



Registrar

# National Electric Power Regulatory Authority

## Islamic Republic of Pakistan

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

No. NEPRA/TRF-281/PGPL-2014/15839-15341

November 2, 2015

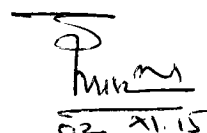
**Subject: Decision of the Authority in the matter of Motion for Leave for Review against the Decision of the Authority dated 31.03.2015 regarding Tariff Petition filed by Pakgen Power Ltd. for Coal Conversion of its Existing RFO Based Power Plant of 365 MW [Case # NEPRA/TRF-281/PGPL-2014]**

Dear Sir,

This is in continuation of this office letter No. NEPRA/TRF-281/PGPL-2014/4551-4553 dated 31<sup>st</sup> March, 2015 whereby Determination of the Authority in the Matter of Tariff Petition filed by Pakgen Power Ltd. for Coal Conversion of its Existing RFO Based Power Plant of 365 MW was sent to the Federal Government for notification in the official Gazette.

2. Please find enclosed herewith the subject decision of the Authority along with Annex-I and II (22 pages) in the matter of Motion for Leave for Review filed by Pakgen Power Ltd. against Determination of the Authority dated 31<sup>st</sup> March, 2015.
3. The Decision is being intimated to the Federal Government for the purpose of notification in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997).
4. Order of the Authority along with 2 Annexes (Annex-I & Annex-II) of the Decision needs to be notified in the official Gazette.

Enclosure: As above

  
( 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.



**DECISION OF THE AUTHORITY IN THE MATTER OF MOTION FOR LEAVE FOR  
REVIEW AGAINST THE DECISION OF THE AUTHORITY DATED 31-03-2015  
REGARDING TARIFF PETITION FILED BY PAKGEN POWER LIMITED FOR COAL  
CONVERSION OF ITS EXISTING RFO BASED POWER PLANT OF 365 MW**

**1. BACKGROUND**

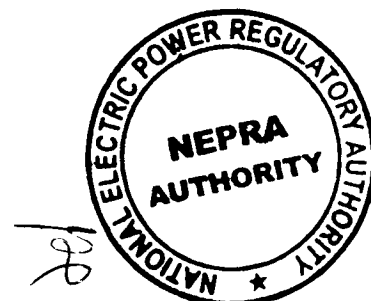
- 1.1 The Authority vide its decision No. NEPRA/TRF-281/PGPL-2014/4551-4553 dated 31<sup>st</sup> March 2015 determined the tariff in the matter of petition filed by Pakgen Power Limited (hereinafter referred to as "PGPL" or the "Petitioner") for coal conversion of its existing RFO based power plant of 365 MW (hereinafter referred to as the "Tariff Determination"). PGPL vide its letter dated 11<sup>th</sup> April 2015 filed a Motion for Leave for Review (hereinafter referred to as "Review Motion") against the Tariff Determination in terms of Rule 16(6) of the Tariff Standards & Procedure Rules, 1998 (the "Tariff Rules") read with NEPRA Review Procedure Regulations, 2009 (the "Review Regulations"). The Authority admitted the Review Motion on April 28, 2015. Comparison of requested and allowed tariff, project cost and efficiency is provided hereunder:

Description	Requested	Approved
<b>Project Cost:</b>	<b>US\$ Million</b>	<b>US\$ Million</b>
CAPEX	262.00	194.714
Customs Duties & Cess	-	7.733
Financing Fee & Charges	13.75	5.314
IDC	12.60	7.723
Total	288.35	215.485
<b>Efficiency</b>	<b>35.60%</b>	<b>36.63%</b>
<b>Tariff:</b>	<b>Cents/kWh</b>	<b>Cents/kWh</b>
1-10 Years Average	8.6314	7.5458
11-20 Years Average	6.5496	6.3740
1-20 Years Levelized	7.9589	7.1672

**2. GROUNDS FOR REVIEW MOTION**

The petitioner filed the review on the following grounds:

- The difference of US\$ 18 million between the disallowed EPC cost of US\$ 67 million and maximum reduction in the renegotiated EPC cost of US\$ 49 million may be allowed.





- The disallowed non-EPC cost of US\$ 14 million for land and its development, project development and construction management is inevitable component of the CAPEX and requested to be allowed.
- In the original tariff petition US\$ 18 million on account of insurance, commissioning & testing and emergency spare parts were omitted to be claimed and requested to allow the same.
- Requested to allow heat rate on 36.5% thermal efficiency with provision for European boiler cost, degradation factors and part load adjustment factors.
- Recalculation of working capital cost on the reference RFO price of Rs. 2843.50/ton instead of Rs. RFO price of 70,000/ton.
- Revision in construction period to 36 months for completion of the project.
- Requested to allow the omitted non-escalable component of existing tariff.
- True up of ROE and debt servicing at COD on actual debt to equity ratio ranging from 80:20 to 70:30.
- Requested to allow the additional fixed O&M cost.
- Requested to allow the additional insurance during operation
- Clarification on tax clause.

### **3. HEARING**

- 3.1 In order to give an opportunity of being heard to the Petitioner and to reach an informed decision, the Authority decided to hold a hearing on 16<sup>th</sup> June 2015 at NEPRA Tower, Islamabad. Individual notices were issued to all concerned. The hearing was held as per schedule and the representatives of the Petitioners, the power purchaser and Private Power Infrastructure Board (PPIB) attended the hearing.

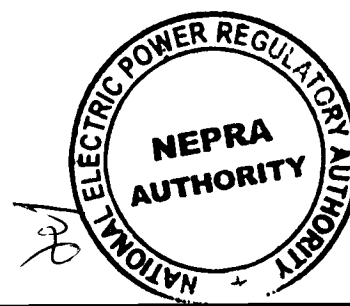
### **4. ANALYSIS OF THE ISSUES**

- 4.1 The analysis and decision of the Authority on the issues/grounds for review is provided in the succeeding paragraphs:

### **5. CAPITAL COST**

- 5.1 Regarding the capital cost, the Petitioner submitted the following:

- i. The Authority reduced the EPC price by US\$ 67 million which made the



project unviable. EPC price was renegotiated with the Contractor which resulted in reduction of US\$ 49 million due to discount of US\$ 24 million and elimination of FGD of US\$ 25 million. Therefore, the difference of US\$ 18 million (US\$ 67 million - US\$ 49 million) on account of EPC Cost may be allowed.

