Encl: Petition for Motion For Leave for Review

01st September 2016

MOTION FOR LEAVE FOR REVIEW

Pursuant ta

Rule 16 (6) of NEPRA Tariff (Standards and Procedures) Rules, 1998

read with the provisions of

NEPRA (Review Procedure) Regulations, 2009;

and

The Regulation of Generation Transmission and Distribution of Electric Power Act, 1997

Submitted by:

Private Power Infrastructure Board (PPIB)

Far:

The Decision by NEPRA in the matter of Matiari-Lahore 4,000 MW ±660 kV HVDC Transmission Line Project (Decision # NEPRA/TRF-351/PPIB-2016/11318-11321 dated 18th August, 2016)

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1. Introduction

The subject ±600 KV HVDC Transmission Line is part of the China Pakistan Economic Corridor ("**CPEC**").

State Grid Corporation of China (SGCC) has been assigned to develop this project under CPEC initiative. State Grid Corporation of China (SSGC) intends to develop the Matiari-Lahore project through its subsidiary, China Electric Power Equipment and Technology Co. Ltd. ("**CET**") and accordingly, the information and cost details provided by CET were submitted to NEPRA for the purpose of approval of tariff.

On 18th of August, NEPRA officially issued its Decision No. NEPRA/TRF-351/PPIB-2016/11318-11321 dated 18th August, 2016 ("**Decision**") for M-L project. CET has reviewed the Decision of the Authority and has shown concerns on their in-ability to develop the M-L project based on the tariff approved by NEPRA. Accordingly, based on the reservations raised by CET on the Decision, PPIB being a one window facilitator, after consulting and review by NTDC hereby submits the Motion for Leave for Review for the Authority to reconsider certain aspects based on information and data provided by CET and NTDC, as the case may be.

The key issues (grounds for motion for leave for review) raised by CET to be reconsidered by NEPRA are as follows:

- EPC Costs
- O&M Costs
- Taxes on Contractors
- Calculation of Sinosure Cost
- Advisor and Consultant Cost (Non-EPC)
- Withholding Tax (WHT) on Dividends
- Construction Period
- Calculations of ROEDC
- Duties and taxes during construction period
- NTDCL development cost
- True-up of drawdowns (debt as well equity)
- Indexation formula for Debt Servicing
- Directions to the Petitioner and NTDCL
- Adjustment at COD for length of Transmission Line

2. Grounds for Motion for Leave for Review

2.1 EPC Costs

CET is of the view that the EPC costs approved by NEPRA do not reflect the actual cost of the HVDC projects. The EPC cost had been reduced by 25.6% from USD1,757 million to 1,307 million. The Authority may please be consider the following clarifications pertaining to "DETERMINATION OF TARIFF PETITION FOR ±660kV 4000MW MATIARI TO LAHORE HVDC TRANSMISSION LINE ("The Determination") in order to arrive at a justified and informed decision:

2.1.1 Clarification for Comparison of EPC cost of Matiari Lahore Transmission line Project with cost data of Brazilian HVDC Projects

Regarding Item 33.7.1 in the Decision, the main difference of EPC cost of ±660kV HVDC M-L project and ±800kV HVDC Belo-Monte project in Brazil is as follows:

a) For Transmission Line:

All of the mentioned HVDC projects in Brazil usually choose the type of guyed tower as per the normal practice and environmental feature in Brazil country. However, according to the practice in Pakistan, the supported tower is widely used. Based on such a design difference, if using self-support tower the relative cost including material, transportation, construction, etc. is expected to be approximately 40-50% higher than the cost for using guyed tower.

Please kindly find the differences point between the transmission line of Matiari-Lahore Project and Belo Monte HVDC project listed below:

Item	Matiari-Lahore Project	Belo-Monte Project	Percent	Remark
(1) The size of conductor	4×1250 mm^2 ACSR 32.76 T/km	6×805 mm^2 AAAC 25.58 T/km	28%	
(2) Type of tower	Self-support tower Average weight:32 ton	Guyed tower Average weight: 22 ton	45.5%	
(3) Tower foundation	174.92 T/km	78.71 T/km	122%	The concrete foundation price percentage of B-M: M-L is

				about 50%.
(5) Construction costs	Comparatively expensive	International price level		Refer to the additional cost in 3.1.1-c)
(4) Local material price	Comparatively expensive	International price level		Refer to 3.1.1-c)-3

Remark:
The price level is based on the EPC Price Proposal and the quotation of suppliers at Sep, 2015.

Cost and Specification Comparison of NTDC 500kV Transmission Line with HVDC Transmission Line

Conductor Specification	Cross Section/Conductor mm2	Total Cross Section mm2	Weight/Conductor(TON/KM)	Total Weight T/L(TON/KM)	Average Tower Weight/KM/Ton	Price/KM/$
CET Conductor/1250	1322.16	10577.28	4.012	32.096	32.7	566,123
Greely	469	11256	1.295	31.08	33.55	500,000
Drake	469	11256	1.295	31.08	33.55	500,000

However, CET is of the view that the HVDC line with the large size conductor, it increases the cost in construction and erection. The conductor shall be installed with high capacity erection machine which is not available in Pakistan. The Authority also should consider the tight schedule and high mobilization charges and high local material price.

b) For Converter Stations:

The following are main different points for converter stations between Matiari-Lahore Project and Belo Monte HVDC project:

i. System Study & Security Control System for Stability

Comparing to Belo-Monte project, it is additional requirement for a system study and a set of Security Control System installed in NTDC grid system to keep the system stability security control system for stability as per the request of NTDC under TSA. The Authority is therefore requested to allow the system study (special subject study) charges at US$4,144,660 and the engineering, procurement and commissioning for security control system for stability

charges at US$8,169,934, so that the CET can carry on a complete system study with NTDC and install the Security Control System in NTDC grid system.

ii. Foundation Treatment

Additional foundation treatment is required as Pakistan landscape is mostly flat with few hills, the converter station should prepare for flood. The preparation has two steps. First, the surfacing soils around the foundation should be striped. Then, the qualified soils evacuated from elsewhere have to be refilled and pile up around the foundation in order to elevate the ground level. The Authority is requested to allow the foundation treatment charges at US$8,651,302.

iii. Local Manufacturing Facilities for HVDC equipment

Comparing to Pakistan local market, major international manufactures for HVDC industry all have manufacturing facilities in Brazil but not have local factories in Pakistan yet, which suggests that costs for HVDC equipment in Brazil tend to be lower level. As a result, all HVDC equipment need to be imported and the cost will be higher accordingly, for example, to consider high cost of transportation for large size of transformers.

iv. Spare Parts and Experimental Equipment

Due to lack of local resource and suppliers especially in HVDC equipment, in order to ensure the required 98.5% availability, we have to stock more imported spare parts and experimental equipment, which will incur additional costs accordingly. The Authority is requested to allow the Spare Parts and Experimental Equipment charges at US$15,350,478.

c) For Construction Period and Shortage of Construction Resources both for transmission line and converter station:

For M-L project, Pakistan side will benefit from 27 months construction period instead of 45-57 months as per CIGRE brochure 388 (page 105-106) as per Authority Decision. For Belo-Monte Project, the construction period is 50 months. It is of the view that the Authority should consider the complexity and unforeseen difficulties for the construction of M-L HVDC project to achieve the construction period of 27 months, and consider the relative increasing on EPC

cost because of such a big difference on construction period between M-L project and Brazil HVDC projects.

The following are the main aspects comparing to the different construction period for Belo Monte ±800kV HVDC Project in Brazil and M-L ±660kV HVDC Project in Pakistan:

1) Mobilization Cost

It is to be noted that more construction workers and equipment have to be mobilized and shipped to the sites in order to catch up with the tight construction schedule; The CET humbly requests the Authority to allow mobilization charge at US$ 36,059,392 for converter stations and transmission line. The cost includes but not limited:

a. Camp facilities for converter station;
b. Emergency Diesel generator and water treatment set.
c. The mobilization of construction machinery, as the number of machinery will be multiplying.

For converter stations:

Item	Unit/ Package Price	For two Converter Stations (USD)
Camp facilities for converter station	4,654,820	9,309,640
Emergency Diesel generator	1,960,784	3,921,568
Water treatment set	97,9248	1,958,496
Construction machinery mounting for converter station	1,419,996	2,839,992
	Subtotal	**18,029,696**

For transmission line:

Item	For 878km transmission line (USD)
Camp facilities for transmission line	9,309,640
Emergency Diesel generator	3,921,568
Water treatment set	1,958,496
Construction machinery mounting for transmission line	2,839,992
Subtotal	**18,029,696**

2) Additional HR allowance of Chinese Staff

In Brazil, there are at least 3 HVDC projects under operation and have enough skilled staff for HVDC project. However, in Pakistan, so far, the skilled engineers and labors are seriously in shortage for construction of HVDC project. Meanwhile, due to the high security risk in Pakistan, CET requests that it needs to have additional HR allowance to attract more Chinese staff. It also depends on the tight requirement of construction schedule that how many local workers should be hired by CET.

