National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No. NEPRA/TRF-347/QATPL-2016/5034-5037
April 14, 2016

Subject: **Determination of the Authority in the matter of Tariff Petition filed by Quaid-e-Azam Thermal Power (Pvt.) Ltd. (QATPL) for Determination of Generation Tariff for its 1180.17 MW Power Project on RLNG/HSD at Bhikki, Sheikhupura, Punjab**

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I, II & IIII (60 pages) in Case No. NEPRA/TRF-347/QATPL-2016.

2. The Decision is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Order of the Authority along with 3 Annexes of the Determination needs to be notified in the official Gazette.

Enclosure: As above

14.04.16
(Syed Safeer 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 Quaid-e-Azam Thermal Power (Private) Limited for determination of Generation Tariff for its 1,180.17 MW Power Project on RLNG/HSD at Bhikki
(CASE NO. NEPRA/TRF-347/QATPL-2016)

April 19,2016

Intervener:
Anwar Kamal Law Associates

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

(Khawaja Muhammad Naeem)
Member

(Maj (R) Haroon Rashid) 13/4/16
Member

(Masood-ul-Hassan Naqvi) 13/4
Member

15.4.16
(Himayat Ullah Khan)
Vice Chairman

(Brig (R) Tariq Saddozai) 13/4/16
Chairman

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14.04.16

1. INTRODUCTION

1.1. Quaid-e-Azam Thermal Power (Private) Limited(hereinafter "QATPL" or the "Company" or the "Petitioner") is a private limited company, wholly owned by the Government of Punjab (GOPB) and incorporated under the Companies Ordinance 1984 on 25th March 2015 with an objective to set up RLNG based power plant on fast track basis at Bhikki, Shekihupura in the Province of Punjab. The Facility will be a thermal Independent Power Producer (IPP) using Re-gasified Liquefied Natural Gas (RLNG) as the primary fuel and High-Speed Diesel (HSD) as back-up/emergency fuel. The proposed Project is based on the combined cycle technology with a capacity of 1180.130 MW at Reference Site Conditions (net 1,156.675 MW). The project will be set up on build, own and operate basis. Private Power and Infrastructure Board (PPIB) has issued a Letter of Intent (LOI) to the project on 13th July 2015.

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) of December 2017; as contractually agreed with globally reputable EPC contractor Harbin Electric International Company Limited (HEI) in joint venture with Habib Rafiq (Pvt.) Limited (HRL) jointly HEI-HRL. The appointment of HEI-HRL as EPC contractor was carried out by QATPL through an International Competitive Bidding process in line with all applicable procurement rules, including the Punjab Procurement Rules, 2014. In pursuance of the same, QATPL has signed the Engineering, Procurement and Construction Contract with the successful bidder, HEI-HRL (the EPC Contract) and established LCs amounting to USD 233,211,000 and PKR 6,445,949,400 in its favour.

b. Long-Term Service Agreement (LTSA): 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. QATPL is in the process of finalizing the LTSA with the successful bidder, GE.

c. Financing arrangements with local banks: with commitments obtained from various local financial institutions. Based on the arrangement agreed in principle, the mandated lead arrangers have provided an underwritten

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commitment to make available a finance facility of up to PKR 72.5 billion from the local banking market to finance the costs of the Project on a debt to equity ratio of 75:25. Finalisation of financing terms is subject to determination of a viable tariff from NEPRA.

2. FILING OF TARIFF PETITION

2.1. Pursuant to the relevant provisions of the NEPRA Act and the Rules and Regulations made there under; QATPL filed a tariff petition for approval of the reference generation tariff for Single Cycle and Combined Cycle Operation for the proposed project vide its letter dated 15th February 2016.

2.2. According to the Petitioner, the power purchase agreement (PPA) with Central Power Purchase Agency Guaranteed Limited (CPPAG) and gas supply agreement (GSA) with Sui Northern Gas Pipeline Limited (SNGPL) have been finalized and are subject to issuance of tariff. QATPL also submitted that in terms of EPC contract, irrevocable letter of credit for the amount of US$ 233.211 million and PKR 6.446 billion in favour of the EPC contractor has been opened on 21st October 2015. Banks have signed an underwritten term sheet with QATPL committing to finance the debt portion of the project and underwriting fee of PKR 270 million have been paid to the lending institutions.

2.3. According to the Petitioner, it is obligated to open an LC for the remaining 55% of the EPC cost by mid-April 2016 and for this purpose, financial close of the project is required to be achieved by the end of March 2016. Financial close in turn is dependent on completion of conditions precedents (CPs) including signing of PPA, Implementation Agreement (IA) and Letter of Support (LOS). All these CPs are dependent on a viable tariff. Hence, a viable and bankable tariff is immediate requirement of the Project. If a viable tariff is not issued to the project immediately, the Company will face situation of contractual default and the timeline of the project of national importance will be compromised.

2.4. On the basis of above grounds, the Petitioner also requested for the issuance of Interim tariff in terms of Rule 4 of NEPRA (Tariff Standards and Procedure) Rules, 1998 along with other enabling provisions of law.

3. SITE

3.1. According to the Petitioner, National Transmission and Dispatch Company (NTDC) and the planning division of Water & Power Development Authority

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(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 QATPL the site at Bhikki, Sheikhupura, Punjab for the Project. The Site will be developed by QATPL to serve the project's land, logistical, water, and drainage requirements.

3.2. According to the Petitioner, the site selected and approved by GoPb is located about 2 km off Sheikhupura-Faisalabad road (15km from Sheikhupura) on Qadirabad-Balloki Link Canal (left bank). The site was previously selected by GoPb for setting-up 1320 MW coal fired power plant. The land measuring 578 Kanals has already been acquired by QATPL. The site is adjacent to Shorkot-PirMahal-Jaranwala-Sheikhupura single railway track (approx. 200km from Shorkot). Gatti-Lahore double circuit 500kV transmission line traverses about 2 km from the site.

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 18 km from the project site) with an Environmental Impact Assessment (EIA) already completed and approved. Environmentally, the project has cleared the EIA because of the relatively low emissions from gas based generation as compared to other fossil fuel based power generation.

3.4. According to the Petitioner, from a power evacuation standpoint, the site posits an advantage because CPPA will not have to add significant transmission infrastructure to the area. As per the current power evacuation plan the project will feed net generation of 1156.675 MW to the nearest grid station of 500 KV located at Gatti District Sheikhupura. According to the Petitioner, detailed study to handle additional load by Gatti Grid Station has already been carried out and it has been confirmed by NTDC that said grid station can handle additional load of 1400 MW to transport to national grid. The power will be evacuated from the Project through 500 KV transmission lines of 2 KM that will connect it to national grid through grid station. The Petitioner submitted that according to NTDC, PC-1 for the transmission line has been approved; NTDC has confirmed that the back feed power electricity by Oct 2016 and system will be ready for the evacuation of power subsequently.

3.5. According to the Petitioner, for the gas supply pipeline the Company will secure connection from the existing SNGPL line originating from Sawan Gas field and passing through Qadirabad Balloki (Sheikhupura Main Road). From Qilla Sattar

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Shah to Bhikki the Project Company will build about 18 KM of spur gas pipeline which is estimated to cost PKR 1,360 Million. 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 QATPL 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 cool 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:

BREAKUP OF PROJECT COST	USD in Million
EPC cost:	**564.760**
Offshore EPC Cost	424.020
Onshore EPC Cost	115.240
Items not covered in the EPC contract scope	25.500
Non EPC Cost:	**90.759**
Engineering consultancy	15.000
Administrative Expenses during construction	18.000

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O&M mobilization & training	6.000
Land Cost	2.000
Security Surveillance	12.500
Insurance during construction @ 1.35% of EPC Cost	7.624
Testing & Commissioning	29.634
Customs Duties &Cess	25.653
LTSA Initial Spare Parts	20.880
Gas Pipeline Cost	13.600
HSD Inventory	26.555
CAPEX	**742.21**
Financing Fees & Charges 4.06% of Debt	22.600
Interest During Construction 30 Months	64.850
DSRA	53.491
One month LNG Escrow Account	36.653
Total Project Cost	**919.80**

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

Description	Combined Cycle	
	RLNG	HSD
Energy Charge (Rs./kWh):		
Fuel cost component	4.6212	8.7491
Variable O&M	0.3336	0.4814
Total	4.9548	9.2305
Capacity Charge (Rs./kW/hour):		
Fixed O&M (Local)	0.1373	0.1373
Fixed O&M (Foreign)	0.1597	0.1597
Cost of working capital	0.0895	0.0895
Insurance	0.0790	0.0790
Return on Equity	0.5561	0.5561
Debt servicing (1-10 years only)	1.1086	1.1086
Total 1-10 years	2.1302	2.1302
Total 11-30 years	1.0216	1.0216
Avg. Tariff 1-10 years @ 92% (Rs./kWh)	7.2702	11.5460
Avg. Tariff 11-30 years @ 92% (Rs./kWh)	6.0652	10.3409
Levelized tariff (Rs./kWh)	6.8506	11.1264
Levelized tariff (Cents/kWh)	6.5244	10.5966

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Description	Simple Cycle	
	RLNG	HSD
Energy Charge (Rs./kWh):		
Fuel cost component	7.1134	12.6895
Variable O&M	0.3336	0.4814
Total	7.4470	13.1709
Capacity Charge (Rs./kW/hour):		
Fixed O&M (Local)	0.1373	0.1373
Fixed O&M (Foreign)	0.1597	0.1597
Cost of working capital	0.0895	0.0895
Total	0.3865	0.3865
Capacity Charge at 92%	0.4201	0.4201
Total Tariff	**7.8670**	**13.5909**

c. **Assumptions**: The Petitioner has assumed the following:

i. **Capital Structure:** The proposed debt equity ratio is 75:25.

ii. **Interest Rate:** The petitioner assumed interest rate of 3 month KIBOR 6.36% + 3% premium for cost of debt and KIBOR + 2% for cost of Working capital.