- ii. The Authority has also inadvertently ignored the non-EPC cost of US\$ 14 million for land and its development, project development and construction management which is inevitable component of the CAPEX.
- iii. Additionally, the Petitioner inadvertently omitted to claim the following costs in the original tariff petition and requested to allow the same in the review:
  - Insurance during construction of US\$ 3 million
  - Emergency Spare Parts US\$ 5 Million
  - Commissioning & Testing Cost US\$ 10 Million

5.2 The Petitioner vide letter dated 8<sup>th</sup> June 2015, in supersession of the above submissions made in the review petition, requested to allow 55% of CAPEX of US\$ 1.16 million/MW determined in the Upfront Coal Tariff for coal conversion project.

5.3 The Authority has considered the submissions made by the Petitioner regarding the capital cost and noticed that the Petitioner has mixed up the EPC cost with CAPEX/capital cost and calculated a difference of US\$ 18 million which actually is US\$ 4 million and the rest US\$ 14 million is for non-EPC cost which the Petitioner has requested as separate line item, thereby doubling the request on account of non-EPC cost.

5.4 The Authority determined CAPEX of US\$ 194.714 million (US\$ 0.53 million/MW) for the subject coal conversion project which is 46% of the CAPEX of US\$ 1.16 million/MW for a comparable green field coal power project approved in the upfront coal tariff. The basis of 46% was an Indian Standard Proposal Module wherein 46% of the cost was identified as boiler and auxiliaries, ash and coal handling, electrical and civil works. In the light of review motion, the Standard Proposal Module was revisited and it was found that erection and commissioning cost accounts for 3.83% for a new plant which was omitted in the assessed 46% cost benchmark for conversion. For an existing plant converting to coal, the erection & commissioning cost is likely to be on the lower side as compared to a green field power plant. Therefore, some allowance has to be provided to cater this cost. Accordingly, the Authority has decided to allow US\$ 13.39 million on account of erection & commissioning cost and the CAPEX has been

revised to US\$ 208.104 million against the earlier assessed CAPEX of US\$ 194.714 million for the subject plant of 365 MW. The upward revision in CAPEX shall also revise the customs duties and cess and financial charges. The request of the Petitioner to allow 55% of CAPEX of US\$ 1.16 million/MW determined in the Upfront Coal Tariff for coal conversion project is without any basis and can not be accepted. The summary of the recommended project cost is as under:

Description	US\$ Million
CAPEX	208.104
Customs Duties & Cess	8.265
Financing Fees & Charges	5.680
IDC	8.254
<b>Total Project Cost</b>	<b>230.303</b>

**6. HEAT RATE / DEGRADATION/PARTIAL LOAD & EUROPEAN BOILER COST**

- 6.1 According to the Petitioner, the determined heat rate/efficiency of 36.63% can be obtained if the project company elects European technology equipment on incremental cost as has been provided in the upfront coal tariff. The Petitioner further submitted that the Authority determined the efficiency on the basis of original efficiency parameters of the existing plant taking into consideration the new boiler, turbine and related equipment. According to the Petitioner, the turbine is in operation since 1997 and by the time the coal conversion plant will achieve its COD, it will be in its 20th year of operation. The degradation and natural wear and tear will have an impact on the performance of the turbine and will not be comparable with brand new equipment. The Petitioner requested to appropriately revise the determined efficiency on the basis of wear and tear and degradation. The Petitioner also requested part load adjustment. According to the Petitioner, with incremental cost of US\$ 0.1 million/MW for European Boiler as has been provided in the upfront coal tariff, PGPL is willing to accept the increase in efficiency from 35.6% to 36.49%. By referring the review decision of the Authority dated 21st November 2014 in the matter of upfront coal tariff, the Petitioner also sought a clarification for application of partial load adjustment curves, degradation curves and startup costs as standard practice under the standard Power Purchase Agreement.
- 6.2 The Authority has carefully considered the request of the Petitioner regarding thermal efficiency, degradation, partial load and provision of European boiler. The Petitioner in its earlier communication dated 1<sup>st</sup> April 2015 submitted that it can achieve efficiency of 36.50% provided partial load and degradation is allowed

without requesting for European boiler. In the feasibility study submitted by the Petitioner, the option of European boiler was neither considered nor was any impact analysis carried out for having or not having the European boiler. It is also pointed out that Saba Power, a considerably smaller size project of 136 MW, has already accepted a net LHV efficiency of 36.5% without requesting for the European boiler. Therefore, the Petitioner's request of European boiler is not maintainable.

6.3 While assessing the thermal efficiency in the decision dated 31-3-2015, the Authority considered the impact of degradation/part load adjustment and life cycle efficiency of 36.63% was approved without the provision of degradation and part load adjustment factors. Regarding the part load, the Authority was of the opinion that the plant will be up in the merit dispatch order after conversion to coal and it is likely to be dispatched as base load plant and part load operation will be nominal. However, considering the possibility that the plant may be dispatched on part load due to technical reasons or system limitations and therefore, the part load adjustment is justified. In these circumstances it will be beyond the control of the power producer and accordingly the Authority has decided to allow the part load adjustment. The power purchaser and the power producer will address the matter in the power purchase agreement in line with other PPAs of 2002 on the basis of part load curves provided by the manufacturer. A minor adjustment has been made to the assessed efficiency to bring it to 36.6% in line with the efficiency assessed in the case of Lalpir Power Limited. Regarding the degradation, the Authority has decided to maintain its earlier decision and degradation adjustment will not be allowed.

