National Electric Power Regulatory Authority
Islamic Republic of Pakistan

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No. NEPRA/TRF-288/JPCL-2014/10158-10160
July 6, 2015

Subject: **Determination of the Authority in the Matter of Tariff Petition filed by Jamshoro Power Company Ltd. for its 2 x 660 MW Coal Fired Power Plant [Case # NEPRA/TRF-288/JPCL-2014]s**

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority along with Annex-I & II (29 pages) in Case No. NEPRA/TRF-288/JPCL-2014.

2. The Determination 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) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Order of the Authority along with Annex-I & II will be notified in the official Gazette.

Enclosure: As above

06.07.15

(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 Jamshoro Power Company Limited
for its 2 × 660 MW Coal Fired Power Plant

June 6, 2015

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 the hearings, and all other relevant material, hereby issues this determination.

AUTHORITY

(Khawaja Muhammad Naeem)
Member

(Maj. (R) Haroon Rashid)
Member

(Himayat Ullah Khan)
Member

(Syed Masood ul Hassan Naqvi)
Member

(Brig. (R) Tariq Saddozai)
Chairman

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06.07.15

1. Jamshoro Power Company limited (JPCL) (hereinafter referred as "the Petitioner") filed a tariff petition on October 17, 2014 for determination of generation tariff for 2 × 600 MW (net) coal fired power plant located at Jamshoro , Sindh. The salient features of the petition are described as under:-

   - The Project is located approximately 20 KM northwest of Hyderabad, and about 150 KM northeast of Karachi. The Indus River is located approximately 3.5 KM east of the Project Site.

   - The Project is proposed to operate on a blended mix of lignite procured from Thar Coalfields and sub-bituminous imported coal in a 20:80 ratio respectively.

   - The Project shall initially utilize imported sub-bituminous coal till such time that extraction of lignite from Thar commences and is available for commercial use. Coal will be delivered to the site primarily through the use of railroad cars, however provisions are made to receive, unload and store coal through the use of trucks also. The railroad trains will have five or six locomotives and fifty cars of 50 tonnes capacity each. Six to seven daily trains of 2,500 tonnes each will be delivered to the site for unloading, and the unloading system will deliver coal to the storage yard.

   - The total cost components of the Project have been tabulated as follows.

Project Cost	USD	PKR
EPC Cost	1,215,686,765	119,915,342,488
Non EPC Cost	165,423,723	16,317,396,048
Development Cost	30,390,736	2,997,742,192
Taxes and Duties	64,940,190	6,405,700,342
Insurance During Construction	9,880,509	974,613,365
Financing Fees and Charges	18,753,605	1,849,855,580
Interest During Construction	132,422,321	13,062,137,755
Project Cost	**1,637,497,848**	**161,522,787,770**

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Unit Gross Capacity	**660 MW**
Auxiliary Load	8.12%
Availability Factor	85.00%
Calorific Value of Sub-Bituminous Coal (LHV)	5,670 kCal / Kg
Calorific Value of Lignite Coal (LHV)	3,553 kCal / Kg
Gross Thermal Efficiency (Sub-Bituminous Coal)	43.40% (39.88% $^{net\ LHV}$)
Gross Thermal Efficiency (Blended Coal)	42.80% (39.22% $^{net\ LHV}$)

- The Project Cost of USD 1.637 billion for the establishment of the 2x660 MW Coal Fired Power Project at Jamshoro is proposed to be financed through a mix of debt and equity financing in accordance with a Debt to Equity Ratio of 70:30.

- Proposed composition of Debt.

Loan type	US$ M	Grace Period	Repayment term	Commitmer Charges pe annum	Interest Rate
ADB OCR Loan 1	840	5 Years	25 Years biannual	0.15%	6 Month LIBOR + 4.50%
ADB OCR Loan 2	30	10 Years	10 Years biannual	0.15%	15% per annum
ADB SF Loan 3	29.89	5 Years	20 years biannual	nil	15% per annum
IDB Loan 4	220	4 Years	15 Years biannual	nil	6 Month LIBOR + 1.15%
Commercial Loan 5	26.35	4 Years	10 Years biannual	0.15%	6 Month LIBOR + 4.50%

- The Return on Equity has been assumed at 27.20% for imported coal fired power projects as per the Authority's decision in the matter of Upfront Tariff for Coal Fired Power Projects dated June 26, 2014.

2. A pre-admission hearing was conducted on November 20, 2014 to decide whether to admit the petition or otherwise. As per outcome of the hearing, the petition was admitted for further processing in accordance with the Tariff {Standards and Procedure Rules 1998}. While admitting the petition, it was also decided to conduct a hearing of all stake-holders so as to arrive at a just and informed decision. The date of hearing was fixed as February 04, 2015 at HESCO Office Hyderabad. Notice of admission/hearing was published in the national newspapers on January 14, 2015 inviting filing of replies, comments or intervention request by any interested person within seven days of the publication of notice.

2. In response to the notices, no comments, replies or intervention request was filed. On the basis of available pleadings, following issues were framed to be discussed during the course of hearing:-

i. Whether the ADB OCR loan -1 amounting to US$ 0.84 billion relent by GOP @ 6 months LIBOR + 4.5% spread is justified when in fact ADB extended the loan facility to the project only at 0.5% Spread over 6 Month LIBOR?

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ii. Whether the ADB OCR loan -2 amounting to US$ 0.03 billion relent by GOP @ 15% per annum is justified when in fact ADB extended the loan facility to the project only at 0.4% Spread over 6 Month LIBOR?

iii. Whether the ADB SF loan -3 amounting to US$ 0.03 billion relent by GOP @ 15% per annum is justified when in fact ADB extended the loan facility to the project only at financing rate of 2%?

iv. Whether the project cost reflected in the feasibility study should be taken as benchmark for tariff determination or the project cost indicated in the petition as both indicated significantly different cost Petitioner 1.24 US$ per mW vs Feasibility study US$ 1.67 million per MW?

v. Whether 27.2% return as requested by the petitioner under cost plus regime is justified where equity drawdowns are to be taken at actual upon COD unlike in upfront regime where equity drawdowns are fixed?

vi. Whether variable O&M cost of Rs 0.37 per kWh is justified?

vii. Whether Port Qasim, (where coal is planned to be imported) have the necessary infrastructure at the time of COD to unload ships in three days without occurring demurrages and other LDs?

viii. Whether Non EPC cost of US$ 165.4 million is justified?

ix. Whether development cost of US$ 30.4 million is justified?

x. Whether financing fee of US$ 18.7 million is justified?

xi. Whether Interest During Construction (IDC)cost of US$ 132.4 million is justified?

xii. Whether insurance during Construction cost of US$ 9.9 million is justified?

xiii. Whether the Auxiliary consumption of 8.12% is justified?

3. Hearing in the matter was held on February 04, 2015 at HESCO office Hyderabad. During the hearing, the Petitioner presented its case for approval of the requested tariff. It was informed by the petitioner that ECC in its decision dated May 23, 2007 put a condition of firmed up EPC contract for the application of tariff determination for all intending investors who wish to build thermal power plants. However, ECC on March 19, 2009 offered waiver of firm EPC cost for coal fired power plant. Therefore, this tariff has been filed based on the feasibility study which was subsequently amended and approved by ECNEC on April 18, 2014.

4. Having heard the petitioner and going through the relevant record, issue-wise findings of the Authority (wherein the above mentioned issues are now either combined and/or rephrased for the sake of coherence) are given as under:-

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Whether the Capital Expenditure of US$ 1422 million is justified?

