Chief Technical Officer (CPPA-G)

No. CEO (CPPA-G)/DGM-R/ 2728-31 Dated: 12/02/2021

The Registrar, NEPRA
Nepra Tower, Ataturk Avenue (East)
Sector G-5/1, Islamabad

Subject: **Application for Determination of Reference Tariff for Import of Power from 969 MW Neelum Jhelum Hydro Power Project.**

Ref: M/s Neelum Jhelum Letter No. CFO/NJHPC/Tariff/2021/24-32-37 dated 15-01-2021

With reference to the letter referred above M/s Neelum Jhelum Hydro Power Project submitted the application for determination of the reference Tariff for import of Power from 969 MW Neelum Jhelum Hydro Power Project.

In this regard, it is apprised that under the import of electric power regulation 2017 dated 23.06.2017 and as per the amendment in such regulation dated 21.07.2020, the following are required to be submitted to the authority in set order for determination of rate for import of power as per the Regulation 3 and sub-regulation 1(A) by the buyer.

It is pertinent to mentioned that the following requirements under the regulation 3 and sub-regulation 1(A) are mentioned below and attached with this letter.

Regulation 3-1(A)

S.No.	Sub-Regulation 1(A)	Provided	Remarks
a.	A comprehensive Tariff proposal, including proposed Rates, details of project cost, tariff break-up and tariff assumptions;	Yes	
b.	A feasilbilty study, if applicable;	Yes	PC-1
c.	An interconnection study duly approved by the relevant Network Operator;	Yes	Letter attached
d.	an undertaking of compliance with the grid code, distribution code and other applicable documents;	Not Provided	
e.	A non-refundable application fee, equivalent to the fee for filing of tariff petition under National Electric Power Regulatory Authority (Tariff Standards and Procedures) Rules, 1998 and other rules and regulations on the subject	Yes	

Regulation 3

Sr.No	Details required for Tariff Proposal	Provided	Remarks
a	Name and address of the applicant;	Yes	
b	Authorization from the competent authority to file application along with affidavit as to the correctness of the information;	Yes	
c	Demand which is going to met through the proposed Import of power;	Yes	Letter attached
d	Detail of Seller including but not limited to name, address, description of generation facilities etc;	Yes	

e	Comprehensive Tariff Proposal including proposed rates of Import of Power;	Yes	
f	Source of Power Generation, where applicable;	Hydro	
g	Capacity and/ or the estimated annual energy to be imported;	Yes	
h	Feasibility study of the project, if applicable;	Yes	PC-1
i	Proposed Rates and Terms and conditions for Import of Power;	Yes	
j	Tariff Details for Which determination of the Authority is being sought along with estimated costs of the power generation and Tariff assumptions;	Yes	
k	Proposed interconnection arrangement with approximate distance;	Yes	
l	Augmentation required in existing transmission network and/ or the grid, if any;	Already connected and transmitted	
m	Estimated costs of the interconnection arrangement and the augmentation required in the transmission network	Already connected and transmitted	
n	The technology, indicating primary fuel, alternate primary fuel and back up fuel. Where applicable;	Hydro	
o	Evidence of compliance with grid code, Distribution code and other applicable documents;	Not provided	
p	The expected commercial operations date;	4th July 2018	
q	The expected duration of Import of Power;	Yes	
r	The adequacy of the transmission system of the national grid company or Distribution Company, as the case may be, to import the electric power;	Yes	
s	The summary of evidence giving brief particulars of the data, facts and evidence in support of the application; and	Yes	
t	Any other information in such format as may be required by the Authority from time to time.	No	Third Party verification (TPV)

As per the regulation 3 and sub-regulation 1(A), CPPA-G has reviewed the Petition submitted by the seller and observed that the seller has fulfill the requirements for submission of their subject application to NEPRA.

Chief Technical Officer (CPPA-G)

No. CEO (CPPA-G)/DGM-R/ Dated: / /2021

Therefore CPPA-G hereby submit the subject application to NEPRA (Authority) as per the import regulation 2017, for reviewing and processing, whereas comments of CPPA-G on the subject matter are attached as (**Annex-A**), however CPPA-G will submit further comments to NEPRA on and before the hearing on the matter if deem appropriate.

12.2.2021

Chief Technical Officer (CPPA-G)

Copy to:

1. Chief Financial Officer, Nelum Jhelum Hydro Power Project, WAPDA Administrative Staff College, H-8/1, Pitras Bukhari Road, Islamabad.
2. Chief Legal Officer (CPPA-G)
3. Chief Financial Officer (CPPA-G)

- Master File.

AlliedBank

Cheque No 13 65326067

ABL-BLUE AREA BRANCH, ISLAMABAD

Date 15 01 2021

Pay M/s NEPRA or bearer

Rupees One million seven hundred nineteen thousand eight hundred & eighty five only

PKR=1719885/=

PK76ABPA0010000813240129

NEELUM JHELUM HYDROPOWER COMPANY (PVT) LTD.

Please do not write below this line.

Signature

⑈653260671⑈021407021:00100008132401 29⑈000⑈

ANNEX-A

Comments on Application for Determination of Reference Tariff for Import of Power from 969 MW Neelum Jhelum hydro Power Project.

1. Carbon Credits:-

As per the current policy and in accordance with NEPRA's decision given in tariff determinations for other hydropower projects, the carbon credits, if earned, by the project shall be distributed between project sponsors and power purchaser in accordance with applicable GOP Power policy.

2. Construction Period

The eight years of construction period for the Subject Project is extremely high as compared to other hydro power project, which are under development in AJ&K on same river. It is pertinent to mentioned that the Authority has to emphasize on timely completion of the project as the same practice is prevailed in the Independent Power Producers(IPPs), however Neelum Jhelum has been commissioned after 8 year which is not favorable condition for the consumers as the construction period has the direct impact on the Tariff.

Moreover, there is mechanism of **"liquidity damages"** in Power Purchase Agreement of the IPPs for delay in construction and the same may please be made applicable for upcoming WAPDA Project. Otherwise, it has been observed that till today no WAPDA project has been brought on time. Further it is highlighted that WAPDA project are not being dealt by CPPA or NTDC during the constructing Stage, so they are not liable to answer any government entity and the result of which has been in front of everyone that the projects are not on time and no NTDC approval has been taken by WAPDA.

It is apprised, construction period is part of the approval of feasibility report , which is in case of IPPs for Hydel approved by Panel of Expert constituted by PPIB. Thus, the same may also be made binding on WAPDA to get their feasibility approved from PPIB. The following construction periods for other hydro projects are tabulated hereunder:

Project	Construction Period (Months)
1124 MW Kohala	78
700 MW Azad Pattan	69
720 MW Karot	60
870 MW Suki kinari	72

It is recommended that Construction period should be evaluated by the expert based on the project plan in order to avoid transfer of impact of in efficiencies to the general public.

CPPA-G is of the view that Construction Period of the Project should be reduced in line with the other mega project as it will reduce the Interest During Construction (IDC) and Return on Equity During Construction (ROEDC) in tariff and make the project viable, if deemed appropriate by the Authority.

3. **Construction Cost: -**

The eight Years of the construction period having the cost incurred is 314,236 Million PKR which is extremely high as compared to other Hydel Power projects (HPPs) which are developed in AJK in the same. The Construction cost comparison of Neelum Jhelum Hydel Power Project with other hydel project are given below:

S. No.	Project Cost	Neelum Jhelum HPP	Sukhi Kinari HPP	Karot HPP	Kohala HPP
	Construction/Civil Cost	314,236 Million PKR	135,492.7 Million PKR	130,034.85 Million PKR	188,298 Million PKR
@165 PKR per US$ reference to the rate used by Neelum Jhelum					

The Construction Cost may kindly be evaluated as per the cost of the other HPPs and shall be brought in line with appropriate and precise value in order to avoid its repercussion on the consumer Tariff. The Authority is once again requested to kindly align the matter with the already awarded Cost under the same head.

4. **Engineering Supervision Cost:-**

The Engineering and supervision cost claimed by M/s Neelum Jhelum seems to be on higher side representing (20.32 billion PKR) US$ 123.157 Million, however NEPRA in its recent determinations allowed substantially low cost to other HPP under the same head and devised mechanism for the determination of the cost for the owner Engineer, which is a part of this head having the maximum share in the Engineering & Supervision cost:

M/s Karot HPP, owner Engineer cost is U$18 Million
Construction Period for the Karot is 60 Months
Neelum Jhelum Construction period is 96 Months (which is still under construction)

Using the pro- rata adjustment in cost, the owner Engineer cost for M/s Neelum Jhelum comes:-

U$ 28.8 Million (4752 Million PKR), further it is highlighted here that in case of M/s Karot HPP owner Engineer cost is approximately about 61% of the total Engineering and supervision cost. Therefore, as per the calculation the cost of the Engineering and supervision shall be equal to U$ 47.21 Million (7,789.65 Million PKR)for M/s Neelum Jhelum.

We consider this cost is exorbitant and therefore may be allowed in line with the recent determinations, however the comparison with the different HPPs are mentioned below for the reference of the Authority.

Projects	Neelum Jhelum HPP (million Rs with exchange rate 165) Million PKR	Kohala HPP (million with same exchange rate of NJHPC exchange rate 165) Million PKR	Suki Kinari HPP (million with same exchange rate of NJHPC exchange rate 165) Million PKR	Azad pattan HPP (million with same exchange rate of NJHPC exchange rate 165) Million PKR
Engineering and Supervision Cost	20,320.905	4,936.8	5,581.95	4,852.65

5. Land acquisition and Least Cost:-

The Land Acquisition and lease cost claimed by the company is 1500 million PKR. The Land Acquisition and Resettlement cost of M/s NJHPC may kindly be verified through the justifiable and documentary evidence.

CPPA-G is of the view that the cost under the head , may please be verified through proper scrutiny by Authority as deemed appropriate.

6. Insurance Cost during Construction-

It is requested that Authority may adjust such cost in light of its latest determination in respect of other HPP. The Authority may verify the cost of M/s NJHPCL upon submission of verifiable documentary evidence from the Project company in order to verify the actual cost.

7. Levelized Tariff

The proposed levelized tariff of M/s NJHPCL at COD stage is 10.3026 **Rs/kWh**, which is exorbitant on comparable basis with other HPP projects in the same region. NEPRA determined the EPC stage tariff of:

Sukki Kinnari HPP 870 MW	8.5853 Rs/kWh
Karot HPP 720 MW	7.6958 Rs/kWh
Azad Pattan 700.7 MW	7.4602Rs/kWh

Kohala HPP 1124 8.2328 Rs/kWh

This is evident in 150 MW Patrind Hydropower Project that the authority has allowed Rs.8.3170/kWh at COD stage tariff.

Therefore, M/s NJHPCL at COD stage Tariff require major revision in all costs and assumptions. Further, a leading consulting firm namely Fichtner Management Consulting AG prepared a guide for International Finance Corporation (IFC) namely **"33 Hydroelectric Power- A Guide for Developers and Investors"** which is recommended to be used as reference for determination and estimations of costs primarily for hydropower developers and investors, where the average Levelized Cost of Electricity is 5.4 cents/kWh and the median value is 6.00 US cents/ kWh. It is, therefore, suggested that tariff number should be revisited in the light of above stated IFC Guidelines.

Subject	NJHPP HPP	Suki Kinari HPP	Kohala HPP	Karot HPP	Azad Pattan HPP
Capacity (MW)	969	870	1124	720	700.7
Levelized Tariff (PKR/kWh)	10.3026	16.66 % high	20.09 % high	25.30% high	27.58% high

8. **Per megawatt comparison of Total Project Cost:**

Furthermore, the per megawatt comparison of Total Project Cost of M/s NJHPCL with EPC stage Tariff of other hydro power project is mentioned below:-

Sr.No	Per Megawatt Cost	M/s NJHPCL	Kohala HPP	Suki Kinari HPP	Comparison with Kohala HPP	Comparison with Suki Kinari HPP
1	Total Project Cost/MW	2.67	2.14	2.078	19 % high	22% high

The per megawatt comparison of M/s NJHPP with authority approved EPC stage tariff of other hydro power project is clearly indicating that the cost mentioned in the Generation stage tariff petition is extremely at higher side, which is unrealistic. CPPA-G is of the view that this cost should reduce and brought near to the realistic approach.

9. **Capacity Test:**

Capacity of the Power Plant, which is mentioned in the tariff has not been validated by Power Purchaser through Capacity Test as such mechanism is the only method for verifying the Capacity of the Power Plant.

It is pertinent to mention that the Power Plant declared their Commercial Operation Date (COD) at their own and did not follow the prudent practices prevail in the industry. Therefore, authority is requested to direct M/s Neelum Jhelum HPP to conduct Capacity Test, for ensuring installed Capacity as and when determined by NEPRA, in the presence Power Purchaser.

10. Third Party Validation (TPV):

The third party validation has not been conducted so for as per the direction of ECNEC. Therefore, in the absence of third party validation the true tariff may not be determined at this stage.

11. Time and Cost Overrun:

Notice to Proceed (NTP) was issued in January 2008 and company achieved its COD as per its claim on 4th July 2018. The authority may look into time and cost overrun.

12. Utilization of Tunnel Boring Machines:

The company procured and deployed Tunnel Boring Machines (TBMs) worth PKR 29,255 Million in order to cover delay in construction of the Head Race Tunnel. The project company stated in the proposed tariff petition that the TBMs can be utilized on future hydropower projects like Diamer Bhasha and Bunji on Indus River as quoted in the petition. Therefore, the entire tunnel boring machine cost may not be capitalized to the instant project. NJHP should submit the updated status of TBMs optimal utilization. Accordingly, the cost may be amortized to the other projects instead of charging the whole to NJHP.

13. Foreign Currency Exchange Loss:

The foreign currency exchange loss of PKR 81,428 Million included in construction cost has been claimed by NJHPP. While evaluating the tariff petition submitted documents of the company it was observed the contract was made in US Dollar and Norwegian Kroner, and invoices were processed in foreign currency. Therefore, the company knowing the fact that overall amounts assessed on this account in PKR. Thus, the company may bear any / under exchange rate loss on this account, as it was evident in Laraib Energy Hydropower project determination, it is therefore suggested that the said cost may not be allowed to the project company.

14. Water Use Charges:

The petitioner has requested for PKR 1.1/kWh as water use charge for 30 years of project life. The policy for power generation projects, 2002 specific provision for hydel projects clause 10.2(76) says the Water Use Charge will be paid by the Generation Company to the Provincial/AJK Government for use of water by the power project to generate electricity will be fixed at the rate of Rs. 0.15kWh. Furthermore, it was observed that authority in other projects has allowed water use charge for 870.25MW Suki Kinari Hydro Power Project is PKR 0.15/kWh, 720MW Karot Hydro Power Project is PKR 0.15/kWh and 150MW Patrind Hydro Power Project is PKR 0.15/kWh. Accordingly, the petitioner's demand for PKR 1.1/kWh as water use charge may be rationalized.

15. No details shared about ICB:

The Company has not provided detail/information for International Competitive Bidding (ICB) in the tariff petition. It is therefore requested to the Authority to ask the project company to provide such details.

16. Contingencies:

The company claimed amount of PKR 4,957 Million for contingencies. As NHPP has already achieved its COD, the contingency amount does not seem to be justified.

17. Withholding Tax on dividends & Zakat:

As per the NEPRA Guidelines for Tariff Determination 2018 "Withholding tax on dividends shall not be allowed as the pass-through item in any technology." Further, the Authority has not allowed the same in resent similar tariff determinations. Therefore, Withholding Tax on dividends shall not be allowed as the pass-through item. Furthermore, company assumed deduction of Zakat on dividend as pass-through item may not be allowed because zakat cannot be collected from public in tariff.

18. PPA Structure:

The company assumed that PPA will be structured on take or pay contract basis, however the calculation of tariff is made on Rs./kWh. The same may be in line.

19. Compounding Disallowed:

Interest during construction (IDC) and Return on Equity during construction (ROEDC) worked out by the company needs to be analyzed by the Authority. Keeping in view of the recent MOUs with IPPs, CPPA-G is of the view that compounding should not be allowed in the calculation of IDC and ROEDC.

20. Debt Servicing is exorbitant:

The Company has raised debt servicing @ 15% fixed rate on foreign relent loans. The authority may rationalize the debt servicing cost.

21. Interim Relief

The company has received the amount on account of interim relief allowed by the authority from 3rd July 2018 to 16th October 2020 the amount may be confirmed by the company and accounted for in the tariff determination.

22. Return on Equity

In case of actual Return on Equity exceeds from the determined Return on Equity, therefore, a clawback mechanism may be added in tariff to rationalize the profits.

23. Indexation of ROE, ROEDC: The company requested in its tariff petition that ROE and ROEDC components of tariff shall be adjusted for variation in PKR/US$ exchange rate during operation. Since the Equity injected by the project company is in local currency, therefore the dollar base indexation seems to be illogical. Thus authority is requested that indexation on Equity may not be allowed to company.

24. Cost of working capital is not applicable in this project.

Regards,

NATIONAL TRANSMISSION & DESPATCH CO. LTD (NTDC)

General Manager (Power System Planning)

No. GMPSP/CETP/TRP-/372-75

Dated: 21-01-2021

Chief Executive Officer,
CPPA-G, Shaheen Plaza,
73-West, Fazl-ul-Haq Rd, Blue Area,
Islamabad,

Subject: Interconnection Study Report Duly Approved by NTDC

Ref: Chief Financial Officer, NJHPC office letter No.CFO/NJHPC/Tariff/2021/2365-67 dated 07-01-2021 (Copy to this office).

With reference to above letter vide which CFO NJHPC has requested to arrange information for NEPRA as mentioned under "Regulation 3 (C) of NEPRA Import of Power Regulations – 2017".

In this regard, the requisite information is enclosed herewith for onwards submission to NEPRA Authority.

(Engr. Safdar Ali)
General Manager (Power System Planning)

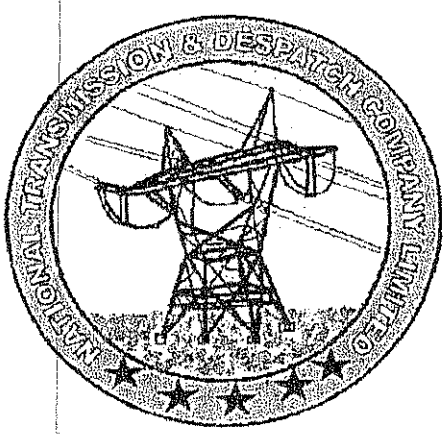
DA: As above (27 pages)

CC:

1. Deputy Managing Director (P&E) NTDC, Lahore.
2. Deputy Managing Director (AD&M) NTDC, Lahore
3. Chief Financial Officer, NJHCPL, WAPDA Administrative Staff College, H-8/1, Islamabad.
4. Master File.

NATIONAL TRANSMISSION & DESPATCH CO. LTD
(NTDCL)

Transmission Interconnection Study Report
For
Dispersal of Power from
Neelum Jehlum Hydro Power Project



Power System Planning
NTDCL, Lahore.

Total Pages: 27

15. Certificate

Certified that the project proposal for "***Transmission Scheme for Dispersal of Power from Neelum-Jhelum, Karot and Azad Pattan Hydro Power Projects***" has been prepared on the basis of guidelines provided by the Planning Commission for preparation of PC-I.

Prepared by:	(Maqsood Ahmad Qureshi) Manager Planning Power NTDCL
Checked by:	(Mahmood Ahmad) 29/5/14 Chief Engineer Projects Planning
Recommended by:	(R.S Rehan) General Manager Planning Power
Approved by:	(Tahir Mahmood) Managing Director NTDCL
Forwarded to Planning Commission by:	Secretary Ministry of Water & Power Govt. of Pakistan

Annex E: Load Flow Studies

1. Introduction

Load flow studies have been carried out for dispersal of power of Neelum Jhelum Hydropower Project (969 MW), Karot (720 MW) and Azad Pattan (650 MW) to the National Grid.

As per latest information, Neelum Jhelum HPP has been planned to be commissioned by GoP in 2015-16 whereas its proposed interconnection line (500 kV D/C transmission line from Neelum Jhelum HPP to Gakkhar (Gujranwala) is not expected to be commissioned by that time. Therefore, an interim interconnection scheme has been proposed and studied for dispersal of power from Neelum Jhelum HPP to the National Grid. This interim arrangement can be utilized up till the commissioning of Tarbela 4th Extension project (1410 MW) which is expected in May 2017 as per current expansion plans after which final interconnection scheme of Neelum Jhelum HPP would be required for its power dispersal in a reliable manner.

The proposed 500 kV D/C transmission line from Neelum Jhelum HPP to Gakkhar would also be used for dispersal of power from the two upcoming HPPs, i.e., Karot (720MW) and Azad Pattan (650MW) at a later stage.

2. Study Assumptions

The load flow studies are based on the following assumptions:

- Latest load forecast
- Latest generation expansion plan
- Latest transmission expansion plans of NTDC and DISCOs.
- The transmission system has been assumed to be operating mostly in an interconnected manner, however, split bus arrangement and necessary line openings have been assumed in some parts of the network as per requirements.
- Tarbela 4th Extension project (1410 MW) along with 500/220 kV transformers augmentation from 3x237 MVA to 3x450 MVA at 500 kV Tarbela switchyard has been assumed in the studies.
- 500 kV switching station of Alliot has also been assumed in the studies for collection of upcoming hydro power and further disperse it to load centers.
- Other proposed HPPs i.e., Dasu (1080 MW), Suki Kinari (832 MW), as well as 1300MW import of power from Tajikistan (CASA project) have been assumed in the studies as per their expected commissioning schedules.
- A 500/220/132 kV Islamabad West substation along with its associated transmission lines has been assumed in the studies.

3. System Study Criteria

The load flow studies have been carried out keeping in view of the following system operating criteria/limits in accordance with NTDC's Grid Code:

Voltage Limits	±5% under normal and ±10% under contingency conditions. However, voltages at some generation buses and some substations may be kept upto +8% under normal operating conditions as per network configuration and/or system requirements.
Transmission Line Loading Limits	100% under normal and N-1 contingency conditions.
Transformer Loading Limits	100% under normal and N-1 contingency conditions.

4. Proposed Interconnection Schemes

a) Interim Scheme for Neelum Jhelum HPP:

"A 500 kV D/C transmission line, approx. 145 km long on quad-bundled Drake conductor, from Neelum Jhelum HPP for looping In/Out on one of the existing Rewat – Gujranwala 500 kV S/C transmission line near Domeli."

b) Final Scheme for Neelum Jhelum HPP:

"A 500 kV D/C transmission line, approx. 270 km long on quad-bundled Drake conductor, from Neelum Jhelum HPP to the existing Gakkhar (Gujranwala) 500 kV Grid Station by constructing the remaining 125 km, 500kV D/C line from Domeli up to Gakkhar (Gujranwala)."

c) Karot HPP:

"A 500 kV D/C transmission line, approx. 5 km long on quad-bundled Drake conductor, for looping In/out one of 500 kV single circuit from Neelum Jhelum HPP to Gakkhar (Gujranwala) at Karot HPP."

d) Azad Pattan HPP:

"A 500 kV D/C transmission line, approx. 5 km long on quad-bundled Drake conductor, for looping In/out the other 500 kV single circuit from Neelum Jhelum HPP to Gakkhar (Gujranwala) at Karot HPP.

It is important to mention here that for dispersal of power from Karot and Azad Pattan HPPs, looping In/out of 500 kV D/C line transmission from Neelum Jhelum to Gakkhar at Alliot 500 kV switching station is also required. Alliot 500 kV switching station is being planned as a part of interconnection scheme of Suki Kinari HPP for which a separate PC-I will be submitted.

5. Load Flow Studies

The necessary load flow studies have been carried out for system conditions of Aug/Sep 2016, Aug/Sep 2017 and Aug/Sep 2020 to analyze the adequacy of the proposed interconnection schemes of Neelum Jhelum, Karot and Azad Pattan HPPs during high water months when output of hydropower plants is maximum and the stress on the transmission system would be the most severe. The results of the load flow studies are presented as under:

Peak Load Aug/Sep 2016

Load flow study for peak load condition of Aug/Sep 2016 under normal system condition with interim interconnection scheme for Neelum Jhelum HPP is attached as Exhibit #1. The generation dispatch of Neelum Jhelum HPP, corresponding to peak load condition in summer, has been assumed as 969 MW. The study depicts that the system would be operating well within limits under normal condition, i.e., the voltage profile of the system is within limits and there would be no transmission system constraints in the flow of power from the Neelum Jhelum HPP to the system.