6.4 On the basis of 36.6% thermal efficiency, coal price of US\$ 129.06/ton, Rs. 97.1/US\$, LHVHHV factor of 1.05 and net LHV Calorific value of 25,555.98 Btu/Kg., the reference fuel cost component works out Rs. 4.5727/kWh and the same is being approved. The reference fuel cost component will be subject to adjustment as per mechanism provided in the order part of this determination.

## 7. WORKING CAPITAL

7.1 The Petitioner requested that instead of adjusting the existing cost of working capital on the assumed fuel price of Rs.70,000/Ton, the base fuel price of Rs.2,843.50/ton should be used as is provided in Schedule-6 of the existing PPA linked with IET factor as provided in Section 15.1 of the existing PPA which in effect is the actual driver of the escalation of the working capital cost component not the fuel price.

7.2 The Authority carefully examined the submission made by the Petitioner regarding the



calculation of existing cost of working capital. The calculation of cost of working capital was based on payment cycle of 60 days, RFO price of Rs. 70,000/ton, GST 17% and interest rate of 13.91% (KIBOR 11.91% plus a premium of 2%). The representative of PPIB during the hearing suggested to ignore the existing cost of working capital in calculation of coal conversion tariff. Power Policy 1994 or the Power Purchase Agreement does not provide for anything about the working capital. However, as per the PPA, company is required to maintain 30 days inventory at full load of fuel and payment of energy invoice shall be made after the 25th day of submission of the invoice. The working capital is an integral part of the project operation and the company has to bear the cost irrespective of the price of fuel and interest rate. The magnitude of this cost depends upon the RFO price and interest rate, both of which have declined as compared to last year at the time of filing of the tariff petition. Therefore, at present the working capital requirement of the company is less as compared to last year. Since the Power Policy and PPA do not provide for basis of calculation of cost of working capital, it is justified to calculate the cost on the basis of inventory and receivable requirement. Therefore, the company's request to base the working capital on reference RFO price of Rs.2,843.50/ton along with indexation factor of escalable component do not merit consideration. In an identical case of Saba Power, the Petitioner requested to base the working capital on current price and current KIBOR and the same has been accepted. Accordingly in the instant case, the Authority has decided to calculate working capital on similar basis.

- 7.3 On the basis of applicable RFO price of Rs. 48,290/ton (including transportation cost of Rs. 4,025/ton) dated 20<sup>th</sup> May 2015, GST of 17%, KIBOR of 7.53% plus a premium of 2% and a payment cycle of 55 days, the revised cost of working capital works out Rs. 0.1863/kW/h instead of earlier determined cost of working capital of Rs. 0.43/kW/h. This cost of working capital shall be applied as reduction to escalable component (Rs. 1.1160/kW/h) to determine the applicable net escalable component of capacity charge (Rs. 0.9297/kW/h).
- 7.4 Since the plant will be required to be available for dispatch on RFO during the construction phase except for the last six months when the existing power plant will be completely shut down, therefore, the appropriate day for calculation of cost of working capital shall be the last day before complete shutdown of the plant for coal conversion. Therefore, the assessed existing cost of working capital of Rs. 0.1863/kW/h shall be trued up at the time of COD on the basis of RFO price, KIBOR and GST prevailing on





the last day of the plant operation on RFO before complete shutdown of the plant for coal conversion.

**8. CONSTRUCTION PERIOD**

8.1 According to the Petitioner, the Authority determined 24 months as construction period including the down time of six (6) months in accordance with the Para 2 of Memorandum of Understanding (MOU) executed among the NTDC and IPPs. According to the Petitioner, the agreed construction period in the MOU had no scientific or technical basis and was imposed upon the IPPs in unusual circumstances without any prior meaningful consultation. According to the Petitioner, the 24 months construction time is unrealistic and will render the project execution unviable. The Petitioner requested 36 months for construction of the project.

8.2 The Legal Counsel of the Petitioner vide Letter dated 8<sup>th</sup> June 2015 further submitted that since the basis of the construction period is germane to the understanding in pursuance of the aforesaid MOU, therefore, the Petitioner has decided to take up this matter with the GoP/NTDC for reconsideration of the construction period.

8.3 The Authority has decided to maintain its earlier decision regarding the construction period.

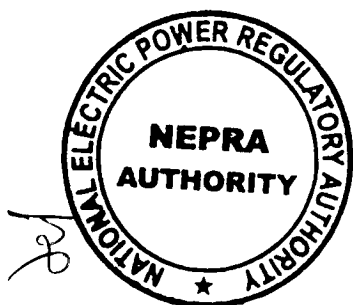
**9. TRUE UP OF ROE AND DEBT SERVICING**

9.1 The Petitioner requested true up of ROE and debt servicing at COD on the basis of actual drawdown, project cost and actual debt to equity ratio ranging from 80:20 to 70:30.

9.2 The request of the Petitioner is in line with the earlier decisions of the Authority and is accepted.

**10. FIXED O&M**

10.1 According to the Petitioner, the Authority disallowed the additional O&M of Rs. 0.0438/kW/h during the existing term of the PPA. The Petitioner submitted that the fixed O&M component for coal and RFO cannot be compared. The incremental O&M was sought to recover the additional costs associated with coal handling and various stages of solid fuel processes before it is conveyed to the boiler for combustion involving blending of coal stockpiles, maintenance of mechanized,







equipment for coal stacking, reclaiming, conveying, sampling, crushing into grade size, screening, gravity separation etc. More frequent cleaning for soot and ash slagging. According to the Petitioner, the older equipment is being committed for extended life of 15 years beyond the design life of 30 years, therefore, would require extra repairs, refurbishment and replacements. According to the Petitioner, this will require extra human resource and mechanized equipment to ensure reliable and seamless plant operation. The Petitioner submitted that the additional O&M is just and reasonable in the given circumstance and may kindly be allowed. The Petitioner also submitted that the Authority recognized higher auxiliary consumption in coal as compared to RFO but same has not been translated in determining the incremental O&M cost for the additional machinery, processes and extra sizing of the equipment.