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 60.11% and 53.04% on RLNG and HSD respectively and Simple Cycle efficiencies are 39.05% and 36.57% 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 1156.675 MW.

viii. **Insurance cost:** The petitioner proposed annual insurance cost @ 1.35% of the EPC Cost for post COD.

ix. **Tariff Period:** The petitioner proposed a tariff control period of 30 Years.

x. **Reference Price:** The Petitioner assumed base fuel price (excluding GST) USD 7 per MMBTU-HHV for gas and PKR 46.21 per Litre on HSD.

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6. ADMISSION OF TARIFF PETITION

6.1. The Authority admitted the tariff petition on 16th February 2016. The Authority also considered the request of the petitioner for grant of interim tariff and considering the facts, circumstances and grounds, decided to allow interim tariff in terms of rule 4(7) of NEPRA Tariff (Standards & Procedure) Rules, 1998. Accordingly, the Interim Tariff was issued on 22nd February 2016. As per the terms and conditions of the interim tariff, the final tariff shall supersede the interim tariff.

6.2. While admitting the petition, the Authority also decided to hold a hearing in the matter. The hearing was fixed for 10th of March 2016. The notice of admission/hearing along with salient features and issues framed for the hearing was made public in national newspapers on 23rd February 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 letters were also sent to all concerned on 23rd February 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 cost of HSD inventory in the Project cost instead of cost of working capital is justified?

vi. Whether the financing fee and charges are justified?

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

viii. Whether the requirement of Debt Service Reserve Account (DSRA) is justified?

ix. Whether the one month LNG Escrow Account is reasonable and justified?

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

xi. Whether the required efficiencies are reasonable and justified?

xii. Whether the Net Dependable Capacity is justified?

xiii. Whether the Variable O&M cost is reasonable and justified?

xiv. Whether the Fixed O&M cost is reasonable and justified?

xv. Whether the Insurance Cost is justified?

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

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

8. FILING OF COMMENTS/INTERVENTIONS

8.1. Anwar Kamal Law Associates filed intervention request in the matter which was forwarded to the petitioner for rejoinder. The Petitioner vide its letter dated 10th March 2016 filed rejoinder in the matter which was also forwarded to the intervener by email on 29th March 2016.

8.2. The Intervener objected the tariff petition on, inter alia, following grounds:

- Due to lower oil price the RFO based power plants are higher in the economic merit order than the RLNG power plants.
- Haste in the processing of the tariff petition.
- The Government of Sindh has shown its serious reservation against this Project.
- Firm GSA for the life of the project has not been executed.
- The price of RLNG is not known. Transmission of RLNG gas from City to the Power Plant is neither in place nor is the cost of the lying of such infrastructure available.
- Calorific value (CV) of RLNG is also not known. Moreover, in case of its mixing with Pakistani higher CV pipeline-quality gas there is no mechanism in place to settle the commercial issues.
- The Intervener also objected the 'Take or Pay' mode and suggested that the tariff should be determined on 'Take and Pay' basis with no responsibility for the supply of Fuel on the Power Purchaser.

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8.3. The comments/objections of the intervener, where ever relevant, have been discussed under relevant heads/issues.

9. HEARING

9.1. Hearing in the matter was held on 10th March at NEPRA Tower, G-5/1, Islamabad. The hearing was attended by the representatives of the Petitioner, CPPA, NTDC, PPIB, Planning Commission of Pakistan, general consumers and other stakeholders.

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

10.1. The issue wise discussion, submissions of the Petitioner, intervener 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$ 564.76 million comprising US$ 539.26 million (offshore US$ 424.02 million and onshore US$ 115.24 million) for Engineering Procurement and Construction (EPC)Agreement and US$ 25.50 million for items not covered in the EPC contract scope.

11.2. The Petitioner entered into an EPC Agreement with Joint Venture of Harbin Electric International Company Limited and Habib Rafiq (Pvt.) Limited ("HEI-HRL Joint Venture" or "the Contractor") for the construction of 1,180.13 MW (Gross)/1156.75 MW (Net) gas based power generation facility to be located at Bhikki, Province of Punjab, Pakistan. According to the Petitioner an international competitive bidding process was carried out to select an experienced, competent and internationally recognized contractor with the capability to undertake the works in accordance with requirements of the Employer. 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. According to the Petitioner, in the light of EPC contract, provision for out of scope items is necessary to allow for variation in scope.

11.3. According to the intervener, it do not have the expertise to comment on whether the EPC cost is reasonable and justified but NEPRA should have known whether

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this EPC Cost is reasonable or not. The intervener also objected to the EPC cost assumptions taken by NEPRA in calculation of upfront tariff. The Petitioner vide its letter dated 10th March 2016 replied the questions raised by the intervener and the same was forwarded to the intervener.

11.4. The Authority considered 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. EPC Agreement price translates into approximately US$ 0.46 million/MW which is the lowest among all the gas based projects already commissioned and one of its kind. Representative of PPIB during the hearing appreciated the very competitive EPC cost. By all standards, the EPC Agreement price is the most efficient, therefore, is approved as such.

11.5. Regarding US$ 25.52 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	Combustion Monitoring System of Gas Turbine	0.50
2	BOP Spares	6.00
3	Housing Complex	6.70
4	Auditorium	3.00
5	Plant Simulator System & Training Centre	2.30
6	Fuel gas Treatment Plant	2.00
7	Buffer Vessel	4.25
8	Land Acquisition for 5,6 & 7 above	0.77
	Total	**25.52**

Combustion Monitoring System of Gas Turbine

11.6. 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 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

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combustors with maximum and minimum temperatures). It generates alarm and trips the GT if the spread is above the set points.

11.7. 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.

Balance of Plant (BOP) Spares

11.8. 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.

11.9. 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 rational and 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. The Authority has also decided to adopt the same benchmark in the instant case and accordingly the maximum spares inventory works out US$ 22.59 million. 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 & Auditorium

11.10. The Petitioner requested US$ 6.7 million and US$ 3 million for housing complex with additional recreation activities and auditorium. According to the Petitioner the plant staff and reputable international O&M Companies would require on-site accommodation for them and their families and this would ensure their safety and security, as travelling back and forth to Plant Site could expose them to security

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threats. The additional recreation activities include games room with pool tables, table tennis, foosball table, basketball court, tennis court, badminton court, squash court, gymnasium, media room and swimming pool. Auditorium shall be for conferences, seminars and concerts etc.

11.11. The request of the Petitioner has been examined in detail. The requested estimated cost of US$ 158/Sq. Ft (Rs. 16,590/Sq. ft.) including furnishing cost of US$ 120/Sq. ft. is substantially on the higher side and do not match with the market standard. The Petitioner did not disclose the covered area, however, by reverse calculation the covered area works out 42,405 square feet for the housing complex and 18,987 square feet for the auditorium. On the basis of information available on record, the Authority has decided to allow average Rs. 5,000/Sq. ft. cost for both housing complex and auditorium. Accordingly, US$ 2.02 million and US$ 0.90 million have been approved for housing complex and auditorium respectively 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 build by EPC contractor free of cost under Section 6.5.4 of the Employer's Requirements.

Plant Simulator System & Training Centre

11.12. 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 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.

11.13. Considering the importance of training on latest technology machines, the Authority has decided to allow the requested cost of US$ 2.3 million for Simulator System & Training Centre with maximum cap subject to adjustment on actual at COD on the basis of verifiable documentary evidence.

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Fuel Gas Treatment Plant

11.14. The Petitioner requested US$ 2 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.

11.15. 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 million with maximum cap subject to adjustment as per actual at COD on the basis of verifiable documentary evidence.

Buffer Vessel

11.16. The Petitioner requested US$ 4.25 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.

11.17. The Authority has considered the request of the petitioner and decided to allow US$ 4.25 with maximum cap for buffer vessel subject to adjustment as per actual on the basis of verifiable documentary evidence at COD.

Land Cost

11.18. The Petitioner requested US$ 0.77 million on account of purchase of land of 32 acres for housing complex, auditorium and training centre in addition to 72 acres of land for power complex.

11.19. The Authority has decided to allow US$ 0.77with maximum cap for additional purchase of 32 acres of land for construction of housing complex, auditorium and training centre 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 72 acres purchased for power complex.