Load flow studies have also been carried out for single line contingency conditions and it has been found that power flows on other transmission lines and transformers and the voltage profile of the system remains within limits. The result of the load flow studies are summarized as under:

Exhibit #	System Condition	Remarks
2	Neelum Jhelum HPP – Gujranwala 500 kV S/C out	Power flows on the other transmission lines and transformers as well as the voltage profile of the system remain within limits.
3	Neelum Jhelum HPP – Rewat 500kV S/C out	-do-
4	Rewat – Gujranwala 500 kV S/C out	-do-
5	Gujranwala – Lahore Old 500kV S/C out	-do-
6	Lahore – Gatti 500 kV S/C out	-do-

Peak Load Aug/Sep 2017

Load flow study for peak load condition of Aug/Sep 2017 under normal system condition with final interconnection scheme of Neelum Jhelum HPP (969 MW) is attached as Exhibit #7. In this scenario, Tarbela 4th Extension (1410 MW) power project has also been assumed. The study depicts that the system would be operating well within limits under normal condition, i.e., the voltage profile of the system is within limits and there would be no transmission system constraints in the flow of power from the Neelum Jhelum HPP to the system.

Load flow studies have also been carried out for single line contingency conditions and it has been found that power flows on other transmission lines and transformers and the voltage profile of the system remains within limits. The result of the load flow studies are summarized as under:

Exhibit #	System Condition	Remarks
8	Neelum Jhelum HPP – Gujranwala 500 kV S/C out	Power flows on the other transmission lines and transformers as well as the voltage profile of the system remain within limits.
9	Rewat – Gujranwala 500kV S/C out	-do-
10	Gujranwala – Lahore 500kV S/C out	-do-
11	Lahore – Gatti 500 kV S/C out	-do-

Peak Load Aug/Sep 2020

Load flow study for peak load condition of Aug/Sep 2020 under normal system condition with the proposed interconnection schemes of Neelum Jhelum, Karot and Azad Pattan HPPs is attached as Exhibit #12. In this scenario, other proposed HPPs, i.e., Dasu (Phase-1), Suki Kinari as well as import of power from CASA Project, have also been modeled with their maximum dispatch and associated interconnection schemes.

The study depicts that the system would be operating well within limits under normal condition, i.e., the voltage profile of the system is within limits and there would be no transmission system constraints in the flow of power from the Neelum Jhelum, Karot and Azad Pattan HPPs to the system.

Load flow studies have also been carried out for single line contingency conditions and it has been found that power flows on other transmission lines and transformers and the voltage profile of the system remains within limits. The result of the load flow studies are summarized as under:

Exhibit #	System Condition	Remarks
13	Neelum Jhelum HPP – Aliot 500kV S/C out	Power flows on the other transmission lines and transformers as well as the voltage profile of the system remain within limits
14	Aliot – Karot HPP 500kV S/C out	-do-
15	Aliot – Azad Pattan HPP 500kV S/C out	-do-
16	Karot HPP – Gujranwala 500 kV S/C out	-do-
17	Azad Pattan HPP – Gujranwala 500 kV S/C out	-do-
18	Aliot – Islamabad West 500 kV S/C out	-do-
19	Rewat – Gujranwala 500 kV S/C out	-do-
20	Gujranwala – Lahore 500 kV S/C out	-do-

6. Conclusions

a) The following interconnection schemes have been proposed for dispersal of power from Neelum Jhelum, Karot and Azad Pattan HPPs to the National Grid:

Interim Scheme for Neelum Jhelum HPP

"A 500 kV D/C transmission line, approx. 145 km long on quad-bundled Drake conductor, from Neelum Jhelum HPP for looping In/Out on one of the existing Rewat – Gujranwala 500 kV S/C transmission line near Domeli."

Final Scheme for Neelum Jhelum HPP

"A 500 kV D/C transmission line, approx. 270 km long on quad-bundled Drake conductor, from Neelum Jhelum HPP to the existing Gakkhar (Gujranwala) 500 kV Grid Station by constructing the remaining 125 km, 500kV D/C line from Domeli up to Gakkhar (Gujranwala)."

Karot HPP

"A 500 kV D/C transmission line, approx. 5 km long on quad-bundled Drake conductor, for looping In/out one of 500 kV single circuit from Neelum Jhelum HPP to Gakkhar (Gujranwala) at Karot HPP.

Azad Pattan HPP

"A 500 kV D/C transmission line, approx. 5 km long on quad-bundled Drake conductor, for looping in/out the other 500 kV single circuit from Neelum Jhelum HPP to Gakkhar (Gujranwala) at Karot HPP.

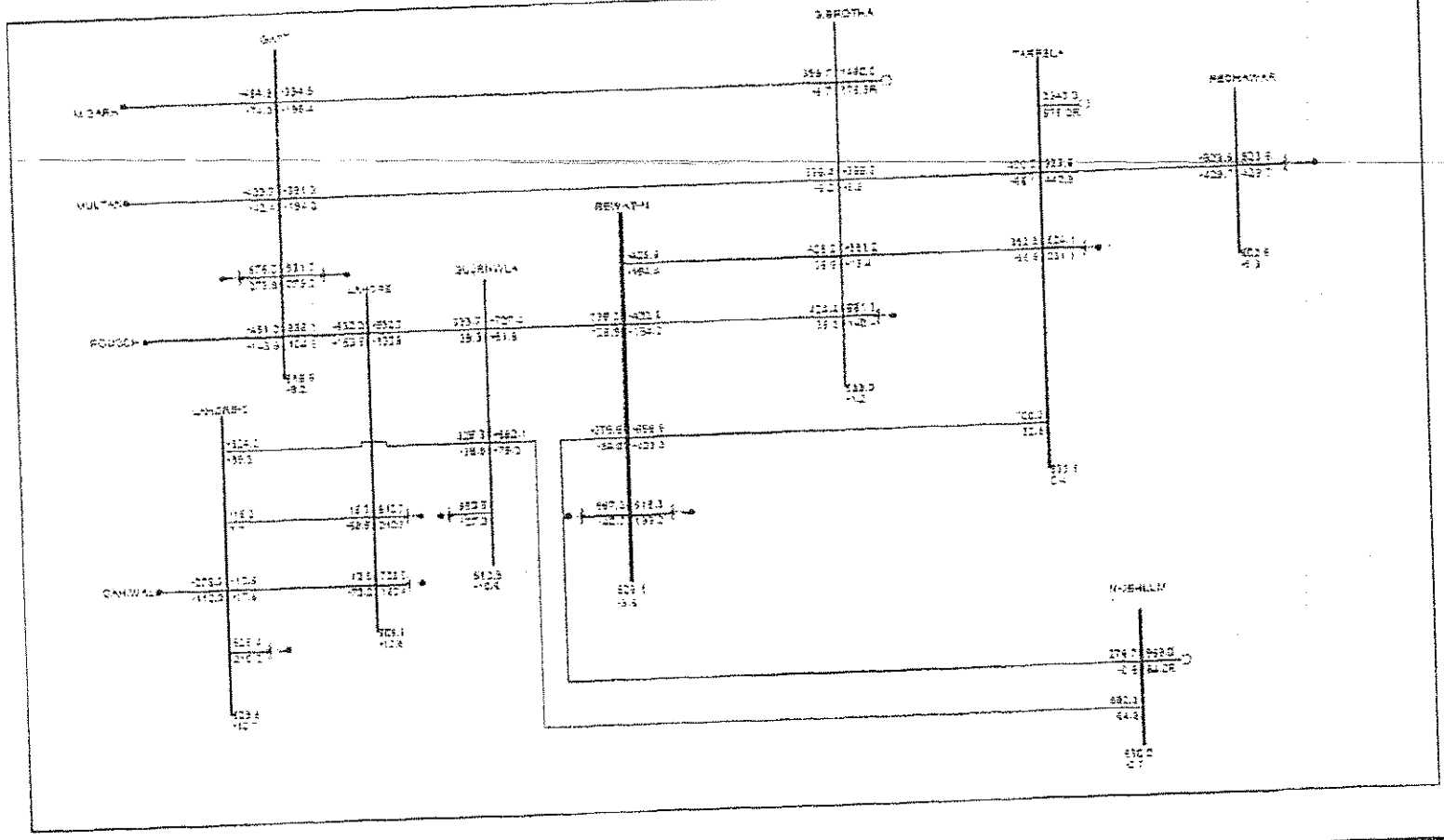
b) The 500 kV D/C transmission line from Neelum Jhelum HPP to Gujranwala would also be required to be looped in/out at Aliot 500 kV substation in order to facilitate the power dispersal from Karot and Azad Pattan HPPs. Aliot 500 kV switching station is being planned as a part of interconnection scheme of Suki Kinari HPP for which a separate PC-I will be submitted.

PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

INTERIM ARRANGEMENT

PEAK LOAD AUG/SEP 2016

EXHIBIT # 1

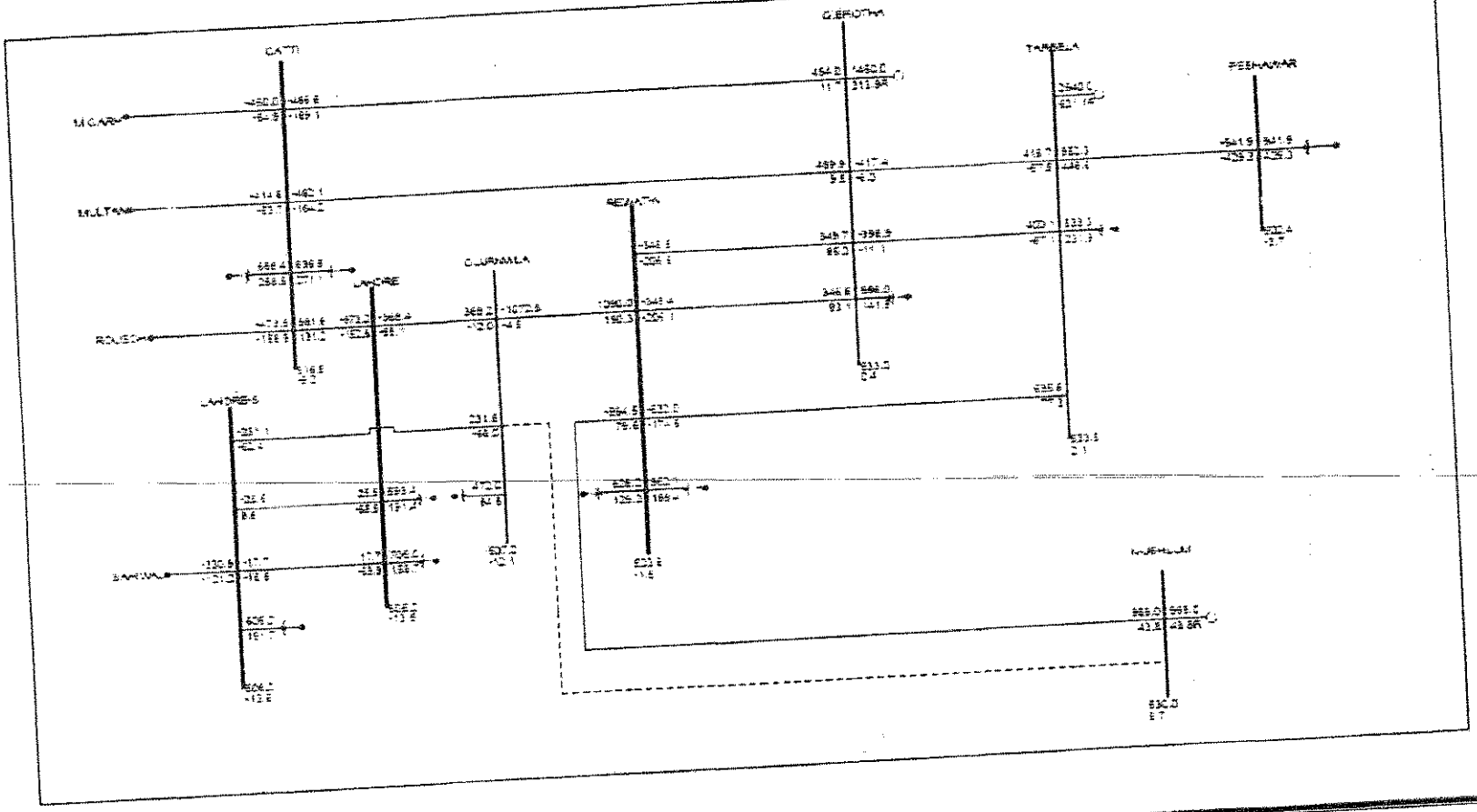


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

INTERIM ARRANGEMENT

PEAK LOAD AUG/SEP 2016

EXHIBIT # 2

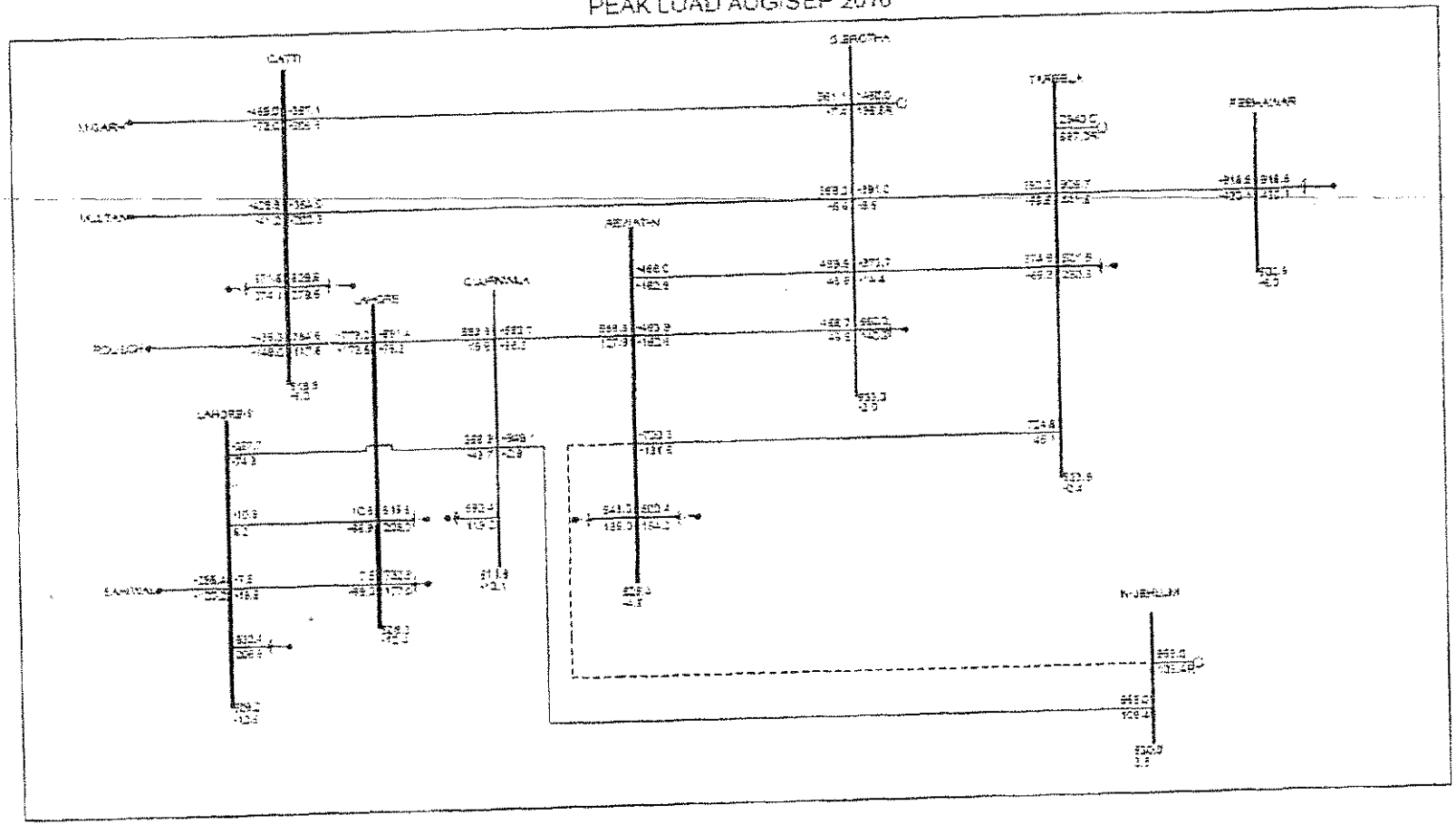


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

INTERIM ARRANGEMENT

PEAK LOAD AUG/SEP 2016

EXHIBIT # 3

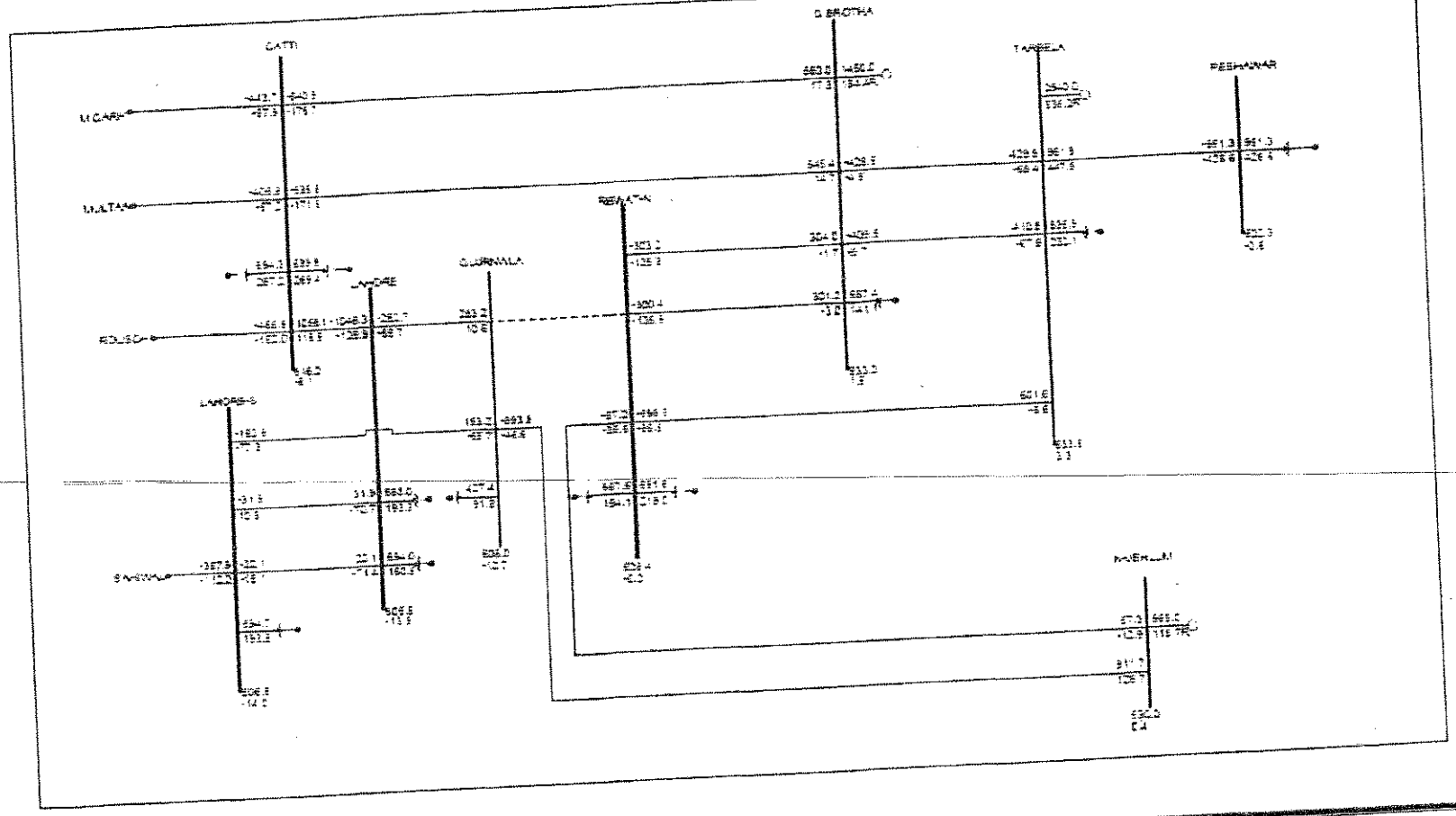


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

INTERIM ARRANGEMENT

PEAK LOAD AUG/SEP 2016

EXHIBIT # 4

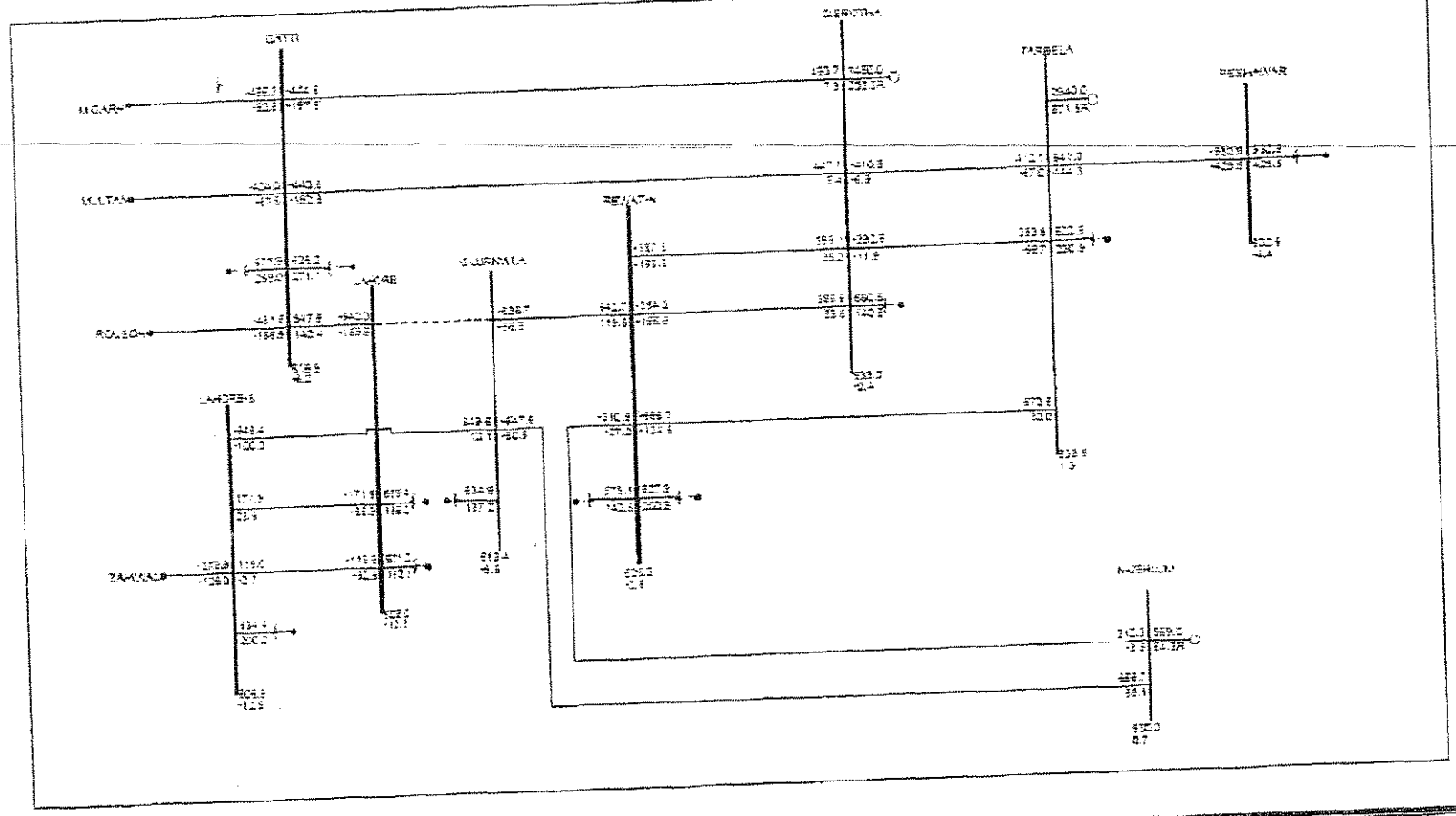


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

INTERIM ARRANGEMENT

PEAK LOAD AUG/SEP 2016

EXHIBIT # 5

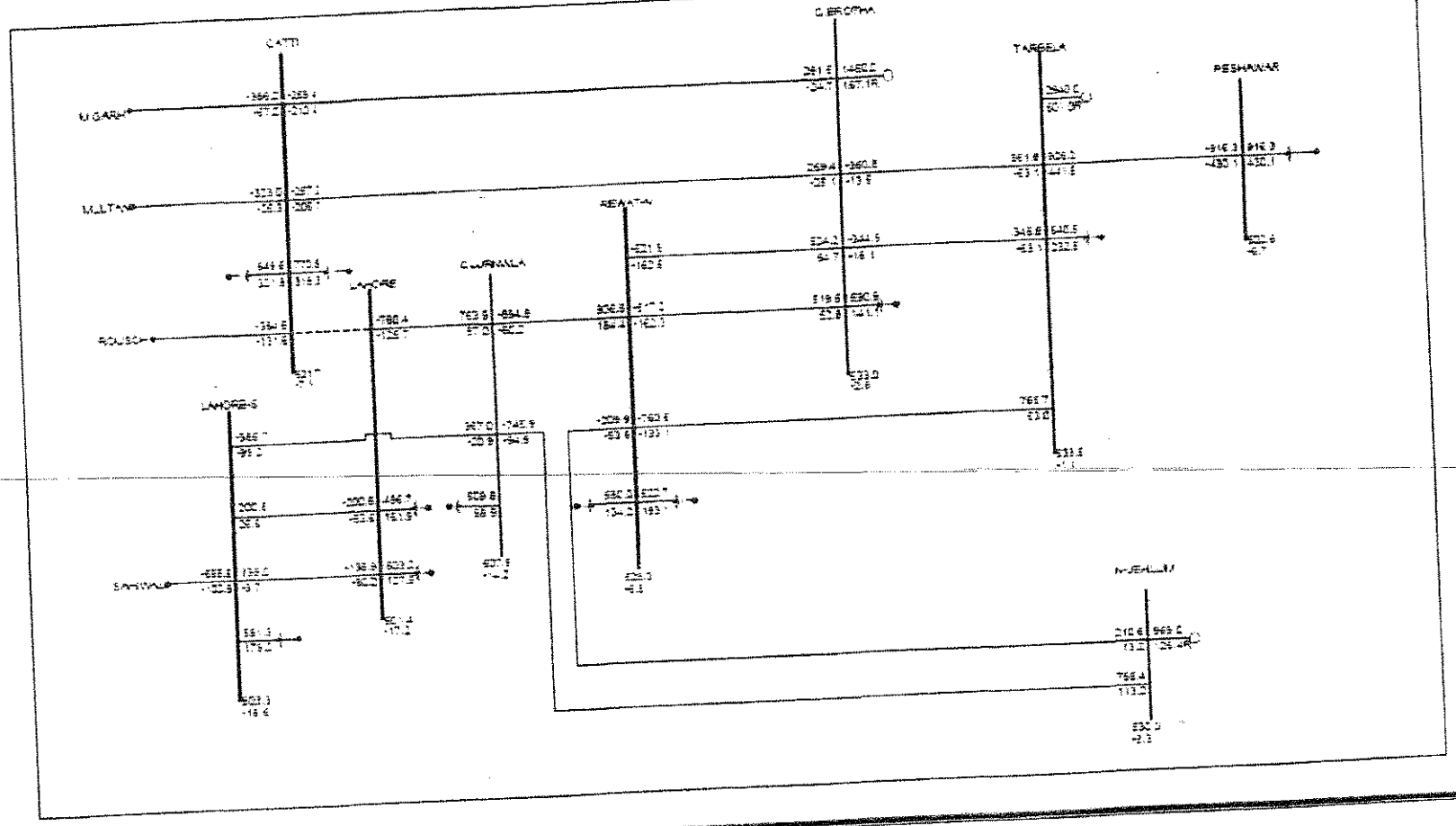


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

INTERIM ARRANGEMENT

PEAK LOAD AUG/SEP 2016

EXHIBIT # 5

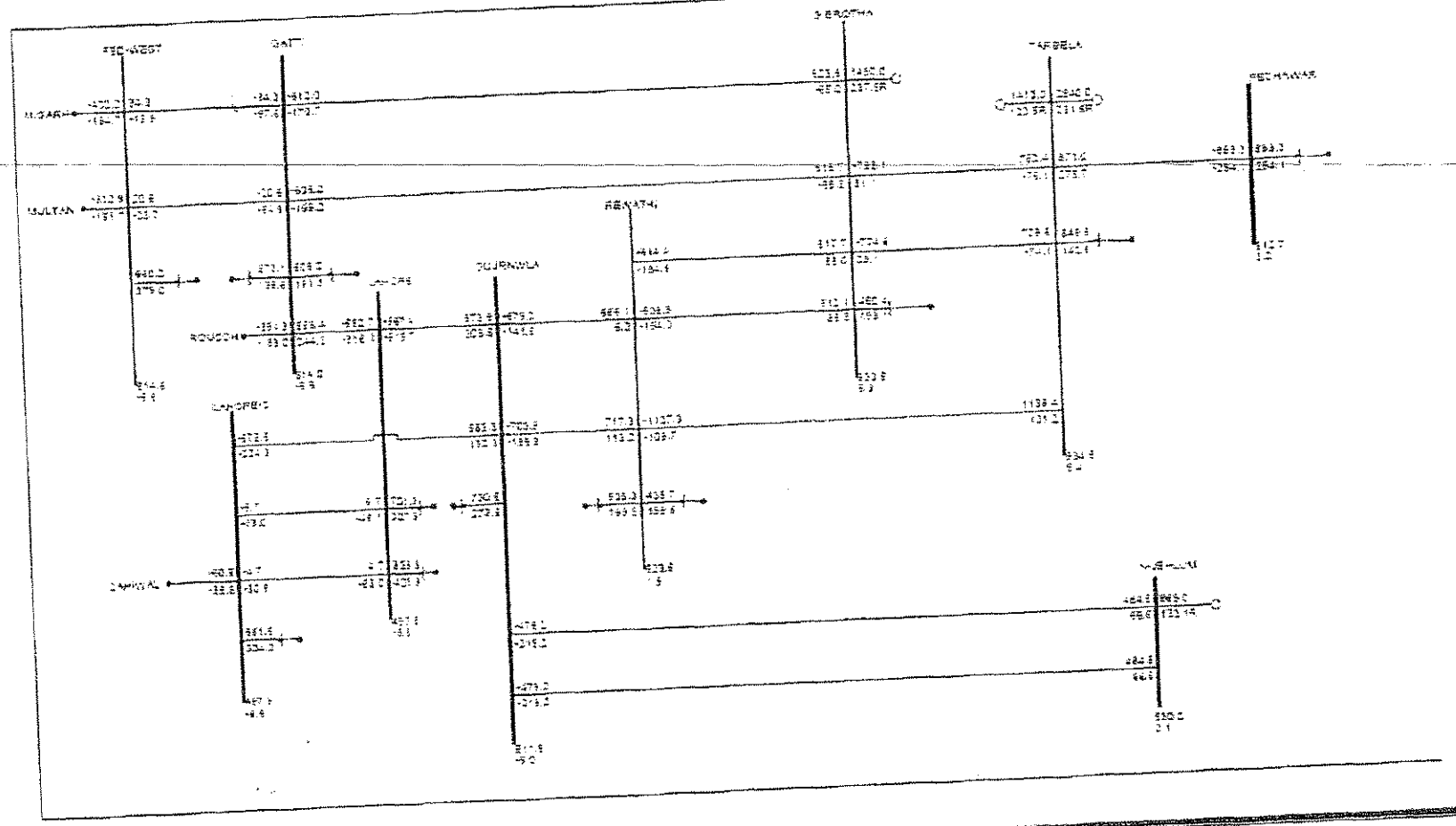


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

FINAL ARRANGEMENT

PEAK LOAD AUG/SEP 2017

EXHIBIT # 7

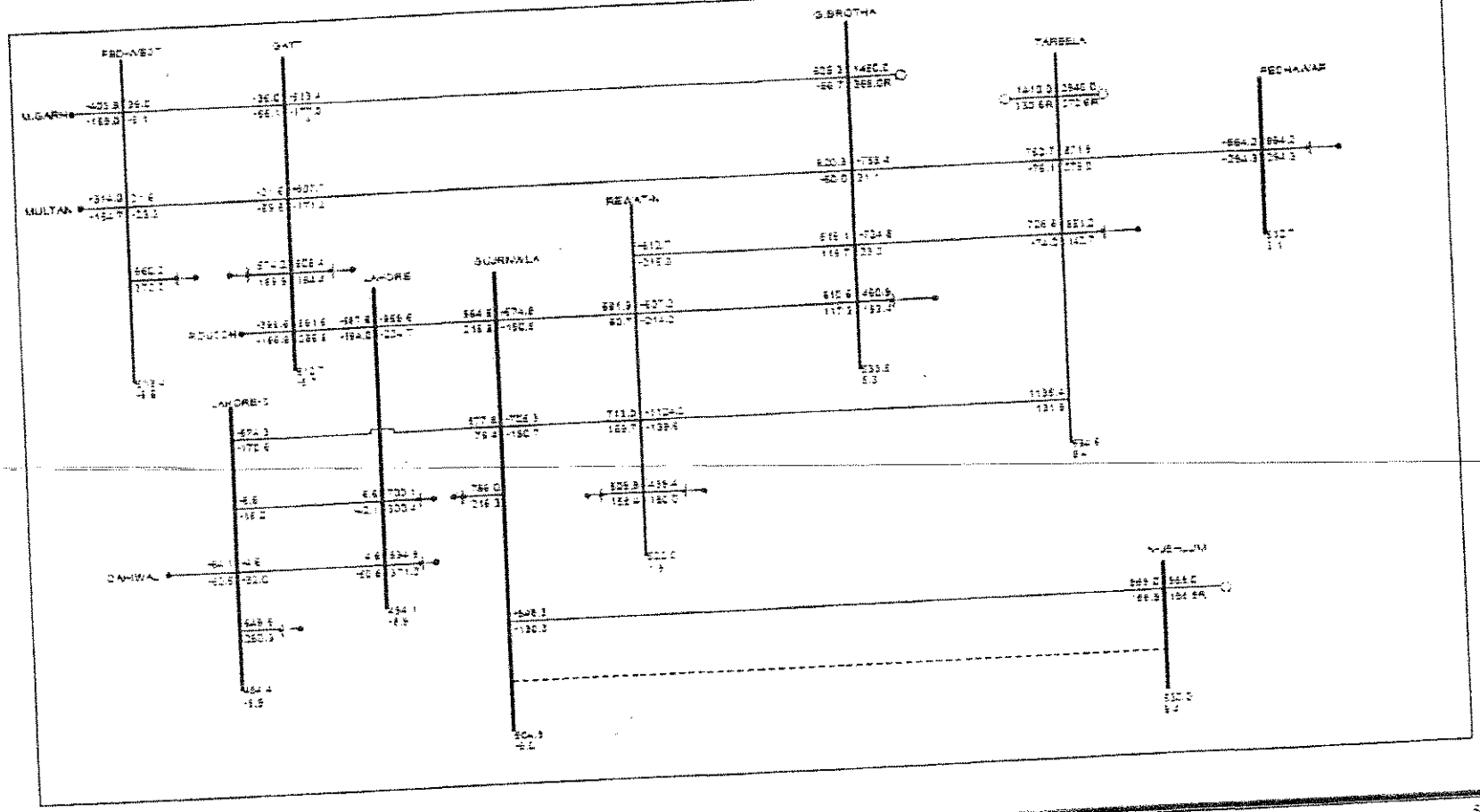


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

FINAL ARRANGEMENT

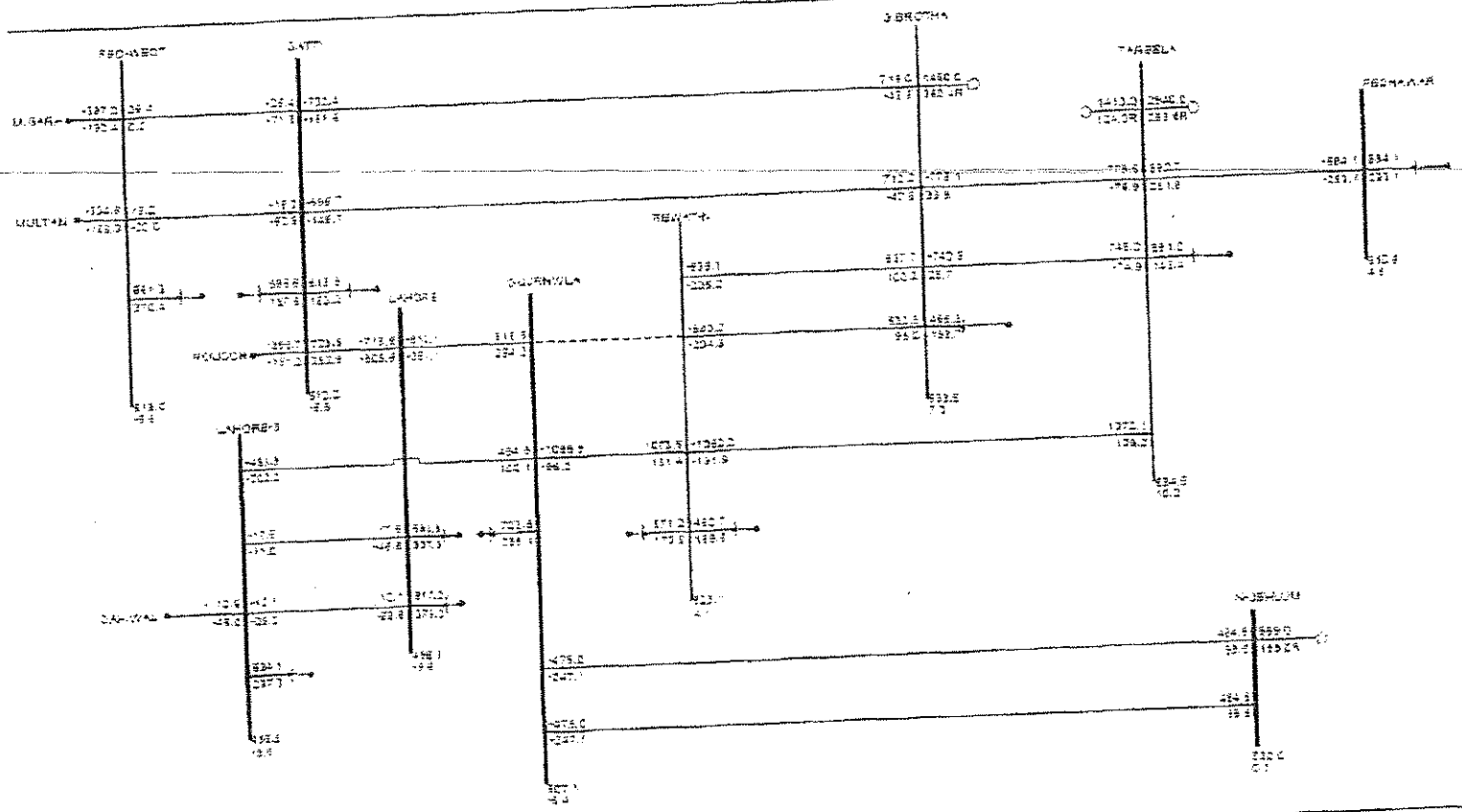
PEAK LOAD AUG/SEP 2017

EXHIBIT # 8



PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT
FINAL ARRANGEMENT
PEAK LOAD AUG/SEP 2017

EXHIBIT # 6

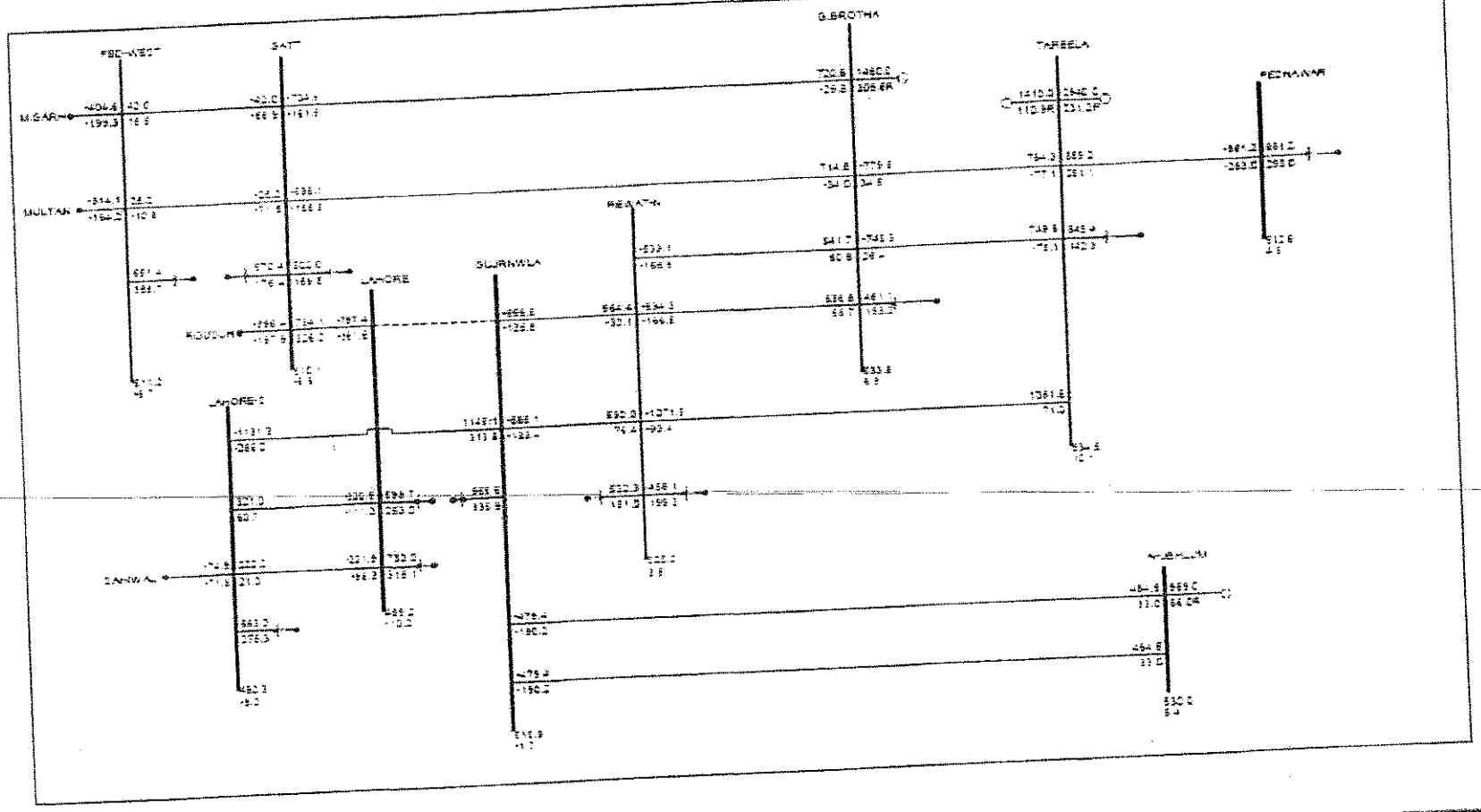


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

FINAL ARRANGEMENT

PEAK LOAD AUG/SEP 2017

EXHIBIT # 10

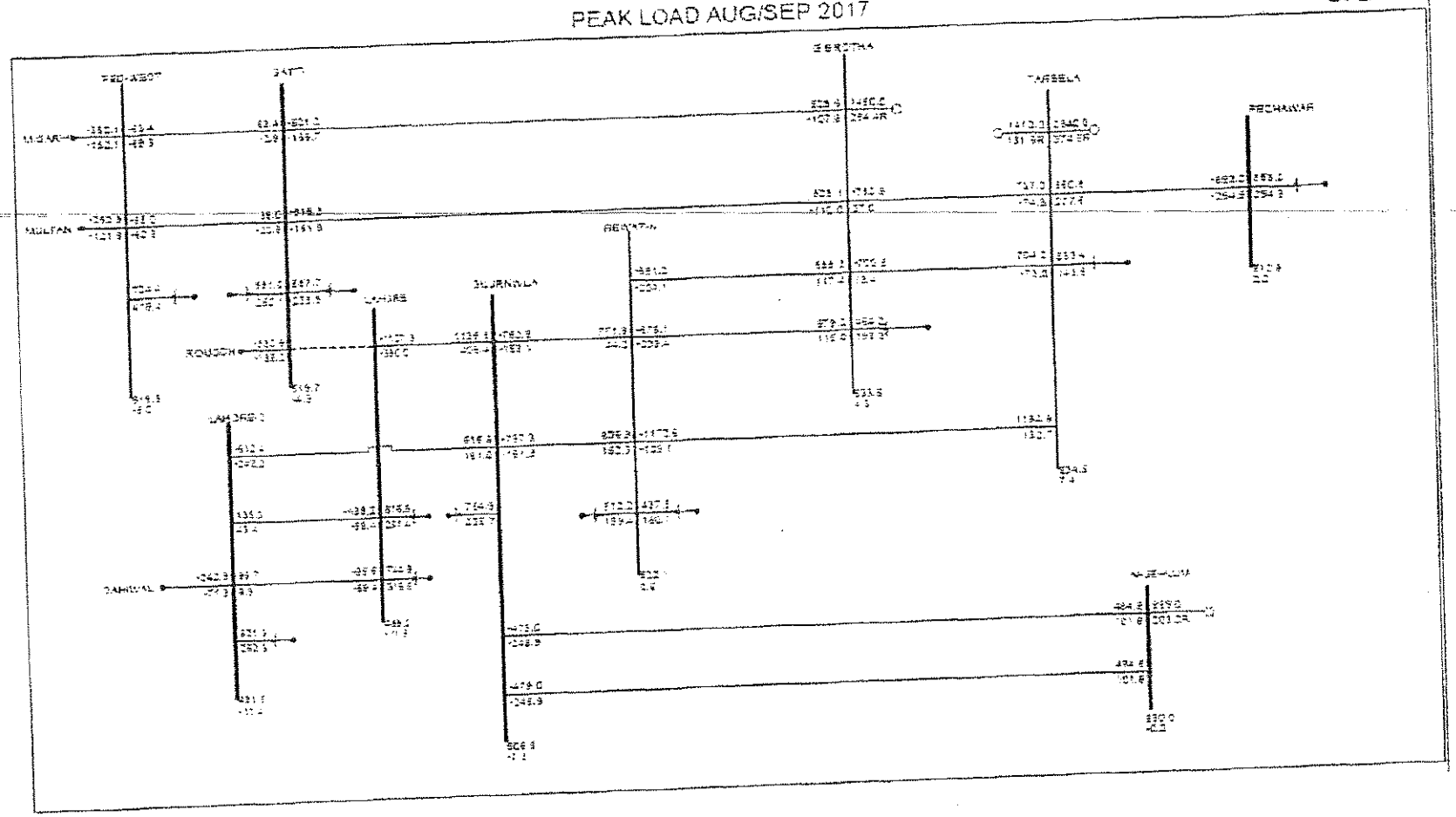


PC-I STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM HYDRO POWER PROJECT