5. The Petitioner submitted a feasibility study along with the PC-1 approved by Executive Committee of the National Economic Council (ECNEC). In the feasibility study, prepared by US Power Consult LLC., the total project cost was estimated to be US$ 2207 million which for 1320 MW project works out to be US$ 1.67 million against the US$ 1.24 million requested in the petition. During the proceedings the Petitioner was asked whether the project cost reflected in the feasibility study should be taken as benchmark for tariff determination or the project cost indicated in the petition as both were significantly different. The Petitioner responded vide its letter dated February 10, 2015 that the tariff petition contains process cost which was rationalized by planning commission and later approved by ECNEC on April 18, 2014. Therefore, the Petitioner requested that project cost mentioned in the tariff petition should be considered for analysis and evaluation.

6. The proposed total cost components of the Project have been tabulated as follows.

Project Cost	USD	PKR
EPC Cost	1,215,686,765	119,915,342,488
Non EPC Cost	165,423,723	16,317,396,048
Development Cost	30,390,736	2,997,742,192
Taxes and Duties	64,940,190	6,405,700,342
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EPC Cost

EPC Cost	USD	PKR
Offshore EPC Cost	1,086,364,900	107,159,033,736
Onshore EPC Cost	100,829,278	9,945,800,000
Freight & Transportation	28,492,587	2,810,508,752
EPC Cost	**1,215,686,765**	**119,915,342,488**

7. The Petitioner has further divided the EPC cost into three component:

   (a) Offshore EPC Cost, which includes foreign cost components of Site Preparation & Engineering, Handling of Fuel Ash & Water, and the lump sum amount for Supercritical Boiler, Coal Fired Steam Power Plant, Unit Transformer, Auxiliary Transformer, other MV / LV Transformers & Equipment, AC / DC System, Control Equipment & System, Demi Water Treatment Plant, Emission Control Panel and Spare Parts etc. which have been combined under the head of Thermal Power Station;

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Offshore EPC Cost	USD	PKR
Site Preparation & Engineering	4,028,400	397,361,376
Handling of Fuel, Ash & Water	132,393,400	13,059,284,976
Thermal Power Station	949,943,100	93,702,387,384
Offshore EPC Cost	**1,086,364,900**	**107,159,033,736**

(b) Onshore EPC Cost, which includes local cost components of Land for Power Station & Colony, Site Preparation & Engineering, Handling of Fuel Ash & Water, and Thermal Power Station; and Freight & Transportation worth US$ 28.492 million

Onshore EPC Cost	USD	PKR
Land for Power Station & Colony	2,139,092	211,000,000
Site Preparation & Engineering	4,409,976	435,000,000
Handling of Fuel, Ash & Water	18,182,279	1,793,500,000
Thermal Power Station	76,097,932	7,506,300,000
Onshore EPC Cost	**100,829,278**	**9,945,800,000**

8. According to the Petitioner, after finalization of EPC arrangement, the Company can then only provide firm EPC price which shall be adjusted accordingly.

Non-EPC Cost

9. According to the Petitioner, Non EPC Costs amounting to USD 0.165 billion or 10.10% of Project Cost has been assumed. The Petitioner informed that this cost head broadly includes the costs of (a) Civil Works & Structure which has been provided to cover the costs of machine hall, buildings, foundations, and structure for equipment, boilers, steam turbine generators, ancillary equipment, water treatment plant, and cable tranches inclusive of cooling water system etc.; (b) Residential Buildings covering the costs of construction for offices, guest house, staff housing, hostels, mosque etc.; (c) Vehicles to provide for costs of passenger cars, jeeps, vans, pickups, coasters, and fire fighting vehicles etc.; and (d) overall erection charges.

Non EPC Cost	USD	PKR
Civil Works & Structure	74,218,978	7,320,960,000
Residential Buildings	12,216,139	1,205,000,000
Vehicles	606,245	59,800,000
Erection Charges	78,382,361	7,731,636,048
Non EPC Cost	**165,423,723**	**16,317,396,048**

Development Cost

10. Development Cost is estimated at USD 0.030 billion to account for costs of (a) Engineering & Consultancy, which in turn are estimated at USD 0.018 billion on the basis of quotations received by the Company in their process of finalizing the consultants for the task; (b) Training & Capacity

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Building to ensure that the staff of the Company is imparted adequate skills and knowledge for the operations of the plant; and (c) Administration & Management, which in turn accounts for the costs primarily related to the staff of the Company employed for the construction period of 48 months for administrative and supervisory responsibilities.

11. The Company is of the opinion that it shall have a more accurate representation of the scope of development, and the associated costs thereof, based on the finalized EPC arrangements, and requests the Authority for a provision of adjustment in the tariff ruling accordingly.

Development Cost	USD	PKR
Engineering & Consultancy	18,055,150	1,780,960,000
Training & Capacity Building	5,402,800	532,932,192
Administration & Management	6,932,786	683,850,000
Development Cost	**30,390,736**	**2,997,742,192**

Insurance During Construction

12. Insurance During Construction has been computed as 1% of 70% of Capital Costs, including EPC Cost, Non EPC Cost and Development Cost, in line with the ruling of the Authority in the matter of Upfront Tariff for Coal Fired Power Projects. However, the same shall be adjusted as per the actual costs incurred at the time of COD.

Insurance During Construction	USD	PKR
Insurance During Construction	9,880,509	974,613,365
Insurance During Construction	**9,880,509**	**974,613,365**

13. Since the Authority has already allowed tariff and approved benchmark Capex for similar technology for 660 MW units therefore, the Authority compared the above submitted Capex cost with the benchmark lump sum capex allowed in the upfront coal tariff to 660 MW units based on imported coal. In order to have right comparison, the allowed Capex in upfront tariff has been adjusted to exclude US$ 0.1 million per MW cost for European. The Authority noted that the Petitioner relied on PKR to US$ exchange rate of 98.4. In the upfront tariff, the Authority determined the tariff on the basis of 97.1 exchange rate. In the comparison below, both the expenditure have now been estimated at 97.1 PKR to US$ exchange rate.

660 MW × 2	JPCL Project	Upfront Coal
Capital Expenditure	**USD million**	**USD million**
EPC Cost	1,217	**1,404**
Non EPC Cost	167	
Development Cost	31	
Insurance During Construction	10	
Capex W/o Taxes	**1,425**	
Capex W/o Taxes US$/MW	**1.08**	**1.06**

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14. While comparing the Capex without custom duties and taxes, the Authority noted that the total difference between the requested Capex and approved capex for similar technology units is not significant i.e. only $ 21 million or the JPCL capex is merely 1.5% higher than the benchmark Capex approved for upfront tariff for similar category of units. The Authority is also aware that JPCL's coal plant is expected to have thermal efficiency of 39.93% LHV ^{net}, which is better than the net efficiency of 39% LHV ^{net} allowed in the upfront coal tariff for similar technology. If the gains due to better efficiency in fuel cost component which is approximately Rs 0.10 per kWh or ~ US$ 9 million per annum is spread across the 30 years project life, the resultant NPV for initial incremental investment of $ 21 million works out to be more than $55 million. Therefore, in the opinion of the Authority if the same cost and efficiency trade-off is maintained, the better efficiency justify the increase in capex.

15. After reviewing the PC-1, and the loan agreements of JPCL's two new 660 MW coal fired power units, the Authority noticed that the Petitioner has included cost to be incurred for JPCL's existing Thermal Power Station (TPS). The Petitioner was subsequently asked to confirm, whether or not the requested total project cost amounting to Rs 161.5 billion include cost of any nature that are supposed to be incurred in JPCL existing TPS. The Petitioner was further advised to give reasons why the Authority should allow such cost in this project when it should ideally be requested in the JPCL's existing tariff?

16. The Petitioner informed vide its letter dated June 01, 2015 informed that as per PC-1 of coal power project, the total environmental mitigation cost is Rs 30 billion which include ESP, FGD and SCR systems for the new projects and certain mitigation facilities for the existing units. According to the Petitioner, total cost for existing facilities works out to be Rs 11,261 million or US$ 112.61 million if the PC-1 PKR to US$ exchange rate of 100 is taken. The Petitioner further informed that this cost will be primarily utilized for installation of FGD in existing units so that the emissions are brought down to IFC standards. According to the Petitioner, this is the pre-condition of ADB loan agreement as stipulated in schedule 5 of the agreement.