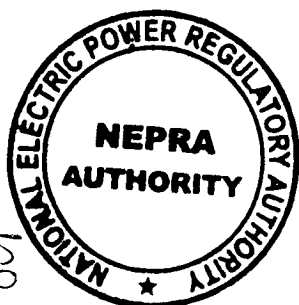
10.2 The Authority disallowed the additional O&M on the basis that lesser maintenance will be required on the new equipment as compared to older equipment, therefore, in the absence of any fresh and valid ground supported by acceptable evidence, the earlier decision of the Authority is maintained.

#### 11. INSURANCE DURING OPERATION

11.1 According to the Petitioner, the two revenue streams are perceived by the insurance provider as an incremental risk for which additional amount is required for insurance coverage, which however, has been disallowed by the Authority. The Petitioner further submitted that after discussion with the insurance provider, the additional insurance cost has been revised from Rs. 0.0617/kW/h to Rs. 0.0208/kW/h and requested to allow the same.

11.2 The Petitioner also requested that Post coal conversion period, the insurance component at actual subject to the maximum of 1% of 70% of the Capital Cost should be allowed consistent with the order of the upfront tariff determination dated 26 June 2014 for 220MW.

11.3 The Authority did not allow the additional insurance on the basis that the existing insurance is sufficient to cover the insurance risks. In a similar case, the Saba Power has accepted the Authority's determination on the issue of additional insurance and did not raise the issue in the review petition. Moreover, regarding the second request, it seems that the Petitioner could not understand the calculation and mechanism of adjustment of insurance cost post coal conversion. The allowed





insurance cost is exactly in line with the determination of the Authority in the matter of upfront coal tariff. Therefore, in absence of any fresh and valid ground supported by evidence, the Authority has decided to maintain its earlier decision regarding cost of insurance during construction.

## 12. NON-ESCALABLE COMPONENT

12.1 According to the Petitioner, the non-escalable component of Rs. 0.0066/kW/hour was inadvertently omitted in the tariff petition and may kindly be allowed.

12.2 According to the reference tariff table at financial close, the outstanding non-escalable component (NEC) is Rs. 4.3487/kW/Month from year 21 to year 30 of the existing PPA. On the basis of average 730 hours in a year, the NEC corresponds to Rs. 0.0060/kW/hour. This cost being legitimate under the existing PPA is allowed as such

## 13. COST OF LIMESTON

13.1 The Petitioner during the course of hearing indicated that in the proposed technology, limestone will not be used and the cost of limestone of 9 Paisa/kWh will either be eliminated or will be minimal. According to the Petitioner the cost of limestone may be deleted from the tariff.

13.2 In accordance with the submissions of the petitioner, the cost of limestone is eliminated from the tariff. However, if during the operation of the plant, limestone is used, the actual per unit cost shall be paid subject to maximum as allowed in the upfront coal tariff.

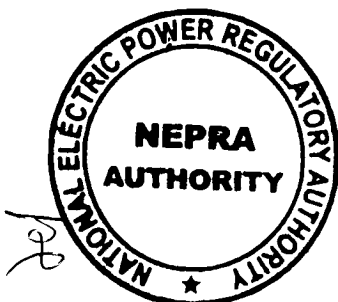
## 14. CLARIFICATIONS

14.1 The petitioner has referred to the Para 56(II) of the determination dated 26<sup>th</sup> June 2014 and requested to clarify/allow the same to the Petitioner.

14.2 Taxes will be dealt as per Para VII(vi) of the Order of the Authority.

## 15. COMMENTS

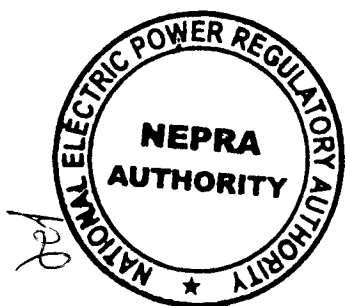
15.1 Whistleblower Pakistan vide its letter dated 2nd July 2015 received on 7th July 2015 forwarded following comments



- i. The commentator objected the rejection of the intervention request by the Authority being time barred. The commentator referred the case of the admission of the time barred reconsideration request of the GOP in the matter of coal upfront tariff and submitted that the rejection tantamount to blowing hot and cold in the same breath.
- ii. There is no firm proposal/agreement of inland coal transportation.
- iii. The RFO prices are quite low these days.
- iv. NEPRA made its decision on the basis of financial analysis while no economic analysis of the proposed project is given.
- v. The efficiency is lower.
- vi. Hidden costs such as export credit agency fee or sinosure fee may result in higher actual tariff at COD.
- vii. The adjustment of limestone and ash handling at the time of COD provides an opening for increase in tariff.
- viii. 9% auxiliary consumption means reduction in capacity.
- ix. Transportation cost will also increase the tariff.

15.2 The commentator submitted that the above are preliminary observations and that the conversion of the old in-efficient plant is not feasible at all and NEPRA has taken its decision on the basis of financial analysis which is neither wise nor correct. NEPRA should not only reject this motion for leave for review but also withdraw the already given determination in the matter.

15.3 The comments submitted by the commentator have been looked into. Although the intervention request was rejected being time barred but the issues raised were taken as comments in the proceedings. The referred time barred reconsideration request of the GOP in the matter of coal upfront tariff was different case and detailed reasoning for accepting the said reconsideration request was provided in the decision of the Authority dated 26<sup>th</sup> June 2014. On the issue of lower prevailing RFO prices these days, conversion of the plant to coal justifies as it will bring substantial saving for the sector. 9% Auxiliary consumption, sinosure fee and cost of ash handling are in line with the decision of the Authority in the matter of upfront coal tariff dated 26<sup>th</sup> June 2014 and will not bring additional costs. Cost of lime stone has been removed from the tariff. So far as the coal transportation is concerned, it is the sole responsibility of the power



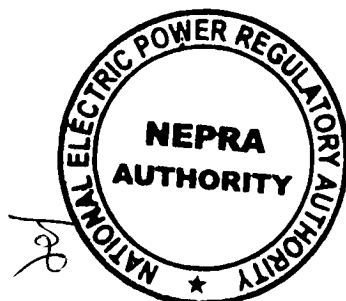


producer to arrange a reliable mode of transportation of coal from port to the plant site and unless the plant is available for dispatch, the power producer will not be able to get a penny from the power purchaser.