FINAL ARRANGEMENT

PEAK LOAD AUG/SEP 2017

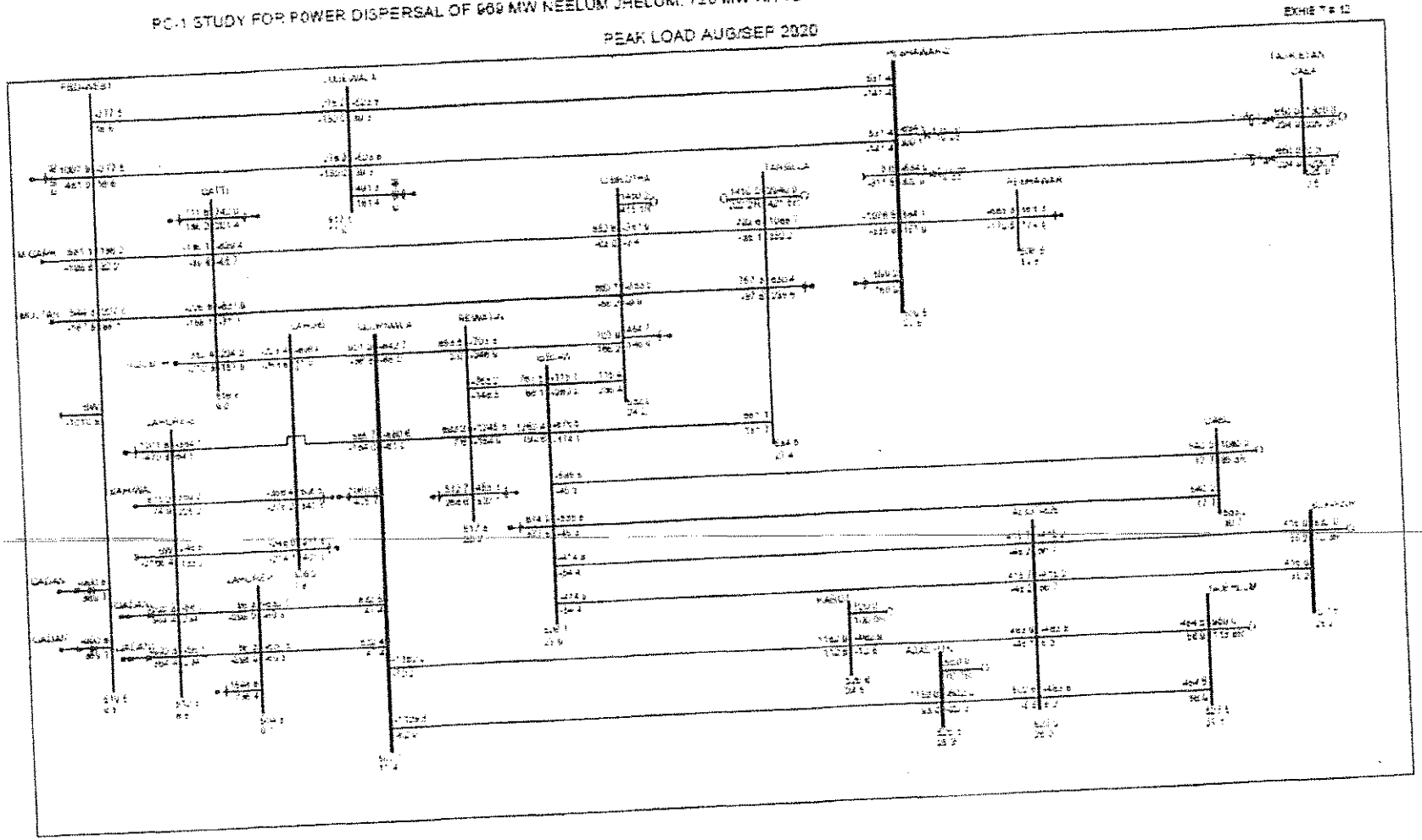
EXHIBIT = 11

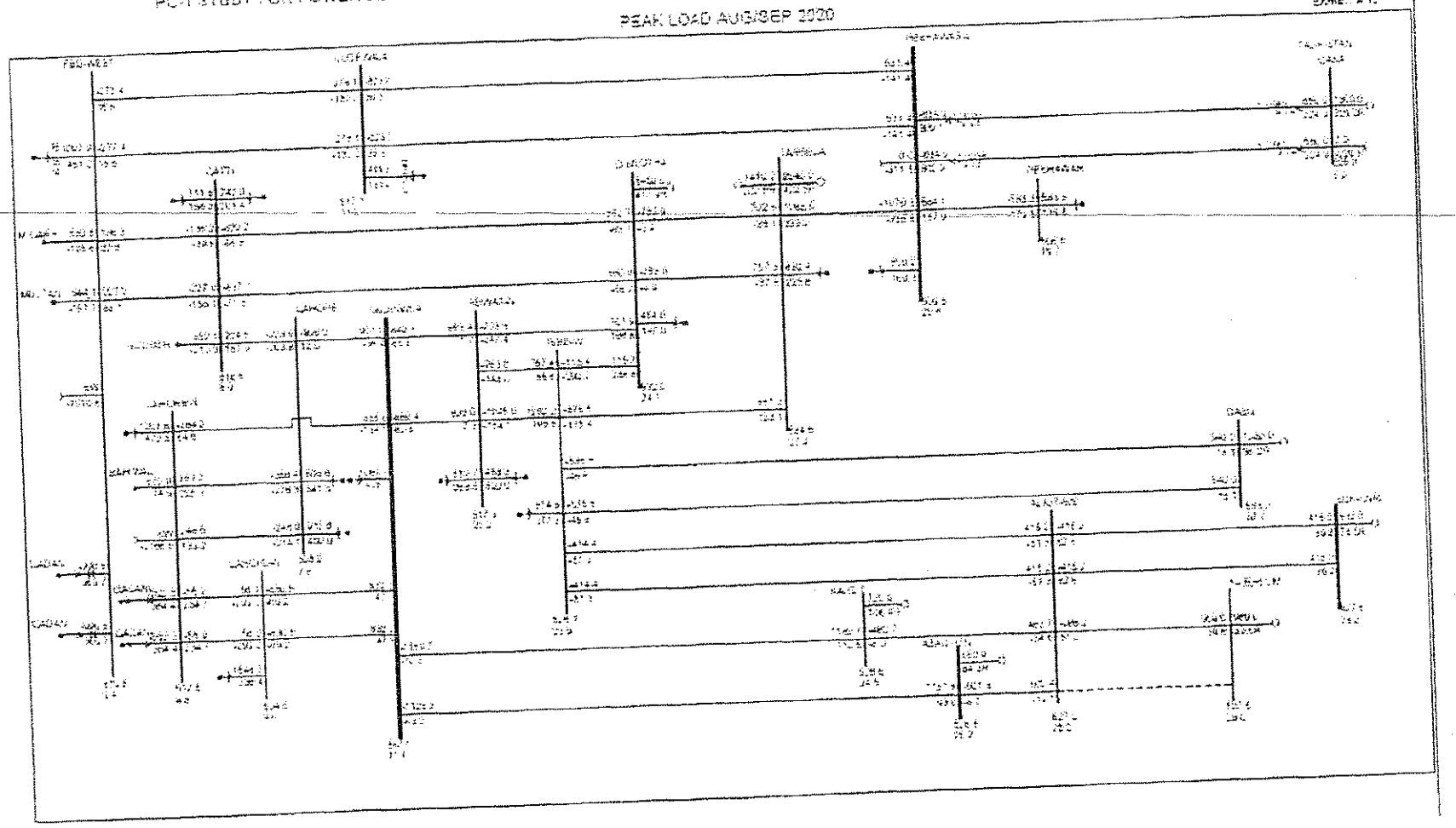


PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 660 MW AZAD PATTAN HYDRO POWER PROJECTS

PEAK LOAD AUG/SEP 2020

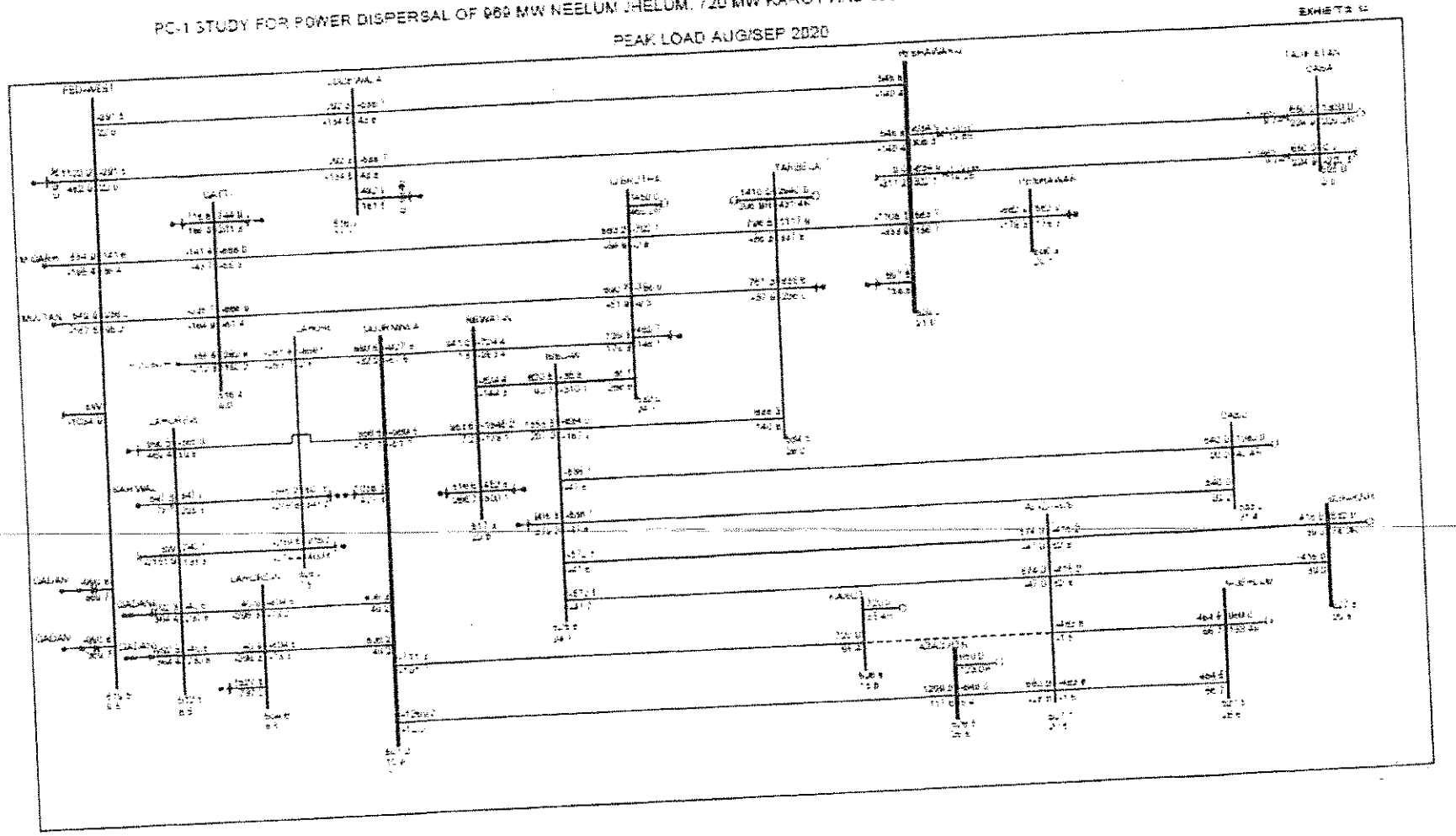
EXHIBIT-B-12




PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 656 MW AZAD PATTAN HYDRO POWER PROJECTS
PEAK LOAD AUG/SEP 2020

PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 850 MW AZAD PATTAN HYDRO POWER PROJECTS

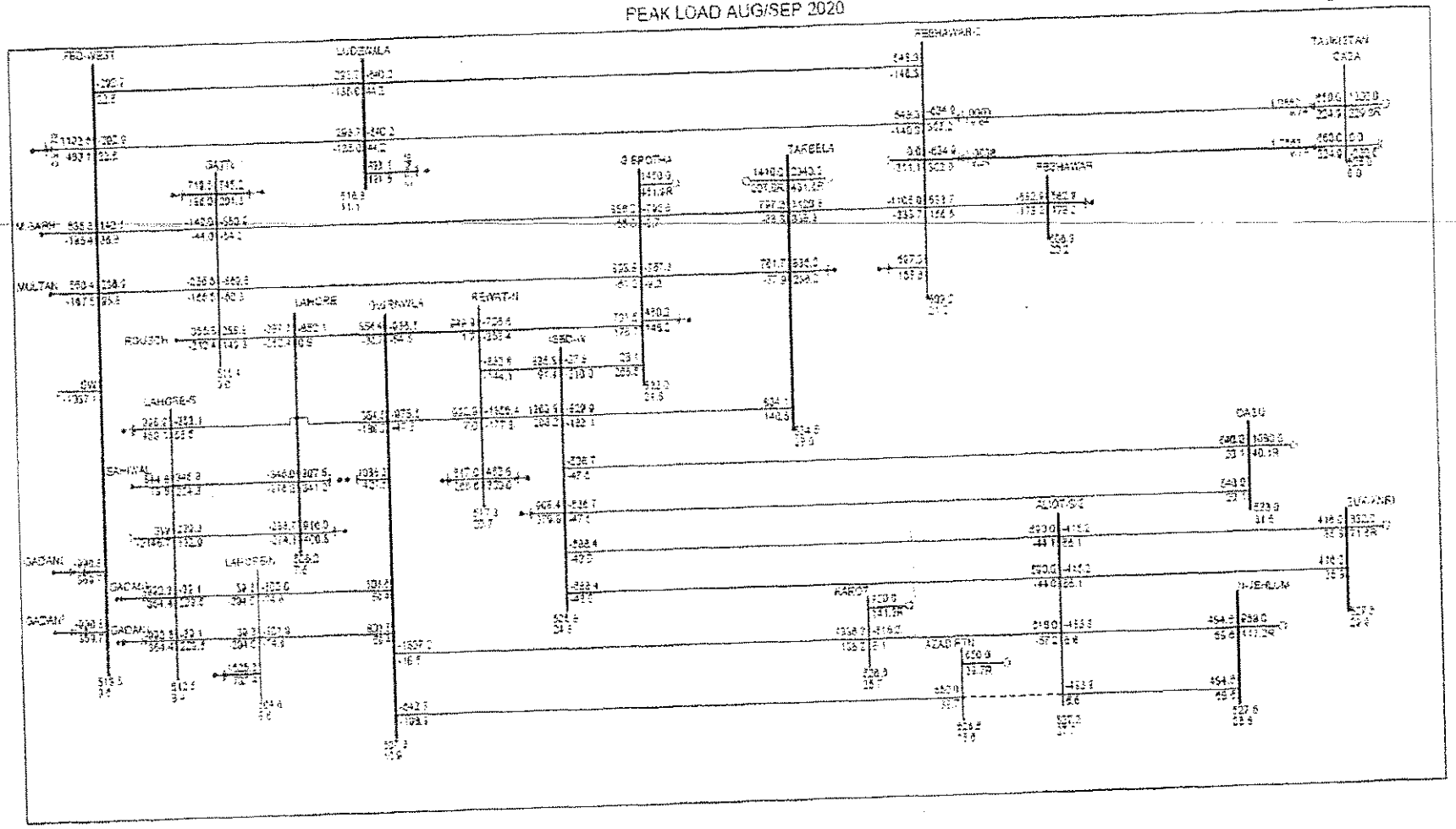
PEAK LOAD AUG/SEP 2020



PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 650 MW AZAD PATTAN HYDRO POWER PROJECTS

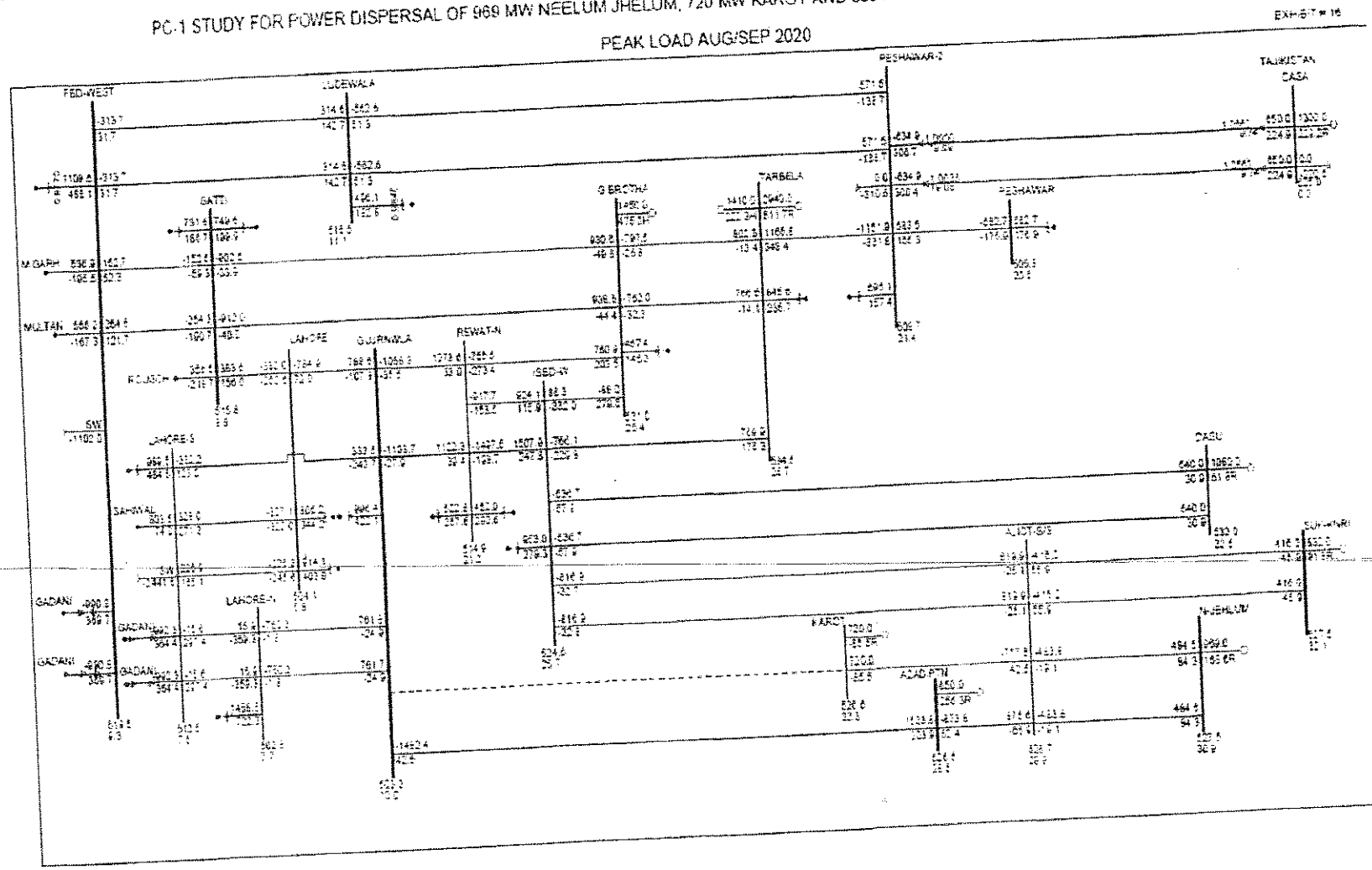
PEAK LOAD AUG/SEP 2020

EXHIBIT # 15



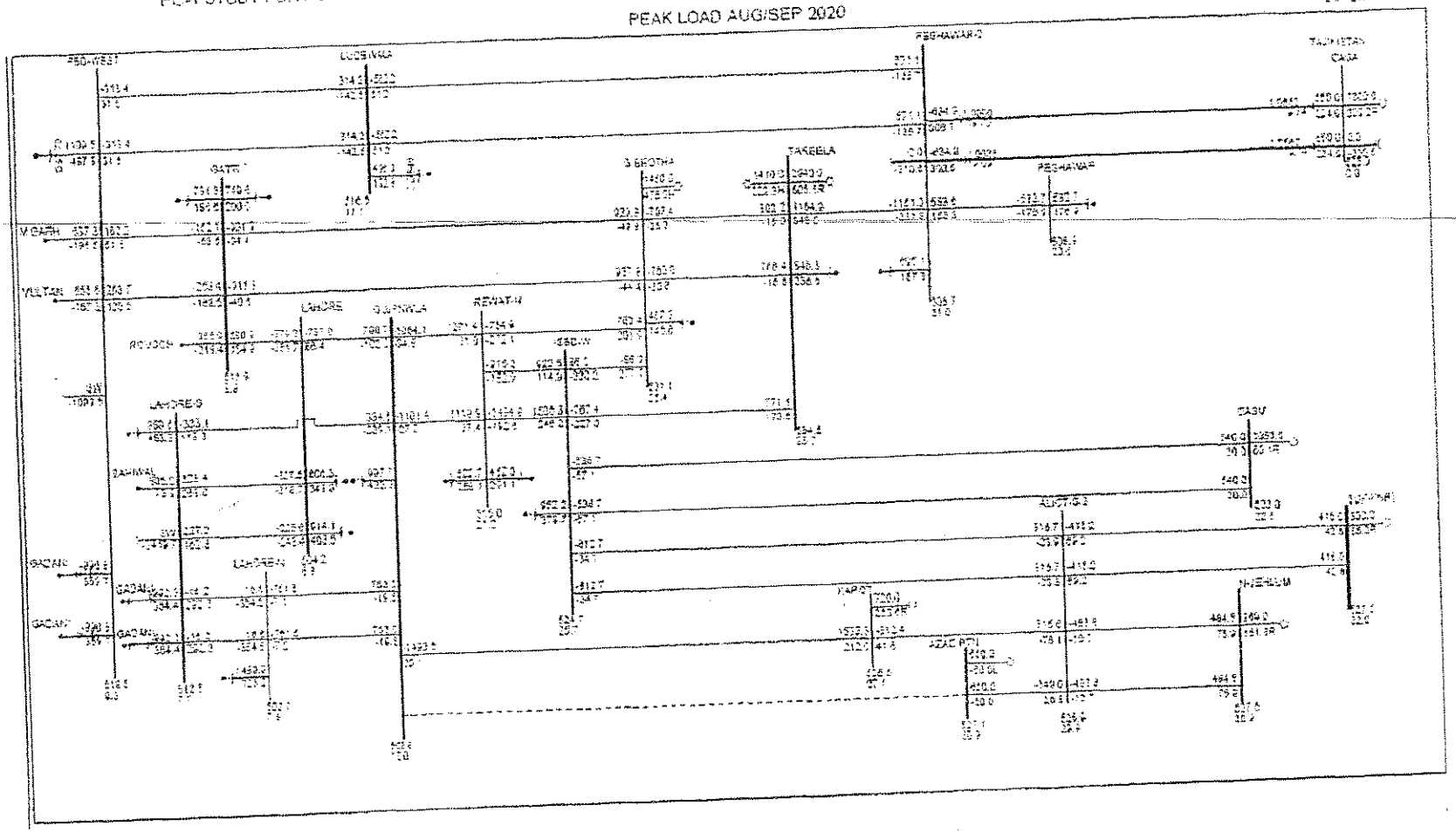
PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 650 MW AZAD PATTAN HYDRO POWER PROJECTS

PEAK LOAD AUG/SEP 2020



PC-I STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 850 MW AZAD PATTAN HYDRO POWER PROJECTS