17. The loan agreements were reviewed by the Authority and observed that environmental related expenditure on existing plant is more than US$ 112.61 million. The Authority observed that Schedule-3 of the loan agreement clearly distinguished cost to be incurred on the existing stations. According to schecule-3 (attachement-1) of agreement, allocation and withdrawal of OCR-1 proceeds include emission control capex for existing TPS amounting to US$ 32 million. As per schedule-3, the emission control is expected to be 20% of the total expenditure. Therefore, total emission control expenditure works out to be US$160 million (32/20%) and not US$ 112.61 million as assessed by the Petitioner.

18. The Authority is the opinion that the Petitioner can't in principal claim this cost in its new 1320 MW project because of this cost has nothing to do with performance of the new project. Further the Authority is also aware that installation of FGD in the existing units which it purported to reduce the emissions to IFC standards, may be the requirement of ADB. However, this cost can't be claimed in

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this project which is supposed to be a Greenfield project. The Authority opined this cost should be separately claimed under the relevant laws in the JPCL's existing tariff.

19. In view of the above discussion, the Authority has decided to deduct US$ 160 million from the assessed Capex of US$ 1425 million. The final assessed Capex without custom duties and taxes thus works out to be US$ 1256.19 million. The assessed capex breakup is tabulated below:

Capex w/o taxes	US$ million
EPC Cost	1,217.33
Non EPC Cost	167.39
Development Cost	30.57
Insurance During Construction	9.91
Less Existing TPS capex	(160.00)
Capex W/o Taxes	**1,265.19**

Whether or not the Taxes and Duties amounting US$ 64.94 million is justified

20. The Petitioner estimated the following Taxes and Duties on imported equipment at the rate of 6% to cater for custom duties, surcharge etc.

Taxes and Duties	USD	PKR
Handling of Fuel, Ash & Water	7,943,604	783,557,099
Thermal Power Station	56,996,586	5,622,143,243
Taxes and Duties	**64,940,190**	**6,405,700,342**

21. In the upfront coal tariff, the Authority allowed taxes @ 5.95% while assuming 66.75% of Capex which for two 660 MW units works out to be US$ 55.76 million. JPCL on the other hand assumed taxes @ 6% of 75.94% of the Capex. The Authority considered that since duties and taxes in both Upfront and JPCL's project case is supposed to be adjusted on actual, therefore, at this stage, the Authority has decided to allow duties and taxes as requested which in the instant case amounts to US$ 64.940 million. Duties and taxes will be subject to adjustment at actual at the time of COD based on the verifiable documentary evidence.

Whether financing fee and Charges amounting to US$ 18.753 million is justified

22. According to the Petitioner, Financing Fees & Charges have been estimated based on costs expected to be incurred, and broadly includes costs associated with Arrangement Fee equal to 1% of debt, LC Charges equal to 0.15% per annum and a LC retirement cost of 0.10%, and Commitment Charges of 0.15% per annum applicable on the relevant debt financing facilities.

23. The Company requested to the Authority that the composition of Financing Fees & Charges may be adjusted on subsequent revision to the actual costs incurred.

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Financing Fees and Charges	USD	PKR
Arrangement Fees	11,462,485	1,130,659,514
LC Charges	5,207,668	513,684,409
Commitment Charges	2,083,452	205,511,656
Financing Fees and Charges	**18,753,605**	**1,849,855,580**

24. The Authority allowed financing fee up to 3.5% of the debt in the upfront coal tariff determination. The Authority observed that in the instant case, US$18.753 million works out to be 2.1% of the assessed capex debt, which is below the approved benchmark. Keeping in view the low benchmark financing fee and charges, the Authority has decided to allow financing fee and charges amounting to US$ 18.753 million subject to adjustment at actual to the maximum of 3.5% of debt at the time of COD.

Whether or not the terms of loan agreements are justified?

25. According to the company, the Project Cost of USD 1.637 billion for the establishment of the 2x660 MW Coal Fired Power Project at Jamshoro has been financed through a mix of debt and equity financing in accordance with a debt to equity Ratio of 70:30.

Capital Structure		USD	PKR
Equity	30.00%	491,249,355	48,456,836,331
Debt	70.00%	1,146,248,494	113,065,951,439
Project Cost	100.00%	1,637,497,849	161,522,787,770

26. The Petitioner informed that equity for the Project shall be injected by the Government of Pakistan through the holding company, GENCO I, amounting to USD 0.491 billion.

27. For the establishment of this Project, GoP has applied to Asian Development Bank (ADB) for two loans from ADB's Ordinary Capital Resources (OCR) and another from ADB's Special Funds (SF). GoP has also applied to Islamic Development Bank (IDB) for a loan of USD 0.220 billion to finance part of the Project Cost. The arrangement for remaining debt financing to make up a total of 70% of the Project Cost is under process.

28. The first loan secured though ADB, namely OCR Loan 1 (OCR-1) , amounts to USD 0.840 billion with a grace period of 5 years, biannual repayment period of 25 years, commitment charges of 0.15% per annum, and a financing rate of 6 Month LIBOR + 0.50% per annum. Similarly, the second loan secured through ADB, namely OCR Loan 2, amounts to USD 0.030 billion with a grace period of 10 years, biannual repayment period of 10 years, commitment charges of 0.15% per annum, and a financing rate of 6 Month LIBOR + 0.40% per annum. Moreover, the third loan secured though ADB, namely SF Loan, in various currencies is equivalent to 19,380,000 Special Drawing Rights (SDR) which in turn is equal to USD 0.030 billion assuming an exchange rate of USD 1.5425588 per SDR. The loan has a grace period of 5 years, biannual repayment period of 20 years, and a financing rate of 2.00% per annum.

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29. As per the terms of the financing agreement with ADB for the three loans, GoP shall relent the proceeds of the (a) OCR Loan 1 on the basis of a 5 years grace period, 25 years biannual repayment period, commitment charges of 0.15% per annum, and a financing rate of 6 Month LIBOR + 4.50%; (b) OCR Loan 2 on the basis of a 10 years grace period, 10 years biannual repayment period, commitment charges of 0.15% per annum, and a financing rate of 15% per annum; and (c) SF Loan on the basis of a 5 years grace period, 20 years biannual repayment period, and a financing rate of 15% per annum.

30. Similarly, GoP secured financing of USD 0.220 billion from Islamic Development Bank with a grace period of 4 years, biannual repayment period of 15 years, and financing rate of 6 Month LIBOR + 1.15%. The Petitioner assumed that GoP shall relent the proceeds of the said loan over the same terms and conditions to the Project.

31. The remaining USD 0.026 billion, to make up total debt as 70% of the Project Cost, is proposed to be arranged through financial institutions with a grace period of 4 years, biannual repayment period of 10 years, commitment charges of 0.15%, and a financing rate of 6 Month LIBOR + 4.50%. The Petitioner requested that the resulting tariff be allowed to be adjusted on the basis of actual financing terms agreed at the time of financial close of the Project.