For converter stations:

Item	Average Number in Construction Period	Additional Unit Cost/ Month (USD)	Sum (USD)	For two Converter Stations (USD)
Construction management	55	1,800	1,980,000	3,960,000
Logistics support	20	1,800	720,000	1,440,000
Skilled worker for civil	420	1,800	15,120,000	30,240,000
Skilled worker for installation	80	1,800	2,880,000	5,760,000
Testing personnel	25	1,800	900,000	1,800,000
Subtotal			**21,600,000**	**43,200,000**

For transmission line:

Item	Average Number in Construction Period	Additional Unit Cost/ Month (USD)	For 878km transmission line (USD)
Construction management	55	1,800	3,960,000
Logistics support	20	1,800	1,440,000
Skilled worker for erection and string	360	1,800	25,920,000
Skilled worker for civil	200	1,800	14,400,000
Subtotal			**45,720,000**

3) Shortage of Construction Resources

Considering the industrial situation as well as the geographical feature of Pakistan, the supply of commodity materials is in shortage. As more and more CPEC projects shall start construction work, the demand for commodity materials will go up. Therefore, the cost of materials is expected to increase.

The following is an example to show the difference on price level for the main material of foundation work.

Item	Pakistan Local Unit Price/ Ton or m^3(USD)	Brazil Local Unit Price/ Ton or m^3(USD)	Percentage = B-M: M-L
Steel Bar	875	450	51%
Cement	150	55	36%
Medium-coarse sand	17.5	12	68%
Crusher	24.5	16	65%

Remark:
The price level is based on the quotation of suppliers at Sep, 2015.

d) For Local O&M Staff Training

Because M-L transmission line is the first HVDC line in Pakistan, there will be a big demand for training O&M local personnel, so there will be additional training cost comparing to other mature HVDC markets which already have a lot of skilled staff.

As per estimate there shall be 10 O&M local staff nominated by NTDCL to be trained in China for M-L transmission line, and RMB ¥ 200,000 per person will be spent during the EPC period. Besides, there shall be 20 O&M local personnel employed by the Company to be trained in China for two converter stations, and RMB ¥ 200,000 per person will be spent during the EPC period. Hence, we claimed 1 million USD for the training for O&M local staff during EPC period,.

e) For Additional cost of Third Party Engineer for commissioning

As per the normal practice in Brazil and other HVDC market, Petitioner will not provide third party engineers for the Purchaser. However, for M-L project, the Third Party Engineer for commissioning is requested by NTDC and will increase additional cost accordingly.

Item	Man-Month	Unit Price	Price
For converter stations:			
Witnessing the substation system commissioning program	4*1	40,000	USD 160,000
Witnessing the system commissioning program	4*3	40,000	USD 480,000
Witnessing the important parts of HVDC system debugging.	4*1	40,000	USD 160,000

For transmission line:			
Reviewing the commissioning outline			USD 50,000
Issuing the third-party records of the whole debugging process of this project.			USD 50,000
Being responsible for checking and accepting the project, and issuing the certificate of completion.			USD 100,000
		Total	**USD 1,000,000**

f) For Security Arrangement

In Pakistan, security cost is a special component of EPC cost because of its high security risk. After discussion with relevant authority of Pakistan, CET is of the view that the requirement of the Pakistan Security exceeds the original security cost assumed in applied EPC cost. The facilities and security staff have to be more strengthened.

The Security Cost for Matiari-Lahore ±660kV HVDC Transmission Line Project has been reviewed and further modified as per the latest additional requirement from GOP after CET submitted the Tariff Petition , which now stands on USD30,721,938, instead of the original USD12,239,256.

The above security cost is based on the following reference:

1. 5ecurity investigation of the areas where the project is to be implemented (in line with the relevant investigation and security program);
2. Security Coordination Conference of CPEC Project on 10th Aug 2016 (at Malir Cantonment, Karachi)
3. Security arrangement available in Port Qasim Power Plant, as provided by Ranger Head Quarter (10th Aug 2016, Malir Cantonment, Karachi);
4. Meetings with head of Sindh Ranger 36 Wing (12th and 18th Aug 2016)
5. Security Deployment as mutually consented between the Sindh Ranger head quarter and CET.

Below is the breakdown of security cost and clarification where necessary

Security Cost for HVDC

Ser	Oescription	Converter Station	Transmission Line	Subtotal
1	Perimeter	2,983,645	4,528,640	**7,512,285**
2	Technical Systems and	670,000	2,680,000	**3,350,000**

	Technology			
3	Security Equipment	1,500,488	3,219,509	**4,719,997**
4	Security Training	1,053,000	567,000	**1,620,000**
5	Security Forces Allowance & Payment	2,800,000	6,356,800	**9,156,800**
6	Security Accommodation	840,000	2,400,000	**3,240,000**
7	Security facilities (Air Conditioner)	52,769	155,077	**207,846**
8	Office Expenses	146,340	529,200	**675,540**
	Total Security Budget	**10,046,242**	**20,436,226**	**30,482,468**

No.	Items	Unit	Unit price	Matiari C/S	Lahore C/S	Total 8 Camps	Qty of C/S	Amount (USD)	Qty of T/L	Amount (USD)
1.1	**Perimeter**									
1.1.1	Ditches	Meter	45.00	2,400		4480	2,400	108,000	4480	201,600
1.1.2	Barbed Fences	Meter	88.00	2,280	2,565	4480	4845	426,360	4480	394,240
1.1.3	Walls and razors	Meter	25.00	2,260	2,545	3840	4805	120,125	3840	96,000
1.1.4	Floodlights	pcs	20.00	45	50	72	95	1,900	72	1,440
1.1.5	Guard Towers	set	3,000.00	6	4	32	10	30,000	32	96,000
1.1.6	Searchlights	set	500.00	6	4	32	10	5,000	32	16,000
1.1.7	Guard Tower Alarm	Set	300.00	6	4	32	10	3,000	32	9,600
1.2	Access Control Facilities	set	-	-	-	-	0	-	0	-
1.2.1	Guard Room at Main Entrances	set	2,000.00	1	1	8	2	4,000	8	16,000
1.2.2	Guard Post at Main Entrances	set	1,000.00	1	1	8	2	2,000	8	8,000
1.2.3	Roadblock Facilities at Main Entrances（barricades、speed humps、lifting rods）	lump sum	3,000.00	2	2	16	4	12,000	16	48,000
1.2.4	Sandbagged Bunkers at Main Entrances	pcs	2.00	300	300	2400	600	1,200	2400	4,800
1.2.5	Iron Gate at Main Entrances	Nos	700.00	1	1	8	2	1,400	8	5,600
1.2.6	Alarm at Main Entrances	pcs	300.00	2	2	16	4	1,200	16	4,800
1.2.7	Floodlight at Main Entrances	pcs	20.00	2	2	16	4	80	16	320
1.2.8	Firefighting Equipment in Guard Rooms	set	100.00	2	2	16	4	400	16	1,600
1.2.9	Visitor Parking Lots	lump	20,000.00	1	1	8	2	40,000	8	160,000

		sum								
1.3	Security Facilities in Camp						0	-	0	-
1.3.1	Partition Fence	Meter	60.00	3,000	3,000	8000	6000	360,000	8000	480,000
1.3.2	Camp Floodlights	set	20.00	12	12	64	24	480	64	1,280
1.3.3	Camp Firefighting Equipments	set	100.00	10	10	80	20	2,000	80	8,000
1.3.4	Firefighting Equipments in Office and Residential Areas	set	100.00	20	20	160	40	4,000	160	16,000
1.3.5	Alarm in Office and Residential Areas	set	300.00	10	10	80	20	6,000	80	24,000
1.3.6	Metal Fence in Key Areas	m2	8.00	500	500	4000	1000	8,000	4000	32,000
1.3.7	Metal Cage Key Areas	pcs	5.00	50	50	400	100	500	400	2,000
1.3.8	Protection Well in Key Areas	meter	20.00	20	20	160	40	800	160	3,200
1.4	Emergency Facilities						0	-	0	-
1.4.1	Emergency Shelter (Strengthened Container)	set	80,000.00	10	10	32	20	1,600,000	32	2,560,000
1.4.2	Emergency Exits	set	2,000.00	1	1	8	2	4,000	8	16,000
1.5	Security Facilities of Mobile Operating Sites						0	-	0	-
1.5.1	Detachable and Portable Bulletproof Fenches (2 meters high)	m2	60.00	10	10	36	20	1,200	36	2,160
1.5.2	Emergency Shelters (Strengthened Container)	pcs	20,000.00	6	6	16	12	240,000	16	320,000
Sub-Total							0	2,983,645		4,528,640