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

12.1. The Petitioner requested US$ 90.759 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	15.000
O&M mobilization & training	6.000
Land Cost	2.000
Insurance during construction	7.624
Testing & Commissioning	29.634
Security Surveillance	12.500
Administrative Expenses during construction	18.000
Total	**90.759**

12.2. According to the intervener submissions made regarding EPC cost are also applicable to non-EPC cost. During the course of the hearing, representatives of PPIB, CPPA and Planning Commission submitted that non-EPC cost is on the higher side and need to be rationalized. The Petitioner while responding the queries of the intervener and objections of other stakeholders submitted that given the high-tech nature of the project, non-EPC costs are expected to be relatively higher and these costs should be seen on a standalone basis without any correlation to EPC price. Hence, the Authority has decided to consider and approve the same separately in the succeeding paragraphs.

<u>Engineering Consultancy</u>

12.3. The Petitioner requested US$ 15 million on account of engineering consultancy services comprising US$ 9.6 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

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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 to4 inspections will be performed at a minimum, i.e. during manufacturing, post manufacturing and pre shipment which have been calculated to be approximately 198.

12.4. According to the consultancy contract, the price in foreign currency is Euro 1,585,422 and US$ 76,000 and in local currency Rs. 782,807,888 including provincial sales tax on services of Rs. 122,633,364. The total contract price in equivalent PKR is 963,046,856. The Petitioner by using Rs. 100/US$ converted it to US$ 9.6 million. The exchange rate used in the petition is Rs. 105/US$, therefore, the dollar amount works out US$ 9.17 million. In addition to that, the provincial sales tax of Rs. 122,633,364 (US$ 1,167,937) is adjustable/refundable, therefore, cannot be claimed as expense. On the basis of documentary evidence and after making the aforesaid adjustment the revised consultancy contract cost works out US$ 8 million and approved as such.

12.5. 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
Total	**5,401,853**

12.6. The Authority has examined the details of the cost of DRM, FAT & 3rd Party inspection. In the opinion of the Authority, both Lahmeyer International and NESPAK are well reputed and experienced firms and that they must be in the knowledge about the fast track nature of the project, therefore, 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 and 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 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

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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. The total consultancy charges works out US$ 10 million and are being approved.

O&M Mobilization & Training

12.7. The Petitioner requested US$ 6 million on account of O&M mobilization & training cost during the construction phase. According to the Petitioner, O&M contractor is expected to be mobilized at least 4 months before the COD of first gas turbine. The Petitioner submitted that the O&M contractor selection and bidding process has recently been initiated, 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 Bhikki plant being a standalone plant with no cost sharing and a much higher capacity and scale will entail a much higher O&M mobilization cost.

12.8. 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

12.9. The Petitioner requested US$ 2 million for purchase of land for the project. According to the Petitioner, land area measuring 552.5 kanals has been acquired

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for the project at an actual cost of US$ 1.3 million. The acquisition of additional land measuring 26 kanals from Evacuee Trust Property Board is in process. Additional cost relating to land development, potential acquisition of the temporary leasehold land and estimated dismantling/ rehabilitation charges are estimated in aggregate at US$ 0.7 million.

12.10. Considering the size of the project and value of land in the Bhikki area, the US$ 2 million for cost of land and its development seems reasonable and approved as such.

Insurance During Construction

12.11. The Petitioner requested US$ 7.624 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.

12.12. 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$ 5.537 million as insurance cost during construction.

Testing & Commissioning

12.13. The Petitioner requested US$ 29.634 million on account of Testing and commissioning cost based on a technical assessment carried out by the advisors.

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The Petitioner provided the following breakup of the testing and commissioning costs:

Description	USD
Fuel during testing	23,166,432
Electricity cost for back feed from National grid	900,000
O&M cost during the shutdown period:	5,568,000
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 4 months prior to COD	2,320,000
Total	**29,634,432**

12.14. According to the Petitioner the RLNG and HSD price has been assumed at USD 7 / MMBTU (HHV) and PKR 46.21 / 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.

12.15. The Petitioner submitted that the O&M contractor and LTSA contractor are required to be deployed at least four months and one month prior to the COD of first gas turbine respectively and accordingly, O&M fixed cost equivalent to five months and LTSA fixed cost for one month prior engagement has been requested. The Petitioner also submitted that Bhikki plant 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.

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

- Duplication of US$ 4.58 million for RLNG testing cost on combined cycle.
- Simple cycle testing on HSD has been inflated by US$ 3.36 million on account of inclusion of GST in HSD price.
- 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 requested separately.
- The Petitioner requested O&M mobilization 4 months prior to COD of US$ 2,320,000seems duplication of O&M mobilization cost as separate cost of US$

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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 per the Employer's Requirements 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.

12.17. Apart from the above observations, the Authority considers that the supply of electricity falls within the scope of work of the EPC contractor, therefore, cannot be allowed. Similarly, the Authority considers that pre & post synchronization tests of 8 days on HSD shall not be required. After adjusting for the guaranteed efficiencies, the cost of RLNG fuel during testing works out US$ 9.38 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 seem justified. Accordingly total testing & commissioning cost of US$ 10.87 million is being approved.

Security & Surveillance

12.18. The Petitioner requested US$ 12.5 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 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	323,539,776	889,734,384	8,473,661
Vehicles Running & Maintenance	22,758,750	62,586,563	596,063
Security Staff Food	39,310,500	108,103,875	1,029,561
Arms & Ammunition	19,745,000	54,298,750	517,131
Costs of Security Barracks, bunkers, cameras etc.	50,000,000	137,500,000	1,309,524
Security Equipment Purchase & Service	30,000,000	82,500,000	785,714
Total	**485,354,026**	**1,334,723,572**	**12,711,653**
Rounded off			**12,500,000**

12.19. 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 Bhikki power 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 Bhikki

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power 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.

12.20. The details provided by the Petitioner has been examined and some errors have been observed in the calculation of security & surveillance cost wherein some items of one time occurrence e.g. Arms & Ammunition, Barracks & Bunkers and Security Equipment cost has been included as annual recurring cost. Moreover provincial GST is adjustable/refundable item, however it has been claimed as an expense. The combined impact of these errors is approximately US$ 2.8 million. After adjusting the error amount, the security & surveillance cost claim works out US$ 9.88 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 and accordingly, the revised security & surveillance cost claim works out US$ 8.257 million.

12.21. 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 more than 400 security persons and some support staff. The breakup is as under:

Designation	No. of Positions
SP	1
Inspector	2
Sub Inspector	8
Asst. Sub Inspector	12
Head Constable	16
Constables	290
Office Boy	6
Drivers	12
Cook	7
Janitor	5
Rangers	60
SSG Commandos	30
Head Office Security	10
Total	459

12.22. During the hearing, the Petitioner submitted that Rangers and SSG Commandos are not available to project and such requirements have also been met from the Police Department. The Petitioner was directed to provide information regarding last six months actual expense on Security Personnel Cost supported by

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agreement/payment to police/rangers and security staff food expenses. The Petitioner, however, did not submit the requisite information.

12.23. The costs allowed to other projects do not include special head of Security and Surveillance related costs and these are covered in the administration expenses. Considering the request of the Petitioner, 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.

Administrative Expenses during Construction

12.24. The Petitioner requested US$ 18 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 QATPL for a period of 36 months (6 months from date of incorporation to Notice to Proceed and 30 months for the construction period). 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:

Description	Annual	36 Months	
	Rs.	Rs.	US$
Employees Cost	360,052,260	1,080,156,780	10,287,207
Rental Agreements	23,227,880	69,683,640	663,654
Entertainment	6,000,000	18,000,000	171,429
Printing & Stationary	9,600,000	28,800,000	274,286
Communication Cost	6,000,000	18,000,000	171,429
Electricity & Generator	18,000,000	54,000,000	514,286
Vehicles running & maintenance	14,952,300	44,856,900	427,209
Travelling, boarding & lodging	18,577,920	55,733,760	530,798
Auditor's remuneration	4,600,000	13,800,000	131,429
Training & Fee	60,080,064	180,240,192	1,716,573
Computer Software/Hardware	6,000,000	18,000,000	171,429

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Repairs & maintenance	3,000,000	9,000,000	85,714
Group life insurance	8,000,000	24,000,000	228,571
Security &surveillance	3,900,000	11,700,000	111,429
PR Campaign, Foundation Stone Ceremony	30,000,000	90,000,000	857,143
Miscellaneous Expenses	12,000,000	36,000,000	342,857
Sub-Total	**583,990,424**	**1,751,971,272**	**16,685,441**
Purchase of Vehicles, Computers, ERP etc:			
Automobiles & Motor Cycles		53,652,000	510,971
Computerization Software/Hardware/Networking		10,010,000	95,333
SAP		30,000,000	285,714
Communication Equipment		5,500,000	52,381
Printers & Fax		4,600,000	43,810
Office Furniture		9,000,000	85,714
Office & Safety Equipment		6,200,000	59,048
Kitchen Appliances		1,000,000	9,524
Sub-Total		**119,962,000**	**1,142,495**
Total		**1,871,933,272**	**17,827,936**
Rounded off			**18,000,000**

12.25. 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 QATPL for a period of 36 months (6 months from date of incorporation to Notice to Proceed and 30 months for the construction period). 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.

