	2.0052	10.4308	9.9341
4	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.4985	0.4208	1.8448	2.0052	10.4308	9.9341
5	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.5468	0.3725	1.8448	2.0052	10.4308	9.9341
6	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.5998	0.3196	1.8448	2.0052	10.4308	9.9341
7	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.6578	0.2615	1.8448	2.0052	10.4308	9.9341
8	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.7215	0.1978	1.8448	2.0052	10.4308	9.9341
9	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.7914	0.1279	1.8448	2.0052	10.4308	9.9341
10	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.8680	0.0513	1.8448	2.0052	10.4308	9.9341
11	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
12	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
13	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
14	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
15	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
16	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
17	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
18	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
19	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
20	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
21	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
22	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
23	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
24	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
25	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
26	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
27	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
28	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
29	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
30	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
<b>Average</b>														
1-10	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.5931	0.3263	1.8448	2.0052	10.4308	9.9341
11-30	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	-	-	0.9255	1.0060	9.4315	8.9824
1-30	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.1977	0.1088	1.2319	1.3391	9.7646	9.2996
<b>Levelized</b>														
1-30	7.9715	0.4540	8.4255	0.0616	0.1369	0.0954	0.0606	0.5710	0.3597	0.2396	1.5247	1.6573	10.0829	9.6027

10.0829 Rs./kWh

9.6027 US Cents/kWh



**National Power Parks Management Company (Private) Limited**  
**Haveli Bahadur Shah Project**  
**Debt Service Schedule**

Gross Capacity	1,230.540 MWs	US\$/PKR Parity	105.00
Net Capacity	1,207.900 MWs	Debt	597.64 US\$ Million
LIBOR	6.35%	Debt in Pak Rupees	62,752.39 Rs. Million
Spread over LIBOR	3.00%	DSRA	- Rs. Million
Total Interest Rate	9.35%		- US\$ Million

Period	Principal Million Rs.	Principal Repayment Million Rs.	Interest Million Rs.	Balaance Million Rs.	Debt Service Million Rs.	Principal Repayment Rs./kW/h	Interest Rs./kW/h	Debt Servicing Rs./kW/h
1	62,752.39	965.06	1,466.84	61,787.34	2,431.89			
2	61,787.34	987.61	1,444.28	60,799.72	2,431.89			
3	60,799.72	1,010.70	1,421.19	59,789.02	2,431.89			
4	59,789.02	1,034.32	1,397.57	58,754.70	2,431.89	0.3778	0.5415	0.9193
<b>1st Year</b>		<b>3,997.69</b>	<b>5,729.88</b>		<b>9,727.57</b>			
5	58,754.70	1,058.50	1,373.39	57,696.20	2,431.89			
6	57,696.20	1,083.24	1,348.65	56,612.95	2,431.89			
7	56,612.95	1,108.56	1,323.33	55,504.39	2,431.89			
8	55,504.39	1,134.48	1,297.42	54,369.91	2,431.89	0.4144	0.5049	0.9193
<b>2nd Year</b>		<b>4,384.79</b>	<b>5,342.78</b>		<b>9,727.57</b>			
9	54,369.91	1,161.00	1,270.90	53,208.92	2,431.89			
10	53,208.92	1,188.13	1,243.76	52,020.78	2,431.89			
11	52,020.78	1,215.91	1,215.99	50,804.87	2,431.89			
12	50,804.87	1,244.33	1,187.56	49,560.55	2,431.89	0.4545	0.4648	0.9193
<b>3rd Year</b>		<b>4,809.37</b>	<b>4,918.20</b>		<b>9,727.57</b>			
13	49,560.55	1,273.41	1,158.48	48,287.13	2,431.89			
14	48,287.13	1,303.18	1,128.71	46,983.95	2,431.89			
15	46,983.95	1,333.64	1,098.25	45,650.31	2,431.89			
16	45,650.31	1,364.82	1,067.08	44,285.49	2,431.89	0.4985	0.4208	0.9193
<b>4th Year</b>		<b>5,275.05</b>	<b>4,452.52</b>		<b>9,727.57</b>			
17	44,285.49	1,396.72	1,035.17	42,888.77	2,431.89			
18	42,888.77	1,429.37	1,002.53	41,459.40	2,431.89			
19	41,459.40	1,462.78	969.11	39,996.63	2,431.89			
20	39,996.63	1,496.97	934.92	38,499.65	2,431.89	0.5468	0.3725	0.9193
<b>5th Year</b>		<b>5,785.84</b>	<b>3,941.73</b>		<b>9,727.57</b>			
21	38,499.65	1,531.96	899.93	36,967.69	2,431.89			
22	36,967.69	1,567.77	864.12	35,399.92	2,431.89			
23	35,399.92	1,604.42	827.47	33,795.50	2,431.89			
24	33,795.50	1,641.92	789.97	32,153.58	2,431.89	0.5998	0.3196	0.9193
<b>6th Year</b>		<b>6,346.08</b>	<b>3,381.49</b>		<b>9,727.57</b>			
25	32,153.58	1,680.30	751.59	30,473.27	2,431.89			
26	30,473.27	1,719.58	712.31	28,753.69	2,431.89			
27	28,753.69	1,759.77	672.12	26,993.92	2,431.89			
28	26,993.92	1,800.91	630.98	25,193.01	2,431.89	0.6578	0.2615	0.9193
<b>7th Year</b>		<b>6,960.57</b>	<b>2,767.00</b>		<b>9,727.57</b>			
29	25,193.01	1,843.01	588.89	23,350.00	2,431.89			
30	23,350.00	1,886.09	545.81	21,463.92	2,431.89			
31	21,463.92	1,930.17	501.72	19,533.74	2,431.89			
32	19,533.74	1,975.29	456.60	17,558.45	2,431.89	0.7215	0.1978	0.9193
<b>8th Year</b>		<b>7,634.56</b>	<b>2,093.01</b>		<b>9,727.57</b>			
33	17,558.45	2,021.46	410.43	15,536.99	2,431.89			
34	15,536.99	2,068.72	363.18	13,468.27	2,431.89			
35	13,468.27	2,117.07	314.82	11,351.20	2,431.89			
36	11,351.20	2,166.56	265.33	9,184.64	2,431.89	0.7914	0.1279	0.9193
<b>9th Year</b>		<b>8,373.81</b>	<b>1,353.76</b>		<b>9,727.57</b>			
37	9,184.64	2,217.20	214.69	6,967.44	2,431.89			
38	6,967.44	2,269.03	162.86	4,698.41	2,431.89			
39	4,698.41	2,322.07	109.83	2,376.35	2,431.89			
40	2,376.35	2,376.35	55.55	(0.00)	2,431.89	0.8680	0.0513	0.9193
<b>10th Year</b>		<b>9,184.64</b>	<b>542.93</b>		<b>9,727.57</b>			