Ser	Items	Unit	Unit price	Matiari C/S	Lahore C/S	Total 8 Camps	Qty of C/S	Amount (USD)	Qty of T/L	Amount (USD)
2	**Technical Systems and Technology**									
2.1	Perimeter Intrusion Detector	set	20,000	1	1	8	2	40,000	8	160,000
2.2	Key Area Intrusion Detector	set	20,000	1	1	8	2	40,000	8	160,000
2.3	CCTV	set	50,000	1	1	8	2	100,000	8	400,000
2.4	Smoke Detecting Alarm	set	10,000	1	1	8	2	20,000	8	80,000
2.5	Emergency Broadcasting	set	5,000	1	1	8	2	10,000	8	40,000
2.6	Electronic Access Control	set	80,000	1	1	8	2	160,000	8	640,000

2.7	Computer Room	set	50,000	1	1	8	2	100,000	8	400,000
2.8	Central Control Room	set	100,000	1	1	8	2	200,000	8	800,000
Sub-Total							0	670,000	0	2,680,000

No.	Items	Unit	Unit price (USD)	Matiari C/S	Lahore C/S	Total 8 Camps	Qty of C/S	Amount (USD)	Qty of T/L	Amount (USD)
3	**Security Equipments**									
3.1	Guard Equipments									
3.1.1	Uniform	Lot	200.00	3	3	16	6	1,200	16	3,200
3.1.2	Flashlights+Telescopic Batons+Spray Device+Telescope	set	200.00	2	2	16	4	800	16	3,200
3.1.3	Baton or Telescopic Baton	set	30.00	2	2	16	4	120	16	480
3.1.4	Electric Baton	set	50.00	2	2	16	4	200	16	800
3.1.5	Flashlight	set	36.00	2	2	16	4	144	16	576
3.1.6	Spray Device	pcs	10.00	3	3	16	6	60	16	160
3.1.7	Rope	pcs	2.00	2	2	16	4	8	16	32
3.1.8	Restraint Strap	pcs	5.00	2	2	16	4	20	16	80
3.1.9	Pronged Poles	pcs	28.00	2	2	16	4	112	16	448
3.1.10	Reflective Vest	pcs	5.00	3	3	16	6	30	16	80
3.1.11	Whistle	pcs	2.00	4	4	27	8	16	27	54
3.1.12	Portable Searchlight	pcs	15.00	3	3	32	6	90	32	480
3.1.13	Portable Searchlight（mobile)	pcs	15.00	2	2	32	4	60	32	480
3.1.14	Warning Sign	pcs	2.00	2	2	32	4	8	32	64
3.1.15	Reflective Warning Signs or Baton	pcs	5.00	2	2	32	4	20	32	160
3.1.16	Cordon	Cancelled								
3.1.17	Shield	Cancelled								
3.1.18	Loudspeaker	set	10.00	2	2	18	4	40	18	180
3.1.19	Canteen	set	15.00	4	4	27	8	120	27	405
3.1.20	Service Recorder（night vision)	set	270.00	2	2	16	4	1,080	16	4,320
3.2	Personal Protective Equipments	set					0	-	0	-
3.2.1	Bulletproof Helmet	pcs	200.00	4	4	24	8	1,600	24	4,800
3.2.2	Bulletproof Helmet（mobile)	pcs	200.00	5	5	45	10	2,000	45	9,000
3.2.3	Bulletproof Vest	pcs	200.00	4	4	27	8	1,600	27	5,400
3.2.4	Bulletproof Vest（	pcs	200.00	5	5	45	10	2,000	45	9,000

	mobile)									
3.2.5	Onife-resistant Glove	pair	20.00	3	3	18	6	120	18	360
3.2.6	Sunglasses	pair	30.00	4	4	27	8	240	27	810
3.3	Communication Equipments	set					0	-	0	-
3.3.1	Shortwave Handheld Radio	set	600.00	4	4	27	8	4,800	27	16,200
3.3.2	Shortwave Handheld Radio (mobile)	set	600.00	10	10	90	20	12,000	90	54,000
3.3.3	Shortwave vehicle Radio	set	800.00	2	2	18	4	3,200	18	14,400
3.3.4	Shortwave Base	set	1,500.00	1	1	9	2	3,000	9	13,500
3.3.5	Satellite Phone	set	10,000.00	2	2	18	4	40,000	18	180,000
3.3.6	Satellite Positioning Handset	pcs	210.00	10	10	90	20	4,200	90	18,900
3.3.7	Patrol UAV+ High-definition Camera+Wireless Image Signal Transmission	set	800.00	1	1		2	1,600	0	-
3.3.8	Image Automatic Identification and Comparison System	set	1,000.00	1	1		2	2,000	0	-
3.4	Security Check Device	set					0	-	0	-
3.4.1	Hand-held Metal Detector	set	100.00	2	2	18	4	400	18	1,800
3.4.2	Hand-held Explosive Detector	set	37,500.00	1	1	9	2	75,000	9	337,500
3.4.3	Archway Metal Detector	set	500.00	1	1	8	2	1,000	8	4,000
3.4.4	X-ray Scanner	set	100,000.00	1	1	8	2	200,000	8	800,000
3.4.5	Car Inspection Mirror	set	1,000.00	1	1	8	2	2,000	8	8,000
3.4.6	Explosion-proof Blanket or Fense	set	2,000.00	1	1	8	2	4,000	8	16,000
3.4.7	Explosion-proof Barrel or Tank	set	100.00	1	1	8	2	200	8	800
3.5	Firefighting Equipments						0	-	0	-
3.5.1	Fire Shovel (Axe)	set	5.00	10	10	80	20	100	80	400
3.5.2	Extinguisher	set	10.00	50	50	450	100	1,000	450	4,500
3.5.3	Fire-extinguishing Ammunition	Set	25.00	50	50	450	100	2,500	450	11,250
3.5.4	Fire Blanket	pcs	10.00	10	10	90	20	200	90	900
3.5.5	Fire Protection Clothing	pcs	80.00	5	5	45	10	800	45	3,600

3.5.6	Anti-fire Gloves	pair	7.00	10	10	90	20	140	90	630
3.6	Security Vehicles									
3.6.1	SUV Land Cruiser	set	100,000.00	2	2	0	4	400,000	0	-
3.6.2	4X4 Pickup	set	60,000.00	3	3	16	6	360,000	16	960,000
3.7.1	Office Equipment and Supplies	3.7	Logistics						0	-
3.7.2	Backup Diesel Generators	set	50,000.00	2	2	8	4	200,000	8	400,000
3.7.3	Water Purification Equipment	set	15,000.00	5	5	16	10	150,000	16	240,000
3.7.4	Tent for Temporary Working Site	pcs	200.00		4	64	8	1,600	64	12,800
3.8	First Aid and Emergency Medical Treatment									
3.8.1	Commonly-used Drugs and First Aid Equipment	set	1,200.00	2	2	18	4	4,800	18	21,600
3.8.2	Individual First-aid Package	set	15.00	4	4	27	8	120	27	405
3.8.3	Individual First-aid Package (Mobile)	set	15.00	5	5	45	10	150	45	675
3.8.4	First-aid Kit	set	250.00	2	2	18	4	1,000	18	4,500
3.8.5	Oxygen Tank and Mask	set	40.00	2	2	18	4	160	18	720
3.8.6	Fixation Splint	set	30.00	2	2	18	4	120	18	540
3.8.7	Stretcher	set	20.00	2	2	18	4	80	18	360
3.8.8	Dismantle Tool	set	350.00	1	1	8	2	700	8	2,800
3.8.9	Rescue Cutting Machine	set	560.00	1	1	8	2	1,120	8	4,480
3.8.10	Hydraulic Clamp	set	750.00	1	1	8	2	1,500	8	6,000
3.8.11	Electric Saw	set	55.00	1	1	8	2	110	8	440
3.8.12	Fire Hammer	pcs	300.00	2	2	18	4	1,200	18	5,400
3.8.13	Lifeline	set	60.00	2	2	18	4	240	18	1,080
3.8.14	Folding Ladder	set	60.00	1	1	8	2	120	8	480
3.8.15	Emergency Supplies (Food)	kg	22.00	10	10	90	20	440	90	1,980
								1,500,488		3,219,509