12.26. 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 36 months is not justifiable and need to be adjusted and accordingly, the revised administrative cost claim works out US$ 13.65 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 78 employees in the presence of full scope consultancy agreement with NESPAK covering feasibility study, preparation of tender

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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.

12.27. 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. The Petitioner was again directed vide letter dated 21st March to provide the requisite information within seven days else the case shall be decided on the basis of information available in this and the other power projects. However, required information was provided. (is it provided or not provided?)

12.28. The Petitioner in support of training cost explained in the petition that this cost is meant for local trainings in LUMS for top management and managers and 4 foreign trainings for technical staff and top management. On a query to the exceptionally high training cost during each year of the construction period of Rs. 60 million, total Rs. 180 million for 3 years (US$ 1.7 million), the representative of the Petitioner submitted that this training cost is meant for the owner staff who will take care of the operations and maintenance regime so that in the event of any conflict, if the owner has to take over the plant and successfully run the plant and these people will also associate with the O&M contractor. This explanation is contradictory to the stated explanation provided in the tariff petition.

12.29. Moreover 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 training 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.

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

12.30. 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."

12.31. The relevant extracts from Employer's Requirements and EPC contract clearly indicate that the explanation provided by the Petitioner during the hearing regarding training cost is not relevant and cannot be accepted and such a high training cost is not justified. Accordingly training cost has been cut down to US$ 0.2 million during the construction period. Likewise the PR campaign and foundation stone ceremony cost is also not justified and consumers can not be burdened for such costs, if required, such costs can be offset against the profits. Computer software/hardware is duplication as the same cost is also requested under one time item cost. The annual printing & stationary cost of Rs. 9.6 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. 1.068 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%. Security surveillance cost is duplication as this cost has been provided under separate head including the head office security. 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 types of insurances when separate OPD allowance is also provided, therefore, separate group life insurance does not seem justified. The Petitioner requested the cost of 6 Vigo, 6 Altis, 1 GLI, 2 Civic, 2 Swift, 3 Cultus and 10 bikes in the construction period and thereafter the cost of 3 Vigo, 3 Altis, 1 Civic, 3 Swift, and 5 bikes under each year under O&M. All of these vehicles have useful life exceeding 5 years, therefore, only annual depreciation is justified.

12.32. After incorporating all the above adjustments, the administrative cost during construction period of 27 months works out US$ 10.508 million comprising recurring cost of US$ 9.876 million and onetime cost of US$ 0.632 million and are being approved as such. The administrative cost during construction shall be adjusted as per actual at the time of COD on the basis of verifiable documentary evidence at COD with maximum cap of US$ 10.508 million.

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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. The Petitioner further explained the rationale for inviting LTSA bids which was to bring the Original Equipment Manufacturer (General Electric) on board early in the process as the turbines being utilized for the project are state of the art and QATPL intended to minimize the potential risk of plant operations. According to Petitioner, the initial LTSA bid for the spares was US$ 34.8 million which was subsequently reduced to US$ 20.88 million. QATPL is presently in advance negotiations with GE for their contractual arrangements in respect of the Long Term Service Agreement for the project. The Petitioner submitted that this is only a part of the capital parts of USD 74 Million required for one GTG whereas the capital cost for one GT of Frame 9E GE machine is only USD 4.7 Million. According to the Petitioner, GE has adopted global inventory support for planned outages, but its dynamics will be different after expiry of GE LTSA after 12 years.

13.2. The intervener did not submit comments on the reasonability of the cost of LTSA spares inventory rather asked to provide a list of spares, if any, developed by NEPRA. The list of necessary spares inventory is provided by the OEM and is part of the manual.

13.3. LTSA initial spares inventory is a mandatory requirement of the LTSA Agreement and was arrived at through competitive bidding. Considering the competitive bidding process, draft LTSA Agreement, cost of spares allowed to other IPPs and size of the project, the cost of US$ 20.88 million of initial spares inventory seems justified and approved as such.

14. Whether the gas pipeline cost is justified?

14.1. The Petitioner requested US$ 13.60 million for Gas Pipeline. According to the Petitioner, for the supply of gas, the Company will secure connection from the existing SNGPL line originating from Sawan Gas field and passing through Qadirabad Balloki (Sheikhupura Main Road). From QillaSattar Shah to Bhikki the Project Company will build about 18 KM of spur gas pipeline which is estimated to cost PKR 1,360 Million. The pipeline is scheduled to be commissioned by the last quarter of 2016 from Qilla Sattar Shah to Bhikki Plant site. According to the Petitioner, SNGPL is already in discussions with OGRA to seek approval for this

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expenditure and if OGRA accedes to this request then the cost of pipeline will be excluded and the project cost shall be adjusted at COD.

14.2. The Intervener did not offer comment on the justification of the gas pipeline cost rather requested to know whether any dedicated gas pipeline is conceived for the projectand if so, the details of construction of pipeline and procedure followed. As evident from the preceding paragraph, no dedicated gas pipeline is being constructed for the project. The proposed gas pipeline is only for the purpose of connection from the plant site to nearby SNGPL network.

14.3. The Power purchaser in its comments during the hearing submitted that with the introduction of Gas Infrastructure Development Cess (GIDC), it is mandatory upon SNGPL to lay this gas pipeline out of their own budget and it should be borne by SNGPL. GIDC is imposed by the Federal Government and the role of the gas company is only to the extent of its billing, collection and onward submission to the Federal Government. The gas company cannot use the cess collected from the gas consumers. As per Section 4 of the Gas Infrastructure Development Cess 2015, the Cess shall be utilized by the Federal Government for or in connection with infrastructure development of Iran-Pakistan Pipeline project, TAPI Pipeline project, LNG or other ancillary projects.

14.4. Primarily the construction of gas pipeline is the responsibility of the gas supplier and the cost shall be included in the fuel price. Ministry of petroleum and natural Resources vide its letter No. No. NG-(II)-16(I)/15-Misc-LNG-Vol-I-Pt dated 10th February 2016 informed OGRA, SNGPL and SSGCL that Economic Coordination Committee (ECC) of the Cabinet while considering a summary submitted by this Ministry vide case No. ECC-6/2/2016 dated 28.01.2016 approved the proposals contained in Para-7 of the said summary as under:

i. ECC of the Cabinet reaffirms its earlier decision made vide case No.ECC-124/15/2015 dated 03.09.2015 whereby gas companies were allowed to arrange funding amounting to Rs. 101 billion from commercial banks instead of GIDC based on GoP guarantee.

ii. OGRA is advised that subject projects will be included in the asset base of gas companies subject to condition that RLNG pricing will be ring fenced and all directly attributable costs will be charged / recovered from RLNG consumers without affecting the consumers relying on domestically produced gas.

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iii. Financial costs incurred in creation of RLNG infrastructure of national importance should be allowed as admissible expense in the revenue requirement of the utility companies

14.5. The Petitioner informed that the above decision of the ECC pertains to the main gas pipeline from Karachi and has nothing to do with the requested spur gas pipeline cost. The Petitioner, in support of its argument, submitted OGRA's letter No. OGRA-9 (404)/2015 dated 8th April 2016 wherein SNGPL was accorded approval of 30" dia x 18 KM Pipeline for Bhikki Power Plant on 100% cost sharing basis. However the SNGPL shall be responsible to undertake operation and maintenance activity of the said pipeline.

14.6. The Authority carefully examined both the letters and is of the view that prima facie it appears that according to the decision of OGRA, the gas pipeline cost has to be borne by the Petitioner. In view thereof the Authority has decided to approve the requested gas pipeline cost of US$ 13.6 million 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 cost of HSD inventory in the Project cost instead of cost of working capital is justified?

15.1. The Petitioner requested US$ 26.555 million on account of HSD inventory in the capital cost of the project. According to the Petitioner, HSD inventory is for backup purposes only to comply with the power purchaser's requirements. According to the Petitioner the Power Purchaser considers the availability of HSD as a strong mitigant in the event of non-supply of gas, however, the probability of using HSD is remote, therefore, the cost of HSD inventory needs to be included as part of the Project Cost and will not be claimed separately as part of Working Capital during the operating phase. The Petitioner further submitted that its long term maintenance, replenishment and/or replacement after recommended storage interval of around 1 year is an element of O&M costs to the company. The Petitioner estimated the HSD inventory at PKR 46.21 / litre (excluding GST) and requested to be indexed to prices as notified by the competent authority from time to time at COD.

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15.2. The intervener objected the use of HSD as backup fuel for the proposed project and raised question on the justification of HSD inventory either in the project cost or in working capital. According to intervener, the existing four gas based projects with HSD as secondary fuel are not being operated due to non-availability of gas and are not being permitted to operate on HSD. According to intervener, these Plants are getting capacity payment for idle capacity from the consumers despite the fact that consumers are suffering load-shedding even after the payment of the capacity price for idle capacity. The power purchaser in its comments during the hearing suggested the HSD inventory cost to be the part of the cost of working capital.

15.3. The Authority has considered the objections of the intervener and is of view that the intervener's comments on the four power plants having HSD as backup fuel are not correct. These plants are being operated on HSD by the system operator as and when required. Plants on HSD are being operated as peaking plants and not as base load. Further, the proposed project has LNG its primary fuel and HSD has been allowed only as back up fuel which means that this plant will be operated primarily on LNG and only in case of unavailability of primary fuel, the plant can be operated by system operator on HSD by following the principle of economic despatch.