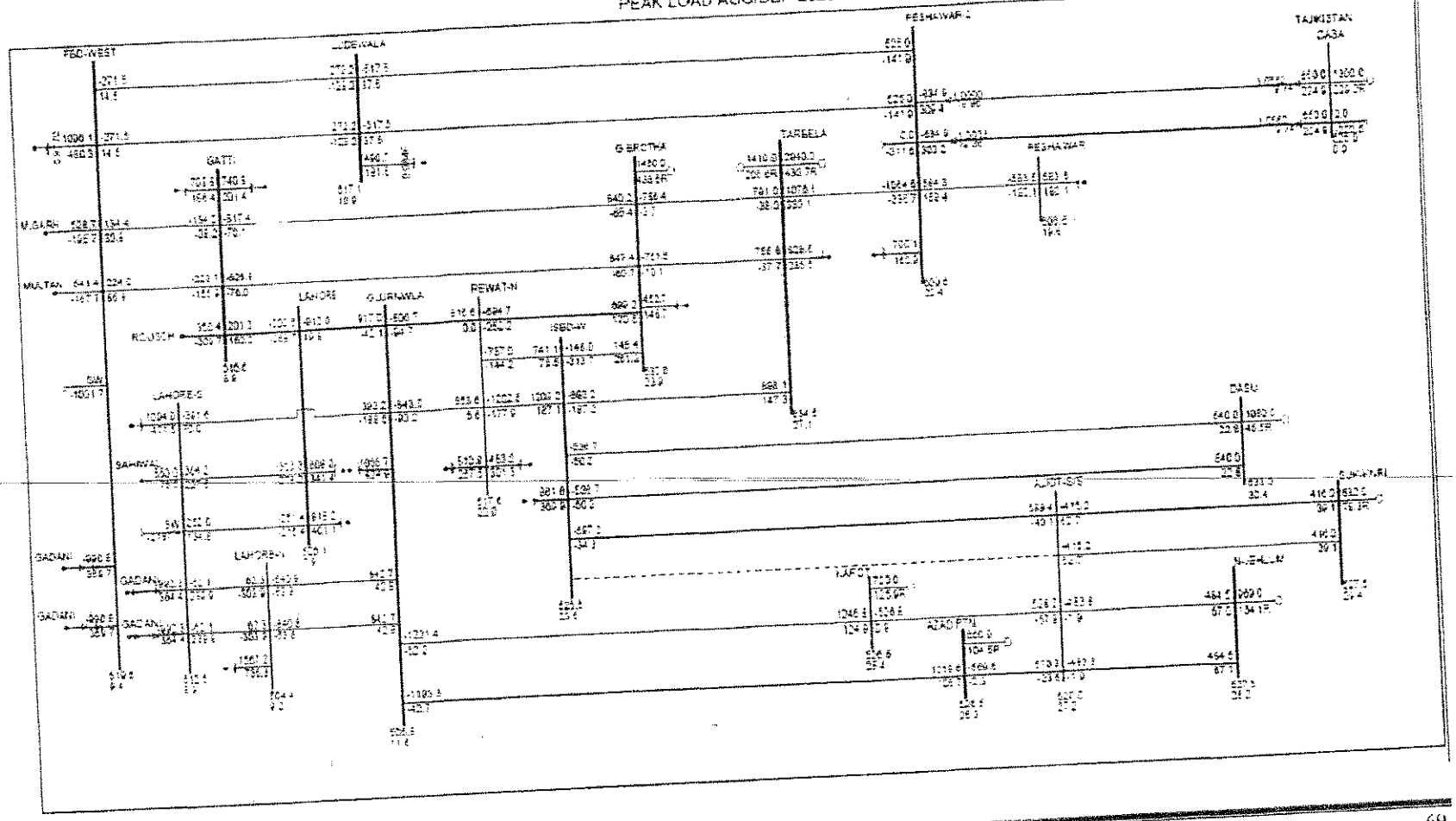
PEAK LOAD AUG/SEP 2020



PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 650 MW AZAD PATTAN HYDRO POWER PROJECTS

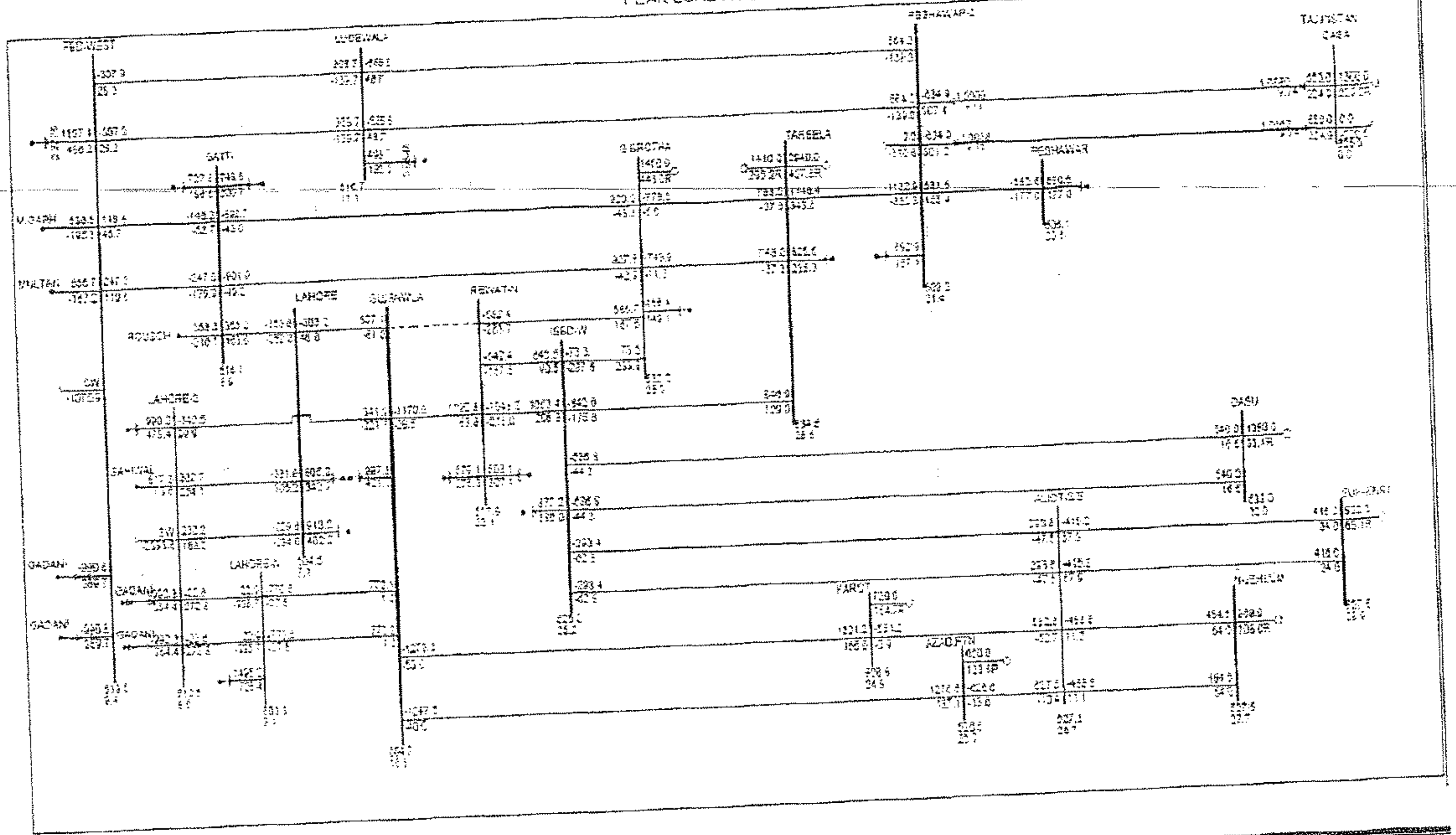
PEAK LOAD AUG/SEP 2020

EXHIBIT # 16



PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 650 MW AZAD PATTAN HYDRO POWER PROJECTS

PEAK LOAD AUG/SEP 2020

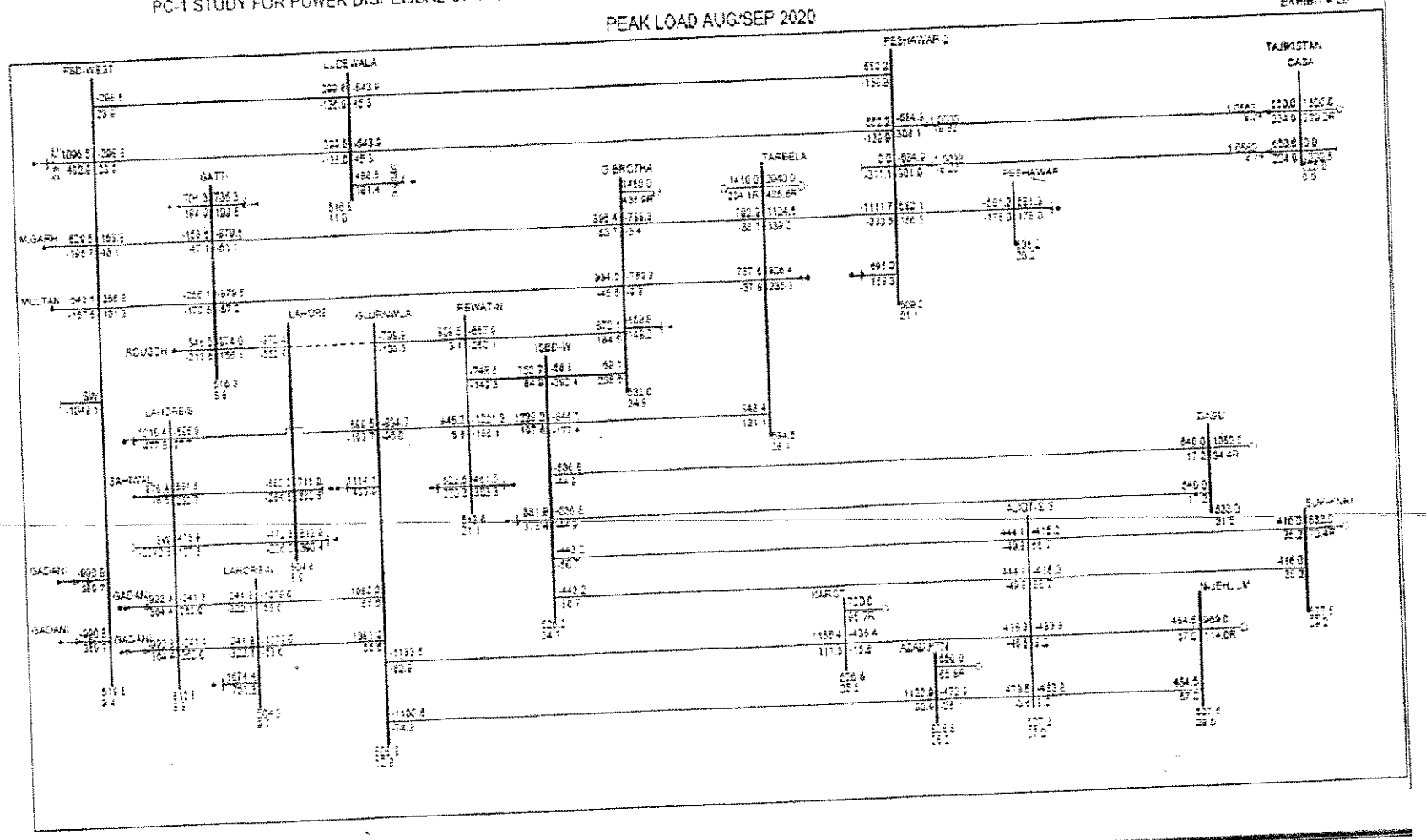


26/27

PC-1 STUDY FOR POWER DISPERSAL OF 969 MW NEELUM JHELUM, 720 MW KAROT AND 650 MW AZAD PATTAN HYDRO POWER PROJECTS

PEAK LOAD AUG/SEP 2020

EXHIBIT # 20



Neelum Jhelum Hydropower Company (Pvt) Ltd
(A Subsidiary of WAPDA)

CHIEF FINANCIAL OFFICER

No.CFO/NJHPC/Tariff/2021/2432-37

Dated: 15.01.2021

Chief Executive Officer,
CPPA-G, Enercon Building, G-5/2,
Islamabad.

Subject: **APPLICATION FOR DETERMINATION OF REFERENCE TARIFF FOR IMPORT OF POWER FROM 969 MW NEELUM JHELUM HYDROPOWER PROJECT**

Ref: CEO (CPPA-G)/CTO/602-05 dated 13.01.2021

In pursuance of your letter under reference, application for determination of reference tariff under the NEPRA Import of Power Regulations 2017 in respect of 969 MW Neelum Jhelum Hydropower Project near Muzaffarabad, AJ&K is enclosed for review and onward submission to NEPRA. The requirements are complied with as under:-

i. The details/information required under Regulaiton-3 of NEPRA (Import of Eclectic Power) Regulations 2017 is submitted as per **(Annex-A)**.

ii. Regarding Third Party Validation, it is submitted that NJHPC sought clarification vide letter dated 01.01.2020 (copy attached) from Ministry of PD&SI for a proper levelized tariff based on the firmed up cost of the project with onetime adjustment at final bill on the following points:-

   a. Pending the Third Party Validation of project costs of Neelum Jhelum, a proper levelized tariff should be determined in light of information reconciled with latest audited accounts.
   b. A Third Party cost Validation process may continue and be completed on priority as deemed appropriate.
   c. Any impact of cost validation if determined by the Third Party may be adjusted in the already determined tariff after the completion of cost validation.

Ministry of Water Resources endorsed NJHPC's points/proposals through letter dated 17.01.2020 (copy attached) to Ministry of PD&SI. MoPD&SI agreed to the proposals of NJHPC/MoWR vide letter 18.02.2020 (copy attached) subject to concurrence of NEPRA as reproduced below-

Sr #	Proposals of Ministry of Water Resources	View Point of Ministry of Planning, Development & Special Initiatives
a.	Pending the 3rd Party Validation of project cost of Neelum Jhelum, a proper levelized tariff should be determined in light of information reconciled with latest audited accounts.	M/O PD&SI may have no objection subject to concurrence of NEPRA.
b.	A 3rd Party cost validation process (TPV) may continue and be completed on priority as deemed appropriate	To expedite 3rd party cost validation of NJHPP, Deputy Chairman Planning Commission has decided that TPV will be carried out by Consultants to be engaged by the Project Wing, M/O PD&SI under the supervision of Member (I&M), Planning Commission for its early completion.
c.	Any impact of cost validation, if determined by 3rd Party may be adjusted in the already determine tariff after the completion of cost validation.	M/O PD&SI may have no objection subject to concurrence of NEPRA.

Address: WAPDA Administrative Staff College, H-8/1, Pitras Bukhari Road, Islamabad – Pakistan
Tel: 051-4863117, Fax:051-4939256, E-mail: cfo_njhpc@yahoo.com, apstocfo@gmail.com

NJHPC has been trying since 2015 to get the TPV completed which was entrusted to M/O PD&SI and will continue its efforts in future as well, however, NEPRA may therefore be requested to proceed with tariff determination in light of above and keeping in view our prayer under section 2.3 and 2.4 of the tariff application. It is requested that the tariff application be forwarded alongwith information/documents at **Annex-A & B** to NEPRA at the earliest to ease the financial constraints of the Company under intimation to this office please.

(Saqlain Manzoor)
Chief Financial Officer

Copy to:-

1. Registrar NEPRA, NEPRA Tower Attaturk Avenue (East), Sector 4-5/1 Islamabad.
2. Chief Technical Officer (CPPA-G), Islamabad.
3. Chief Legal Officer (CPPA-G), Islamabad.
4. Chief Financial Officer (CPPA-G), Islamabad.
5. APS to CEO NJHPC.

(Annex-A)

a)	Name and address of the applicant	Neelum Jhelum Hydropower Company (NJHPC), Official Address: WAPDA Administrative Staff College, Pitras Bukhari Road, Sector H-8/1, Islamabad. Email: cfo@njhpc.org, njhp17@gmail.com	
b)	Authorization from the competent authority to file application along with affidavit as to the correctness of the information;	Attached (Annex-I &II)	
c)	Demand which is going to be met through the proposed Import of Power;	CPPA-G has been requested vide letter dated 07.01.2021 to provide demand to NEPRA after obtaining from the concerned department (copy attached).	
d)	Details of the Seller including but not limited to name, address, description of generation facilities etc;	Section 1.1 and 2.1 of the Tariff Application	
e)	Comprehensive Tariff Proposal including proposed Rates of Import of Power, details of project cost, tariff break-up and tariff assumptions;	Tariff proposal	Section-9 of the Tariff Application
		Project Cost	Section-5 of the Tariff Application
		Tariff assumptions	Section 12.2 of the Tariff Application
f)	Source of power generation, where applicable;	Own Hydropower Plant	
g)	Capacity and/or the estimated annual energy to be imported;	Section 3.5.1 and 3.5.2 of the Tariff Application	
h)	Feasibility study of the project, if applicable;	Attached in soft	
i)	Proposed interconnection arrangement with approximate distance;	Section 3.2 of the Tariff Application	
j)	Augmentation required in existing transmission network and/or the grid, if any;	Not required, already connected and transmitted over 11 billion units into National Grid	
k)	Estimated costs of the interconnection arrangement and augmentation required in the transmission network;	N/A	

l)	The technology, indicating primary fuel, alternate primary fuel and back up fuel, where applicable;	Hydro
m)	Undertaking from Seller to comply with the grid code, distribution code and other applicable documents;	Attached (Annex-III)
n)	The expected commercial operations date;	4th July 2018
o)	The expected duration of Import of Power;	50 Years
p)	The adequacy of the transmission system of the national grid company or Distribution Company, as the case may be, to import the electric power;	Transmission System of NTDC is adequate and transmitting electricity from plant into the National Grid since April 2018.
q)	The summary of evidence giving brief particulars of the data, facts and evidence in support of the application; and	Provided with Tariff Application
r)	Any other information in such format as may be required by the Authority from time to time	Third Party Validation (TPV) of cost estimates: - Section-6 of the Tariff Application.

Annex - I

Neelum Jhelum Hydropower Company (Pvt) Ltd

(A Subsidiary of WAPDA)

Phone: 051-9250347
051-4863117
Fax: 051-4863118
E-mail: cs.njhpc@gmail.com

MD/Chief Executive Officer,
Liaison & Coordination Office NJHPC
WAPDA Administrative Staff College,
H-8/1, Islamabad.

No. MD/CEO/NJHPC /2020/ 1945-46 Dated: 03-11-2020

AUTHORIZATION TO FILE TARIFF PETITION WITH NEPRA THROUGH CPPA-G

It is intimated that Board of Directors of Neelum Jhelum Hydropower Company (Pvt) Limited in their 54th BoD meeting held on October 16, 2020 at Rawal Rest House Islamabad resolved as under:

RESOLVED, that the Company may file a tariff petition in relation to a (approximately) 969 MW hydro power generation facility to be located at located in Azad and Jammu Kashmir, 22 km south of Muzaffarabad (the "Tariff Proposal") to the Central Power Purchasing Agency (Guaranteed) Limited ("CPPA-G") for onwards submission before the National Electric Power Regulatory Authority ("NEPRA" or "Authority").

FURTHER RESOLVED THAT, Chief Executive Officer/Managing Director Neelum Jhelum Hydropower Company , Chief Financial Officer Neelum Jhelum Hydropower Company, are duly authorized jointly and severally to file and submit the Tariff Proposal (along with annexes) and any documents in support thereof for submission before NEPRA by CPPA-G, sign the necessary documentation, pay the necessary filing fees, appear and/or make any oral/written representations on behalf of the Company necessary for the filing of the Tariff Proposal in accordance with the applicable law, and undertake or do any matter(s)/act(s) necessary or incidental thereto."

(SHAKEEL AHMED)
Company Secretary
Neelum Jhelum Hydropower Company

Neelum Jhelum Hydropower Company (Pvt) Limited
Subsidiary of WAPDA

Copy to:-

1. Chief Financial Officer NJHPC
2. APS to CEO NJHPC

PETITION FOR TARIFF DETERMINATION

AFFIDAVIT of Saqlain Manzoor age: 43 years son of Ch. Muhammad Manzoor, having CNIC No. 35202-2577903-3, Lahore, Chief Financial Officer of Neelum Jhelum Hydropower Company (Pvt) Limited being the duly authorized representative of Neelum Jhelum Hydropower Company (Pvt) Limited having its registered office at WAPDA Administrative Staff College Sector, H-8/1 Islamabad.

I, Saqlain Manzoor age: 43 years son of Ch. Muhammad Manzoor, Deponent, do hereby solemnly affirm and declare that:

1. I am the Chief Financial Officer, the principal and authorized representative/attorney of Neelum Jhelum hydropower Company (Pvt) Limited.
2. The contents of the accompanying tariff petition including all supporting documents are true and correct to the best of my knowledge and belief and nothing material or relevant thereto has been concealed or withheld.
3. I also affirm that all further documentation and information to be provided by me in connection with the accompanying tariff petition shall be true to the best of my knowledge and belief.

DEPONENT
(Chief Financial Officer)
CNIC No.35202-2577903-3

Verification:

Verified on oath at Islamabad on this 3rd day of **November 2020** that contents of the above affidavit are correct and true to the best of my knowledge and belief.

DEPONENT
(Chief Financial Officer)
CNIC No. 35202-2577903-3

ATTESTED
TARIQ IQBAL MAHER
Advocate High Court
Notary Public
ISLAMABAD

Attachment Annex-A(C)

Neelum Jhelum Hydropower Company (Pvt) Ltd

(A Subsidiary of WAPDA)

CHIEF FINANCIAL OFFICER

No.CFO/NJHPC/Tariff/2021/2365-67 Dated: 07-01-2021

Chief Executive Officer,
CPPA-G, Enefcon Building, G-5/2,
Islamabad.

Subject: NEPRA IMPORT OF POWER REGULATIONS - 2017

Ref: CPPA-G/CLO/DMF-VI/2020/1365-67 dated 18.11.2020.

It is summitted that in terms of Regulation 3 (C) of NEPRA Import of Power Regulations - 2017, CPPA-G is to provide information to NEPRA regarding demand to be met through the proposed import of power which is missing in case of NJHPC Tariff Application.

It is requested to arrange and provide the required information to NEPRA at the earliest under intimation to this office.

(Saqlain Manzoor)
Chief Financial Officer

Copy to:

1. General Manager Power System Planning NTDC 4th Floor, PIA Tower, Egerton Road Lahore.
2. APS to MD/CEO NJHPC.

O/C

Address: WAPDA Administrative Staff College, H-8/I, Pitras Bukhari Road, Islamabad – Pakistan
Tel: 051-4863117, Fax:051-4939256, E-mail: cfo_njhpc@yahoo.com, apstocfo@gmail.com

ANNEX – III

Neelum Jhelum Hydropower Company (Pvt) Ltd

(A Subsidiary of WAPDA)

CHIEF FINANCIAL OFFICER

No.CFO/NJHPC/Tariff/2021/2431 Dated: 15.01.2021

Chief Executive Officer,
CPPA-G, Enercon Building, G-5/2,
Islamabad.

Subject: **Undertaking Under NEPRA (Import of Electric Power) Regulations, 2017**

Dear Sir,

We, Neelum Jhelum Hydropower Company (Pvt.) Limited, hereby undertake to comply with the requirements under Grid Code, distribution code and other applicable documents.

This undertaking is being issued pursuant to Clause 3 (1) (m) of the NEPRA's Import of Electric Power Regulations 2017 as notified through S.R.O 549(1)/2017 dated June 22,2017.

Yours sincerely,

(Saqlain Manzoor)
Chief Financial Officer

Address: WAPDA Administrative Staff College, H-8/I, Pitras Bukhari Road, Islamabad – Pakistan
Tel: 051-4863117, Fax:051-4939256, E-mail: cfo_njhpc@yahoo.com, apstocfo@gmail.com

Attachment-I

Neelum Jhelum Hydropower Company (Pvt) Ltd

(A Subsidiary of WAPDA)

CHIEF FINANCIAL OFFICER

No. CFO/NJHPC/PC-I/2020/01-02 Date: 01-01-2020

Chief Energy (Energy Wing)
Ministry of Planning Development & Reforms
Pak Secretariat Islamabad

Subject: 3RD PARTY VALIDATION OF COST ESTIMATES OF NEELUM JHELUM HYDROPOWER PROJECT

1. Neelum Jhelum Hydropower Company Pvt Ltd started the construction of project in January 2008 and since then WAPDA has invested huge amount in the strategic power project while no financial benefit is earned from the investment till to-date. NJHPCL has also not paid Rs. 89 billion to government of Pakistan either on account of foreign relent loans as well as cash development loans. In the meanwhile the project was substantially completed without the financial close and started generating electricity/power from the 9th April 2018 and till to date has injected more than 6300 million units into the National Grid.