Ser	Description	UOM	Unit Price (USD)	Converter Station Staff	Transmission Line Staff	Days	Transmission Line Training Cost	Converter Station Training Cost	Amount (USD)
5	**Security Training**								
5	Chinese Expatriate Employees Training (trained in Beijing, Including food and accommodation)	per person per day	100	1,926	954	5	477,000	963,000	1,440,000
5	Local Security Personel Training (trained in Pakistan)	per person per day	20	1,500	1,500	3	90,000	90,000	180,000
	Sub-Total						**567,000**	**1,053,000**	**1,620,000**

Relative Month	Converter Stations					Transmission Line (One Lot)			Allowance for Ranger /police of Lahore C/S	Payment for Private Guard for Matiari C/S	Allowance for Ranger /police of T/L	Payment for Private Guard of T/L
Allowance and Payment for Ranger and Private Guard												
	Total	Ranger/ Army	Police	Private Guard	Total	Ranger / Army	Police	Private Guard	USD	USD	USD	USD
T1	30	10	10	10	0				4000	8000	-	-
T2	30	10	10	10	0				4000	8000	-	-
T3	50	15	15	20	0				6000	16000	-	-
T4	50	15	15	20	0				6000	16000	-	-
T5	50	15	15	20	46	20	20	6	6000	16000	32,000	19,200
T6	50	15	15	20	94	20	20	54	6000	16000	32,000	172,800
T7	50	15	15	20	94	20	20	54	6000	16000	32,000	172,800
T8	50	15	15	20	94	20	20	54	6000	16000	32,000	172,800
T9	100	30	30	40	94	20	20	54	12000	32000	32,000	172,800
T10	200	100	50	50	124	50	50	54	30000	40000	80,000	172,800
T11	200	100	50	50	188	100	50	38	30000	40000	120,000	121,600
T12	200	100	50	50	188	100	50	38	30000	40000	120,000	121,600
T13	200	100	50	50	188	100	50	38	30000	40000	120,000	121,600
T14	350	100	100	150	218	100	50	68	40000	120000	120,000	217,600
T15	350	100	100	150	218	100	50	68	40000	120000	120,000	217,600
T16	350	100	100	150	218	100	50	68	40000	120000	120,000	217,600

T17	350	100	100	150	218	100	50	68	40000	120000	120,000	217,600
T18	350	100	100	150	250	100	50	100	40000	120000	120,000	320,000
T19	350	100	100	150	250	100	50	100	40000	120000	120,000	320,000
T20	350	100	100	150	186	100	50	36	40000	120000	120,000	115,200
T21	350	100	100	150	186	100	50	36	40000	120000	120,000	115,200
T22	350	100	100	150	186	100	50	36	40000	120000	120,000	115,200
T23	350	100	100	150	186	100	50	36	40000	120000	120,000	115,200
T24	350	100	100	150	186	100	50	36	40000	120000	120,000	115,200
T25	200	100	50	50	92	30	30	32	30000	40000	48,000	102,400
T26	200	100	50	50	92	30	30	32	30000	40000	48,000	102,400
T27	200	100	50	50	92	30	30	32	30000	40000	48,000	102,400
T28	200	100	50	50	92	30	30	32	30000	40000	48,000	102,400
T29	200	100	50	50	92	30	30	32	30000	40000	48,000	102,400
T30	200	100	50	50	84	30	30	24	30000	40000	48,000	76,800
T31	200	100	50	50	84	30	30	24	30000	40000	48,000	76,800
T32	200	100	50	50	54	10	20	24	30000	40000	24,000	76,800
Subtotal:									**856,000**	**1,944,000**	**2,280,000**	**4,076,800**
Total										**2,800,000**		**6,356,800**

Cost of Accommodation for Security Forces and AC Facilities

Ser	Location	Ranger /Army	Special Police	Private Guards	Total Security	Office Room (No AC)	Officer Bed Room	Security Staff Bed Room (8 men /room)	Total room	Total AC Set	Total Cost of Accommodation (USD)	Total Cost of AC (USD)
1	Matiari Converter Station	100	100	150	350	3	2	44	49	95	420,000	26,385
2	Lahore Converter Station	100	100	150	350	3	2	44	49	95	420,000	26,385
	Subtotal:										840,000	52,769
3	Transmission Lot-1	100	100	50	250	3	2	31	36	69	300,000	19,385

4	Transmission Lot-2	100	100	50	250	3	2	31	36	69	300,000	19,385
5	Transmission Lot-3	100	100	50	250	3	2	31	36	69	300,000	19,385
6	Transmission Lot-4	100	100	50	250	3	2	31	36	69	300,000	19,385
7	Transmission Lot-5	100	100	50	250	3	2	31	36	69	300,000	19,385
8	Transmission Lot-6	100	100	50	250	3	2	31	36	69	300,000	19,385
9	Transmission Lot-7	100	100	50	250	3	2	31	36	69	300,000	19,385
10	Transmission Lot-8	100	100	50	250	3	2	31	36	69	300,000	19,385
	Subtotal:	100	100	150	350	3	2	44	49	95	2,400,000	155,077
					3050	33	22	380	435	837	3,240,000	207,846

Note:

1. Each security person is allotted 5m2 area for accommodation, including the area for bathroom, toilet and public area
2. Based on the latest offer for the camp construction, each M2 will cost about U5D 240, including all basic facilities.

Ser	Oescription	Budget for Converter Station $U5/Camp	Budget for Transmission line $U5/Camp	Quantity(man Month)	Converter Station	Transmission Line and Ware House	Subtotal for Converter Station	Subtotal for Transmission Line	Total
8	**Office Expenses**								
8.1	Office Expense Security Managerial Personnel from CET、General Security Officer and Security Officer)	500	300	27.00	2.00	8.00	27,000	64,800	91,800
8.2	Communication Expenses Security Managerial Personnel from CET、General Security Officer and Security Officer)	160	200	27.00	2.00	8.00	8,640	43,200	51,840
8.3	Orinking Water Security Managerial Personnel from CET、General Security Officer and Security Officer)	250	150	27.00	2.00	8.00	13,500	32,400	45,900
8.4	Security Vehicle Maintenance and Petrol	1800	1,800	27.00	2.00	8.00	97,200	388,800	486,000
	Total :						146,340	529,200	675,540

Note:

a. Item 1 – Perimeters of $7.51 million (item 1): the security perimeters are **based on the model of the security arrangement of Port Qasim Power Plant, as requested by the rangers/army during recent meetings.**
b. Item 2 and 3 - Security Technical System and equipment of $8.06 million: these are the cost for procurement and installation of the CCTV, communication system, detectors, X-ray machines, and security vehicles for private security companies, etc, as per the security requirement.
c. Item 4 – Security Training of $1.62million: Security training is compulsory for all the Chinese nationals working in Pakistan. There are about 3000 Chinese nationals working for the project, who must be security-trained.
d. Item 5 - Security Forces Cost of $9.15 million: It is lately known that **GoP do not have sufficient security forces to meet the demand of the security for the transmission line**, therefore, the security forces will be composed of ranger/army, police and ranger-certified private guards. The total security forces numbers from 100 men in the beginning, up to 1350 in peak time of construction.
e. Item 6 - Security Accommodation of $ 3.24 million: **This is requested by the ranger/army recently that** they shall be provided with accommodation and necessary facilities;
f. Item 7 - Security accommodation facilities of $0.21million: **This is also the requirement of the ranger/army** for their accommodations, including air conditioners, and the O&M cost.
g. Item 7 - Offices expense of $0.68million: These are the cost related with security offices, operation costs of security equipment and vehicles.

6. In view foregoing, CET is of the view that security cost may be adjusted as aforesaid.

2.1.2 Clarification for Comparison of EPC cost of Matiari Lahore Transmission line Project with cost data of India HVDC Project

Regarding Item 33.7.2 in Decision, CET clarification for the main different respects comparing to India and Pakistan HVDC project is as follows:

- According to an India HVDC project document, EPC cost for the Indian project is an unfixed and tax free price with adjustment terms which is that costs can be indexed upon exchange rate, labor cost and material index.

- The availability for the Indian project is 97% while the rate for this project is 98.5%.
- The construction period for the Indian project is 42 months while the period for this project is 27 months.
- Major international manufactures for HVDC projects, such as ABB, SIEMENS and ALSTOM all have manufacturing facilities in India. However, the necessary equipment used in our project has to be imported.