15.4. The Petitioner's submission of HSD inventory at Rs. 46.21 / litre (excluding GST) is not correct. The Petitioner estimated HSD inventory on the basis of HSD price at Rs. 75.79/litre including GST which, however, is in line with the decisions of the Authority in similar cases and accepted as such. The impact of HSD inventory on tariff has also been worked out under both options i.e. as part of the capital cost or as part of working capital. The option 1 as part of capital cost is costlier than the option 2 as part of working capital. Another consideration is whether to allow 7 days inventory at full load or 60% (notional) load. Since the plants to be operated on HSD shall be as peaking plants only, HSD fuel requirement for 7 days at 60% load will be sufficient considering the lead time for refilling of the inventory. The inventory requirement shall be cut down by US$ 10.26 million and financing arrangement shall be comparatively easy.

15.5. Considering all above, the Authority has decided to include cost of HSD inventory of US$ 15.393 million for 7 days at 60% load in the cost of working capital.

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16. Whether the financing fee and charges are justified?

16.1. The Petitioner requested financing fees & charges of US$ 22.60 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 at 3.50% of the loan amount in line with earlier determinations of NEPRA and industry norms and provincial services sales tax/FED has also been assumed to be added to the aforesaid rate. According to the Petitioner, in case the provincial services sales tax/federal excise duty is allowed as pass through QATPL is willing to revert to the NEPRA allowed benchmark of 3.5%.

16.2. According to the intervener financing fees & charges are not justified when local banks are ready to invest in good projects and consumers have to pay the principal along with interest. The Authority has considered the objection of the intervener and is of view that this cost is unavoidable as all the financial institutions and banks; whether foreign or local, charge financing fees for making the funds available.

16.3. The request of the Petitioner of 3.5% debt amount as financing fees & charges is in line with the previous decisions of the Authority, therefore, is being approved as such. On the basis of revised CAPEX amount, the financing fees & charges have been worked out as US$ 18.448 million which shall be subject to adjustment at COD on actual with maximum cap of 3.5% of the debt amount.

16.4. 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.

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

17.1. The Petitioner requested to allow construction period of 30 months and 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.

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17.2. The intervener submitted that the country has surplus generation capacity and the commissioning of this plant shall add to the existing surplus capacity, therefore, this plant should be allowed to be constructed in the normal construction time. The request of early commissioning bonus is not warranted in the circumstances and must be declined.

17.3. The Petitioner while replying the objection of the intervener regarding the early commissioning bonus submitted that it should be viewed in the contest of government's strategy for making efforts for early resolution of the power shortfall issue. The provision of bonus has been made to provide the EPC contractor with an incentive to complete the project even earlier than the required time by mobilizing extra resources.

17.4. The request of the Petitioner regarding construction period of 30 months and payment of early completion bonus has been examined along with the relevant clauses of the EPC contract and was found contradictory. According to the EPC Agreement, the maximum construction period allowed is 27 months and the delay shall attract liquidated damages. Similarly 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% x AP/day for max 50 days. Max limit 1%.

ii. For Complex on combined cycle, 0.05% x AP/day. Max limit 3%.

iii. No bonus would be payable on early completion of GTI 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.

17.5. Since the completion of the project before the agreed time shall result in savings in IDC, ROEDC and administrative cost, its impact against the early commissioning

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bonus has to be evaluated. Accordingly the financial impact of project completion of 50 days earlier has been calculated which works out saving of approximately US$ 13.8 million on account of IDC, ROEDC and administrative & security cost.

17.6. The intervener objected the provision of the early commissioning bonus and suggested that the project should be completed in the normal course of time. Considering the agreed terms of the EPC contract, savings in IDC, ROEDC and administrative costs 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$ 48.742 million on the basis of loan drawdown of 27%, 60% and 13% in 1st year, 2nd year and last 3 months respectively as proposed by the Petitioner. 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.

18. Whether the requirement of Debt Service Reserve Account (DSRA) is justified?

18.1. The Petitioner requested DSRA of US$ 53.49 million equivalent to two quarterly debt servicing instalments at COD in line with the financing agreements being finalized with project lenders and established financing norms. According to the Petitioner DSRA is a standard requirement for any project financing and provides comfort to the lenders that in the event of any short term variability in cash flows (Circular debt/plant availability etc) the lenders would still receive the debt instalment on time by drawing down the DSRA which can subsequently be topped up through project cash flows.

18.2. The intervener objected the DSRA amount and submitted that it should not be allowed as it will not only increase the cost but will also set a new trend in power sector investment. The intervener further submitted that if we are claiming that our credibility for investment in the country has been increased then why we are even considering allowing the DSRA.

18.3. During the hearing, all the stakeholders including PPIB and CPPA objected to include DSRA requirement in the project cost. According to the stakeholders, the DSRA requirement has to be met through the project cash flows like all other IPPs operating in the country.

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18.4. Keeping in view the comments from intervener and other stakeholders and in line with the earlier decisions in cases of other power projects, the Authority has decided to turn down the request of the Petitioner for allowing the cost of DSRA.

19. Whether the one month LNG Escrow Account is reasonable and justified?

19.1. The Petitioner requested US$ 36.65 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 draft GSA. The Petitioner also requested a onetime adjustment on the basis of price at COD.

19.2. According to the intervener this should not be allowed as it will not only increase the cost but will also set a new trend in power sector investment. The intervener further submitted that if we are claiming that governance in the power sector has improved then why is the investor asking for this escrow account and why are we even considering it. The representative of the power purchaser during the hearing suggested that it should be made part of working capital.

19.3. The Petitioner while responding to the objections of the intervener and power purchaser submitted that the LNG escrow account is provided as a backstop for power purchaser's inability to make timely payments which can then result in cascading default scenario under the GSA. The Petitioner further submitted that the concept of escrow account has already been incorporated in the GSA and has been approved by OGRA and the escrow account will be adjusted against the last year payments to be made under the PPA. The Petitioner also submitted that if all costs including 2 months' SBLC, escrow account, HSD inventory, LTSA spares, DSRA etc. are made part of working capital, the amount required for working capital will be exceptionally huge and will not be agreed by the lenders to finance in view of already huge amount of long term debt envisaged in the project.

19.4. The Petitioner's request and stakeholder comments have 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. Interest income, if any, on Escrow Account would be credited to the power purchaser through adjustment against the outstanding payments.

19.5. In view of the justification provided by the Petitioner for the escrow account and the decision of the Authority in similar case, cost of one month escrow account of US$ 35.77 million is being approved.

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

20.1. The Petitioner assumed RLNG price of US$ 7/MMBtu HHV for the purposes of calculation of fuel cost component. According to the Petitioner, based on the recent LNG agreement between Government of Pakistan and Qatar, the likely price of LNG is expected to be lower. The Petitioner further submitted that the price of LNG is a 'placeholder' for tariff purposes and will be determined by the competent authority (OGRA) and shall be pass-through. 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.

20.2. The intervener submitted that price of RLNG is not available and only the provisional prices have been notified by the PSO. According to the intervener as per March 16 Notification of PSO HSD price is Rs. 71.12 per litre while the price given in the advertisement is Rs.46.21 per litre. The intervener asked why lower prices were taken. Whether it was to show a lower Reference Tariff on HSD or were there any other reasons?

20.3. RLNG price has been estimated keeping in view the recent RLNG Supply Agreement with Qattar and decline in the Oil and RLNG prices in the international market. The Assumed HSD price is Rs. 75.79/litre as notified by PSO effective 1st February 2016. For the calculation of fuel cost component, only ex-GST price is applicable which in the instant case is Rs. 46.21/litre.(Who is saying this?)

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20.4. One of the stakeholder during the hearing requested that the pricing and delivery mechanism of RLNG Agreement should be made part of this entire petition so that the end consumers are aware what will be the long run impact of RLNG being used as a fuel. Determination of RLNG price does not fall within the purview of NEPRA like other fuels and fuel prices determined by the relevant agency are being used for calculation of fuel cost component. However, analysis of increase/decrease in the fuel price and its impact on the cost of electricity can be worked out. With the increase in the prices of oil, the price of RLNG shall be bound to increase and accordingly the fuel cost component shall also increase e.g. if the RLNG prices increase by 50%, the fuel cost component shall also increase by 50% and vice versa. Once the heat rates have been fixed, the fuel cost component shall increase/decrease in direct proportion to the increase/decrease in the price of RLNG.

20.5. 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.

21. Whether the required efficiencies are reasonable and justified?

21.1. The Petitioner proposed combined cycle efficiencies of 60.11% and 53.04% on RLNG and HSD respectively and Simple Cycle efficiencies of 39.05% and 36.57% 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.

21.2. According to the Petitioner, the efficiency factor is based on the following:

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- High risk of maintaining highest efficiency regimes that is to be validated globally. 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.
- It is also submitted that due to the scale of these projects and the level of commitment shown by the Government to undertake these projects has resulted in an efficient procurement.
- 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, the company will try its best to actually achieve the efficiency if there is an incentive to do so.