## 16. SUMMARY OF TARIFF

16.1 On the basis of the foregoing discussions, the Summary of tariff is provided hereunder:

Tariff Components	1-10 Years	11-25 Years	Indexation
<b>Capacity Charges (Rs./kW/hr):</b>			
Fixed O&M (Local)	-	0.1535	CPI (General)
Fixed O&M (Foreign)	-	0.1535	US CPI &Rs./US\$
Insurance	-	0.0988	Actual with subject to maximum limit
Cost of working capital	0.2447	0.2445	KIBOR & Weighted average cost of coal
ROE	0.3918	0.3666	Rs./US\$
Debt Servicing	0.7343	-	KIBOR &Rs./US\$
Existing capacity charges:			
Escalable Component	0.9297	-	US CPI &Rs./US\$
Non-Escalable Component	0.0060	-	Nil
<b>Total</b>	<b>2.3065</b>	<b>1.0423</b>	
<b>Energy Charge (Rs./kWh):</b>			
Fuel cost Component	4.5727	4.5688	Weighted average cost of coal
Variable O&M (Local)	0.0456	0.0456	CPI (General)
Variable O&M (Foreign)	0.0684	0.0684	US CPI &Rs./US\$
Ash Handling	0.2200	0.2200	As per actual
<b>Total</b>	<b>4.9067</b>	<b>4.9067</b>	



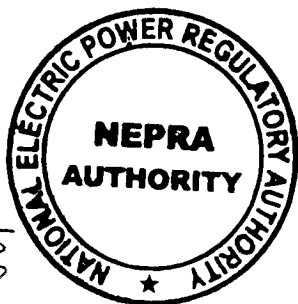


#### 14. ORDER

- I. The Authority hereby determines and approves the following coal tariff and adjustments/indexations for the proposed coal conversion project of Pakgen Power Limited for delivery of electricity to the power purchaser:

Tariff Components	1-10 Years	11-25 Years	Indexation
<b>Capacity Charges (Rs./kW/hr):</b>			
Fixed O&M (Local)	-	0.1535	CPI (General)
Fixed O&M (Foreign)	-	0.1535	US CPI &Rs./US\$
Insurance	-	0.0988	Actual with subject to maximum limit
Cost of working capital	0.2447	0.2445	KIBOR & Weighted average cost of coal
ROE	0.3918	0.3666	Rs./US\$
Debt Servicing	0.7343	-	KIBOR &Rs./US\$
Existing capacity charges:			
Escalable Component	0.9297	-	US CPI &Rs./US\$
Non-Escalable Component	0.0060	-	Nil
<b>Total</b>	<b>2.3065</b>	<b>1.0423</b>	
<b>Energy Charge (Rs./kWh):</b>			
Fuel cost Component	4.5727	4.5688	Weighted average cost of coal
Variable O&M (Local)	0.0456	0.0456	CPI (General)
Variable O&M (Foreign)	0.0684	0.0684	US CPI &Rs./US\$
Ash Handling	0.2200	0.2200	As per actual
<b>Total</b>	<b>4.9067</b>	<b>4.9067</b>	

- i. Since the exact timing of the COD of the proposed coal conversion plant is not



known at this stage, 10 years of the remaining period of the existing PPA has been assumed after the COD. However, the assessed existing escalable component of tariff will remain in force till the expiry of the existing PPA i.e. May 2028. The assessed existing escalable component of tariff will immediately cease on expiry of the existing PPA. Likewise, the fixed O&M and insurance components will be immediately applicable on expiry of the existing PPA.

- ii. The Reference Tariff Table and Debt Service Schedule are attached as Annex-I and Annex-II.

## II. One Time Adjustment at COD

- i. Since the exact timing of payment to EPC contractor is not known at this point of time, therefore, an adjustment for relevant foreign currency fluctuation for the portion of payment in the relevant foreign currency will be made against the reference exchange rate of Rs. 97.1/US\$. In this regard the sponsor will be required to provide all the necessary relevant details along with documentary evidence. The adjustment shall be made only for the currency fluctuation against the reference parity values. The Customs Duties and Cess will be adjusted as per actual.
- ii. The financing fees and charges will be adjusted as per actual with maximum of 3.5% of the debt amount.
- iii. Interest during construction will be reestablished at the time of COD on the basis of actual project financing, actual debt draw downs and actual LIBOR/KIBOR and applicable premiums.
- iv. In case, export credit agency fee or sinosure fee on foreign financing is payable, the benchmark established in the upfront coal tariff will be adopted and appropriate adjustment in the project cost will be made.
- v. The assessed existing cost of working capital of Rs. 0.1863/kW/h shall be trued up at the time of COD on the basis of RFO price, KIBOR and GST prevailing on the last day of the plant operation on RFO before complete shutdown of the plant for coal conversion. The trued up cost of working capital shall be applied as reduction to the existing escalable component of the capacity charge.

- vi. The existing escalable component of Rs. 1.1551/kW/Hour will be subject to US CPI and exchange rate (Rs./US\$) indexation. The reference US CPI is 119.867 and reference exchange rate is Rs.100.575/US\$. The reference US CPI after adjustment at the time of COD will be replaced by US CPI (All Urban Consumers) in line with US CPI indexation applicable to other tariff components. The net existing escalable component shall be re-established on the basis of indexed escalable component, reduced by trued up cost of working capital and appropriate adjustment mechanism shall be incorporated for indexation of escalable component post COD. Non-escalable component of the existing capacity charge will not be subject to indexation.