Thus, the EPC costs proposed for M-L HVDC project in Pakistan can not be simply compared with India HVDC project cost. Moreover, the original applied EPC costs for M-L HVDC project are all based on the local pricing information and actual quotations.

2.1.3 Clarification for Comparison of EPC cost of Matiari Lahore Transmission line Project with cost data of Chinese HVDC Project

CET had reviewed section 33.7.3.2 of the table of project costs of transmission line built by CSG in Determination document. The EPC costs of the converter station range are from USD 277,496 to USD 365,711 per MW. The transmission line cost range is from USD 445,990 to USD 741,934 per KM. Moreover all the conductor size is lower than the M-L HVDC project. So, CET provides a further break-down in the below table and finds out that the HVDC EPC cost of M-L HVDC project is reasonable.

Project Title	Guiguang OC Power Transmission	Yunguang OC Power Transmission	Nuozhadu OC Power Transmission	Xiluodu DC Power Transmission	Matiari-Lahore HVDC Project
Year	Dec. 2007	June 2010	Sep. 2013	June 2014	Estimated 2018
Voltage(kV)	±500	±800	±800	±500	±660
Capacity(MW)	3000	5000	5000	6400	4000
Lengths(KMs)	1194	1373	1413	2*1223	878
Conductor(mm^2)	4*720	6*630	6*630	4*900	4*1250
Availability	≥95%	≥95%	≥95%	≥95%	≥98.5%
Cost of Converter Station/ MW	277,496	305,795	315,329	365,711	315,034
Cost of Transmission Line/ KM	445,990	568,847	741,934	637,663	566,123
Total Project Cost Billion US$	1.365	2.31	2.625	2.73	1.757

Further, China has undertaken more HVDC construction projects and more than 20 Chinese HVDC projects have already achieved commercial operation. China is quite experienced with the construction and operation of HVDC projects. So such price of HVDC projects should be more referable. So, considering the following points, the EPC cost for M-L HVDC project is at a reasonable level:

- The costs of converter station and transmission line of the referred CSG projects are higher than this project, and the cross-section of conductor is less than the size of this project.
- Based on the analysis of the referred C5G project, the cost for machinery and construction work in China at the period of 2007 and 2014 is rising.
- All the equipment and service procurement of CSG projects have gone through public bidding process.
- The availability of this project (98.5%) is higher than the referred CSG projects (95%).

2.1.4 Clarification for Comparison of EPC cost of Matiari Lahore Transmission line Project with cost data of Ningdong Shandong Project

Regarding Item 33.7.4 in Decision, our clarification for the main aspects comparing to Ningdong 5handong Project in China and M-L Pakistan HVDC project are as follows:

- The cross-section of conductor of Ningdong project adopts 4*1000mm^2, differ from Matiari-Lahore project as 4*1250mm^2.
- The cost of materials, transportation , mobilization, and construction, commissioning will increase because the different environment and local resource for HVDC industry filed between China and Pakistan.
- The actual length of Ningdong project is 1333kM instead of the claimed 2518kM.
- The indexed price of 2016 referred to in the tariff determination is not provided by CET. The HVDC industry price level (refer to CSG table), wage index (refer to Chinese National Bureau of 5tatistic) do not support the indexed price referred in the determination. For example, the wage index is already increased by 52% from the year of 2010 to 2015.
- More detailed comparison in technical aspects is listed below:

Item	Ningdong to Shandong ±660kV HVDC Project	Matiari to Lahore ±660kV HVDC Project	Remark
Bipole Power in	4,000 MW	4,000 MW	

Bipole Voltage	± 660	± 660	
Converter Station			
Primary Equipment			
Converter Transformers	28 (One phase two winding transformer with spare)	28 (One phase two winding transformer with spare)	
Thyristor Valves and Wall bushings	thyr. type 5"	thyr. type 5"	
AC Filter/ Cap. Banks (500kV AC buses)	Ningdong side:14*150 Mvar; Shangdong side:14*180 Mvar	Matiari side:9*150 Mvar+7*180 Mvar; Lahore side:8*150 Mvar+8*160 Mvar	M-L increasing 470 Mvar
Breaker Bays	Yingchuandong side: 7+2+3+2+2 Qingdao side: 6+3+2	Matiari side:10+4+2; Lahore side:6+4+2	M-L increasing one incoming line and 7 set 500kV reactors
DC Filters	8	8	
DC Yard	Includes metallic return	Includes metallic return	
Smoothing Reactors	18 With spare reactor in each terminal	18 With spare reactor in each terminal	
Secondary Equipment			
HVDC C&P	Includes: DC filter protection; telecomm; RCI; SFR; and TFR	Includes: DC filter protection; telecomm; RCI; SFR; and TFR	
AC C&P	Includes: bus/bay/filter/capacitor protections; breaker control	Includes: bus/bay/filter/capacitor protections; breaker control	With NTDC requirement of Europe Components for AC Protection
Aux. Equipment	Includes converter valve cooling	Includes converter valve cooling	
Transmission Line (878km)			
Conductor Option	4×1000 mm^2	4×1250 mm^2	M-L increasing the cross-section of conductor
Tower Option	Self-Supporting Tower	Self-Supporting Tower	M-L increasing the tower weight
Others			
Project Management and Engineering	30 Month Proj.	27 Month Proj.	Taking into account Pakistan domestic situation (local rainy season, Ramadan, transportation and other factors)
Transportation	Domestic Transportation	Domestic Transportation Marine Cargo Transportation Inland Transportation of Pakistan	M-L increasing shipping rates, custom clearance and large-scale equipment transportation.
Civil & Installation	With iine; electrodes and mitigation measures	With line; electrodes and mitigation measures	1-Local construction materials are higher

			price than in China. 2-Chinese engineer and works salary are higher than in China. 3-More mobilization and measures cost for Chinese worker and construction equipment.
Commissioning	9 months	4 months	More commissioning engineer and instrument with 4 months.
Security Control System	No	Yes	
System Losses	6%	4.3%	With larger cross-section of conductor.
System Availability	96%	98.5%	With the requirement on higher reliability of equipment is increasingly enhanced, higher prices of elements are requested.
Security Coverage Cost	No	Yes	The security staff salaries, security equipment, security buildings and etc.
Construction Measures for local conditions	No	Yes	High temperature, rainy season and etc.
O&M Training, technical support and supervision cost for Pakistan staff	No	Yes	
Communication System	SDH+OPGW	2 OPGW+DC PLC	M-L increasing DC PLC.
Price Level	2010 year	2015 year	
Converter Stations Million USD	1006	1260	Cost increase will be explain further below
Transmission Line Million USD	628 (1335 km, 4n Linem^2)	497 (878 km, 44n Line^2)	
Transmission Line Million USD / km	0.471	0.566	Cost increase due to bigger size conductor
Total Project cost Million USD	1419	1757	Covert to same transmission distance of 878km with different conductor
Transmission Line Million USD	497	497	Both Projects using 1250mm^2 Conductor
Total Costs Million USD	1503	1757	M-L Project is about 116.9% of Ningdong Project

As a result, CET is of the view that the EPC cost for M-L HVDC project is reasonable in comparison with Ningdong project.

2.1.5 Clarification for Comparison of EPC cost of Matiari Lahore Transmission line Project with cost data obtained from manufacturers

Regarding Item 33.7.5 in Decision,
CET understands that the price information from GE, ABB and BV do not consider the specific details of the project under the Pakistan local situation. So these prices cannot be regarded as benchmark to M-L HVDC project.

2.1.6 Clarification for Comparison of costs with CASA-1000

Regarding Item 33.7.6 in Decision, our clarification for different aspects comparing to CASA-1000 HVDC Project and M-L Pakistan HVDC project are as follows:

- CET is of the view that because the main technical specification for steel tower, conductor, foundations are completely different with each other , the unit price for transmission line for CASA-1000 project could not directly comparable with M-L project.

- Though the tariff determination contains some brief introduction towards the tariff related factors and technical specifications, the basic commercial model and technical specification are different with each other, so we understand these two HVDC projects are essentially not comparable.

- The bidding process for CASA1000 project has not yield any results, which suggests that the proposed costs at the feasibility stage cannot be verified. Therefore, we have no comments on whether the data of CASA1000 is reliable or whether it is comparable to the cost of this project.

2.1.7 Clarification for Claimed Transmission Line Cost Analysis

In item 33.9.4 in tariff determination, we would like to clarify that the US$1,275/ton is the tower price, instead of the steel price; The US$2,892/ton is the conductor price, instead of the aluminum price, which are similar to the current market price level we already use in our original EPC application.