21.3. 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 60.11%and 39.05%respectively as quoted by Siemens during the bidding process. It is proposed that any excess efficiency over and above 60.11% 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

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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.

21.4. The intervener opposed the operation on Simple Cycle and suggested that the efficiencies given by the manufacturer of the machines and guaranteed by the EPC Contractor in the bids should be used and the Investor should not be allowed to earn any profit on this account. The Petitioner in its reply to the objections of the intervener submitted that the simple cycle operation is likely to be around 39.05% efficiency which would still be better than many plants currently in operation.

21.5. According to the guaranteed performance levels agreed between the Petitioner and the EPC Contractor, net LHV combined cycle efficiencies are 61.59% for RLNG, 54.90% for HSD and simple cycle efficiency of 39.47% 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.

21.6. 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

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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. Regarding the comments/objections of intervener on operation of plant on simple cycle, the Authority has seen that operation of plant on simple cycle for certain period is a part of signed EPC contract and any change at this stage will affect overall scheme of establishment of this plant. However to discourage the operation of plant on simple cycle for longer period, the Authority has only decided to allow simple cycle operation on RLNG for 8-9 months before the COD of the complex on combined cycle operation.

21.7. 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 61.59% for RLNG and 54.90% for HSD and simple cycle efficiency of 39.47% for RLNG, the fuel cost components works out as under:

Operation	Fuel	Rs./kWh
Combined Cycle	RLNG	4.5101
Simple Cycle	RLNG	7.0377
Combined Cycle	HSD	8.4527

22. Whether the Net Dependable Capacity is justified?

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

Description	Combined cycle (2GTsx1ST)		Single cycle (1 GT)	
	LNG	HSD	LNG	HSD
Gross Capacity	1,180,130 kW	1,076,880 kW	364,222 kW	363,852 kW
Net Capacity	1,156,675 kW	1,039,980kW	358,506 kW	357,114kW
Auxiliary load	23,455 kW	36,900kW	5,716 kW	6,738kW
Auxiliary load	1.99%	3.43%	1.57%	1.85%

22.2. 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

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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 during the hearing requested that its tariff components are to be adjusted at COD based on IDC tests subject to a 3% cap of Auxiliary Consumption.

22.3. 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 1.99% is the lowest as compared to auxiliary consumption allowed by the Authority to other gas based projects. In the upfront tariff for LNG based power projects, the Authority allowed 3% auxiliary consumption for 800 MW & above projects.

22.4. 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.

22.5. Keeping in view the auxiliary consumption allowed in various other projects, the Authority has decided to accept the proposed net capacity of 1,156.675 MW 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.

23. Whether the Variable O&M cost and Fixed O&M Cost is reasonable and justified?

23.1 The Petitioner requested Variable O&M cost of Rs.0.3336/kWh on gas and Rs.0.4814/kWh on HSD (100% foreign) and Fixed O&M cost of Rs. 0.2970/kW/h comprising local O&M of Rs. 0.1373/kW/h and foreign O&M of Rs. 0.1597/kW/h. The Petitioner calculated the O&M components on the basis of following cost assumptions:

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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	1,483,810	1,392,000	2,875,810
O&M Operator Fee – Foreign	20,711,941	7,058,879	27,770,820
O&M Operator Fee – Local	-	1,245,685	1,245,685
Company's OH cost	-	12,000,000	12,000,000
Total	**29,614,798**	**28,656,564**	**58,271,362**

23.2 The Petitioner has derived the LTSA costs from the draft LTSA Agreement @ 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	Plant Factor	F O&M	V O&M	Total	Remarks of the Petitioner
		Rs./kWh	Rs./kWh	Rs./kWh	
UCH-II	60%	0.4115	0.3230	0.7345	Only variable cost is available. Fixed cost has been estimated
K-Elctric (BQPS-2)	90%	0.2136	0.3970	0.6106	Only variable cost is available. Fixed cost has been estimated
Foundation Power	N/A	0.4852	0.3429	0.8281	Only variable cost is available. Fixed cost has been estimated
Engro Powergen	N/A	0.1925	0.3026	0.4951	Only variable cost is available. Fixed cost has been estimated
KAPCO-II	N/A	0.1820	0.3024	0.4844	Fixed cost component is an interpreted assumption
Bhikki assumed	92%	0.2970	0.3336	0.6306	

23.3 According to the Petitioner, the bidding process for the Operation and Maintenance of the Facility is underway under Punjab Procurement Regulatory Authority regulations. The Petitioner was asked through an information direction to provide justification/details of the costs claimed under LTSA costs not covered in the LTSA Agreement, O&M Operator Fee and company's annual overhead cost. In response, the Petitioner only provided the breakup of the company's annual overhead cost which is as under:

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Description	Annual	
	Rs.	US$
Employees Cost	404,441,406	3,851,823
Rental Agreements	24,281,244	231,250
Entertainment	12,000,000	114,286
Printing & Stationary	12,000,000	114,286
Communication Cost	6,000,000	57,143
Electricity & Generator	18,000,000	171,429
Vehicles running & maintenance	43,761,600	416,777
Travelling, boarding & lodging	27,720,000	264,000
Auditor's remuneration	7,400,000	70,476
Training & Fee	60,080,064	572,191
Computer Software/Hardware	12,000,000	114,286
Repairs & maintenance	48,000,000	457,143
Group life & Health insurance	8,000,000	76,190
Security &surveillance	415,603,186	3,958,126
CSR activity, annual events	30,000,000	285,714
Infrastructure Cost	36,000,000	342,857
Postage, Telephone & Telex	18,000,000	171,429
Miscellaneous Expenses	24,000,000	228,571
Sub-Total	**1,207,287,500**	**11,497,976**
Purchase of Vehicles, Computers, ERP etc:		
Automobiles & Motor Cycles	26,326,000	250,724
Computerization Software/Hardware/Networking	5,850,000	55,714
ERP	15,000,000	142,857
Communication Equipment	5,500,000	52,381
Printers & Fax	2,300,000	21,905
Office Furniture	5,000,000	47,619
Office & Safety Equipment	4,000,000	38,095
Sub-Total	**63,976,000**	**609,295**
Total	**1,271,263,500**	**12,107,271**

23.4 The items under purchase of vehicles, computers, ERP etc have also been claimed under Administrative Expenses during construction. These items are of one time nature or have useful life ranging 5-10 years and are not annual recurring expenses. Under the annual recurring expenses, there is duplication of expenses e.g. communication expenses and postage, telephone and telex expense and computer hardware/software has been claimed both under recurring expenses and purchase of vehicles, computers etc. The infrastructure cost is of one time nature

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and cannot be claimed as recurring cost. The cost requested under each item also seems substantially on the higher side. In order to assess the company's annual overhead cost during operation, recurring costs of US$ 9.88 million approved under administrative expense during construction period of 27 months may be used as a benchmark. On proportionate basis, the annual cost works out US$ 4.39 million. Security & surveillance cost is not part of administrative cost during construction, therefore, annual US$ 0.61 million has been considered as security expense of the power plant during the operational period. Accordingly US$ 5 million has been approved as company's annual overhead expenses during the operational phase. Since US$ 4.39 million is based on administrative expenses during the construction which is subject to adjustment on actual basis at the time of COD, US$ 4.39 million shall also be adjusted at the time of COD on the basis of adjusted recurring administrative expenses.

23.5 The intervener submitted that the O&M cost in the instant case should be less than that allowed in the cases of 4 similar combined cycle power plants.

23.6 In order to assess the reasonability of the requested O&M cost, it will be appropriate to look at the O&M cost allowed to other gas based power projects. Size of the plant plays an important role in per unit O&M cost and other things remaining the same, a bigger plant shall have low O&M as compared to a small plant. The comparison of O&M allowed to other gas based projects are as under:

Name	Capacity	Variable O&M	Fixed O&M	Total
	MW	Rs./kWh	Rs./kW/h	Rs./kWh*
Uch-II Power Limited	375	0.2151	0.3113	0.5263
Fondation Dharki Power	180	0.3710	0.3125	0.6835
Engro PowerGen	217	0.3274	0.2502	0.5776
Orient Power Electric	213	0.2119	0.3310	0.5429
Halmore Power Gen.	206	0.3622	0.2368	0.5990
Saif Power	210	0.3606	0.2427	0.6033
Sapphire Electric Power	212	0.3728	0.2338	0.6066
LNG Upfront Tariff	400	0.2300	0.2900	0.5200
LNG Upfront Tariff	800 & above	0.1900	0.2300	0.4200

* for the purposes of analysis, Rs./kW/h ignored in case of fixed O&M.

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23.7 The Petitioner in its analysis of IPPs O&M cost submitted total O&M of Rs. 0.7345/kWh for Uch-II, Rs. 0.8281/kWh for Foundation Power and Rs. 0.4951/kWh for Engro Powergen, all of which are incorrect and misleading.