32. The Petitioner's provided debt's term are tabulated below:

Summary of Loan

Debt Financing		USD	PKR
ADB OCR Loan 1	73.28%	840,000,000	82,857,600,000
ADB OCR Loan 2	2.62%	30,000,000	2,959,200,000
ADB SF Loan	2.61%	29,894,790	2,948,822,040
IDB Loan	19.19%	220,000,000	21,700,800,000
Commercial Loan	2.30%	26,353,704	2,599,529,399
Total Debt	**100.00%**	**1,146,248,494**	**113,065,951,439**

Terms of Loan

Loan	US$M	Grace Years	Tenor (years)	ADB to GOP (Rate)	GOP to JPCL (Rate)	Commit. Charges
ADB OCR Loan 1	840.00	5	25	0.5%*	4.5%	0.15%
ADB OCR Loan 2	30.00	10	10	0.4%*	15%**	0.15%
ADB SF Loan	29.89	5	20	2%	15%**	-
IDB Loan	220.00	4	15	1.15%	1.15%	-
Commercial Loan	26.353	4	10	4.5%	4.5%	0.15%

**Margin over LIBOR*

*** Exchange rate risk included. Assume to be a flat throughout the term of loan*

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33. The Petitioner was asked to justify why higher margin over OCR-1 loan has been assumed when the cost of loan to the project is very low. The Petitioner replied in its letter dated February 10, 2015 that Government of Pakistan has charged rate of interest on re-lending of foreign loans as per operational precedents and policies of Ministry of Finance and Economic Affairs. Therefore, in view of the Petitioner, interest rates on ADB financing for coal fired power project of JPCL are reasonable and justifiable.

34. The Authority noted that Asian Development Bank (ADB), has extended Ordinary Capital Resource (OCR)-1, which constitute 73% of the total debt, at concessionary rate of only 0.5% margin over 6 month LIBOR. Similarly, OCR-2 loan, though constitute hardly 3% of the total loan has been agreed @ 0.4% margin. The Authority is aware that in public sector projects, the borrower which is generally a Government of Pakistan (GoP) negotiates loan terms with multilateral lending agencies in foreign currencies and relent the loans to the project at another rate. The Authority noted that under section 3.0.1 of the OCR loan, the borrower which in the instant case is Government of Pakistan has agreed with the Asian Development Bank to relend the proceeds of the Loans to JPCL under the Subsidiary Loan Agreement the rate equal to the sum of LIBOR and 4.5% per annum and a repayment term of 25 years and a grace period of 5 years. This means that the relend rate of 4.5% has already been agreed and signed between the ADB and GoP (the borrower). The margin of 4.5% is within the benchmark allowed in similar cases, therefore the Authority has decided to approve OCR-1 with 6 month LIBOR + margin of 4.5%. Similarly the Authority allow ADB OCR-2 loan at fixed interest rate of 15%, ADB SF loan at 15% per annum and IDB loan at 1.15% margin over 6 month LIBOR. Commercial loan in foreign currency if availed will be allowed at maximum margin of 4.5% over LIBOR.

Whether Interest During Construction amounting to US$ 132 million is justified

35. The Petitioner computed Interest During Construction (IDC) on the basis of cost drawdowns estimated in the feasibility study/PC-1. The Petitioner further assumed that Debt and Equity injection shall be made on a pro rata basis. Similarly, debt injection shall be made proportional to the total share of each debt facility. Interest During Construction over a period of 48 months is thus estimated to be USD 0.132 billion.

36. In the upfront coal tariff determination, the Authority allowed IDC at fixed debt drawdowns of 33.3% for the first two years of construction period, 13.3% for the third year and 20% for the fourth year of the 48 month construction period. The Petitioner provided the following capex drawdowns:

Debt Drawdowns	JPCL	Upfront Coal
First year	18.3%	33.3%
Second Year	27.5%	33.3%
Third year	38.5%	13.3%
Fourth Year	15.7%	20.0%

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37. Unlike in upfront tariff, JPCL tariff is on cost plus basis where, debt and equity drawdowns will be adjusted based on actual. Therefore, the Authority has decided to assume debt drawdowns requested by the Petitioner which will be subject to adjustment at the time of COD.

38. The Petitioner informed that 30% of the Project shall be financed through equity injected by GoP through GENCO I, whereas the remaining amount is to be secured through debt financing. According to the Petitioner, a significant portion of the required debt financing has already been secured through a mix of financing facilities arranged from Asian Development Bank (ADB) and Islamic Development Bank (IDB), whereas the remaining amount shall be arranged through commercial debt arrangements.

39. The Petitioner has stated that the remaining loan which amounts to US$ 26.35 million will be secured from the market at commercial term. The Authority has noted that Capex has been reduced as result of deduction of US$ 160 million on account of JPCL's existing TPS expenditure. This has slightly reduced the overall debt requirement. At this stage the Authority has decided to use the percentage loan share provided by the Petitioner as tabulated below and accordingly reflected the reduction in project cost in all the five loans including the commercial loan.

Debt Financing	Loan Share	Base Libor	Margin	Total Interest
ADB OCR Loan 1	73.28%	0.45%	4.5%	4.95%
ADB OCR Loan 2	2.62%	-	-	15%
ADB SF Loan	2.61%	-	-	15%
IDB Loan	19.19%	0.45%	1.15%	1.60%
Commercial Loan	2.30%	0.45%	4.5%	4.95%
Total Debt	**100.00%**			

40. Based on the above assumptions and assuming debt drawdowns as requested by the Petitioner, IDC have been worked out as US$ 114.10 million and the same is therefore approved.

41. Following is the detail comparison between the assessed vs requested project cost

Project Cost	Assessed US$ million	Requested US$ million
EPC Cost	1,217.33	1215.67[a]
Non EPC Cost	167.39	165.424[a]
Development Cost	30.57	30.39[a]
Insurance During Construction	9.91	9.88a
Less Existing TPS capex	(160.00)	0
Taxes and Duties	64.94	64.94
Capex	**1,330.13**	**1486.322**
Financing Fees and Charges	18.75	18.75
Interest During Construction	114.10	132.422
Project Cost	**1,462.99**	**1637.497**
US$ million per MW	1.11	1.24

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a- *The Authority has assessed the cost based on PKR to US$ exchange rate of 97.1 whereas, the Petitioner converted the PKR portion of respective cost head with 98.64 PKR to US$ exchange rate. This has resulted in slight difference between assessed and requested cost in the project cost indicated above.*

Whether the Auxiliary consumption of 8.12% is justified.

42. The Petitioner assumed an annual plant Availability of 85%, along with an auxiliary consumption of 8.12% resulting in a net capacity of 1,213 MW. The Authority allowed 8% auxiliaries to 660 MW SC units. The Authority observed that in the project feasibility study, the consultant has expected the auxiliary consumption in the range of 6.0% ~ 9.5%. Which means that this number is not finalized yet. The Authority opined that the Petitioner requested auxiliaries are slightly higher than the approved benchmark. In the upfront tariff, auxiliary consumption is subject to adjustment based on actual as long as it is not higher than 8% benchmark. At this stage, the Authority has decided to approve auxiliary consumption of 8% subject to adjustment on actual with a ceiling of 8%.

Project Tariff Component

Energy Purchase Price

43. According to the Petitioner, the Energy Charge, based on the actual net electrical output measured on kWh, consists of variable cost components including Cost of Fuel, Cost of Ash Disposal, Cost of Limestone, Variable O&M – Foreign, and Variable O&M – Local. The individual cost components, levelized over a period of 30 years, have been detailed in the table below.

Energy Charge	Fuel	Ash Disposal	Limestone	Variable O&M	
				Foreign	Local
5.1835	4.5045	0.2200	0.0900	0.3559	0.130

Fuel cost component

44. According to the Petitioner, the calorific value of the imported sub-bituminous coal, price of the imported sub-bituminous coal, thermal efficiency of the plant, and other plant parameters have all been based on the values contained in the PC-I Feasibility Study for the Project. The Petitioner computed cost of fuel based on the assumptions tabulated below.