### III. Adjustment due to Variation in Net Capacity

The reference tariff has been determined on the basis of minimum net capacity of 332.15 MW at delivery point at mean site conditions. All the tariff components of capacity charge shall be adjusted at the time of COD based upon the Initial Dependable Capacity (IDC) tests to be carried out for determination of contracted capacity. Adjustment shall not be made if the net output is established less than 332.15 MW.

### IV. Adjustment in Insurance as per actual

The insurance component post existing PPA will be adjusted annually as per actual with maximum of US\$ 2.9601 million on applicable exchange rate at the start of the coverage period each year post existing PPA. The adjustment mechanism is as under

AIC	=	$\text{Ins}_{(\text{Ref})} / P_{(\text{Ref})} * P_{(\text{Act})}$
Where:		
AIC	=	Adjusted Insurance Component of Tariff
$\text{Ins}_{(\text{Ref})}$	=	Reference Insurance Component of Tariff
$P_{(\text{Ref})}$	=	Reference Premium Rs. 287.42 million.
$P_{(\text{Act})}$	=	Actual Premium or US\$ 2.9601 million on applicable exchange rate at the start of the coverage period each year post existing PPA whichever is lower



**V. Cost of Limestone**

Cost of limestone has not been assumed under the proposed technology arrangement. However, during the course of operation, if the limestone is used in the operation, the per unit cost shall be included in the tariff subject to maximum of the cost allowed under the upfront coal tariff.

**VI. Indexations:**

The following indexations shall be applicable to the reference tariff;

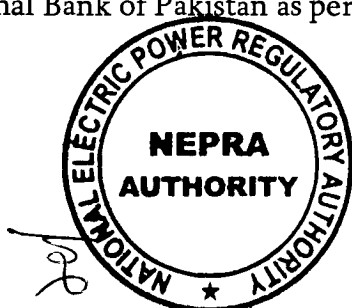
**i) Indexation of Return on Equity (ROE)**

After COD, ROE component of tariff will be quarterly indexed on account of variation in PKR/US\$ parity according to the following formula:

$ROE_{(Rev)}$	=	$ROE_{(Ref)} * ER_{(Rev)} / ER_{(Ref)}$
Where;		
$ROE_{(Rev)}$	=	Revised ROE Component of Tariff
$ROE_{(Ref)}$	=	ROE Component of Tariff established at the time of COD
$ER_{(Rev)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(Ref)}$	=	The reference TT & OD selling rate of RS. 97.1/US\$

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

The O&M component of tariff will be adjusted on account of local Inflation (CPI) and foreign inflation (US CPI) and exchange rate quarterly on 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April based on the latest available information with respect to CPI notified by the Pakistan Bureau of Statistics (PBS), US CPI 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:



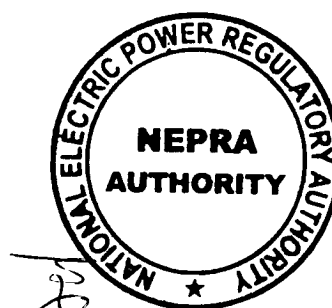




$L V O\&M_{(REV)}$	=	$L V O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
$L F O\&M_{(REV)}$	=	$L F O\&M_{(REF)} * CPI_{(REV)} / CPI_{(REF)}$
$F V O\&M_{(REV)}$	=	$F V O\&M_{(REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$
$F F O\&M_{(REV)}$	=	$F F O\&M_{(REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$
Where:		
$L V O\&M_{(REV)}$	=	The revised Local Variable O&M Component of tariff
$L F O\&M_{(REV)}$	=	The revised Local Fixed O&M Component of tariff
$F V O\&M_{(REV)}$	=	The revised Foreign Variable O&M Component of tariff
$F F O\&M_{(REV)}$	=	The revised Foreign Fixed O&M Component of tariff
$L V O\&M_{(REF)}$	=	The reference Local Variable O&M Component of tariff
$L F O\&M_{(REF)}$	=	The reference Local Fixed O&M Component of tariff
$F V O\&M_{(REF)}$	=	The reference Foreign Variable O&M Component of tariff
$F F O\&M_{(REF)}$	=	The reference Foreign Fixed O&M Component of tariff
$CPI_{(REV)}$	=	The revised Consumer Price Index (General) published by Pakistan Bureau of Statistics
$CPI_{(REF)}$	=	The reference Consumer Price Index (General) for the month of June 2014
$US CPI_{(REV)}$	=	The revised US CPI (All Urban Consumers) published by US Bureau of Labor Statistics
$US CPI_{(REF)}$	=	The reference US CPI (All Urban Consumers) for the month of June 2014
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar published by National Bank of Pakistan
$ER_{(REF)}$	=	The reference TT & OD selling rate of RS. 97.1/US\$

iii) Indexation for LIBOR Variation

The interest part of fixed 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 LIBOR (KIBOR in case of local financing) according to the following formula;



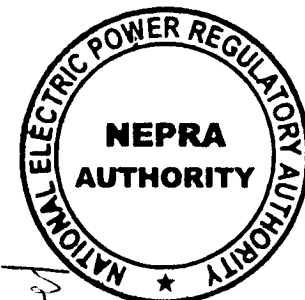
$\Delta I$	=	$P_{(REV)} * (LIBOR_{(REV)} - 0.45\%) / 4$
Where:		
$\Delta I$	=	the variation in interest charges applicable corresponding to variation in 3 months LIBOR. $\Delta I$ can be positive or negative depending upon whether $LIBOR_{(REV)}$ is > or < 0.45%. The interest payment obligation will be enhanced or reduced to the extent of $\Delta I$ for each quarter under adjustment applicable on quarterly basis.
$P_{(REV)}$	=	The outstanding principal (as indicated in the attached debt service schedule to this order) on a quarterly basis on the relevant quarterly calculation date. Period 1 shall commence on the date on which the 1 <sup>st</sup> installment is due after availing the grace period.