23.8 In case of LNG upfront tariff on the basis of input from various stakeholders during the proceedings, O&M cost of Rs. 0.4200/kWh was determined for plant capacity of 800 MW & above. However, the Petitioner at that time filed motion for leave for review and among others requested to allow increase in O&M from Rs. 0.15/kwh to Rs. 0.20/kwh. The Petitioner submitted O&M estimates on the basis of LTSA quotes of GE, Simmons and Mitsubishi. The analysis of each quotation along with the upfront tariff for 1150MW project is provided hereunder:

Description	Upfront	Siemens	Mitsubishi	GE
	Million US$			
Minimum:				
Foreign	30.69	29.90	32.31	37.28
Local	7.84	9.87	10.59	12.08
Total	38.53	39.77	42.91	49.36
Maximum:				
Foreign	30.69	32.90	35.31	40.28
Local	7.84	9.87	10.59	12.08
Maximum	38.53	42.77	45.91	52.36
O&M Cost:	Rs./kWh			
Min	0.42	0.43	0.47	0.54
Max	0.42	0.47	0.50	0.57

23.9 The instant request of the Petitioner for O&M does not match with the already submitted information by the Petitioner. The Petitioner requested annual US$ 29 million on account of cost of O&M contractor who shall be responsible for the operation & maintenance of the plant during the operational phase except for the LTSA part for which LTSA contractor shall be responsible. According to the Petitioner, bidding process for selection of O&M contractor has been initiated which has yet to be finalized. The Petitioner requested annual US$ 14.38 million on account of LTSA contractor 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. 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

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the request of the Petitioner for O&M contract cost and LTSA cost subject to adjustment at COD as per the signed LTSA Agreement and O&M Contract. However, LTSA cost not covered in the LTSA Agreement seems unjustified as it should either be covered in the LTSA Agreement or in the O&M Agreement scope, therefore, the same has been set aside. In the light of above approvals, summary of the O&M budget is provided hereunder:

Description	V O&M	F O&M	Total
	US$	US$	US$
LTSA	7,419,048	6,960,000	14,379,048
O&M Operator Fee – Foreign	20,711,941	7,058,879	27,770,820
O&M Operator Fee – Local	-	1,245,685	1,245,685
Company's OH cost	-	5,000,000	5,000,000
Total O&M Budget	**28,130,989**	**20,264,564**	**48,395,553**

23.10 Accordingly, Variable O&M component of Rs.0.3169/kWh on gas and Rs.0.4572/kWh on HSD (100% foreign) and Fixed O&M component of Rs. 0.2100/kW/h comprising local O&M component of Rs. 0.0.0647/kW/h and foreign O&M component of Rs. 0.1453/kW/h have been determined for the proposed project.

24. Whether the Insurance Cost is justified?

24.1. The Petitioner requested insurance cost component of Rs.0.0790/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 coverall risk insurance/reinsurance for the Project, as well as business- interruption insurance which is a lender-stipulated requirement.

24.2. 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 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 of the Authority 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.0.0574/kW/h and approved as such. The insurance cost

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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.

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

25.1. The Petitioner requested working capital cost component of Rs. 0.0895/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 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.

25.2. According to request of the Petitioner, payment cycle of 60 days has been assumed 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% has been assumed subject to adjustment as per actual arrangement finalized in the GSA. As approved under the issue of HSD inventory, 7 days inventory at 60% load has been included in the cost of working capital. Accordingly, on the basis of 3 months KIPBOR 6.36% +2% premium, cost of working capital works out Rs. 0.0970/kWh/h and the same is being approved.

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

26.1. The Petitioner requested the return on equity (ROE) component of Rs. 0.5561/kW/h. The equity contribution of the project shall be provided by the Government of Punjab. 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 expected equity utilization up to COD and 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.

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26.2. The Petitioner requested the debt servicing component of Rs. 1.1086/kW/h. The Petitioner assumed 100% debt from local banks and financial institutions. Habib Bank Limited and National Bank of Pakistan are acting as the Lead Arrangers. 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 6.36% plus a premium of 3%.

26.3. The request of the petitioner is in line with the decision of the Authority in similar cases and accepted as such. Accordingly ROE component of Rs. 0.4481 /kW/h and Debt servicing component of Rs. 0.9281 /kW/h has been worked out on the basis of revised project cost of US$ 769.976 million and debt equity ratio of 75:25. The 3% premium over KIBOR shall be subject to adjustment as per actual and saving in premium shall be shared between the power purchaser and the power producer in the ratio of 60:40. 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 during the construction period at the time of COD.

27. SUMMARY OF PROJECT COST & TARIFF

27.1. 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
EPC cost:	**553.710**
Offshore EPC Cost	424.020
Onshore EPC Cost	115.240
Items not covered in the EPC contract scope:	14.450
Combustion Monitoring System	0.500
BOP Spares	1.710
Site Housing Complex with recreational facilities	2.020
Auditorium	0.900
Plant Simulator System & Tranining	2.300
Fuel Gas Treatment Plant	2.000
Buffer Vessel	4.250
Acquisition of Land	0.770
Non EPC Cost:	**53.171**
Engineering consultancy	10.000
O&M mobilization	6.000

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Land Cost	2.000
Insurance during construction	5.537
Security Surveillance	8.257
Administrative Expenses during construction	10.508
Testing & Commissioning	10.869
Customs Duties &Cess	25.653
LTSA Initial Spare Parts	20.880
Gas Pipeline Cost	13.600
One month LNG Escrow Account	35.772
CAPEX	**702.786**
Financing Fees & Charges	18.448
Interest During Construction	48.742
Total Project Cost	**769.976**

TARIFF ON COMBINED CYCLE

Description	RLNG	HSD
Energy Charge (Rs./kWh):		
Fuel cost component	4.5101	8.4527
Variable O&M	0.3169	0.4572
Total	**4.8270**	**8.9099**
Capacity Charge (Rs./kW/hour):		
Fixed O&M (Local)	0.0647	0.0647
Fixed O&M (Foreign)	0.1453	0.1453
Cost of working capital	0.0970	0.0970
Insurance	0.0574	0.0574
Return on Equity	0.4481	0.4481
Debt servicing (1-10 years only)	0.9281	0.9281
Total 1-10 years	1.7405	1.7405
Total 11-30 years	0.8125	0.8125
Avg. Tariff 1-10 years @ 92% (Rs./kWh)	6.7189	10.8018
Avg. Tariff 11-30 years @ 92% (Rs./kWh)	5.7101	9.7930
Levelized tariff (Rs./kWh)	**6.3676**	**10.4506**
Levelized tariff (Cents/kWh)	**6.0644**	**9.9529**

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TARIFF ON SIMPLE CYCLE RLNG

Description	Rs./kWh
Fuel cost component	7.0377
Variable O&M	0.3169
Fixed O&M (Local)	0.0647
Fixed O&M (Foreign)	0.1453
Cost of working capital	0.0970
Total	7.6616

28. ADJUSTMENT/INDEXATIONS

28.1. 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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29. ORDER

I. The Authority hereby determines and approves the following generation tariff for Quaid-e-Azam Thermal Power (Private) Limited for its 1,156.675 MW (net) Power Project on RLNG/HSD at Bhikki 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
Capacity Charges (Rs./kW/hr):			
Fixed O&M (Local)	0.0647	0.0647	CPI (General)
Fixed O&M (Foreign)	0.1453	0.1453	US CPI &Rs./US$
Cost of working capital	0.0970	0.0970	KIBOR and Fuel Price
Insurance	0.0574	0.0574	Actual subject to maximum limit
ROE	0.4481	0.4481	Rs./US$
Debt Servicing	0.9281	-	KIBOR
Total	**1.7405**	**0.8125**	
Energy Charge RLNG (Rs./kWh):			
Fuel cost Component	4.5101	4.5101	Fuel Price
Variable O&M (Foreign)	0.3169	0.3169	US CPI &Rs./US$
Total	**4.8270**	**4.8270**	
Energy Charge HSD (Rs./kWh):			
Fuel cost Component	8.4527	8.4527	Fuel Price
Variable O&M (Foreign)	0.4572	0.4572	US CPI &Rs./US$
Total	**8.9099**	**8.9099**	

The Reference Tariff Tables and Debt Service Schedule are attached as Annexure to this determination

Simple Cycle Operation RLNG

Description	Rs./kWh	Adjustment/Indexation
Fuel cost component	7.0377	Fuel Price
Variable O&M (Foreign)	0.3169	US CPI &Rs./US$
Fixed O&M (Local)	0.0647	CPI (General)
Fixed O&M (Foreign)	0.1453	US CPI &Rs./US$
Cost of working capital	0.0970	KIBOR and Fuel Price
Total	**7.6616**	

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II. <u>One Time Adjustment of at COD</u>

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$ 424.02 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$ 14.45 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$ 25.653 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$ 8.257 million for Security & Surveillance cost.

vi) Adjustment as per actual with maximum of US$ 10.508 million for Administrative cost.

vii) Adjustment as per actual with maximum of US$ 13.60 million for gas pipeline cost.

viii) Adjustment as per actual of US$ 18.448 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 and actual recurring administrative expenses.