Fuel Cost Parameters	
Plant Capacity	1,320 MW
Plant Capacity / Availability Factor	85.00%
Annual Energy Output of Plant	9,030,627,936 kWh
Calorific Value of Sub-Bituminous Coal (LHV)	5,670 kCal / Kg
Price of Coal	USD 120.00 / Tonne
Exchange Rate	PKR 98.64 per USD

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Fuel Cost Parameters	
Gross Thermal Efficiency of Plant	43.40%
Conversion Factor – Btu per kWh	3,412.14 Btu / kWh
Conversion Factor – Btu per kCal	3.97 Btu / kCal
Heat Rate	7,862.08 Btu / kCal
Heat Value Required per Annum	77,274,158 MMBtu
Annual Coal Consumption	3.4366 Mtpa
Cost of Fuel	PKR 4.5045 / kWh

45. The Authority considered that the Petitioner's requested gross efficiency of 43.4% after deducting 8% auxiliaries works out to be net LHV efficiency of 39.93%, which is just over 0.93% more than 39% minimum thermal efficiency allowed in upfront coal tariff for 660 MW imported coal units. Keeping in view the scale of the project, this translate into saving of ~US$ 9 million per annum as already indicated in the preceding paras. The Petitioner proposed to use 20% of local coal most likely Thar coal. With blending, the Petitioner expects that the efficiency will drop to 39.22% LHV. The Petitioner' proposed efficiency is better than the benchmark efficiency approved for similar technology therefore, the Authority has decided to accept thermal efficiency of 39.93%. The Authority noted that the Petitioner used coal calorific value of 22,485 BTU/kg, while in upfront the imported coal CV is 25,556 BTU/kg. For fuel cost assessment, the Authority decided to use CV of 25,556 BTU per kg assuming all imported coal usage as adjustment will be allowed once the origin and quality of local coal is ascertained.

46. With coal rate of US$ 119.6 per ton as assumed in upfront tariff and PKR to US$ exchange rate of 97.1, the resultant fuel cost component works out to be Rs3.8832 per kWh and the same has been approved at this stage this will be subject to adjustment once EPC contract is finalized.

Cost of Ash Disposal and Limestone

47. The Petitioner informed that cost of Ash Disposal, along with Cost of Limestone, has been discussed in the PC-I/Feasibility Study of the Project, however these have not been quantified in the same. For the purposes of the Petition, the Petitioner assumed the benchmark upfront coal costs of Rs 0.22/kWh for ash disposal and Rs 0.09/kWh for Limestone. The Authority has decided to allow the same for tariff calculations. The cost Lime Stone and As Disposal will be adjusted on actual basis at the time of COD.

OPERATION AND MAINTENANCE

Variable O&M Costs

48. According to the Petitioner, variable O&M Costs have been assumed to include Spares & Maintenance, as indicated in the PC-I Feasibility Study, where the bifurcation into Foreign and Local has been undertaken on the basis of the foreign and local cost components provided therein.

Variable O&M Cost	USD	PKR	Foreign	Local
Year 1 to 10	33,760,000	3,330,086,400	33,760,000	-
Year 11 to 30	33,806,602	3,334,683,200	30,380,000	338,000,000

49. Accordingly, the Petitioner has proposed variable O&M local expense of Rs 0.130/kWh and foreign O&M expense of Rs 0.3503/kWh.

Fixed O&M

50. According to the Petitioner, Fixed O&M primarily caters to the Administrative Expenses of the Project, which in turn comprises of both foreign and local components. According to the Petitioner, since this is one of the first coal fired power plants to be operated in Pakistan, the top level management shall consist of expatriates having expertise of operating coal fired power plants. The dependence on foreign resources for the O&M of the Project shall reduce after a period of 10 years, through indigenization.

Fixed O&M Cost	USD	PKR	Foreign	Local
Year 1 to 10	8,500,527	838,492,000	4,050,000	439,000,000
Year 11 to 30	8,505,556	838,988,000	2,950,000	548,000,000

51. Thus based on the above estimate, levelized foreign and local fixed O&M expense works out to be Rs 0.335/kW/h and Rs 0.0448/kW/h respectively. In terms of Rs/kWh, while assuming 85% plant factor and exchange rate of 97.1, the levelized foreign and local fixed O&M tariff component works out to be Rs 0.0394/kWh and Rs 0.0527 /kWh respectively. In total, fixed O&M sums up to Rs0.0921/kWh

52. The Authority noted that the total variable O&M of Rs 0.3629/kWh requested by the Petitioner is substantially higher than the variable O&M approved for similar technology/fuel which is Rs 0.1140/kWh. However, the fixed O&M of Rs0.0921 per kWh as requested by the Petitioner is less than Rs 0.3376 per kWh (@85% plant factor) allowed in the upfront coal tariff. The Authority further discerned that on the holistic level, the total requested O&M cost of Rs 0.4550/kWh (fixed + variable) is almost equal to the total O&M allowed in upfront which is Rs 0.4516/kWh. In the opinion of the Authority, the Petitioner submitted O&M estimates are reasonable and within the benchmark approved O&M expense therefore, the Authority has decided to approve the O&M estimate as requested.

53. The Authority noted that due to below par performance of public sector generation companies like NPGCL, JPCL etc., a strong need has been felt in the sector to outsource O&M of Gencos's to reputable O&M service providers. While realizing this, NPGCL has in principle decided to outsource the O&M contract of its newly built 425MW Nandipur power plant. The Authority consider this realization an encouraging sign which should be replicated by NPGCL's peers. In the instant case, the Petitioner plans to do the O&M on its own. Keeping in view the past trend, the Authority has strong concern that in the long run, this plant will not be able to maintain its optimal performance. The

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Authority is also aware that the Federal Government is committed to privatize all Gencos. Therefore, privately managed 1320 MW power plant will help lure the investors. Further, as per the power policy and NEPRAs precedence, many incentives that were once available to IPPs are now availed by public sector companies i.e. computation of ROE and benefit of better debt terms negotiation etc. All this increases, the performance expectation from Gencos.

54. In view of the above, the Authority therefore, direct to outsource the O&M contract to reputable O&M contractors through transparent and competitive process.

Insurance Cost

55. The Petitioner requested Operating Insurance, equivalent to 1.00% of 70% of Capital Costs including EPC Cost, Non EPC Cost, and Development Cost. According to the Petitioner, this is in line with the Authority's decision in the matter of Upfront Tariff for Coal Fired Power Projects dated June 26, 2014. As per the Petitioner, the resulting cost has been worked out as USD 9.880 Million, which shall be subject to adjustments on the basis of actual cost incurred up to a maximum of the defined benchmark of 1.00% of 70% of Capital Costs.

56. With regards to the Insurance cost, the Authority in para (xxii) of the upfront tariff decision dated June 26, 2014 approved the Insurance component of tariff on the basis of actual insurance cost with maximum of 1% of the 70% of Capital Cost. The Petitioner's request is in line with the approved benchmark therefore, the Authority has decided to accept the same. Based on the same benchmark the Insurance component works out to be Rs 0.0808/kW/h.

Cost of Working Capital

57. The Petitioner while referring to the Authority's decision in the matter of Upfront Tariff for Coal Fired Power Projects dated June 26, 2014, requested Working Capital cost equal to 01 Month of Fuel Charge receivables amount and cost of 03 Months of Coal Inventory. The Petitioner informed that the working capital cost will be secured through a short term debt facility for which financing rate has been assumed at 1 Month KIBOR + 2.00%. The Petitioner requested that Working Capital may be adjusted subsequent to the introduction of blended coal for utilization in the Project on pro rata basis, where the local coal inventory shall be allowed for only 01 Month. Following is the working capital estimate submitted by the Petitioner:

Working Capital Requirement	
Fuel Cost per kWh	PRK 4.5045 per kWh
Coal Inventory Requirement at 100% Output	PKR 11,800,489,648
Fuel Charge Receivables Requirement at 100% Output	PKR 3,933,496,549
Total Working Capital Requirement	PKR 15,733,986,198
Annual Cost of Working Capital	**PKR 1,924,266,512**

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58. The Petitioner's working capital estimate is as per the Authority approved benchmark for imported coal tariff therefore, the Authority has decided to accept the submitted assumptions. The Authority noted that the Petitioner didn't incorporate GST @ 16% in its working capital calculation which as per the standard is a pass through item. Therefore, after taking the assessed fuel cost component of Rs 3.8832/KWh while allowing 16% GST on both coal inventory requirement for 90 days and fuel charge receivables for 30 days, the resultant working capital component works out to be Rs 0.1811/kW/h and the same is being approved.