#### VI. Fuel Cost Adjustment

During the tariff period the fuel cost shall be calculated according to the following formula on monthly basis;

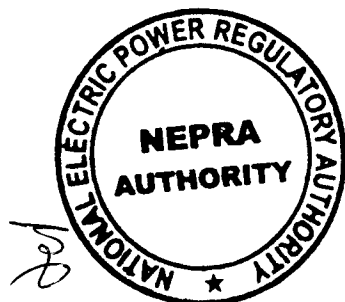
$$\begin{aligned}
 FCC = & \left( \left( (CP_{(RB)} + Ft_{(M)} + MI + OC \pm Premium/Discount) \times \frac{HR}{HV_{(RB)}} \times \right. \right. \\
 & \left. \frac{Q_{(RB)}}{Q_{(T)}} \right) \times FC_{(Exch)} + \left( (CP_{(NCA)} + Ft_{(M)} + MI + OC \pm Premium/Discount) \times \right. \\
 & \left. \frac{HR}{HV_{(NCA)}} \times \frac{Q_{(NCA)}}{Q_{(T)}} \right) \times FC_{(Exch)} + \\
 & \left( (CP_{(NCI)} + Ft_{(M)} + MI + OC \pm Premium/Discount) \times \frac{HR}{HV_{(NCI)}} \times \frac{Q_{(NCI)}}{Q_{(T)}} \right) \times \\
 & FC_{(Exch)} + \left( CP_{(Local)} \times \frac{HR}{HV_{(Local)}} \times \frac{Q_{(Local)}}{Q_{(T)}} \right) + Ft_{(Inland)}
 \end{aligned}$$

Where;





- CP(RB) = Actual Weighted Average Richard Bay (South Africa) coal prices on the basis of Opening Inventory of coal and purchases of coal till the month immediately preceding the invoice month indicated in the Globalcoal
- HV(RB) = Actual Weighted Average Heating Value of the coal imported from South Africa
- CP(NCA) = Actual Average Newcastle (Australia) coal prices on the basis of Opening Inventory of coal and purchases of coal till the month immediately preceding the invoice month indicated in the Globalcoal
- HV(NCA) = Actual Weighted Average Heating Value of coal imported from Australia
- CP(NCI) = Actual Average Newcastle (Indonesia) coal prices on the basis of Opening Inventory of coal and purchases of coal till the month immediately preceding the invoice month indicated in the Globalcoal
- HV(NCI) = Actual Weighted Average Heating Value of coal imported from Indonesia
- CP(Local) = Actual Coal price of local coal expressed in US\$/M.Ton calculated according to the following formula;
- $$CP_{(Local)} = \left( \frac{HV_{(Local)}}{\left( \left( \frac{Q_{(RB)}}{Q_{(T)}} \times HV_{(RB)} \right) + \left( \frac{Q_{(NCA)}}{Q_{(T)}} \times HV_{(NCA)} \right) + \left( \frac{Q_{(NCI)}}{Q_{(T)}} \times HV_{(NCI)} \right) \right)} \right) \times \left( \left( \frac{Q_{(RB)}}{Q_{(T)}} \times CP_{(RB)} \right) + \left( \frac{Q_{(NCA)}}{Q_{(T)}} \times CP_{(NCA)} \right) + \left( \frac{Q_{(NCI)}}{Q_{(T)}} \times CP_{(NCI)} \right) \right)$$
- HV(Local) = Heating Value of Local Coal
- Ft(M) = Actual Weighted Average Contracted Marine Freight per ton from South Africa, Australia and Indonesia
- Q(RB) = Actual quantity of coal (Tons) purchased from South Africa during the month immediately preceding the invoice month
- Q(NCA) = Actual quantity of coal (Tons) purchased from Australia during the month immediately preceding the invoice month
- Q(NCI) = Actual quantity of coal (Tons) purchased from Indonesia during the month immediately preceding the invoice month





- Q(Local) = Actual Quantity of local coal purchased during the month immediately preceding the invoice month
- QT = Total quantity of coal purchased during the month immediately preceding the invoice month
- Ft(Inl) = Actual Inland Freight expressed in Rs./M.Ton
- OC = Other cost include Bunker Fuel, Port Charges, Insurance & common jetty facility in \$/Ton
- FC(Exch) = PKR/\$ exchange rate average for the month

**VII. Terms and Conditions of Tariff:**

The above tariff and terms and conditions, stipulated hereunder, shall be incorporated in the Energy Purchase Agreement between the Power Purchaser and the Power Producer:

- i. Capacity Charge Rs./kW/hour applicable to dependable capacity at the delivery point.
- ii. The tariff is applicable for a period of 25 years commencing from the date of the Commercial Operation.
- iii. Dispatch criterion will be based on the Energy Charge.
- iv. For the new investment, all new equipment will be installed and the plant will be of standard configuration
- v. Auxiliary consumption of 9% has been assumed.
- vi. In case the company is obligated to pay any tax on its income from generation of electricity from coal, 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 pass-through.
- vii. 100% of debt has been assumed to be foreign provided however that in the event the Petitioner uses local loans or a mix of foreign and local loans, the actual cost shall be passed on to the Power Purchaser.
- viii. The minimum availability of the plant will be 86.1%.





- ix. Part load adjustment factors shall be applicable. The applicable factors shall be incorporated in the power purchase agreement in line with other PPAs of coal fired power plants.
- x. Plant degradation shall not be applicable.
- xi. General assumptions, which are not covered in this determination, may be dealt with as per the standard terms of the Power Purchase Agreement.