III. <u>Adjustment due to Variation in Net Capacity</u>

The reference tariff has been determined on the basis of guaranteed net capacity of 1,156.675 MW with auxiliary consumption of 1.99% (23.455 MW). All the tariff components of capacity charge shall be adjusted at the time of COD based upon

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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$ 5.537million 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

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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 1st July, 1st October, 1st January and 1st 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;

Δ I	=	P$_{(REV)}$* (KIBOR$_{(REV)}$ - 6.36%) /4
Where:		
Δ I	=	The variation in interest charges applicable corresponding to variation in 3 months KIBOR. Δ I can be positive or negative depending upon whether KIBOR$_{(REV)}$ is> or <6.36%. The interest payment obligation will be enhanced or reduced to the extent of ΔI 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 1st 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. 46.2134/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 75:25. Minimum equity requirement is 20%. There will be no limit on the maximum

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amount of equity; however, equity exceeding 30% of the total project cost will be treated as debt.

iv) Interest income, if any, on Escrow Account shall be credited to the power purchaser through adjustment against the outstanding payments.

v) The plant availability shall be 92%.

vi) The tariff control period shall be 30 years from the date of commercial operation.

vii) 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.

viii) 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.

ix) The dispatch will be at appropriate voltage level mutually agreed between the power purchaser and the power producer.

x) The dispatch shall be in accordance with economic merit order.

xi) 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.

xii) 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.

xiii) This tariff determination shall supersede the interim tariff issued on 22nd February 2016.

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xiv) General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the Power Purchase Agreement.

30. 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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Quaid-e-Azam Thermal Power (Pvt) Limited

Refrence Tariff Table RLNG

Year	Energy Purchase Price (Rs./kWh)			Capacity Purchase Price (PKR/kW/Hour)									Total Tariff	
	Fuel	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	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.3810	0.5470	1.7405	1.8919	6.7189	6.3989
2	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.4180	0.5101	1.7405	1.8919	6.7189	6.3989
3	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.4585	0.4696	1.7405	1.8919	6.7189	6.3989
4	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.5029	0.4251	1.7405	1.8919	6.7189	6.3989
5	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.5517	0.3764	1.7405	1.8919	6.7189	6.3989
6	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.6052	0.3229	1.7405	1.8919	6.7189	6.3989
7	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.6638	0.2642	1.7405	1.8919	6.7189	6.3989
8	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.7282	0.1999	1.7405	1.8919	6.7189	6.3989
9	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.7988	0.1293	1.7405	1.8919	6.7189	6.3989
10	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.8762	0.0519	1.7405	1.8919	6.7189	6.3989
11	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
12	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
13	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
14	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
15	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
16	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
17	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
18	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
19	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
20	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
21	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
22	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
23	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
24	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
25	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
26	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
27	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
28	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
29	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	5.7101	5.4382
Average														
1-10	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.5984	0.3296	1.7405	1.8919	6.7189	6.3989
11-30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.0000	0.0000	0.8125	0.8831	5.7101	5.4382
1-30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.1995	0.1099	1.1218	1.2194	6.0464	5.7585
Levelized														
1-30	4.5101	0.3169	4.8270	0.0647	0.1453	0.0970	0.0574	0.4481	0.3629	0.2420	1.4174	1.5407	6.3676	6.0644

6.3676 Rs./kWh 6.0644 US Cents/kWh

Quaid-e-Azam Thermal Power (Pvt) Limited
Reference Tariff Table HSD

Year	Energy Purchase Price (Rs./kWh)			Capacity Purchase Price (PKR/kW/Hour)									Total Tariff	
	Fuel	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	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.3810	0.5470	1.7405	1.8919	10.8018	10.2874
2	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.4180	0.5101	1.7405	1.8919	10.8018	10.2874
3	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.4585	0.4696	1.7405	1.8919	10.8018	10.2874
4	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.5029	0.4251	1.7405	1.8919	10.8018	10.2874
5	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.5517	0.3764	1.7405	1.8919	10.8018	10.2874
6	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.6052	0.3229	1.7405	1.8919	10.8018	10.2874
7	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.6638	0.2642	1.7405	1.8919	10.8018	10.2874
8	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.7282	0.1999	1.7405	1.8919	10.8018	10.2874
9	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.7988	0.1293	1.7405	1.8919	10.8018	10.2874
10	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.8762	0.0519	1.7405	1.8919	10.8018	10.2874
11	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
12	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
13	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
14	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
15	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
16	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
17	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
18	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
19	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
20	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
21	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
22	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
23	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
24	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
25	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
26	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
27	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
28	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
29	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
30	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	-	-	0.8125	0.8831	9.7930	9.3267
Average														
1-10	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.5984	0.3296	1.7405	1.8919	10.8018	10.2874
11-30	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.0000	0.0000	0.8125	0.8831	9.7930	9.3267
1-30	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.1995	0.1099	1.1218	1.2194	10.1293	9.6470
Levelized														
1-30	8.4527	0.4572	8.9099	0.0647	0.1453	0.0970	0.0574	0.4481	0.3629	0.2420	1.4174	1.5407	**10.4506**	**9.9529**

Levelized Tariff = 10.4506 Rs./kWh 9.9529 US Cents/kWh

Quaid-e-Azam Thermal Power (Pvt) Limited

Debt Service Schedule

Gross Capacity	1180.13	MWs	US$/PKR Parity	105.00	
Net Capacity	1156.68	MWs	Debt	577.48	US$ Million
KIBOR	6.36%		Debt in Pak Rupees	60,635.61	Rs. Million
Spread over KIBOR	3.00%				
Total Interest Rate	9.36%				

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	60,635.61	931.99	1,418.87	59,703.62	2,350.86			
2	59,703.62	953.80	1,397.06	58,749.82	2,350.86			
3	58,749.82	976.12	1,374.75	57,773.71	2,350.86			
4	57,773.71	998.96	1,351.90	56,774.75	2,350.86	0.3810	0.5470	0.9281
1st Year		3,860.86	5,542.59		9,403.45			
5	56,774.75	1,022.33	1,328.53	55,752.42	2,350.86			
6	55,752.42	1,046.26	1,304.61	54,706.16	2,350.86			
7	54,706.16	1,070.74	1,280.12	53,635.42	2,350.86			
8	53,635.42	1,095.79	1,255.07	52,539.63	2,350.86	0.4180	0.5101	0.9281
2nd Year		4,235.12	5,168.33		9,403.45			
9	52,539.63	1,121.43	1,229.43	51,418.20	2,350.86			
10	51,418.20	1,147.68	1,203.19	50,270.52	2,350.86			
11	50,270.52	1,174.53	1,176.33	49,095.99	2,350.86			
12	49,095.99	1,202.02	1,148.85	47,893.97	2,350.86	0.4585	0.4696	0.9281
3rd Year		4,645.66	4,757.79		9,403.45			
13	47,893.97	1,230.14	1,120.72	46,663.83	2,350.86			
14	46,663.83	1,258.93	1,091.93	45,404.90	2,350.86			
15	45,404.90	1,288.39	1,062.47	44,116.51	2,350.86			
16	44,116.51	1,318.54	1,032.33	42,797.98	2,350.86	0.5029	0.4251	0.9281
4th Year		5,095.99	4,307.45		9,403.45			
17	42,797.98	1,349.39	1,001.47	41,448.59	2,350.86			
18	41,448.59	1,380.96	969.90	40,067.63	2,350.86			
19	40,067.63	1,413.28	937.58	38,654.35	2,350.86			
20	38,654.35	1,446.35	904.51	37,208.00	2,350.86	0.5517	0.3764	0.9281
5th Year		5,589.98	3,813.46		9,403.45			
21	37,208.00	1,480.19	870.67	35,727.80	2,350.86			
22	35,727.80	1,514.83	836.03	34,212.97	2,350.86			
23	34,212.97	1,550.28	800.58	32,662.69	2,350.86			
24	32,662.69	1,586.55	764.31	31,076.14	2,350.86	0.6052	0.3229	0.9281
6th Year		6,131.86	3,271.59		9,403.45			
25	31,076.14	1,623.68	727.18	29,452.46	2,350.86			
26	29,452.46	1,661.67	689.19	27,790.78	2,350.86			
27	27,790.78	1,700.56	650.30	26,090.22	2,350.86			
28	26,090.22	1,740.35	610.51	24,349.87	2,350.86	0.6638	0.2642	0.9281
7th Year		6,726.26	2,677.18		9,403.45			
29	24,349.87	1,781.07	569.79	22,568.80	2,350.86			
30	22,568.80	1,822.75	528.11	20,746.05	2,350.86			
31	20,746.05	1,865.40	485.46	18,880.64	2,350.86			
32	18,880.64	1,909.05	441.81	16,971.59	2,350.86	0.7282	0.1999	0.9281
8th Year		7,378.29	2,025.16		9,403.45			
33	16,971.59	1,953.73	397.14	15,017.86	2,350.86			
34	15,017.86	1,999.44	351.42	13,018.42	2,350.86			
35	13,018.42	2,046.23	304.63	10,972.19	2,350.86			
36	10,972.19	2,094.11	256.75	8,878.07	2,350.86	0.7988	0.1293	0.9281
9th Year		8,093.51	1,309.93		9,403.45			
37	8,878.07	2,143.11	207.75	6,734.96	2,350.86			
38	6,734.96	2,193.26	157.60	4,541.70	2,350.86			
39	4,541.70	2,244.59	106.28	2,297.11	2,350.86			
40	2,297.11	2,297.11	53.75	0.00	2,350.86	0.8762	0.0519	0.9281
10th Year		8,878.07	525.37		9,403.45			