2.1.8 Clarification for EPC estimates review by Teshmont

Regarding Teshmont's comments on this project in Item 33.10, CET has responded comments in the past meetings and discussions. CET understands that the data proposed by Teshmont has not given consideration to the actual physical and social environment of Pakistan and therefore are not consistent with this project.

Besides, in item 33.10.2, based on our knowledge, as the 500KV 2000MW project is still in feasibility study stage and has not reach implementation stage, CET believes that the referred project is not comparable to this project.

In Teshmont report, "The CET converter costs are at the low end of the costs that would be expected for a project of this size and voltage in a Western market from a mature HVDC equipment supplier".

As a result, CET is of the view that the original EPC price is at the reasonable level.

2.1.9 Security Arrangement Cost (GOP Security Service Cost not included)

For the security arrangement cost issue, it is requested in IA that CET shall provide basic security arrangement for the protection and security of the Converter Stations, camps and residences for the HVDC Transmission Project.

The security arrangement from GoP are only responsible for the security of Chinese nationals, whereas the security of all the different sites, camps, stores, residence, equipment and machines will have to be taken care of by the local security companies to be paid from EPC cost.

As a result, according to the requirement from GoP, the additional facilities and increase the number of security personnel will take a bigger charge than it first thought of security arrangement cost.

In conclusion, based on our clarification and comments in the above from item 2.1.1 to 2.1.9, CET is of the view that the original EPC cost is at a reasonable price level both for transmission line and converter station.
So CET humbly requests:

1) The Authority to reconsider and allow the transmission line keeping the original application price that is US$566,123 per KM, totally US$497,056,671 for 878KM for transmission line.

2) The Authority to reconsider the cost of converter station as the current approved cost is too low.

3) Moreover, recently NTDCL has requested to change the site of converter station, hence, it is possible that the length of transmission line will change accordingly. Therefore, we humbly request the cost of transmission line shall be adjusted based on actual length and the unit price per km at COD.

2.2 O&M Costs

CET understands that NEPRA would like to foster the local expertise for HVDC technology. In the original Petition documents, we had already considered the reduction of the number of O&M Chinese Employee, and increase the number and ratio of Local staff. The training program will be provided to local staff in China and Pakistan for the O&M of HVDC technology. Furthermore, less O&M cost during warranty period had already been considered. Hence, the O&M cost claimed US$76.81 million is fair and reasonable which 3.6% of the total investment. The details breakdown of total US$76.81 million is as follows:

US$	Fixed O&M Cost - Foreign	Fixed O&M Cost - ITC Local	Total
Converter Stations			
O&M Cost for Subcontractor			
Pay and Allowance	5,881,917	1,519,452	7,401,369
Spare parts and tools	2,059,601	1,244,974	3,304,575
Schedule Maintenance	2,903,528	1,170,596	4,074,124
Administration and others	4,561,982	8,165,364	12,727,346
Sub Total O&M Cost for Subcontractor	**15,407,028**	**12,100,385**	**27,507,413**
O&M Cost for Project Co.			
Unschedule Maintenance	5,288,812	-	5,288,812
Overhaul	11,139,608	588,235	11,727,843
Sub Total O&M Cost for Project Co.	**16,428,420**	**588,235**	**17,016,655**
Sub Total Converter Stations	**31,835,448**	**12,688,620**	**44,524,069**

Transmission Line			
O&M Cost for Project Co.			
Specialized Tools and Instrument	650,000	325,000	975,000
Spare parts	1,772,995	886,498	2659,493
Offshore goods transportation expenses	102,335	-	102,335
Trainings	200,000	200,000	400,000
Supervision of transmission line and others	-	655,375	655,375
Sub Total O&M Cost for Project Co.	**2,725,330**	**2,066,872**	**4,792,203**
Sub Total Transmission Line	**2.725330**	**2,066,872**	**4,792,203**
Operating Cost for Project Co.			
Fixed Assets/Vehicles/Office Equipment	-	1,100,404	1,100,404
Housing/Office rental expenses	-	353,780	353,780
Salary (Pakistan Staff)	-	684,270	684,270
Local Administration Cost	-	1,751,478	1,751,478
Consultant Cost	-	1,013,482	1,013,482
Security Cost	-	294,817	294,817
Salary and Traveling Cost (Chinese Staff)	2,839,360	-	2,839,360
Bank account management fee	215,000	-	215,000
Sub Total Operating Cost for Project Co.	**3,054,360**	**5,198,230**	**8,252,590**
Grand Total	**37,615,138**	**19,953,723**	**57,568,861**

Further, there are clarifications in details for Fixed O&M cost foreign and ITC local, which are 37.62 million and 19.95 million in total, respectively. The foreign cost is paid in USD while the local cost paid in PKR.

For two converter stations, the annual cost items by O&M contractor mainly includes, the payment and allowance for the Chinese and local employees, spare parts and tools, schedule maintenance, administration and others.

a) The annual payment and allowance is the average cost during 25 years, which considering the reduction of number of O&M Chinese employee and increasing of number and ratio of local employee; the variation of payment during 25 years is as follows;

1-25th year annual payment and allowance of all employees in 2 converter stations

US$ in million	1-5th	6-10th	11-15th	16-25th	Annual cost
Payment and Allowance	12.24	8.98	7.20	4.28	7.40
Fixed O&M – Foreign	11.78	7.49	5.38	2.36	5.88
Fixed O&M – Local	0.46	1.49	1.82	1.91	1.52

After the overhaul in the 15th year, there are only a few Chinese engineers (we estimate 10-12 persons) for each station to supervise the O&M work, and the local employee could work on O&M for converter station independently.

b) Spare parts and tools have the life spend of 5 years, which have to be replaced totally every 5 years, in the claimed EPC cost, we claim 15,35 million USD for the total cost of spare parts for 2 converter stations, besides, there shall be annual depreciation cost for O&M tools every 5 years. Considering the warranty period, the annual 3.30 million USD cost for spare parts and tools of two converter stations is reasonable.

c) Administration and others cost; the administration cost for two converter stations mainly includes, the office management, accommodation, travelling, vehicles, public awareness, water and power, communication, plant and clean, housing maintenance, living goods, labor protection goods and so on. Other cost includes the security cost, consultant cost, society donation and O&M contract tax which refers to sales tax ratio of 16% in Punjab and 13% in Sindh.

Annual cost of administration and others in 2 converter stations

US$ in million	Annual cost for 2 converter stations
A. Annual administration cost	**6.80**
B. Others	**5.93**
Security cost	1.60
Consultant cost	0.25
Society donation	0.15
O&M Contract tax	3.93
Fixed O&M – Foreign	**4.56**
Fixed O&M – Local	**8.17**
Total (USD in million)	**12.73**

d) The concerns observed by the Authority on schedule maintenance, unscheduled maintenance and Overhaul claimed in the petition are explained in the below.

1. Scheduled maintenance of converter station is the necessary scheduled outage and examination. To ensure the 98.5% availability, there shall be 3 days for scheduled outage every year. The outage schedule shall be communicated with NTDCL in advance. However, the schedule maintenance does not mean the outage due to system failure.

   The annual scheduled maintenance of converter station in China is organized by O&M contractor, to make sure all equipment is in a good operating condition, where 8 zones of converter station are subcontracted to related manufacturers according to the scheduled maintenance contract, which 8 zones are converter transformers, converter valves, converter valve cooling systems, AC field, AC filter field, DC field, control and protection system, and communication systems. About 400 Chinese labors will be employed and it will take 15 days, each manufacturer will make annual maintenance schedule and schemes in advance and submit to O&M contractor. For Matiari-Lahore project, there are only 3 days for scheduled maintenance, hence, there shall be more local labors estimated as 1500 persons to be employed. Each manufacturer will assign its engineering teams to Pakistan to make the detail scheme with other manufacturer groups in order to avoid conflicts. According to the 20 years HVDC O&M experience in China, the schedule maintenance subcontract cost of two converter stations for all related manufactures is as follows:

Annual cost of schedule maintenance in 2 converter stations

US$ in million	Subcontract cost(Foreign)	Local labor and machines cost(local)	total
converter transformers	1.00	0.40	1.40
converter valves	0.20	0.07	0.27
valve cooling systems	0.40	0.20	0.60
AC field	0.30	0.10	0.40
AC filter field	0.40	0.20	0.60
DC field	0.20	0.05	0.25
control and protection system	0.20	0.05	0.25
communication systems	0.20	0.05	0.25
Inland transportation	-	0.05	0.05
total	2.90	1.17	4.07

2. Unscheduled Maintenance is for the system repair due to emergency failure. The Emergency failure is mainly the result of the weak AC grid and deteriorated operation conditions. Besides, the CET has considered the fact that there is a lack of professional staffs and expertise in Pakistan to handle this kind of outage.