VIII. The above Order of the Authority along with 2 Annexes will 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.

**AUTHORITY**

(Khawaja Muhammad Naeem)

Member

(Maimayat Ullah Khan)

Member

(Syed Masood-ul-Hassan Naqvi)

Member

(Maj (R) Haroon Rashid)

Vice Chairman

(Brig (R) Tariq Saddozai)

Chairman



02.11.15

**Pakgen Power Limited**  
**Reference Tariff Table Post Coal Conversion**

Annex-I

1	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.4574	0.2769	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
2	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.4804	0.2539	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
3	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.5047	0.2296	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
4	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.5301	0.2042	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
5	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.5568	0.1775	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
6	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.5849	0.1494	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
7	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.6144	0.1199	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
8	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.6454	0.0889	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
9	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.6779	0.0564	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
10	4.5727	0.2200	0.0684	0.0456	4.9067	-	-	0.2447	-	0.3918	0.7121	0.0222	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
11	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
12	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
13	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
14	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
15	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
16	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
17	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
18	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
19	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
20	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
21	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
22	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
23	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
24	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161
25	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	-	-	1.0423	-	-	1.2262	6.1329	6.3161

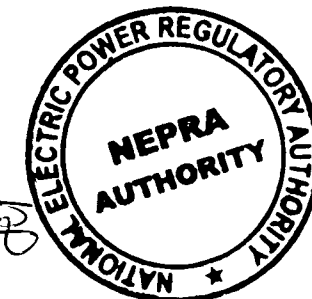
**Average**

1-10	4.5727	0.2200	0.0684	0.0456	4.9067	0.0000	0.0000	0.2447	0.0000	0.3918	0.5764	0.1579	1.3708	0.9297	0.0060	2.7135	7.6202	7.8478
11-25	4.5727	0.2200	0.0684	0.0456	4.9067	0.1535	0.1535	0.2447	0.0988	0.3918	0.0000	0.0000	1.0423	0.0000	0.0000	1.2262	6.1329	6.3161
1-25	4.5727	0.2200	0.0684	0.0456	4.9067	0.0921	0.0921	0.2447	0.0593	0.3918	0.2306	0.0631	1.1737	0.3719	0.0024	1.8211	6.7279	6.9288

**Levelized**

1-25	4.5727	0.2200	0.0684	0.0456	4.9067	0.0496	0.0496	0.2447	0.0319	0.3918	0.3755	0.1216	1.2647	0.6293	0.0041	2.2330	7.1397	7.3530
------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

Levelized Tariff = **7.1397 Rs./kWh**      **7.3530 Cents/kWh**



## Debt Service Schedule

Gross Capacity	365.00	MWs	US\$/PKR Parity	97.10
Net Capacity	332.15	MWs	Equity	25%
LIBOR	0.45%		Debt	75%
Spread over LIBOR	4.50%		Debt in Pak Rupees	16,771.80 PKR Million
Total Interest Rate	4.95%			

Period	Principal Million \$	Principal Repayment Million \$	Interest Million \$	Balaance Million \$	Debt Service Million \$	Principal Repayment Rs./kW/hour	Interest Rs./kW/ Hour	Debt Servicing Rs./kW/h
1	172.73	3.36	2.14	169.36	5.50			
2	169.36	3.40	2.10	165.96	5.50			
3	165.96	3.45	2.05	162.51	5.50			
4	162.51	3.49	2.01	159.02	5.50	0.4574	0.2769	0.7343
1st Year		13.71	8.30		22.00			
5	159.02	3.53	1.97	155.49	5.50			
6	155.49	3.58	1.92	151.91	5.50			
7	151.91	3.62	1.88	148.29	5.50			
8	148.29	3.67	1.84	144.63	5.50	0.4804	0.2539	0.7343
2nd Year		14.40	7.61		22.00			
9	144.63	3.71	1.79	140.91	5.50			
10	140.91	3.76	1.74	137.16	5.50			
11	137.16	3.80	1.70	133.35	5.50			
12	133.35	3.85	1.65	129.50	5.50	0.5047	0.2296	0.7343
3rd Year		15.12	6.88		22.00			
13	129.50	3.90	1.60	125.60	5.50			
14	125.60	3.95	1.55	121.66	5.50			
15	121.66	4.00	1.51	117.66	5.50			
16	117.66	4.04	1.46	113.62	5.50	0.5301	0.2042	0.7343
4th Year		15.88	6.12		22.00			
17	113.62	4.09	1.41	109.52	5.50			
18	109.52	4.15	1.36	105.38	5.50			
19	105.38	4.20	1.30	101.18	5.50			
20	101.18	4.25	1.25	96.93	5.50	0.5568	0.1775	0.7343
5th Year		16.69	5.32		22.00			
21	96.93	4.30	1.20	92.63	5.50			
22	92.63	4.35	1.15	88.28	5.50			
23	88.28	4.41	1.09	83.87	5.50			
24	83.87	4.46	1.04	79.40	5.50	0.5849	0.1494	0.7343
6th Year		17.53	4.48		22.00			
25	79.40	4.52	0.98	74.89	5.50			
26	74.89	4.57	0.93	70.31	5.50			
27	70.31	4.63	0.87	65.68	5.50			
28	65.68	4.69	0.81	60.99	5.50	0.6144	0.1199	0.7343
7th Year		18.41	3.59		22.00			
29	60.99	4.75	0.75	56.25	5.50			
30	56.25	4.80	0.70	51.44	5.50			
31	51.44	4.86	0.64	46.58	5.50			
32	46.58	4.92	0.58	41.65	5.50	0.6454	0.0889	0.7343
8th Year		19.34	2.66		22.00			
33	41.65	4.99	0.52	36.67	5.50			
34	36.67	5.05	0.45	31.62	5.50			
35	31.62	5.11	0.39	26.51	5.50			
36	26.51	5.17	0.33	21.34	5.50	0.6779	0.0564	0.7343
9th Year		20.31	1.69		22.00			
37	21.34	5.24	0.26	16.10	5.50			
38	16.10	5.30	0.20	10.80	5.50			
39	10.80	5.37	0.13	5.43	5.50			
40	5.43	5.43	0.07	(0.00)	5.50	0.7121	0.0222	0.7343
10th Year		21.34	0.66		22.00			