2. NJHPCL had filed a tariff application with NEPRA through CPPA-G in October 2017. NEPRA asked for comments of Planning Commission before public hearing during 2018. Planning Commission while forwarding their comments on the petition of Neelum Jhelum, narrated the PC-1 approval of NJHPCL as conditional to 3rd party validation of cost estimates. During public hearing of our tariff application, a former member energy (PC) Syed Akhtar Ali raised an observation regarding the 3rd Party validation of NJHPCL project cost estimates. The Planning Commission representatives sitting in the public hearing did not explain the point of view of PC. It was construed from the reply of PC and observation of Syed Akhtar Ali that PC is opposing the tariff application on the grounds that project costs may not be justified for award of a tariff.

3. However, keeping in view, the strategic nature of the project along-with the peculiar conditions/financial constraints, NEPRA allowed a provisional tariff, which is considerably less than the financial requirements of NJHPCL and WAPDA. NJHPCL wrote two letters to your office during January and February 2019 for conducting the cost validation of NJHPCL Project. Thereafter your representative attended the review hearing of NJHPCL on 6th March 2019 in NEPRA office and a question about third party validation was raised during the hearing. Your representative informed the house that 3rd party validation is all about

Address: WAPDA Administrative Staff College, H-8/1, Pitras Bukhari Road, Islamabad - Pakistan
Tel: 051-4863117, Fax:051-4939256, E-mail: cfo_njhpc@yahoo.com, apstocfo@gmail.com

learning the lessons and not to question the project costs of NJHPCL.

4. From your reply to NJHPCL letter and your representative reply in public hearing, it was understood that you were not opposing to the tariff application instead emphasizing the need to validate the costs of the project as a lesson for improvements in future developmental projects.

5. In that perspective we are preparing to approach NEPRA for a proper levelized tariff based on the provisionally firmed up costs of the project with one-time adjustment at final bill. You are requested to intimate your considered point regarding the project cost validation of NJHPCL clarifying the following:-

   a. Pending the 3rd party validation of project costs of Neelum Jhelum, a proper levelized tariff should be determined in the light of information reconciled with latest audited accounts.

   b. A 3rd party cost validation process may continue and be completed on priority as deemed appropriate.

   c. Any impact of cost validation if determined by the 3rd party may be adjusted in the already determined tariff after the completion of cost validation.

6. Please do keep in view the adverse consequences of refusal for a proper tariff for NJHPCL, which is already finance-starved with huge pending liabilities for which Govt. is the guarantor and the guarantee may be called by the lenders if the company defaults on debt servicing.

(Muhammad Hamid Mahmood)

Copy to:

1. APS to CEO – NJHPC, Islamabad.
2. Master file.

(Attachment) - D

MOST IMMEDIATE

Government of Pakistan
Ministry of Water Resources
*****

No. 2(39)/2016-HP

Islamabad, January 17, 2020

OFFICE MEMURANDUM

Subject:- 3RD PARTY VALIDATION (TPV) OF COST ESTIMATES OF NEELUM JHELUM HYDROPOWER PROJECT

The undersigned is directed to refer to NJHPC's letter No. DFO/NJHPC/PC-I/2020/01-02 dated 01.01.2020 and Ministry of Planning, Development & Special Initiatives letter No. 1(94-1) Energy/PC/08 dated 10.01.2020 on the subject cited above which is self explanatory and to say that PD&SI Division may consider the request of NJHPC and furnish the view point on the following points so that Company may approach NEPRA for a proper levelized tariff base on the provisionally firmed up cost of the project with one time adjustment at final bill to overcome huge financial starved.

a. Pending the 3rd party validation of project costs of Neelum Jhelum, a proper levelized tariff should be determined in the light of information reconciled with latest audited accounts.
b. A 3rd party cost validation process may continue and be completed on priority as deemed appropriate.
c. Any impact of cost validation, if determined by the 3rd party may be adjusted in the already determined tariff after the completion of cost validation.

2. An early response on the subject matter will be highly appreciated.

(Muhammad Zeeshan Ishaq)
Section Officer (HP)
051-9244923

Secretary
Planning Development & Special Initiatives
(PD&SI),
Government of Pakistan,
Islamabad.

Please discuss on priority
ADG-A
20/1

Cc:

- Chairman WAPDA, WAPDA House, Lahore.
- CEO Neelum Jhelum Hydropower Company, WASC, Islamabad
- CEO CPPA-G, Islamabad
- PS to Secretary, Ministry of Water Resources, Islamabad
- APS to Joint Secretary (Water), Ministry of Water Resources, Islamabad

1. Feasibility study of the project,
   if applicable attached in soft (Annex-A)

2. Financial Model Soft Sr. # 06 (Annex-B)

(Attachment)-II

Government of Pakistan
Ministry of Planning, Development & Special Initiatives
(Energy Wing)
*****

No.1(94-1) Energy/PC/08 Islamabad, the 18th February, 2020

OFFICE MEMORANDUM

Subject: 3rd PARTY VALIDATION (TPV) OF NEELUM JHELUM HYDROPOWER PROJECT

The undersigned is directed to refer to M/o Water Resources O.M No: 2(39)/2016-HP dated 17.1.2020 on the above subject and to say that requisite para-wise comments of M/o Planning, Development & Special Initiatives (PD&SI) are as under:

Sr#	Proposals of Ministry of Water Resources / NJHPC	View Point of Ministry of Planning, Development & Special Initiatives
a	Pending the 3rd party validation of project cost of Neelum Jhelum, a proper levelized tariff should be determined in light of information reconciled with latest audited accounts.	M/O PD&SI may have no objection subject to concurrence of NEPRA.
b	A 3rd party cost validation process (TPV) may continue and be completed on priority as deemed appropriate.	To expedite 3rd party cost validation of NJHPP, Deputy Chairman Planning Commission has decided that TPV will be carried out by Consultants to be engaged by the Project Wing, M/o PD&SI under the supervision of Member (I&M), Planning Commission for its early completion.
c	Any impact of cost validation, if determine by 3rd party may be adjusted in the already determine tariff after the completion of cost validation.	M/O PD&SI may have no objection subject to concurrence of NEPRA.

(Fozia Ayub)
Deputy Chief (Power)

Mr.Muhammad Zeeshan Ishaq
Section Officer(HP),
M/O Water Resources,
Federal Flood Commission, G-5/1,
Islamabad.

Copy to:

i) SPS to Secretary, M/O PD&SI, Islamabad
ii) SPS to Secretary, M/O Water Resources, Federal Flood Commission, G-5/1, Islamabad.
iii) SPS to Member (Energy), Planning Commission, Islamabad
iv) SPS to Member (I&M), Planning Commission, PPMI Building, Islamabad
v) PS to CEO NJHPC, Wapda Administrative Staff College, Islamabad.
vi) PS to Joint Secretary (Water), M/O Water Resources, Federal Flood Commission, G-5/1, Islamabad.
vii) PS to Chief (Energy), Energy Wing, PD&SI, Islamabad
viii) PS to Chief (EF&E), Energy Wing, M/O PD&SI, Islamabad

BAD-G file in Tariff file.

(Annex-B)

1. Approved PC-I, 4th Revised.
2. Audited Accounts for last 03 years (FY 2019-20, 2018-19 & 2017-18).
3. For Construction Cost, Duties & Taxes and Insurance during construction: -
    a. Civil Works IPC-114.
    b. EMH Works IPC-87.
    c. Construction Contract with CGGC-CMEC.
4. Consultancy Services Agreement.
    a. Original Agreement.
    b. Amendment No.4.
    c. Consultant Invoice No.148.
5. For Loan and Interest during construction, Financing Agreements with Amortization Schedule.
6. Financial Model (Soft).
7. Share issue Certificate in respect of equity.
8. GoP decision regarding imposition of Neelum Jhelum Surcharge.
9. GoP decision regarding Water Usage Charges.
10. Decision of last detriment tariff.
11. Insurance for O&M phase (evidence of cover & 1st installment invoice).
12. Cheque for Rs.1,719,885/- dated 15.01.2020 in favour of NEPRA as processing fee.

Central Power Purchasing Agency Guarantee Limited
A Company of Government of Pakistan

Chief Technical Officer (CPPA-G)

No. CEO (CPPA-G)/DGM-R/ 2728 - 31   Dated: 12/02/2021

The Registrar, NEPRA
Nepra Tower, Ataturk Avenue (East)
Sector G-5/1, Islamabad

Subject: **Application for Determination of Reference Tariff for Import of Power from 969 MW Neelum Jhelum Hydro Power Project.**

Ref: M/s Neelum Jhelum Letter No. CFO/NJHPC/Tariff/2021/24-32-37 dated 15-01-2021

With reference to the letter referred above M/s Neelum Jhelum Hydro Power Project submitted the application for determination of the reference Tariff for import of Power from 969 MW Neelum Jhelum Hydro Power Project.

In this regard, it is apprised that under the import of electric power regulation 2017 dated 23.06.2017 and as per the amendment in such regulation dated 21.07.2020, the following are required to be submitted to the authority in set order for determination of rate for import of power as per the Regulation 3 and sub-regulation 1(A) by the buyer.

It is pertinent to mentioned that the following requirements under the regulation 3 and sub-regulation 1(A) are mentioned below and attached with this letter.

Regulation 3-1(A)

S.No.	Sub-Regulation 1(A)	Provided	Remarks
a.	A comprehensive Tariff proposal, including proposed Rates, details of project cost, tariff break-up and tariff assumptions;	Yes	
b.	A feasilbilty study, if applicable;	Yes	PC-1
c.	An interconnection study duly approved by the relevant Network Operator;	Yes	Letter attached
d.	an undertaking of compliance with the grid code, distribution code and other applicable documents;	Not Provided	
e.	A non-refundable application fee, equivalent to the fee for filing of tariff petition under National Electric Power Regulatory Authority (Tariff Standards and Procedures) Rules, 1998 and other rules and regulations on the subject	Yes	

Regulation 3

Sr.No	Details required for Tariff Proposal	Provided	Remarks
a	Name and address of the applicant;	Yes	
b	Authorization from the competent authority to file application along with affidavit as to the correctness of the information;	Yes	
c	Demand which is going to met through the proposed Import of power;	Yes	Letter attached
d	Detail of Seller including but not limited to name, address, description of generation facilities etc;	Yes	

For information & n/a
- Adl. Dir (T) TDR-II
- MF copy to: ADG(Tariff)
15/2/21
Chairman
Vice Chairman

REGISTRAR
2890
15/2/21

(is linked here) the same forwarded to Registrar Deptt.
Scan cc copy
Along with supporting document of ... for ... Dy. Registrar ... for retaining copy... deposit ... Received along cheque of Rs. 1,719,885/-

Pl find enclosed herewith cheque no. 65326067 dated 15.01.2021 amounting to Rs. 1,719,885/- for n.a.

Dir (Fin)

23/2/21

SECTION 1. INTRODUCTION

1.1 About the Petitioner/Project Company

Neelum Jhelum Hytdropower Company Private Limited ("**NJHPC**" or the "**Project Company**" or the "**Petitioner**") is a Company incorporated under the laws of Pakistan and is wholly owned by WAPDA. NJHPC was incorporated to design, construct, own, operate and maintain the Neelum Jhelum Hydropower Project (the "**Project**") on Build, Own, Operate (BOO) basis, a 969MW run-of-the-river project in AJK with an underground power generation facility. It is the largest hydropower project undertaken by WAPDA since the completion of Mangla, Tarbela and Ghazi Barotha Hydropower Projects.

It is important to highlight the fact that besides being the largest project WAPDA has handled after Tarbela & Ghazi Brotha, NHJPP was a most challenging and difficult Project to execute being the first underground hydropower project of such large magnitude in Pakistan. The Project involves 48.5 km long underground headrace tunnel, an underground power house and tailrace tunnel. The length of the entire underground tunneling works is about 68 kilometers.

The Project is designed to divert the water from river Neelum through a diversion dam into a tunnel. The dam is at Nauseri 41 Km North East of Muzaffarabad and the underground powerhouse constructed at Chatter Kalas, 22 Km South of Muzaffarabad. The diverted water to produce electric power by passing through the turbines and thereafter this water is released back into the River Jhelum, about 4 Km South of Chatter Kalas.

1.2 About the Sponsor

WAPDA is a statutory body established through the Water and Power Development Authority Act, 1958. Its purpose is to "provide for the unified and coordinated development of water and power resources". It was established under a special statute on the pattern of Tennessee Valley Authority for the integrated development of water & power resources of the Indus Basin. Under WAPDA Act 1958, the WAPDA authority is responsible for, irrigation, water supply, power generation, flood control, prevention of water logging and salted lands and inland navigation. WAPDA has three wings, namely (i) water wing, (ii) power wing, and (iii) finance and administration wing. The Authority consists of a chairman, member of each wing (Water, Power and Finance) and secretary WAPDA and performs the role of governance. General Managers of different departments report directly to the Members of respective wings. WAPDA is operationally and financially autonomous although it benefits from the umbrella support and full backing of Government of Pakistan.

The WAPDA Power Wing was unbundled into eight distribution, four generation and one Transmission and Dispatch Company in 1998. Following that WAPDA is responsible for operation, maintenance, up-gradation and expansion of its in-operation hydel power stations and construction of new projects for generation of power using hydel sources on Build, Own and Operate (BOO) basis. WAPDA Power Wing (Hydroelectric) is operating under the generation license granted in 2004 by NEPRA for operation, maintenance, and development of hydel power resources in Pakistan.

NEPRA has recently approved the revised installed capacity of 17,360 MW for twenty-four hydel power stations of WAPDA out of which five are under construction. Nineteen (19) hydel power stations with generation capacity of 6,902 MW are active out of which four projects of 350 MW capacity were completed during financial year 2014. Section 25 of WAPDA Act requires WAPDA to ordinarily sell power in bulk and at the rate at which WAPDA is required to sell power is to be so fixed as to provide for meeting the operation cost, interest charges and depreciation of the assets, the redemption at due time of loans other than those covered by the depreciation, the payment of any taxes and a reasonable return on investment. Under section 8 of WAPDA Act, NJHPC was established as a wholly owned Company of WAPDA and was incorporated on 18 November 2004 under the Companies Ordinance, 1984.

SECTION 2. GROUNDS FOR THE PETITION

2.1 Basis of the Petition

Since the project is located in the State of Azad Jammu and Kashmir ("**AJK**"); therefore, in terms of regulation 3(1) of Import Of Power Regulations, 2017 **("Import Regulations")** read with Regulation of Generation, Transmission And Distribution Of Electric Power (Amendment) Act, 1997 (Act XL of 1997) **"NEPRA Act")** and (Tariff Standards and Procedure) Rules, 1998 **("Tariff Rules")** the Petitioner is required to submit an application to the Buyer, which in the instant case is Central Power Purchasing Agency (Guarantee) Limited ("**CPPA-G**" or "**Power Purchaser"**) for onward submission to the National Electric Power Regulatory Authority ("**NEPRA**"), seeking determination of Rates proposed by the Seller **("The Petitioner")**.

CPPA-G being the agent procures power on behalf of distribution and transmission companies under the NEPRA (Market Operator Registration, Standards and Procedure) Rules, 2015 read with the Commercial Code 2015. CPPA-G is empowered to apply for permission to acquire power and negotiate a tariff with the Petitioner under the Interim Power Procurement (Procedures & Standards) Regulations 2005 (the "**2005 Regulations**") and **"Import Regulations".**

Details of the petitioner are as under;

Official Address	WAPDA Administrative Staff College, Pitrus Bukhari Road, Sector H-8/1, Islamabad
Email	cfo@njhpc.org, njhp17@gmail.com
Contact No.	051-9250347
Company Registration No.	00000014068/20041102

2.1.1 Project Sponsor

Water & Power Development Authority ("**WAPDA"**)	Main Sponsor/Parent Company

2.1.2 Representative of Petitioner

Engineer Muhammad Zareen	CEO NJHPC
Saqlain Manzoor	CFO NJHPC

2.1.3 Owner's Engineer/NJHPC Consultants

The services of a consortium of five foreign and local firms have been procured as owner's engineer for design review and construction supervision.

Montgomery Watson Harza (MWH)	United States of America
NORPLAN, Int.	Norway
National Engineering Services (NESPAK)	Pakistan
National Development Consultants (NDC)	Pakistan
Associated Consulting Engineers (ACE)	Pakistan

2.1.4 Legal Counsel

Samdani & Qureshi Law Associates (Farrukh Karim Qureshi Bar-at-Law)

2.1.5 Taxation Counsel

M/s Rafaqat Babar & Co Chartered Accountants (Mr. Aamir Javaid FCA)

2.2 Tariff Determination History

A comprehensive tariff petition based on the actual **Project Construction Cost** under the **4th revised PC-1** was submitted to CPPA-G "**Purchaser"** for onward submission to NEPRA **"Regulator"** seeking determination of proposed Rates.

Owing to the reasons mentioned in the para 5.2 and para 5.3 of the original tariff determination in case No.NEPRA/IPT-03/NJHPC-2018 dated 19th November 2018, the regulator did not decide the petition on its merits and considering the financial hardships of the project and to protect the government investment and public money from waste, the regulator determined a provisional tariff under the section 16(2) of NEPRA (Tariff Standards and procedures) Rules 1998;

"the seller is allowed to charge a tariff of Rs.5.9180 per KWh on take and pay basis with must run condition for a period of one year from the date notification or till such time additional information/evidence is submitted before the authority which warrants a revision in the instant tariff whichever is earlier."

The allowed tariff mainly comprised of two components i.e project operations cost and payment of debt service liability.

The petitioner being aggrieved with the Authority's decision filed a review petition through purchaser. The motion was accepted and a partial modification in the original tariff was allowed vide Case No. NEPRA/IPT-03/NJHPC-2018 dated 19th August 2019 reproduced as under;

"the seller is allowed to charge a tariff of Rs. 9.1184 per KWh (which includes a revised debt servicing component of Rs.8.3967 per KWh) on take and pay basis with must run condition. This tariff shall have a term not exceeding 1 (one) year from the date of notification and shall have effect from 4th July, 2018. Any accumulated arrears arising from the instant tariff for energy already generated and supplied shall be payable by the CPPA-G/Buyer in six equal installments"

The proposed tariff from 4th July 2018 to 16th October 2020, works out as Rs.13.0331 per kwh as against the allowed interim tariff Rs.9.1184 per kwh. As a result there of Rs.2.8147 per kwh excluding WUC of Rs. 1.10 per kwh remained unrecovered.

The Authority in its provisional tariff determination dated 19th November 2018 gave direction to NJHPCL to submit further information before or at the expiry of the term of determination for revision.

2.3 Request for Tariff Determination

2.3.1 In accordance with the requirements of the Regulations of Generations, Transmission and Distribution of Electric Power Act 1997, National Electric Power Regulatory Authority (Tariff Standards and Procedures) rules 1998, NEPRA Interim Power Procurement (Procedures and Standards) Regulation 2005, NEPRA (Import of Electric Power) Regulations 2017 and reference Hydropower Tariff Mechanism for Project in Jurisdiction of NEPRA, **NJHPC hereby submits this petition for re-determination/ determination of tariff.** Brief facts of the case are given as below;

2.3.1.1 On 7 July 2007, the Chinese consortium CGGC-CMEC (China Gezhouba Water & Power [Group] Co. Ltd. and China National Machinery Import and Export Corporation) were awarded the contract to execute the work on project. The construction contract was settled at a cost of PKR 90.90 billion by the end of the year and in January 2008, the letter of commencement was issued. It is worth noting that this mega Project with state of the art features is of immense national importance.

2.3.1.2 Though the notice to proceed was issued to the contractor in January 2008, yet the project construction work could substantially start in the late quarters of 2010. The construction of the project at present is more than ninety nine percent (99.74%).The Project's generation was tied -up with the national grid on 9th April 2018. The project generation units remained under testing till 3rd July 2018. The generation unit No.4 was taken over by the project staff for defect liability operations on 4th July 2018. Other units were taken over by the project staff for defect liability operations on 22nd August 2018, 4th October 2018 and 28th December 2018. The punch list items (defects) identified while taking over certificate issued are being rectified by the contractor. The taking over certificate for the whole of the works shall be issued shortly under the contract provisions.

2.4 Prayer

Based on the information provided as required, the Buyer is requested to file this Petition for levelized tariff Rs.10.3026 per kWh for 30 years (1-10 Rs.13.0331/kwh, 11-20 Rs.5.8174/kwh, 21-30 Rs.3.5661/kWh) before NEPRA Registrar subject to the risk of availability of water for hydro projects to be borne by the Buyer by making payment of fixed monthly CPP Component of the tariff in the project company, thereby enabling NEPRA to proceed further with the Tariff Determination process.

It is further requested that the unrecovered amount of Rs. 30,111 million on account of tariff differential of Rs.2.8147/kWh for the period from 4th July 2018 to 16th October 2020 may be allowed to be recovered in 6 monthly equal installment. (10,697,651,900 x 2.8147)

The Authority is requested to allow immediate application of the proposed tariff in terms of Tariff Rule 4, Sub-rule 7 of the Tariff Rules keeping in view heavy debt service liability of company, subject to an order for refund for the protection of consumers, or for satisfactory security to be provided for refund, while the proceedings are pending before the Authority.

The Tariff Proposal has been based mainly on the following grounds;

- The term of the tariff determined is near to completion
- To allow Water Use Charges **("WUC")** @Rs.1.10/kWh as approved by CCI or as agreed between GoP & GoAJK.
- The project being substantially complete all project loans have been closed and since a DSL amortization schedule has been finalized; therefore the relevant tariff components be modified accordingly.
- The insurance component has to be modified because the CAR insurance has expired and Operational phase insurance has been obtained.
- Since Kishan-Ganga impact in the hydrology is now clearly known; therefore has to be accounted for in the generation estimates.
- The impact of increased compensation and environmental flow from 9 to 20 cumes as per direction of the GoAJ&K and GoP needs to be considered.
- ROE and ROEDC, which was not allowed previously may be considered in terms of Tariff Rule 17(3)(ii) & (iii) as reproduced below;

  "tariffs should generally be calculated by including depreciation charge and a rate of return on the capital investment of each licensee commensurate to that earned by other investments of comparable risk";

  "tariff should allow licensees a rate of return, which promotes continued reasonable investment in equipment and facilities for improved and efficient service";

- Indexations, Adjustments, and Escalations to be accounted for according to the formula provided in Sub-Clause 70.3 of COPA Part IIB of NJHPP Contract Document, agreed at the time of signing being in line with **Pakistan Engineering Council ("PEC") guidelines**, which is also compatible with **NEPRA 3-stage Mechanism** for determination of tariff for hydro power projects ;

  The value of Price Adjustment for Lots C1, C2, C3 is adjusted monthly as per the formula of: Price Adjustment = Vn x Pn

  Where "Vn" is the value to be certified for the month "n" in respect of payments at the base value for Works included under Sub-Clause 60.1 (a) and (b) using the rates and prices entered in the BoQ of the Contract and "Pn" is an adjustment factor, detail of which along with details of indices, coefficients and their weightings is provided in Section 5.2.3.3 of the Document.