   During 25 years, the outage due to weak AC grid and deteriorate operation conditions is bound to occur every year, and almost all repair resource shall be assigned from China. CET says that it has to foresee the operation risk in Pakistan Power Grid, and Unscheduled Maintenance cost is in charge by the CET, not only prepared for converter stations, but also for the transmission line. However, only when the outage results from the weak AC grid and deteriorate operation conditions occurs, the unscheduled maintenance cost shall be applied. According to the 20 years HVDC O&M experience in China, US$ 5.29 million is the averagely annual minimum cost of an HVDC project for unscheduled maintenance.

3. The overhaul is for the replacement of the aged equipment and material which will seriously reduce the project availability and increase system loss at end of the service life. In accordance with proven practice and experience, the following material and equipment do not have a service life of 25 years due to tough environment and limited service life. CET must perform an Overhaul on HVDC system at the 15thyear claimed in TSA in order to ensure the system keeping availability above 98.5% and system loss less than 4.3%. The material and equipment to be replaced including the following:

   (1) Composite insulator for transmission line
   (2) Air cooling system and water cooling system for converter valves
   (3) Control and Communication system
   (4) UPS and Battery

   The annual overhaul cost is the total overhaul cost divided by 25 (years), which is mainly aiming at the above equipment and material. Overhaul claimed in TSA will last 90 days which includes procurement, transportation, dismantling, installation, and commissioning.

For transmission line, the annual cost is spent to assist NTDCL with spare parts, specialized tools and instruments, staff training and technical supervision which claimed in the O&M agreement.

The O&M costs shall consider the following items:

(1) 98.5% availability and 4.3% loss which is higher than the HVDC project in China and India at the similar voltage;
(2) Severe natural environment (max temperature 52.5℃ in summer and serious smog and pollution in winter);
(3) Unpredictable local social environment increasing cost for security staff and facilities;
(4) No HVDC manufacturing facilities and local expertise;
(5) High redundant spare parts and special tools for O&M;
(6) Remote from Urban require independent colony for O&M staff
(7) Always under full load operation status due to high output of coal fired power plant;
(8) Weakness in power grid structure and system stability;
(9) Low O&M cost will too hard to be a bankable project financing

As proposed, the EPC cost for converter station is USD 1,260 million and likewise USD 497 million for transmission line, thus the ratio of EPC cost is 2.5:1. Since more than one hundred type equipment will be installed in the Converter Station, it makes it more complex and difficult for O&M. It also demands a large amount of spare part, special tools and Staff. Accordingly, we suggest that the ratio of O&M cost for converter station and transmission line shall be higher than the ratio of EPC cost.

In conclusion, the proposed annual O&M cost is based on O&M experience of Chinese HVDC projects as real costs envisaged, and also giving consideration to the actual situation of HVDC project in Pakistan. CET is still of the view that the original O&M price is reasonable and we humbly request the following:

a) To keep the O&M cost of USD 76.81 million as the maximum ceiling cost. If the actual incurred expense is exceeding the ceiling, CET/Project Company shall pay the extra cost on its own cost. If the actual incurred expense is less than the ceiling, CET shall return the difference between the actual cost and maximum ceiling cost.

b) However, if annual USD 41.90 million is approved by the Authority, CET humbly requests the Authority to approve the treatment of the exceeding cost as pass-through item.

2.3 Taxes on Contractors

Referring to the EPC cost break-ups (Para 33.2 and 33.3), O&M cost break-ups (Para 46.2), Land lease cost (Para 46.3) details, Interest cost details submitted to NEPRA earlier, as evident from those break-ups, no Withholding Tax or Sales Tax has been assumed in the calculations. If any WHT or Sales Tax is payable by the ITC, it will be ITC's final tax liability and will impact equity IRR, however, this has not been allowed as pass-through unlike precedents approved by NEPRA.

In this regard, following decisions of NEPRA are referred:

- Authority's Decision No. NEPRA/TRF-TCUT/2014/7834-7836 dated 9th July 2014 in the matter of upfront tariff for Thar Coal based mine-mouth power projects

- Authority's Decision No. NEPRA/TRF-UTC/2013/7195-7197 dated 26th June 2014 in the matter of upfront tariff for Imported and Local coal (other than Thar)based power projects

Review of Para 51 (Order), sub-para ix (Custom Duties, Cess and Withholding Tax) of the above mentioned decisions of the Authority requests that, Withholding Taxes on all contractors have been allowed to be included in the Project Costs at the time of Commercial Operations Date ("**COD**"). Such provisions have not been included in the Decision for the Matiari-Lahore project. CET requests the same to be allowed for this project so that WHT on EPC costs, O&M costs, Land Lease costs, costs of foreign contractors for services provided by non-residents etc. can be included in the Project Costs at COD.

As mentioned above, no Sales Tax has been assumed in the cost calculations as evident from the calculations submitted to NEPRA earlier. If any Sales Tax is payable by the ITC to its contractors/advisors, such Sales Tax will not be adjustable/refundable and will impact the equity IRR. Accordingly, we would like to clarify about the Decision of the Matiari-Lahore project that Para 51 (Order), sub-para II (Pass-Through Items), clause (c) will also include the Sales Tax as pass-through that will have to be paid by the ITC to the EPC/O&M Contractors which will be of non-refundable/non-adjustable nature.

Reference to Authority's Decision No. NEPRA/TRF-347/QATPL-2016/5034-5037 dated 14th April 2016 in the matter of 1,180 MW power project on RLNG/HSD by Quaid-e-Azam Thermal Power (Pvt.) Ltd.. If we refer to clause 16.4 of the mentioned Decision, Authority agreed that in case Sales Tax is final liability, it can be added to the duties and taxes which is a pass-through item instead of being included in the Project Costs. CET requests similar allowance for the Matiari-Lahore project that if any Sales Tax is payable on any costs (of non-adjustable/non-refundable nature), it should be made pass-through as this was not included in the cost estimates submitted to NEPRA on the assumption that this will be allowed as pass-through.

2.4 Calculation of Sinosure Cost

Based on the formula for Overseas Investment Policy for Sinosure Costs (during construction) approved by NEPRA, as per our calculations, the cost comes out to be USD 15.20 million exclusive of WHT (inclusive of annual premium of 0.6% and commitment fee of 0.090%) during the 27 month construction period whereas NEPRA has approved a cost of USD 13.80 million based on the same formula referring to the Decision, Para 36.5. We would request NEPRA to review the calculations and rectify accordingly.

In addition, referring to the Decision, Para 36.5, it is mentioned that the limit for Sinosure buyer credit policy is 7% of the total debt. However, according to precedent determination made by NEPRA, the limit for buyer credit policy is 7% of the total debt and the interest payment. According to the Sinosure buyer credit policy, the fee calculation should be based on the total debt and the interest to be paid in the entire loan tenor, which is align with the precedent determination. We would request NEPRA to review and rectify accordingly.

2.5 Advisory and Consultant Cost (Non-EPC)

The requested cost was USD 7.89 million while NEPRA has approved USD 4.5 million referring to the Decision, Para 40.2. The requested cost included costs of financial advisor, legal advisor, technical engineer etc. along with their estimated out of pocket expenses (travelling costs etc.). All these costs were based on the contracts entered into with 3rd parties for their appointment. CET can submit the contracts that it entered into with 3rd parties proving these costs.

CET requests this to be approved at the level requested as the intention is to not make profits from the savings under this head. We can submit evidence to NEPRA at COD proving these costs and these can accordingly be finalized at COD based on the evidence submitted subject to a cap of USD 7.89 million.

2.6 Withholding Tax (WHT) on Dividends

Referring to the Decision Para 43, WHT on dividends is not allowed as a pass through item. It is pertinent to mention that WHT on dividends for IPPs is 7.5% (reduced rate), however, for a transmission line project we understand that the prevailing rate is 12.5% which is significantly higher than the WHT rate for IPPs and consequently has a bigger impact on the equity IRR for the developers.

It was agreed under the Cooperation Agreement by NTDCL that the guaranteed IRR to SGCC would be 17% and based on this commitment, SGCC decided to move ahead with the project 16 months ago and initiated work on the preliminary tasks through its subsidiary CET. If WHT on dividends is not allowed, the guaranteed IRR to SGCC will not be 17% because of WHT as agreed in the Cooperation Agreement.