Whether 27.2% return as requested by the Petitioner under cost plus regime is justified where equity drawdowns are to be taken at actual upon COD unlike in upfront regime where equity drawdowns are fixed?

59. The Petitioner requested a straight Return on Equity of 27.20% while citing the Authority's decision in the matter of Upfront Tariff for Coal Fired Power Projects dated June 26, 2014, wherein RoE of 27.2% was allowed to projects based on imported coal. The Petitioner further informed that since the project envisages the use of blended coal by incorporating 20% of local (Thar) therefore, Return on Equity percentage allowed to the Project be adjusted accordingly to 27.66% (27.20% × 80% + 29.50% × 20%).

60. The Authority clarified in the Review decision filed by Asad Umar in the matter related to coal upfront tariff dated November 21, 2014 that imported coal RoE of 27.2% is based on IRR of 17%.

61. The Authority considered the petitioner requested for flat ROE of 27.2% and opined that 27.2% ROE allowed to imported coal based project was computed assuming 100% of equity to be exhausted in just two years of the construction i.e. 80% in the first year and 20% in the second. This was allowed to upfront in order to minimize the level of adjustment that needs to be undertaken at the time of COD. The Petitioner had the option to opt for upfront coal tariff but the Petitioner opted to choose the cost plus route. Cost plus regime involve greater scrutiny to ascertain prudently incurred cost and other benchmarks. Unlike cost plus regime, upfront entail different level of risk and return trade off. For instance, in case of upfront the Authority's approved per MW project cost is almost fixed with minimal adjustment no matter how much the actual project cost deviates from the benchmark cost. All these uncertainties/risk are lower for investors like JPCL who has applied for tariff under cost plus regime.

62. In view of the above, the Authority has decided to allow ROE on imported coal to the project based on the draw down provided in the rationalized PC-1 of the project which are given below:

Equity Drawdowns	
1st year	18.6%
2nd Year	27.0%
3rd year	38.0%
4th year	16.4%

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63. The Petitioner informed that it plans to blend local coal preferably Thar coal with imported coal in a ratio of 20% and 80% respectively. So, the Petitioner requested that its RoE component may be adjusted to incorporate return allowed to local coal. The Authority considered the request of the Petitioner and is of the opinion that at this stage it's not clear the exact quantity of local coal to be utilized in the blend. Therefore, imported coal ROE have been assumed. Return will be subject to adjustment once the exact percentage of local coal usage is ascertained.

64. Based on the abovementioned equity drawdown, assuming, debt equity ratio of 70:30 and construction period of 48 months, at assessed equity portion of US$ 438.9million, ROE works out to be US$ 102.89 million, which translates into tariff component of Rs 0.9391/kW/hr. JPCL's ROE shall be subject to adjustment on the basis of actual coal blending (Imported + Local). For COD adjustments, the abovementioned equity draw down will be used.

Debt Servicing Component

65. The Petitioner has informed that Debt Servicing Costs for the Project is driven from the various debt facilities arranged for the Project. Due to the difference in the terms of the various facilities secured, debt servicing costs, catering to both the principal repayments and interest charge, does not conform to the traditional cash flow stream, but rather varies in cost each year for up to 25 years. The Petitioner requested to the Authority that this may be allowed as a pass through cost to the Project, subject to relevant indexation indexations. For terms of loans, the table on page 11 may be referred.

66. The structure of financing has already been detailed earlier and the decision taken accordingly.

67. The Authority noted that grace period of ADB OCR-1 (grace period 5 years), OCR-2 (grace period 10 years) and ADB SF loan (grace period 5 years) is more than the 4 year construction period. Accordingly, principle repayment will start after one year of operation for ADB OCR-1 and ADB SF loan and six years post COD for ADB OCR2 loan. In the tariff petition, the Petitioner incorrectly started the repayment of these loan from start of COD for OCR1 and ADB SF and from the start of six year for OCR-2 loan. This anomaly has been addressed in the approved debt servicing component. Further the Petitioner inadvertently applied yearly interest rate for interest payment calculation while it should be half yearly interest rate for interest payment calculation. This has also been corrected.

68. Based on the aforesaid discussions, while assuming the following terms loan, the levelized debt servicing component for the Petitioner coal project works out to be Rs 0.6836/kWh/h.

Loan Description	Base Libor	Margin	Total Interest	Grace period (yrs.)	Repayment period (yrs.)	Amount US$ M
ADB OCR-1 Loan	0.45%	4.5%	4.95%	5	25 (biannual)	750.17
ADB OCR-2 Loan	-	-	15%	10	10 (biannual)	26.792

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Loan Description	Base Libor	Margin	Total Interest	Grace period (yrs.)	Repayment period (yrs.)	Amount US$ M
ADB SF loan	-	-	15%	5	20 (biannual)	27.12
IDB Loan	0.45	1.15	1.60%	4	15 (biannual)	196.47
Commercial Loan	0.45%	4.5%	4.95%	4	10 (biannual)	23.54

Whether Port Qasim, (where coal is planned to be imported) have the necessary infrastructure to unload coal in time.

69. According to the feasibility study of the project, one 600MW unit will consume coal about 6,800 tons/day with 20% lignite and 80% sub-bituminous blended ratio at full load. At an 85%capacity factor, the annual coal consumption for one unit will be about 2.1 million tons/year (1.7 million tons of sub-bituminous and 0.4 million tons of lignite). Total coal consumption for both units will be about 4.2 million tons/year. Coal will be delivered to the site primarily by railroad car; however, provisions are made to receive, unload, and store coal by truck also.

70. On the issue PQA capacity constraints, the Petitioner responded that at Present PQA is not capable to fulfil our daily coal requirement. However, ministry of Water and Power has taken up the matter with Ministry of Ports and Shipping for making arrangement to handle loading and unloading of all required quantity of Jamshoro coal project. The Petitioner further informed that it is arranging with PIBT, and FOTCO to provide these facilities for JPCL and they have principally agreed with the proposal.

71. The Authority considered the reply of the Petitioner in the matter and observed that the capacity constrains at PQA and KPT is one of the issue facing large imported coal power plants. As per the feasibility study of the project, PQ has the facility to unload and store the coal required for the project which is approx. 4 million ton per annum and KPT has capacity of around 7 million ton of coal per annum of which 4 million ton per annum is utilized. Pakistan International Bulk Terminal (PIBT) has been granted concession rights for 30 years by Port Qasim Authority (PQA), through an Implementation Agreement to build, operate and transfer fully mechanized dirty bulk cargo handling Terminal at Port Qasim. According to PIBT website, the terminal will have an initial annual handling capacity of up to 12 million tons of the dirty cargo which will include coal, clinker and cement. ADB is also backing the project which give additional comfort that this issue will be resolved in timely manner. At this stage, the Authority direct to update NEPRA about status of the coal unloading at the port from time to time.