- Adjustments in accordance with Clause 51.1 of the FIDIC based Contract on account of Cost Re-openers through Variation Orders authorized by the Engineer and approved by the competent authority;
- To bring efficiency an ERP/IT based environment is in-evitable therefore a component for the provision of this project needs to be undertaken; and
- Other matters/ pass through items relevant to the project as set out in the Petition

SECTION 3. TECHNICAL

3.1 Technical Details

3.1.1 Civil Works

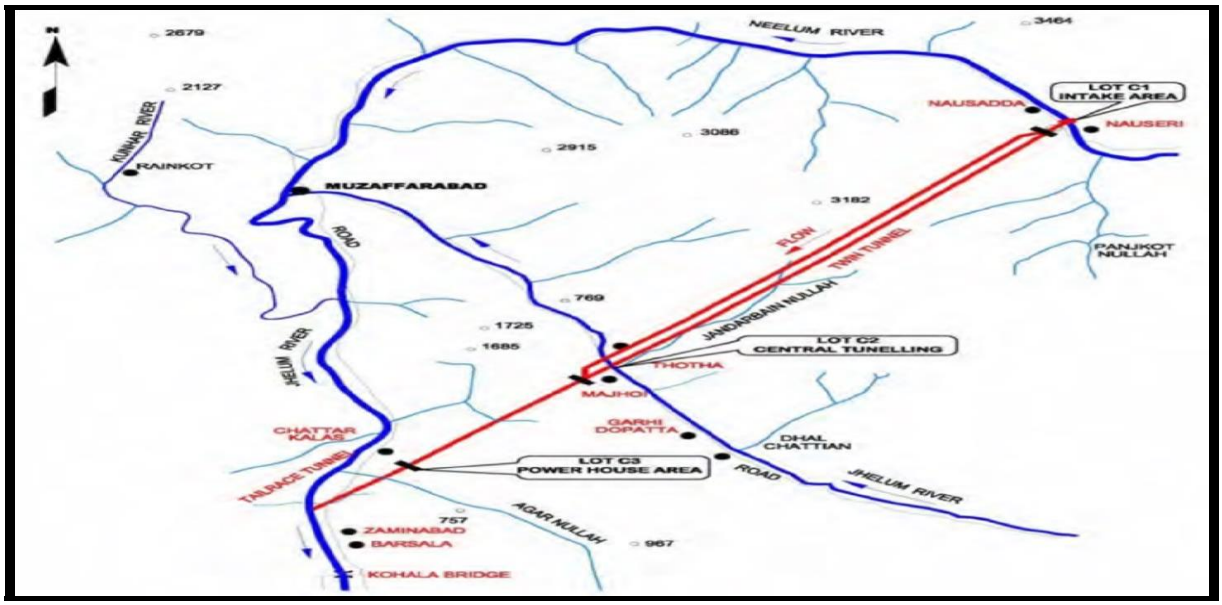
Civil works for the project includes construction of access roads and bridges, installation of camps and construction facilities, a diversion tunnel to divert the flows of Neelum River during construction period, upstream & downstream cofferdams, construction of a composite dam, spillways and underground tunnels and powerhouse cavern and transformer cavern as well as a 500 kV GIS Switchyard, construction works relating to reservoir area, diversion and intake structure etc. Civil Works also include certain allied physical works such as site roads, water supply, sewer, surface drainage, electricity, communication system operation building, store and vehicle services station residential colony office building, dispensary and first aid facilities, recreation facilities, & school. A brief description of main civil works is given below:

3.1.1.1 Dam & Intake

A concrete dam of 160 m length and 60 m height plus clay core rock-fill dam having a desander structure, 3 spillway gates, 2 debries channel gates, stilling basin located near Nauseri on the Neelum River. The dam having reservoir gross capacity of 10 million m^3 with live storage capacity of 3.8 million m^3 allows daily peaking of more than four (4) hours. The dam has three large low-level spillway gates designed to pass floods up to the 1:1000 year recurrence period and also allows the reservoir to be drawn down for sediment flushing. A diversion tunnel with a capacity of 500 m^3/sec built to divert river around the dam foundation site to allow the construction of the dam. Cofferdams were built on both the upstream and downstream of the dam during construction stage.

The intake structure with a capacity of 280 m^3/sec is located close to the dam and incorporates six (6) intake gates which are connected to the sediment basins by six (6) culverts. The basins are designed to trap sediments that could otherwise erode the turbine blades at the powerhouse. Flushing gates are installed at the downstream end of the basins which takes the sediment back to the Neelum River.

The intake works are designed to divert up to 280 m^3/s into the headrace tunnels. After being used to generate electricity, the water is discharged into the Jhelum River through a 3.5 km long tail-race tunnel. The drop-in elevation between the dam and power station provides an average hydraulic head of 420m.



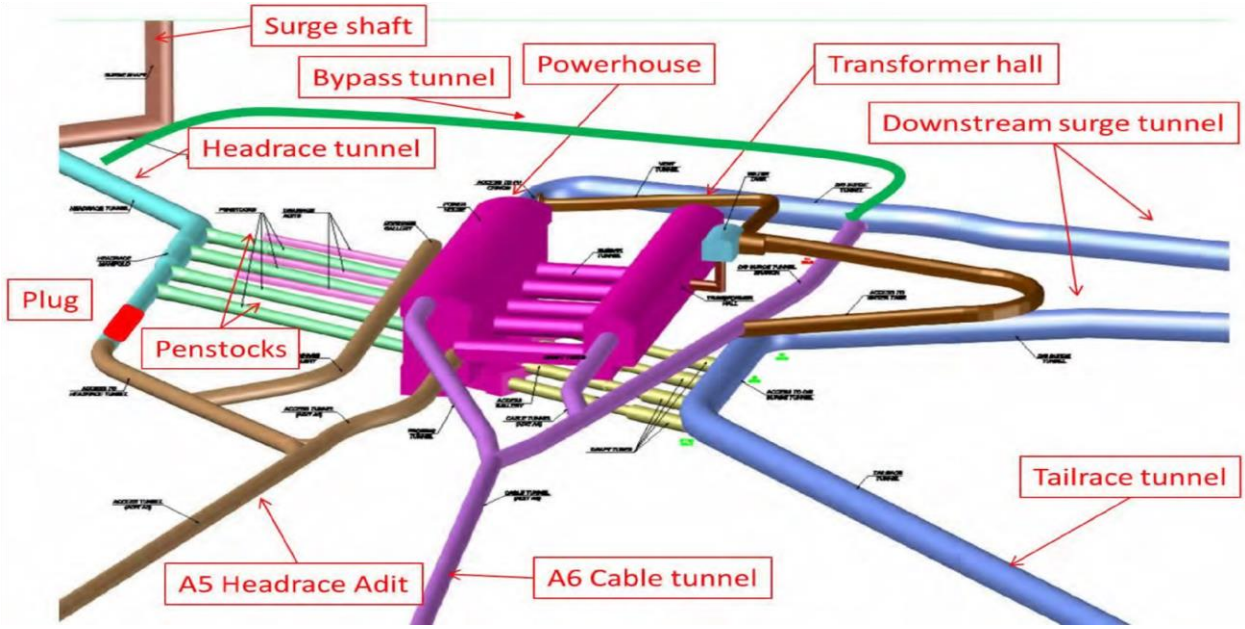
3.1.1.2 Head Race Tunnel

The dam diverts up to 280 cumecs water of the River Neelum into a 48.5 km long head-race tunnel. The headrace tunnel which is 48.5 km long conveys the water from the intake at Nauseri to the powerhouse near Chattar Kalas. The tunnel crosses under high overburden, crosses the fault line, as well as also passes approximately 200m below Jhelum River.

3.1.1.3 Power House Complex & Tailrace Tunnel

From the headrace tunnel, water through a manifold structures and four (4) penstocks (110 m long) enters into the turbines in the Power House. The underground power station has four (4) generating units, each of capacity 242.25 MW, with an overall installed capacity of 969 MW. The powerhouse cavern is about 137.0 m long, 23.5 m to 25.0 m wide and about 47.0 m high from the turbine floor. The electro-mechanical equipment consists of four vertical-shaft Francis turbines and associated generators. The main access tunnel to the power station is 763m long with a cross-section of 58m^2.The thirteen (13) single phase transformers, each of capacity 98.7 MVA, have been placed in a separate transformer hall parallel to the Power House which is 151m long, 16.4m wide and about 20m high.

Layout of Power House



The water is discharged back into the Jhelum River near Zaminabad through a 3.5 km tailrace tunnel. The transformer hall is connected with a surface switchyard through high power cables. Switchyard is onward connected to national grid.

3.1.2 Electrical and Mechanical Equipment

The equipment included under E&M package are as follows:

- Generators Transformers;
- 525 KV Switchgear;
- Control System;
- Protection;
- 400 V Power Distributions;
- Power House Auxiliary Equipment;
- Radial Gates with Hydraulic System;
- Flap Gate with Hydraulic System;
- Diversion Dam Stop Log;
- Gantry Crane and Bridge Crane;
- Intake Gates and Trash Racks;
- Under sluicing Gates;
- Sediment Basin Outlet Gates;
- Adit Bulk Heads;
- Draft Tube Bonnetted Gates;
- Tailrace Outlet Gates;
- Turbines;

- Generators;
- Governors;
- Inlet Valves;
- Cranes; Cooling and Fire Water Equipment;
- Tunnel and Power Station Drainage Equipment;
- Dewatering Equipment; and
- Workshop Equipment.

3.2 Interconnection Arrangement

The switchyard of the project is connected with national grid near Domeli through 270 km high power transmission line of 525 kvA.

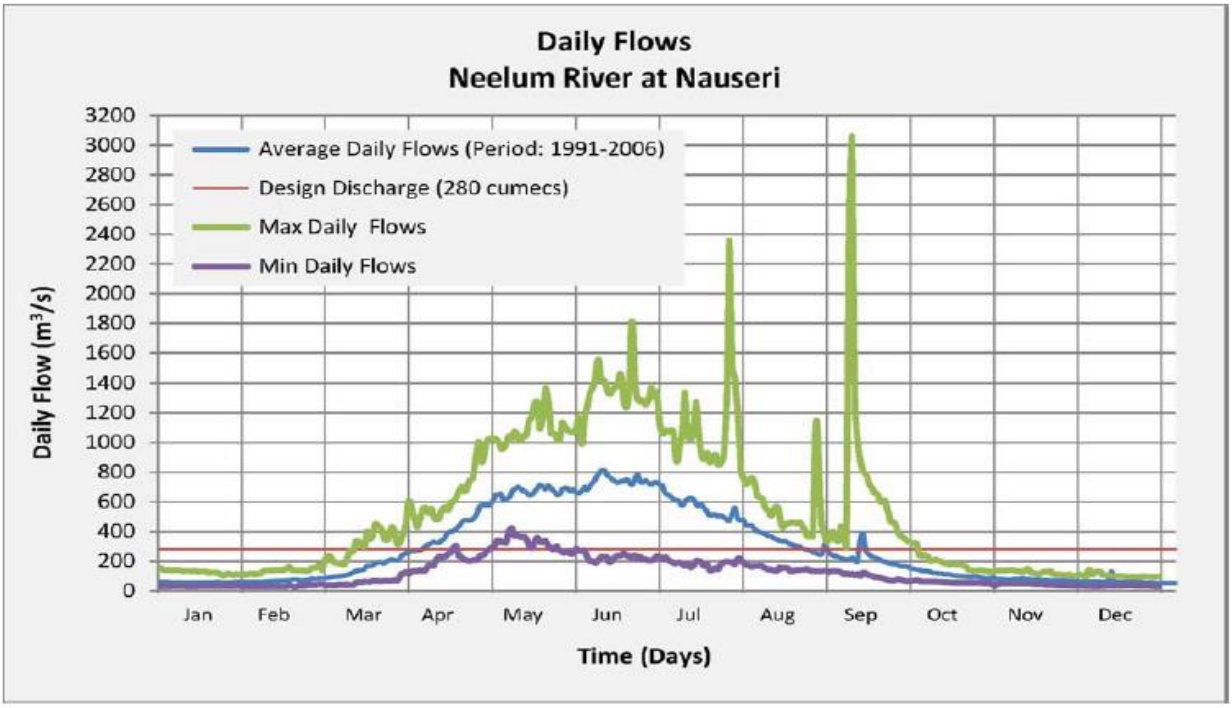
3.3 Project Category & Difficulty Level

Project is located in an area having complex geology, seismic zone with fault line. After the earthquake of 2005, it was imperative that the seismic parameters recorded be incorporated in the design. Based on these considerations the project was redesigned.

In addition, the flood of 2010 created further challenges causing delays. Early completion of the project was also a serious challenge in view of Kishenganga project and for claiming water rights issues

3.4 Hydrology & Power Generation Data

A stream flow record of the Neelum River was available for designing of the project for the period 1963 to 2010 inclusive. There are about forty (47) years of observation data (including the 1992 flood event) available. The average annual flows of Neelum River at Nauseri and Muzaffarabad are about 269.5 and 335.16 m3/s respectively. The average monthly flows at Nauseri (post Kishenganga project) are shown in graph below along with low and high flow records;



3.5.1 Monthly Average Water flow & Energy Generation Data

Month	Available Flow for Power Channel after Kishan- Ganga Diversion and E-Flow		Power (MW)	Energy (GWh)
January	36.4		113	84.4
February	45.0		143	94.2
March	102.5		337	254.5
April	488.1		944	697.5
May	680.3		969	702.1
June	774.3		944	679.5
July	589.4		944	702.1
August	347.5		920	683.1
September	150.1		498	358.4
October	80.5		263	194.8
November	55.6		178	128.6
December	43.3		137	101.8
Total Annual Average Energy				4663
Plant Factor				54.93%

3.5.2 Project Operation

The underground power station has four generating units, each 242.25MW, with a total maximum capacity of 969MW. The plant factor for Neelum Jhelum Project is about fifty-five (55%) with tentative unit operation time (per annum) as follows:

- 1st Unit 365 Days (assuming partial Project shut down for maintenance works)
- 2nd Unit 215 Days
- 3rd Unit 185 Days
- 4th Unit 150 Days

SECTION 4. CONSTRUCTION CONTRACTOR – PROCESS & SELECTION

4.1 Construction Contractor's Selection Procedure

In order to award construction contract the tendering process was first time initiated in February 2005 on International Competitive Bidding (ICB) basis with the condition of financing foreign exchange component under Supplier's credit. The local component of the funds was to be provided through PSDP. All the three bids, received in May 2005, were found non-responsive and nullified.

Tenders were re-invited in June 2005. Two Tenders were received and both were found non-responsive. Considering the implications attached with the Supplier's credit, the Government of Pakistan allowed WAPDA to invite tenders under Buyer's credit financing. Tenders were invited for the 3rd time through International Competitive Bidding ("**ICB**") under single stage, two envelope method of bidding. Following four JV firms submitted bids by the closing date (15.07.2006)

(i) Frontier Works Organization (FWO)
(ii) Synohydro Corporation, China (SHC-HPE JV)
(iii) China International Water & Electric Corp. China (CWE JV)
(iv) China Gezhouba Group, China (CGGC-CME Consortium)

4.1.1 Evaluation

Technical Proposals were opened on July 15, 2006. The Bid of FWO did not meet the minimum qualifying criteria and was considered non-responsive. The JV at serial (ii) did not submit Bid Security and hence was considered non-responsive. The Tenders submitted by the remaining two (2) Chinese firms at serial (iii) & (iv) were found substantially responsive and their Financial Proposals were opened. The quoted price of each of these Bidders after applying offered discounts was as below:

- CWE JV Rs. 108.37 Billion
- CGGC-CME Consortium Rs. 87.42 Billion

After receipt of missing information, clarification on quoted prices and other details, the contract was awarded to the lowest evaluated bidder i.e. the Consortium of CGGC-CMEC (the **"Contractor**") at the contract price of Rs. 90,900,240,404.00 (Rs. 90.90 Billion) or US$ 1506.22 Million (at 1US$=60.35 PKR) which translates into per MW cost of US$ 1.55 Million/MW. The construction contract was based on the design carried out by NORCONSULT & NORPLAN IN 1996/97. The notice to proceed ("**NTP**") was issued to the Contractor in January 2008. The original contract documents sub-divided the scope of works into the following lots:

- **Lot C1:** Dam, Intake, De-sander, and upstream portion of Headrace Tunnel (HRT);
- **Lot C2:** Middle Portion of Headrace Tunnel (HRT);
- **Lot C3:** Downstream Portion of Headrace Tunnel (HRT), Surge Shaft and Surge Tunnel, Powerhouse Civil Works, Tailrace Tunnel and Outlet Works;
- **Lot M1:** Mechanical Works;
- **Lot E1:** Electrical Works; and
- **Lot H1:** Gates and Hydraulic Steel Works.

4.2 Contractual Arrangement

The Construction Contract for Neelum Jhelum Project is based upon the International Federation of Consulting Engineers (FIDIC) 4th Edition 1987, re-printed in 1992; General Conditions of Contract for Works of Civil Engineering Construction. "The Contract executed for the Project was not an Engineering, Procurement & Construction (EPC) contract where the EPC Contractor guarantees the price, performance and schedule of the project. Rather the contract portion for Civil Works this Project was re-measurement contract which is customary for large scale projects. The contract portion for Electro-Mechanical & Hydraulics (EMH) works was item based cost.

The NJHPP contract based on Red Book Format, contains following four types (4) types of project cost re-openers and price escalation factors:

i) Design Changes/Variation Orders
ii) Price Adjustment for Civil Works
iii) Price Adjustment for Hydraulic, Mechanical & Electrical (EMH) Works
iv) Currency (US$ Vs. Pak Rupees) Exchange Variation

The Clause 51.1 of the FIDIC base Contract authorizes the Engineer to modify design and get it implemented from the contractor through variation orders. According to the aforesaid Clause of NJHPP **Construction Contract**;

"The Engineer shall make any variation of the form, quality or quantity of the Works or any part thereof that may in his opinion, be necessary, and for that purpose, or if any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor Shall do any of the following:

a) increase or decrease the quantity of any work included in the Contract
b) omit any such work
c) change the character or quality or kind of any such work
d) execute additional work of any kind necessary for completion of the Works
e) change any specified sequence or timing of construction of any part of the Works."

4.3 The Contractor – CGGC-CMEC Consortium

- **China Gezhouba Group Corporation (CGGC)**

  China Gezhouba Group Corporation (CGGC), founded in 1970, is a core member of China Energy Engineering Group Co., Ltd., a super central state-owned enterprise. CGGC's businesses cover the design, construction, investment and operation in water conservancy, hydropower, thermal power, nuclear power, wind power, power transmission & transformation, highways, railways, bridges, municipal works, airports, ports, waterways, industrial and civil buildings, as well as real estate, production of cement and civil explosives, energy engineering, etc. In China, CGGC is one of the most competitive listed companies with very strong financing capabilities. As a transnational operation enterprise with the fastest growth in China, CGGC's has expanded its business in

more than 100 countries and regions, ranking among the foremost 100 in the ENR Top 250 International Contractors.

- **China Machinery and Engineering Company (CMEC)**

  Founded in 1978, CMEC is the first large engineering & trade company in China, and a member of China National Machinery Industry Corporation. It is a conglomerate taking engineering contracting as it core business and integrating trade, R&D, and international service. CMEC has extended its business in the fields of international engineering contracting and international trade in general. CMEC holds experience in constructing mega hydropower projects worldwide.

SECTION 5. PROJECT COST

5.1 The actual project cost remained PKR 428,296 million as against the project cost of PKR 506,808 million as per 4th revised PC1 remained PKR 428,296 million, the detail of which given below:

Project cost	PC-1	Claimed
	PKR in million	
Main Contract Price & Variation Orders	197,283	156,083
Contractor Claim	4,500	1,693
Duties & Taxes	7,500	6,129
Cost of Insurance & P.Gs	3,577	2,676
Cost of Escalations/Indexations	73,252	68,158
Exchange Loss	100,768	81,428
Land Acquisition & Lease	2,000	1,500
Engineering & Supervision	20,321	20,321
Project Management Cost	5,955	5,330
CSR & Mitigation Measures	5,237	5,237
Physical Contingencies	4,957	4,957
Total Base Cost	**425,350**	**353,512**
Interest During Construction	81,458	74,784
Total Project Cost	**506,808**	**428,296**

5.2 Construction Cost

As mentioned in Section 4.1.1, the Construction Contract of the Project was awarded at a cost of Rs. 90.90 Billion, but due to the technical & site-specific reasons, this cost increased to Rs. 197.283 Billion. The increase of Rs.106.383 Billion in the Contract Cost was incorporated through issuance of Variation Orders as per 4th revised PC1. However, the actual base cost for the project till COD is Rs.156.083 billion. The description of the causes of base construction cost escalation and associated cost implications are as follows:

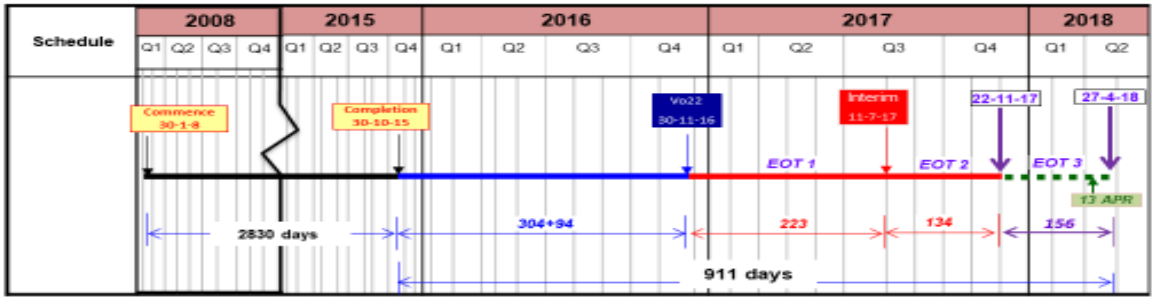
As mentioned above, this Project was originally contracted at a price of Rs. 90.900 Billion in 2007 and its original completion date was anticipated to occur in October 2015. Though, even at that time, some price escalation was expected because of the standard cost escalation clauses in the Contract but the main reason for escalation of cost was because of the major changes in design made after the award of the contract due to which scope of work was significantly enhanced. The tender design was based on the design made by NORCONSULT & NORPLAN in 1996/97 without the Detailed Project Design Report.

Furthermore, due to the compelling factor of water rights issue, anticipated due to the upstream dam construction in occupied Kashmir by India, the Contractor was mobilized at the site seven (7) months before the mobilization of the Engineer whereas the Sponsor (WAPDA) had not secured full financing for the Project at that stage. These factors not only resulted in project delays but also led to the significant cost changes later on during the construction of the Project.

5.2.1 Reasons for Delay

The development of necessary infrastructure at site, community beneficial schemes and land acquisition and resettlement of affected communities had been a challenging process during project development and proved to be as cost escalating and project delaying factors as indicated in the following Bar Chart:

DELAY BAR CHART



Inauguration/ Generation *13-04-2018*
Whole of the works *27-04-2018*

▪ EOT VO 22 *land*	398 days	(30 Nov 16)
▪ EOT 1 *rock burst*	223 days	(11 July 17)
▪ EOT 2 *TBM assy, test*	134 days	(22 Nov 17)
▪ EOT 3 (C14) *rock sp*	156 days	(27 Apr 18)
Total	911 days	

5.2.1.1 Extension of Time Phase-1

a) Power Supply

Lack of uninterrupted and quality electric power supply from the local electricity distribution network at the entire site of the Project proved to be a significant hindrance in physical progress of the Project resulting in increase in the cost of the project. At the project site, providing the power was not only the direct responsibility of WAPDA but it was to be provided through Hydro Electric Board, Azad Jammu and Kashmir, Muzaffarabad. Despite the fact that WAPDA vigorously pursued, the power supply issue but could not resolve. In certain cases, power supply was there but voltage was not proper and Contractor's work suffered. As per the contractual obligations providing proper power at different project sites was the responsibility of the Employer. In Tunneling works, reliable power was extremely important because the ventilation system, light system, dewatering system etc. depended upon the power supply. Without this it was risky and difficult to continue the work. To mitigate this ironic issue, finally it was decided to purchase three (3) fuel oil-based generators each of four (4) megawatt capacity to provide stable electricity supply during the construction of the works at all three sites.

b) Land acquisition issues

Land acquisition at the project was to be done by AJ & K Government and for this purpose funds were transferred to the Govt. as and when required. NJHPC/WAPDA was not involved directly in the land acquisition process.

For acquiring land it was required to have a participatory approach so that process of payment of compensation be acceptable to the local community. Due to unreasonable demands from the land owners/affectees and the process being complicated, AJ & K Govt. could not complete the process in time which delayed the construction works.

The Engineer evaluated 304 days of Extension of Time (EOT) due to electricity issue and non-availability of land, which was accordingly incorporated in the Revised Approved PC 1. The cut-off date for this EOT was 30 June 2009. The approval in this regard was given in BOD-08 meeting held on 29 October 2010.

Extention Of Time Under VO-022

The procurement of TBMs for mining operation was approved by the Employer in accordance with the terms of MOU signed between the Contractor and the Employer. Extension of Time for a delay of 94 days on this account was granted under the contractual provisions beyond 30-6-2009 with a revised cutoff date of 21-4-2011.