Referring to Authority's Decision No.NEPRA/TRF-309/KPCL-2015/5764-5766 dated 27th April 2016 in the matter of EPC stage tariff of 720 MW Karot Hydropower Project, NEPRA has allowed WHT on dividends as pass-through capped at 7.5% (which is the prevailing rate for IPPs) of (ROE+ROEDC).

We would also like to refer to the following decisions of NEPRA:

- Authority's Decision No. NEPRA/TRF-TCUT/2014/7834-7836 dated 9thJuly 2014 in the matter of upfront tariff for Thar Coal based mine-mouth power projects

- Authority's Decision No. NEPRA/TRF-UTC/2013/7195-7197 dated 26thJune 2014 in the matter of upfront tariff for Imported and Local coal (other than Thar)based power projects

In the above mentioned decisions, NEPRA has moved away from an IRR based approach to a simple ROE based on the fact that for calculation of IRR based returns, a lot of information is required which is a cumbersome and time consuming process. Also NEPRA was of the view that the process for IRR

calculation is not only complex but also very subjective and prone to analyst's bias. Hence, NEPRA approved a simple ROE % for Thar coal, imported coal and local coal based projects based on a guaranteed IRR number (20% for Thar Coal, 17% for Imported Coal and 18% for Local Coal). If we calculate the IRR based on the ROE numbers approved by NEPRA, the guaranteed IRR numbers are reached upon after deduction of WHT on dividends meaning thereby that NEPRA has indirectly allowed WHT on dividends by building a cushion in the ROE percentages. Although, WHT on dividends is not allowed as pass-through separately, the ROE component includes the WHT impact and hence the guaranteed IRR is net of WHT.

The above decision of NEPRA of including WHT on dividends as part of ROE came after the GOP via its reconsideration request dated 11th February 2014 requested NEPRA to reconsider certain items including WHT on dividends. The wordings mentioned by GOP were *"Twelve (12) IPP projects have been commissioned under Power Policy 2002. NEPRA while determining their tariffs allowed withholding tax of 7.5% on dividends in all cases."*

Although CET understands that the power generation market in Pakistan has matured over time and with excess supply expected in the coming years, incentives to IPPs may be tightened to increase efficiency and competition. However, considering that this is the first private sector transmission project in Pakistan and these are unchartered waters for any private sector developer, not allowing WHT on dividends has a significant negative impact in terms of attracting new private sector investors for development of such transmission projects.

Based on the above, CET requests the Authority to reconsider and allow WHT on dividends as pass-through without any caps so that the IRR approved by NEPRA for the Matiari-Lahore Project is net of WHT.

2.7 Construction period

It was mentioned that CET proposed a project construction period of 27 months from construction start to COD. However, CET wants to clarify that the construction period requested should be from financial close, instead of construction start to COD. Therefore, CET humbly request that a construction period of 27 months from financial close to COD should be allowed by the Authority.

2.8 Calculations of ROEDC

The tariff component of ROEDC approved is PKR 0.0290/kwh, however, if we take all the project cost assumptions approved by NEPRA in the Decision and calculate the ROEDC component at our end (based on the same principles as NEPRA has calculated in the precedents), the tariff component of ROEDC comes out to be PKR 0.0387/kwh. CET calculations are based on quarterly equity draw-downs as mentioned in the Decision and quarterly accrual of ROEDC during the 27 months period assuming end of period accrual. CET requests NEPRA to review the calculations and rectify accordingly.

2.9 Duties and taxes during construction period

Referring to the Decision Para 51 (Order), sub-para I (One Time Adjustments), clause (a), it is mentioned that duties and / or taxes, imposed on ITC for the import of its plant, machinery and equipment will be subject to adjustment at actual on COD. CET would like to clarify that the plant, machinery and equipment will also include transmission line, the conductor, steel tower, insulator and fitting etc. as these are regarded as materials which make the major components of the transmission line.

2.10 NTDCL development cost

Referring to the Decision Para 51 (Order), sub-para I (One Time Adjustments), clause (b), it is mentioned that NTDCL development cost will be adjusted on the basis of actual up to maximum limit of US$ 12 million. The largest portion of the development cost is right of way compensation which is very critical to the progress of the construction. Given the importance of the right of way compensation and the maximum amount cannot be estimated specifically at this stage, we humbly requested the NTDCL development cost will be adjusted on the basis of actual with a cap of USD 15.21 million.

2.11 True-Up of Drawdowns

The drawdowns requested for debt and equity by the CET were based on the expectations of payment terms in relation to the capital and other costs and were requested to be kept the same at COD. NEPRA has approved these to be actualized at COD referring to the Decision Para 51 (Order), sub-para I (One Time Adjustments), clause (h) and clause (k).

We would like to highlight that this means that NEPRA intends to calculate an IRR based return under the tariff instead of a simple ROE and ROEDC based approach. CET strongly believe that an IRR based return does not provide reasonable flexibility to the ITC for efficient drawdowns and payments. Further, to do these calculations at COD, a lot of information is required which is cumbersome and time consuming. Also, IRR based approach is very subjective. Also, this does not provide sufficient incentive to the investor to complete the project at the earliest. For efficient utilization of funds and incentive for expediting the construction process, we would request a simple ROE and ROEDC based approach. This means that the true-ups at COD should not be linked with the actual debt and equity drawdowns.

CET would like to refer Authority's Decision No. NEPRA/TRF-TCUT/2014/7834-7836 dated 9th July 2014 in the matter of upfront tariff for Thar Coal based mine-mouth power projects where Authority's opinion was in line with what we have mentioned above. Under para 32, the following was mentioned:

"In Authority's opinion, IRR based return (which automatically accounts for RoEDC) does not provide reasonable flexibility to the investor for efficient drawdowns and payments to the EPC contractor. For making adjustment at the time of COD, a lot of information is required, which involve a cumbersame time consuming pracess. Moreover this also daes not provide incentive ta the investor far early completion of the project. In order to provide incentive to the investor for early completion and efficient utilizatian of funds, the Authority has decided to allow ROE instead of IRR."

Further, CET believes that the above request is in line with Rule 17(3)(iv) of Rules which mentions *"tariffs shauld include a mechanism to allow licensees a benefit fram, and penalties for failure to achieve, the efficiencies in the cost of providing the service and the quality of service."*.

Accordingly, we would request for the debt and equity drawdowns not to be actualized upon COD.

2.12 Indexation Formula for Debt Servicing

Referring to the Decision, Para 51 (Order), within the table it is mentioned that indexation on debt servicing component will be based on LIBOR as well as US$:PKR adjustment, however, when we refer to Para 51 (Order), sub-para III (Indexation), clause (ii), the formula provided only takes into account the

LIBOR variation on debt servicing. The US$:PKR indexation approved by the Authority on the debt servicing component (principal as well as the interest component) seems to not have been reflected in the formula.

CET would requests NEPRA to reflect the same in the formula as we believe that the intention is to allow US$:PKR indexation on both the debt servicing components in line with what has been approved by NEPRA in all precedent transactions with foreign currency loan.

2.13 Directions to the Petitioner and NTDCL

Referring to the Decision, Para-52.V.f (Directions to the Petitioner and NTDCL) ,according to the transmission line policy 2015, the CET would like to clarify and request to change the original sentence to "The TSC will be due and paid whether or not any power is transmitted to the Transmission Line subject to the availability of the transmission line and the detailed mechanism to be agreed under the TSA".

2.14 Adjustment at COD for length of Transmission Line

NEPRA has approved a lump sum EPC cost under the Decision, however, the basis of calculation is per MW for Converter station and per KM for Transmission Line. As the technical specifications are locked at ±660 kV and 4,000 MW for Converter station, the converter station cost will not be revised at COD, however, as the length of the Transmission Line is based on approximations, it may be revised at COD based on the final land acquired by NTDCL (route may have to be changed during construction in case of land issues leading to change in length). Hence we would like to request NEPRA to allow adjustment of Transmission Line related EPC cost based on the actual length at COD based on evidence submitted to NEPRA at COD.

Notwithstanding the forgoing, the instant Motion for Leave to Review is being filed by PPIB under the directions of Federal Government as one window facilitator and coordinator and as such information and data set out herein have been provided by CET the veracity/authenticity whereof is liable to be scrutinized independently and all grounds for review are to be determined on its own merit with PPIB's position being indifferent.

3. Relief Sought

In view of the forgoing, the Authority is requested to review the justifications provided by the CET as contained herein and accordingly may grant the Motion on its own merit in accordance with NEPRA Act and applicable rules thereunder.

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