ORDER

72. Pursuant to Section 31 (4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Rule 16 (11) of NEPRA Tariff Standards and Procedure Rules, 1998, the National Electric Power Regulatory Authority (hereinafter "the Authority") has hereby determined

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the following reference tariff of Jamshoro Power Company Limited (JPCL) (hereinafter 'the Petitioner"):

Reference Tariff

Tariff Components	Year 1 to 30	Indexation
Capacity Charge PKR/kW/Hour)		
O&M Foreign	0.0335	US$ /PKR & US CPI
O&M Local	0.0448	CPI
Cost of Working Capital	0.1811	KIBOR
Insurance	0.0808	US$ /PKR
Debt Service – Foreign	0.6836	LIBOR
Return on Equity	0.9391	US$ /PKR
Total Capacity Charge	**1.9629**	
Energy Charge on Operation on Imported Coal Rs./kWh		
Fuel Cost Component	3.8832	Fuel Price
Variable O&M		
Foreign	0.3499	US$/PKR & US CPI
Local	0.0130	CPI

Note:

(a) The above Reference feasibility stage tariff shall be adjusted at Engineering Procurement and Construction (EPC) Contract stage.

(b) The Reference tariff adjusted at EPC stage shall be further adjusted at the time of Commercial Operation Date (hereinafter "COD") based on the Initial Dependable Capacity and Net Thermal efficiency test jointly carried out by the Central Power Purchasing Agency (CPPA) of the National Transmission and Dispatch Company (NTDC) and the Petitioner.

(c) The above mentioned reference tariff has been calculated on the basis of Net Contracted Capacity of 1214.4 MW.

(d) The Petitioner is availing various loans with multiple repayment periods, all will be paid in the first 26 years of commercial operation of plant after COD.

(e) The component wise tariff is indicated at **Annex-I**. Debt Service Schedule is attached as **Annex-II**.

73. The following adjustments/indexations shall be applicable to the reference feasibility stage tariff:

<u>One Time Adjustment</u>

Adjustment in EPC Cost

74. The Authority has assessed total EPC cost at US$ 1,057.33 million. This assessed EPC cost has been adjusted to exclude US$ 160 million expenditure to be incurred in JPCL's existing thermal power stations. This cost will be adjusted at EPC stage. The Petitioner shall ensure that final EPC cost is arrived through transparent and competitive process under the applicable law to the satisfaction of

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the Authority. The Petitioner shall ensure that the scope of work of the firmed EPC contract clearly identify cost to be incurred on new coal power project and on JPCL's existing thermal power station. Furthermore, since the exact timing of payment to EPC contractor is not known at this point in time therefore, adjustment for relevant foreign currency fluctuation for the portion of payment in the relevant foreign currency will be made after finalization of EPC contract at COD. In this regard, the sponsor will be required to provide all the necessary relevant details along with documentary evidence.

Adjustment due to Variation in Net Capacity

75. The reference tariff has been determined by the Authority on the basis of feasibility study along with the PC-1 approved by Executive Committee of the National Economic Council (ECNEC) and on the basis of net capacity of 1214.4 MW at delivery point at mean site conditions. All the relevant tariff components shall be adjusted at EPC stage and thereafter, at COD based upon the Initial Dependable Capacity (hereinafter "IDC") tests to be carried out for determination of contracted. Since the EPC contract is not finalized at this point in time wherein the details of plant's critical parameters including minimum net efficiency is established therefore, the formula for adjustment in net capacity on account of capacity variation is not advisable. Such formula will be provided at EPC stage when the Petitioner will approach the Authority after finalization of EPC contract.

Adjustment due to Variation in Net Efficiency

76. The reference feasibility stage tariff has been determined on the basis of minimum net efficiency of 39.93% on net Lower Heating Value (hereinafter "LHV"). The fuel cost component shall be adjusted at EPC stage and thereafter at COD based upon Heat Rate Test. The adjustment formula shall be provided to the Petitioner at EPC stage.

Adjustment Based on Actual Interest During Construction & Financing Fees

77. Debt Service, Return on Equity (hereinafter RoE) shall be adjusted at EPC stage and thereafter at COD on account of actual variation in drawdown and Interest During Construction and financing fees. Adjustment on account of financing fees and charges is restricted to the extent of 3.5%.

Adjustment due to Custom Duties & Withholding Taxes

78. Debt Service, RoE shall be adjusted at EPC stage and thereafter, at COD on account of actual variation in custom duties & withholding Taxes.

Adjustment in Insurance as per actual

79. The reference annual Insurance component has been established as US$8.86 million. The reference insurance component will be adjusted at EPC stage. The actual insurance cost for the minimum cover required under contractual obligations with the Power Purchaser not exceeding 1% of the 70% of Capex will be treated as pass-through. The formula for annual indexation only with regards to PKR/US$ exchange rate variation (if applicable) shall be provided at EPC stage.

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Adjustment in ROE

80. The Authority decided to allow ROE to the Petitioner. The Authority further decided that the Petitioner will be allowed ROE in case it utilizes indigenous coal and the higher Return on Equity will be calculated on pro-rata basis. Since the reference component of RoE along with all the relevant component of the Petitioner's tariff will be adjusted after the finalization of EPC contract therefore, the Authority has decided that the adjustment formula for post COD quarterly adjustment in RoE components with regards to quarterly adjustment on account of variation in PKR/US$ parity shall be provided at EPC stage.

Indexations:

81. The following indexation shall be applicable to the reference feasibility stage tariff as follows:

Indexation applicable to O&M

82. The Fixed O&M local component of Capacity Charge will be adjusted on account of Inflation (CPI) and Fixed O&M foreign component on account of variation in US CPI and dollar/Rupee exchange rate. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 1st July, 1st October, 1st January and 1st April based on the latest available information with respect to CPI notified by the Federal Bureau of Statistics (FBS), 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. The reference indexation benchmarks will be as under:

CPI	=	The reference CPI of May 2015 i.e.199.66
US CPI	=	The reference US CPI (All Urban Consumers) of April 2015 i.e.236.599
ER	=	the Revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan reference value is 97.1

Note: The reference numbers indicated above shall be replaced by the revised numbers after incorporating the required adjustments at COD.

Adjustment for LIBOR Variation

83. The Authority has established debt servicing schedule at feasibility stage based on total debt of US$1024.09 million and interest rate of 4.95% (6-Month LIBOR of 0.45% plus 4.5% margin) subject to adjustment at EPC stage. The formula for LIBOR or KIBOR, as the case may be, shall be provided at EPC stage.

Notification

84. The above Order of the Authority along with 02 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.

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Jamshoro Power Company Limited
Jamshoro 2x600 MW Coal Fired Power Project
Tariff Table

Year	Fuel	Cost of Ash Disposal	Cost of Limestone	Variable O&M		Energy Charge	Fixed O&M		Cost of WC	Insurance	Return on Equity	Principal	Interest	Capacity Charge	Capacity Charge at 85%	Tariff	
				Foreign	Local		Foreign	Local									
	PKR per kWh						PKR per kW per hour								PKR per kWh		US¢ per kWh
1	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.1238	0.4514	1.8545	2.1817	6.7375	6.9387
2	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.4256	0.4449	2.1498	2.5291	7.0849	7.2965
3	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.4283	0.4262	2.1337	2.5103	7.0660	7.2770
4	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.4310	0.4074	2.1177	2.4914	7.0471	7.2575
5	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.4338	0.3885	2.1016	2.4725	7.0282	7.2381
6	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.4366	0.3696	2.0855	2.4536	7.0093	7.2186
7	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.5415	0.3482	2.1689	2.5517	7.1074	7.3197
8	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.5445	0.3194	2.1432	2.5214	7.0771	7.2885
9	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.5476	0.2905	2.1174	2.4911	7.0468	7.2572
10	3.8832	0.2200	0.0900	0.3625	-	4.5557	0.0370	0.0413	0.1811	0.0808	0.9391	0.5508	0.2615	2.0916	2.4607	7.0164	7.2260
11	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.5263	0.2328	2.0386	2.3983	6.9551	7.1628
12	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.4843	0.2066	1.9704	2.3181	6.8749	7.0803
13	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.4863	0.1854	1.9512	2.2956	6.8524	7.0570
14	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.4884	0.1642	1.9321	2.2730	6.8298	7.0338
15	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.4905	0.1429	1.9129	2.2505	6.8073	7.0106
16	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.3572	0.1221	1.7588	2.0692	6.6260	6.8239
17	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.3710	0.1028	1.7534	2.0628	6.6196	6.8173
18	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.3710	0.0832	1.7338	2.0397	6.5965	6.7935
19	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.3710	0.0636	1.7141	2.0166	6.5734	6.7698
20	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.3710	0.0440	1.6945	1.9936	6.5504	6.7460
21	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.3710	0.0244	1.6749	1.9705	6.5273	6.7222
22	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.0391	0.0092	1.3278	1.5621	6.1189	6.3017
23	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.0391	0.0073	1.3259	1.5599	6.1167	6.2993
24	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.0391	0.0053	1.3239	1.5576	6.1144	6.2970
25	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.0391	0.0034	1.3220	1.5553	6.1121	6.2947
26	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	0.0391	0.0015	1.3201	1.5530	6.1098	6.2923
27	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	-	-	1.2795	1.5053	6.0621	6.2431
28	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	-	-	1.2795	1.5053	6.0621	6.2431
29	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	-	-	1.2795	1.5053	6.0621	6.2431
30	3.8832	0.2200	0.0900	0.3262	0.0374	4.5568	0.0269	0.0515	0.1811	0.0808	0.9391	-	-	1.2795	1.5053	6.0621	6.2431
															Levelized Tariff	6.8654	7.0705

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Jamshoro Power Company Limited
Jamshoro 2x600 MW Coal Fired Power Project

Financing Structure

Capital Structure	Debt Share	USD Million	PKR Million
Equity		438.90	42,617
Debt		1,024.09	99,439
ADB OCR Loan 1	73.25%	750.17	72,842
ADB OCR Loan 2	2.62%	26.792	2,601
ADB SF Loan	2.65%	27.12	2,633
IDB Loan	19.19%	196.47	19,078
Commercial Loan	2.30%	23.54	2,285

ADB OCR Loan 1				US$ million
Year	Opening Balance	Principal Charge	Interest Charge	Closing Balance
0	750	-	37	750
1	750	31	37	719
2	719	31	35	687
3	687	31	34	656
4	656	31	32	624
5	624	31	31	593
6	593	38	29	555
7	555	38	27	518
8	518	38	25	480
9	480	38	23	443
10	443	38	21	405
11	405	38	20	368
12	368	38	18	330
13	330	38	16	293
14	293	38	14	255
15	255	38	12	218
16	218	39	10	179
17	179	39	8	139
18	139	39	6	100
19	100	39	4	61
20	61	39	3	21
21	21	4	1	17
22	17	4	1	13
23	13	4	1	9
24	9	4	0	4
25	4	4	0	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-
29	-	-	-	-
30	-	-	-	-

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Financing Structure

Capital Structure		USD	PKR
Equity		438.90	42,617
Debt		1,024	99,439
ADB OCR Loan 1	*73.25%*	*750.17*	*72,842*
ADB OCR Loan 2	*2.62%*	*26.792*	*2,601*
ADB SF Loan	*2.65%*	*27.12*	*2,633*
IDB Loan	*19.19%*	*196.47*	*19,078*
Commercial Loan	*2.30%*	*23.54*	*2,285*

ADB OCR Loan 2				US$ million
Year	Opening Balance	Principal Charge	Interest Charge	Closing Balance
0	26.79	-	4.02	26.792
1	26.79	-	4.02	26.79
2	26.79	-	4.02	26.79
3	26.79	-	4.02	26.79
4	26.79	-	4.02	26.79
5	26.79	-	4.02	26.79
6	26.79	5.09	3.83	21.70
7	21.70	5.09	3.06	16.61
8	16.61	5.09	2.30	11.52
9	11.52	5.09	1.54	6.43
10	6.43	5.09	0.77	1.34
11	1.34	0.27	0.19	1.07
12	1.07	0.27	0.15	0.80
13	0.80	0.27	0.11	0.54
14	0.54	0.27	0.07	0.27
15	0.27	0.27	0.03	-
16	-	-	-	-
17	-	-	-	-
18	-	-	-	-
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-
22	-	-	-	-
23	-	-	-	-
24	-	-	-	-
25	-	-	-	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-
29	-	-	-	-
30	-	-	-	-

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
NEPRA
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Financing Structure

Capital Structure		USD	PKR
Equity		438.90	42,617
Debt		1,024	99,439
ADB OCR Loan 1	*73.25%*	*750.17*	*72,842*
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ADB SF Loan	*2.65%*	*27.12*	*2,633*
IDB Loan	*19.19%*	*196.47*	*19,078*
Commercial Loan	*2.30%*	*23.54*	*2,285*

ADB SF Loan				US$ million
Year	Opening Balance	Principal Charge	Interest Charge	Closing Balance
0	27	-	4	26
1	27	1	4	26
2	26	1	4	24
3	24	1	4	23
4	23	1	3	22
5	22	1	3	20
6	20	1	3	19
7	19	1	3	18
8	18	1	3	16
9	16	1	2	15
10	15	1	2	14
11	14	1	2	12
12	12	1	2	11
13	11	1	2	9
14	9	1	1	8
15	8	1	1	7
16	7	1	1	5
17	5	1	1	4
18	4	1	1	3
19	3	1	0	1
20	1	1	0	-
21	-	-	-	-
22	-	-	-	-
23	-	-	-	-
24	-	-	-	-
25	-	-	-	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-
29	-	-	-	-
30	-	-	-	-

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
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Financing Structure

Capital Structure		USD	PKR
Equity		438.90	42,617
Debt		1,024	99,439
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ADB OCR Loan 2	*2.62%*	*26.792*	*2,601*
ADB SF Loan	*2.65%*	*27.12*	*2,633*
IDB Loan	*19.19%*	*196.47*	*19,078*
Commercial Loan	*2.30%*	*23.54*	*2,285*

IDB Loan				US$ million
Year	Opening Balance	Principal Charge	Interest Charge	Closing Balance
1	196	12	3	185
2	185	12	3	173
3	173	12	3	161
4	161	12	3	149
5	149	12	2	136
6	136	13	2	123
7	123	13	2	111
8	111	13	2	98
9	98	13	2	84
10	84	13	1	71
11	71	14	1	57
12	57	14	1	43
13	43	14	1	29
14	29	14	0	15
15	15	15	0	-
16	-	-	-	-
17	-	-	-	-
18	-	-	-	-
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-
22	-	-	-	-
23	-	-	-	-
24	-	-	-	-
25	-	-	-	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-
29	-	-	-	-
30	-	-	-	-

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Financing Structure

Capital Structure		USD	PKR
Equity		438.90	42,617
Debt		1,024	99,439
ADB OCR Loan 1	*73.25%*	*750.17*	*72,842*
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ADB SF Loan	*2.65%*	*27.12*	*2,633*
IDB Loan	*19.19%*	*196.47*	*19,078*
Commercial Loan	*2.30%*	*23.54*	*2,285*

Commercial Loan				US$ million
Year	Opening Balance	Principal Charge	Interest Charge	Closing Balance
1	24	2	1	22
2	22	2	1	20
3	20	2	1	18
4	18	2	1	15
5	15	2	1	13
6	13	2	1	11
7	11	3	1	8
8	8	3	0	6
9	6	3	0	3
10	3	3	0	-
11	-	-	-	-
12	-	-	-	-
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	-	-	-	-
17	-	-	-	-
18	-	-	-	-
19	-	-	-	-
20	-	-	-	-
21	-	-	-	-
22	-	-	-	-
23	-	-	-	-
24	-	-	-	-
25	-	-	-	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-
29	-	-	-	-
30	-	-	-	-

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