5.2.1.2 Extension Of Time Phase-II

The EOT Phase-II is comprised of the following Claims;

a)	Claim-12 (TBM Assembly delays)	=	134 days
b)	Claim -13 (31st May 2015 Rock Bursts Event)	=	223 days
c)	Claim -14 (Addl. Rock Supports and Precautionary measure)	=	156 days
	Total	**=**	**513 days**

a). CLAIM – 12: TBM Assembly Delays

The Claim was based on delays occurred in TBM Assembly due to technical reasons and insufficiency in Power Supply required for TBM assembly. This delay affected the schedule of TBM mining operation. The Engineer recommended 134 days of Extension of Time (EOT). The cut of date for the EOT was 01-6-2013,which was approved in BOD-41 meeting held on 03 October 2018. This EOT has also been considered in 4th Revised PC-1.

b). CLAIM-13: 31st May 2015 Rock Burst

As a result of a rock burst occurred on 31-5-2015 in the right TBM tunnel, TBM 696 was stuck in the tunnel and it was heavily damaged. Its repair and restart wasted a lot of time delaying TBM mining operation. On this account the Engineer recommended 223 days of EOT with a new cutoff date of 09 January 2016, which was approved in BOD-37 meeting held on dated 09.10.2017. This EOT has also been acknowledged in 4th revised PC-1.

c). CLAIM-14: Precautionary and Treatment Works for Rock Bursts

After the TBM rock bursts, for safety of TBM and the workers, the Engineer redesigned the rock support and recommended other measures for the mining operation of TBMs tunnels. These additional measures affected the progress of TBM mining operation. The Engineer recommended 156 days of EOT for the delay caused with a new Cut-off date of 05 May 2017. This EOT has also been acknowledged in the 4th Revised PC-1.

5.2.1.3 IMPACT OF 911 DAYS EOT ON PROJECT TIMELINE

Considering 304 days, 94 days and 513 days EOT (Total 911 days) for which provisions already exist in 4th Revised PC-1 and adding with original project completion schedule, the date of completion of the whole of the works shifted to 27-4-2018.

The first unit commissioned in 13-4-2018 and its TOC issued on 04-7-2018. TOC of the fourth unit issued on 28-12-2018 while TOC of the whole of the works has not been issued so far, however, its date has been agreed with the Contractor which is 28-5-2019.

(i) As per 4th revised PC-1, the completion of whole of the Project was scheduled by end of FY 2018-19 and in this context the contractual completion dates are within the approved 4th Revised PC-1 Schedule.

(ii) The floods during 2010, 2012 & 2014 also caused significant delays in project completion, particularly because of the flood in July 2010 being one of the largest in the country's history.

(iii) The ToC of whole of the work has not been issued due to contractual reasons but date has been agreed with contractor. In Jul & Oct 2019, when the project was under Defect Liability Period (DLP), there was sporadic shelling from Indian side in which some shells fell in NJHPP reservoir. Chinese contractor, who was at site for completing the remaining works as well as rectifying the punch list item, suspended the work at site C-1. Later they resumed work in March 2020 resulting in delay in the completion of remaining works and the work of punch list items.

(iv) Similarly when the contractor resumed work in March 2020, COVID 19 issue emerged and because of lockdown announced by the GoAJ&K / GoP the work further suffered.

5.2.2 Variation Orders

A variation order is any change or modifications to the tender design, quality or scope of work. Variation orders can be either caused by the Employer, the Consultant or the Contractor, but the Employer caused changes are the most noteworthy causes of the variation orders.

Due to the numerous complexities involved and unknown & unforeseen conditions at each hydropower project site, it becomes inevitable to cause design changes and issue variation orders. The contract clause 51.1 gives the right to issue variation orders to the Engineer and obligates the contractor to execute those variations in the following language format:

"The Engineer shall make any variation of the form, quality or quantity of the Works or any part thereof that may, in his opinion, be necessary and for that purpose, or if any other reason it shall, in his opinion, be appropriate, he shall have the authority to instruct the Contractor to do and the Contractor shall do any of the following:

- increase or decrease the quantity of any work included in the Contract;
- omit any such work;
- change the character or quality or kind of any such work;
- **execute additional work of any kind necessary for the completion of the Works;** and
- change any specified sequence or timing of construction of any part of the Works.

The Engineer has the authority to determine the price of the additional works on the basis of the prices in the executed Contract. If the Contract does not contain any rates or prices applicable to the varied work, the rates and prices in the Contract shall be used as the basis for valuation so far as may be reasonable, failing which, after due consultation by the Engineer with the Employer and the Contractor, suitable prices or rates shall be agreed upon between the Engineer and the Contractor. In the event of disagreement, the Engineer shall fix the rates or prices as are, in his opinion, appropriate and shall notify the Contractor accordingly. In case, the Contractor disputes the prices determined by the Engineer, it even then has to execute those additional works and the price of such works shall be determined through the process of Arbitration. (Clause 67.3):

"From the above, it is clearly evident that Variation Orders are largely in the control of Employer's appointed Engineer both in terms of scope and cost and in view of that, it is customary practice to get the additional works on the project done through the same contractor by issuance of variation orders".

Accordingly, in the context of major design changes implemented in the Neelum Jhelum Project to deal with the numerous reasons encountered, 119 Variation Orders with the base cost of Rs.106.383 Billion with the justification of major VOs' are as under;

5.2.2.1 Site & Technology Oriented Technical Reasons

This mega Project suffered extensive design changes "after the award of the Construction Contract" leading to Contract changes (Variation Orders) which added on huge costs to the Project. After the award of the Construction Contract, the Neelum Jhelum Consultants/ the Engineer undertook the review of the tender design as part of their scope of services. The review of the tender design identified many areas of concern requiring major design changes. These major design changes resulted from a cluster of technical considerations as explained below. The

associated costs additionally required to implement the design change, which was considered technically feasible and economically viable in view of available options, and to eradicate the confronted technical impediments at the Project site follows the description of the design change as well:

(i) Design changes due to revision in Seismic Parameters
(ii) Change in design and Location of Dam
(iii) Modification in Dam & Spillways Hydraulics
   a. Overtopping
   b. Addition of Stilling Basin
(iv) Modification in River Diversion Scheme
(v) Increase in Tunnel Diameter and Application of Concrete Tunnel Linings
(vi) Spread in Powerhouse Dimensions
(vii) Complex Geology
(viii) Steel Lining of Head Race Tunnel (HRT) at Jhelum River Crossing

5.2.2.1.1 Design Changes due to Revision in Seismic Parameters

The design on which tenders were awarded, was prepared as per seismic parameters established before earthquake of 8 October 2005. The earthquake dictated to initiate review of the detailed engineering design carried out at feasibility stage, which had its own financial implications. The seismic hazard study of the Project prior to the tender design showed that there are considerable uncertainties regarding the hazard. The spatial distribution of earthquakes does not suggest that any part of the scheme should have a significantly different hazard rating than any other. There is, therefore, no particular reason to differentiate the hazard to different sections of the scheme. The seismic parameters adopted for the tender design on the basis of this study were as follows:

(a) Operating Base Earthquake (OBE)

An earthquake ground motion with a return period of two hundred (200) years is customarily adopted as the design basis for dams and hydropower plants. This is broadly in accordance with ICOLD recommendations. ICOLD Bulletin 72 suggests that the ground motion with a fifty percent (50%) probability of exceedance in hundred (100) years might be appropriate. The two hundred (200) year event has a forty percent (40%) probability of being exceeded in hundred (100) years. However, considering the tectonic setting of the scheme with areas of, currently, much higher seismic activity on comparable geological structures, it would seem imprudent to adopt such low values. Structures and plant items and component which are vital to power production were therefore proposed to be designed to higher criteria as follows:

- Surface installations: 0.25 g peak ground acceleration (rock site)
- Underground works: 0.20 g peak ground acceleration

This gives a return period of 1000 to 2000 years for the design earthquake.

(b) Maximum Credible Earthquake (MCE)

The MCE earthquake ground motions as determined in the report on seismic hazard for the Project were adopted for the tender design of the Project. These are as follows:

- Surface installations: 0.45 to 0.60 g peak ground acceleration (rock site)
- Underground works: 0.30 to 0.40 g peak ground acceleration

Conservatively, the upper values were adopted for the MCE.

(c) Up-dated Design Parameters

After the October 2005 earthquake, the seismic design parameters adopted for the tender design of the Project were thoroughly reviewed, and seismic design of the Project structures was appropriately revised to account for the following updated seismic parameters which also indicated that the seismic hazard for various parts of the Project is of different level.

For Dam Site

Operating Basis Earthquake (OBE): 0.34 g peak ground acceleration
Maximum Credible Earthquake (MCE): 1.16 g peak ground acceleration

For Powerhouse Site

Operating Basis Earthquake (OBE): 0.25 g peak ground acceleration
Maximum Credible Earthquake (MCE): 0.62 g peak ground acceleration

For Underground Works

Operating Basis Earthquake (OBE): 0.17 g peak ground acceleration

"Higher seismic factor dictated by the Earthquake of October 08, 2005 is now 1.16g for Maximum Credible Earthquake (MCE) against 0.60g adopted in the tender design".

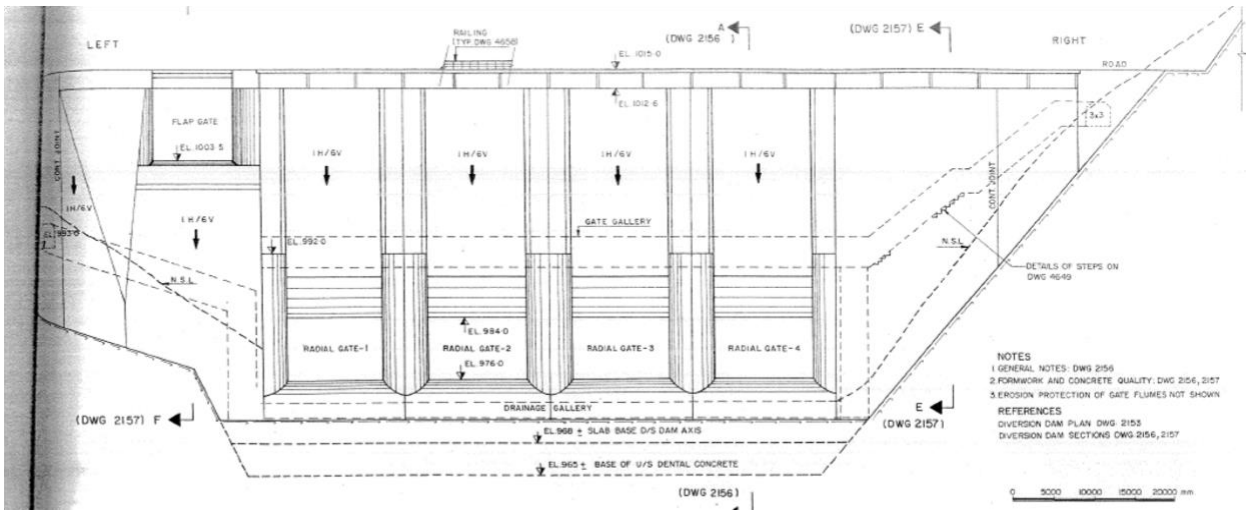
5.2.2.1.2 Change in Design & Location of Dam

The earthquake of October 2005, one of largest in the country's recorded history, in Muzaffarabad and adjoining areas inflicted a loss of around 70, 000 human beings. It caused widespread damage to buildings, bridges, roads and created a humanitarian crises throughout the Project region. Under such emergency conditions, the Employer could not proceed with the preparatory works such as additional geological studies, topographic studies and land acquisition. "Earthquake engineering evolves according to experience.

So, after every major earthquake, earthquake design codes and design criteria tend to change. This earthquake was no exception and the Engineer was directed to develop new seismic hazard criteria for design of the Project structures in view of safety and long term viability of the Project". The Sponsor (WAPDA) also mobilized an independent Panel of Experts ("**POE**"). The POE included the Chairman of the Seismic Safety Committee of the International Commission on Large Dams ("**ICOLD**"). This earthquake of October 2005 led to a substantial modification of the seismic design criteria which resulted in:

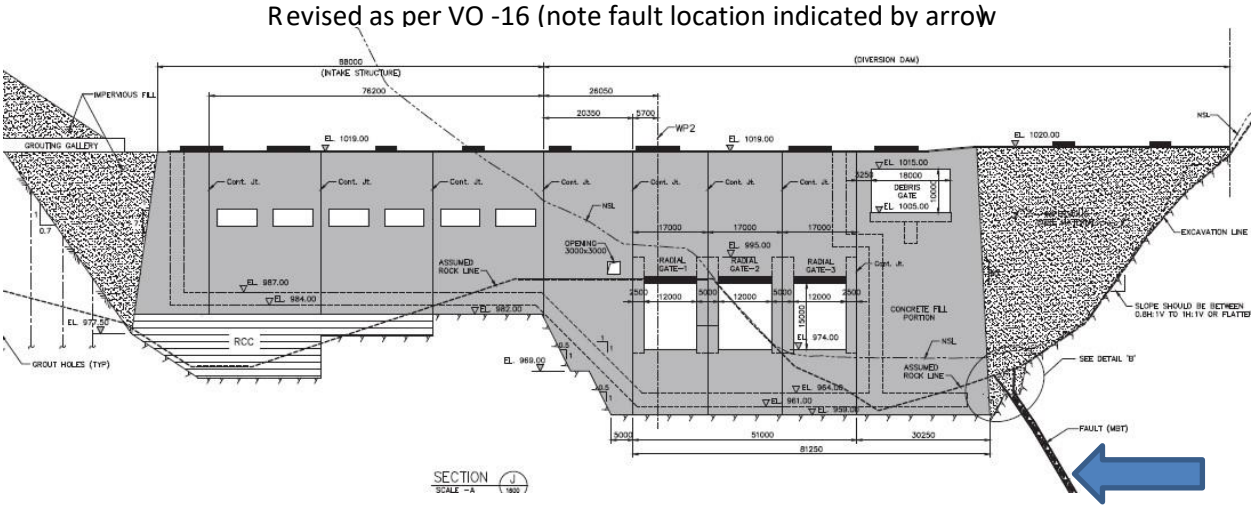
- a change of the dam type from an all-concrete gravity dam to a composite concrete gravity plus clay core-rockfill dam;
- a shift of the dam location away from the Main Boundary Thrust (MBT) fault;
- a general rearrangement of the dam gates to suit the modified structural arrangement;
- more robust, more earthquake resistant dam, intake and de-sander structures;

"At the dam site, the Neelum River follows a fault known as "Main Boundary Thrust (MBT)" fault. The original dam design (1996) showed a concrete structure sitting on the fault. At that time it was considered inactive. After 2005 earthquake, in 2010, the Panel of Experts (POE) accepted a study, considering the MBT as a potentially active fault. Current design practices do not recommend seating concrete structures on active faults. This decision to consider MBT as an active fault prompted rearrangement of dam, change of dam type and substantial increases in earthquake design loads, affecting the dam, intake, de-sander structures and gates".



Upstream Elevation of Dam, as Tendered

Revised as per VO -16 (note fault location indicated by arrow



Revised Upstream Elevation of Dam

The dam was changed from an all-concrete structure with four radial spillway gates and one flap gate to a composite concrete gravity plus clay core-rockfill dam. “The concrete structure was also shifted away from the Main Boundary Thrust (MBT) fault”. The dam height and so the head pond elevation was raised too. This increased the reservoir storage capacity as well the pressures on the dam, gates for the Spillways, the Intake and the under sluices. Maximum and minimum operating levels were raised by three (3) meters which eliminated undesirable fluctuating water levels in the upper reaches of the headrace tunnel.

“This design change was authorized and implemented by issuance of a Variation Order (VO-16) costing Rs. 17,467 Million”.

5.2.2.1.3 Modification in Dam & Spillways Hydraulics

a) Overtopping of dam avoided

Two improvements to the dam and spillways hydraulic performance were made:

- increased spillways capacity; and
- addition of stilling basin.

The original tender design allowed water to flow over the dam during extreme floods. This philosophy was considered undesirable from a public safety point of view. Upon the recommendations of the Panel of Experts (POE), the spillways capacity increased to handle the Project’s Probable Maximum Flood (PMF) of 12,500 m^3/sec. This required a larger spillway cross section and larger & heavier gates. The shift of the dam away from the MBT had already reduced the available width for the dam. The original dam structure had four (4) spillway gates whereas the revised design has three (3) larger & heavier spillway gates. “The shift in

design philosophy from "overtopping allowed" to "overtopping not allowed" increased the hydraulic capacity of the spillways".

The Changes to Lot H1 (Gates and Hydraulic Steel Works) were developed by the Engineer between April 2009 and December 2011. The Contractor had to stop his design for more than two and half (2.5) years and wait for new designs from the Engineer**.** As a result of the disruptive nature of these changes and the prolonged work stoppage, the Contractor requested the Employer/Sponsor to uncap escalation of the entire lot H1 (Gates and Hydraulic Steel Works). Instead, the limitations on escalation in Clause 70 (5% per annum cap) were partially relaxed. Escalation on the value of the original tendered scope of the works was uncapped during the delay period from April 2009 to December 2011. Escalation on the extra works (the price of the revised scope minus the price of the original scope) was uncapped from the time of the tender. As a consequence of the specific conditions of Lot H1 (Gates and Hydraulic Steel Works) Clause 70, the price adjustments are higher for Lot H1 than Lot E1 and Lot M1 which have not suffered major design changes.

"This design change was authorized and implemented by issuance of a Variation Order (VO-24) costing Rs. 6,729 Million". Variation Order-24 was priced by taking the weights of the various gates provided at the time of the tender and the prices in the tender to back calculate prices per ton and then applying these unit prices to weights calculated from shop drawings of new design or estimated using industry standard formulas.

b) Addition of Stilling Basin

In the original tender design, water was supposed to flow through the spillway and directly into the riverbed. Water flows down the spillway at a high speed, releasing tremendous energy. Without a stilling basin, this energy can erode the river bed at the toe of the dam and eventually compromise the stability of the dam. "The Sponsor, upon the recommendations of its Engineer/Neelum Jhelum Consultants decided to add a stilling basin downstream of the spillway to dissipate this energy and protect the river bed and the dam against riverbed scour. This required a longer diversion tunnel and more work to be done in the riverbed".

Several rounds of tests have been performed at the Hydraulic Research Station at Nandipur, (Sialkot, Punjab) which have validated the hydraulic design of the works. The Nandipur Hydraulic Research Station is a vast facility where multiple dams are modelled and tested.

"The cost of this design change was included in the Variation Order (VO-16)".

5.2.2.1.4 Modification in River Diversion Scheme

The river diversion scheme was modified to allow more time and more space for work in the river bed. The diversion tunnel is sized to divert river flows from October to April. A single diversion tunnel large enough to handle year round flows is simply not technically feasible. "The original diversion scheme consisted of upstream and downstream embankment coffer dams that would have washed away every April and required to be rebuilt every October". The Contractor would also have to re-excavate and clean the foundation pit at the start of every dry season, resulting in a significant loss of time. This scheme was revised to provide a non-erodible upstream coffer dam and a longitudinal wall that would allow diverted water to flow through one half of the river, while leaving the other half available for excavation and concrete work, even during high flow seasons. The length of the river diversion tunnel also increased from 167 m to approximately 500 m due to addition of the stilling basin.

"These design changes were authorized and implemented by issuance of a Variation Order (VO-02) costing Rs. 488.392 Million and VO-30, amounting to Rs. 247.958 million".

5.2.2.1.5 Increase in Tunnel Diameter and Application of Tunnel Concrete Linings

The original tender design specified "drill and blast" tunnels. The Engineer's review of the Tender Design revealed that the tunnels lacked the hydraulic capacity required for the Project's stipulated output. The original designer had considered lower roughness coefficients (known as Manning's Coefficients) that can be achieved in a drill and blast tunnel. The hydraulic roughness of the headrace tunnel and, to a lesser extent, the tail race tunnel, is a key factor in overall project performance. The roughness governs the friction losses to the flow in the tunnel and these in turn govern the pressure head and flow available to drive the turbines, which determines power output.

The original tender design estimated the gross head at the turbines as 420 meters. It was based upon the following assumed Manning's "n" values (friction coefficients)

- 0.0185 for the shotcreted drilled and blasted rock
- 0.0133 for the concrete invert

The resulting head loss is about 40 meters. Selection of "n" value for design of the headrace and tailrace tunnels due to the lack of documented experience in the Muree Formation and the Contractor's untested skills in tunnel excavation and shotcreting. The literature reported the following generally recommended "n" values for drill & blast (D&B) tunnels:

- D&B: well-trimmed + shotcrete lined "n" value = 0.021 – 0.025
- D&B: smooth blasting "n" value = 0.024 – 0.028
- D&B: normal blasting, well-trimmed "n" value = 0.026 – 0.031

From the above literature recommended values, the design value of "n" = 0.0185 appeared to be too low by a substantial margin. It applies better to tunnels excavated by a Tunnel Boring Machine (TBM) than by Drill & Blast. The Engineer recommended the following Manning's "n" values for the tunnels in the Project:

- n = 0.028 for shotcrete lined Drill and Blast tunnels
- n = 0.0185 for shotcrete lined, Machine Bored tunnels

The Panel of Experts (POE) accepted and recommended the following friction factors based upon the measurement from another project:

- n = 0.030 for shotcrete lined Drill and Blast tunnels
- n = 0.0185 for shotcrete lined, Machine Bored tunnels

"The Engineer thus estimated 1.51 times more friction than the original tender designers".

This issue of higher roughness coefficients could have been properly dealt with either by increasing the tunnel cross sections or reducing the roughness. The Engineer first proposed increase in the tunnel cross sections. This, however, would have required more mucking, larger spoil deposits and more complex excavation sequencing and tunnel support systems. Further assessments and discussions resulted in a conclusion that it would be preferable to limit the required increase in tunnel cross sections as much as possible by using a smooth tunnel lining (hydraulic lining) to reduce friction losses and thereby enhance hydraulic capacity. This approach also reduced the land required for spoils disposal. The Engineer analyzed eleven (11) different combinations of tunnel dimensions and finish types that would result in the same head loss estimated by the original tender designers. These included combinations that involved a machine bored section and others that did not. The combination expected to provide the schedule and least cost was selected.

(a) <u>Application of Concrete Tunnel Linings</u>

The Concrete Tunnel Linings will be applied to all sections of Headrace Tunnel, except for the TBM tunnels. Neelum Jhelum twin tunnel and single tunnel diameters are 23.2 ft and 32.6 ft respectively. Concrete tunnel linings were selected to improve hydraulic performance and keep the tunnel cross sections to more manageable dimensions. Very large tunnels require more elaborate and expensive support systems and excavation procedures and as a result, these can be more costly to construct. A lined tunnel is more durable, requires less maintenance down time and will remain in service for longer periods. Investments that shorten maintenance outages or extend the service life of the facility yield an attractive rate of return.

"The Variation Orders, VO-17 (Rs. 12,320 Million) and VO-26 (Rs. 13,879 Million) were issued and implemented to eradicate the problem of overestimated hydraulic capacity in the original tender design".

5.2.2.1.6 Spread in Powerhouse Dimensions

Responsibility for detailed powerhouse equipment arrangement and design rests with the Contractor. Design of an underground powerhouse must consider a number of conflicting technical considerations. On the one hand, it must be large enough to house the equipment and allow maintenance. On the other hand, it must be as small as possible to minimize disturbance to the surrounding rock mass. Considerable discussions between the Engineer and the Contractor resulted in a larger powerhouse vault, ventilation tunnels and busbar tunnels than the original tender design.

5.2.2.1.7 Complex Geology

Geology constitutes a major source of technical uncertainty on any hydroelectric project, because it is not possible to investigate every portion of a hydroelectric project site in much detail. This is particularly true when the project includes long tunnels or deep caverns as in this Project. Industry best practice is to keep a contingent of geologists available on site to update the geological interpretations and identify risk areas as these appear in the excavations. Instruments monitor movements in the rock mass. Design of rock supports are adjusted according to the instrumentation results.

The Project is located in a geological formation known as the "Murree Formation", made up of sedimentary rocks (sandstones, siltstones, and mudstones). Sedimentary rocks are deposited in horizontal layers, but in the Murree formation, tectonic forces have pushed the rock layers into an accordion-like sub-vertical pattern. Where the rock bedding planes lie parallel to existing slopes, frequent landslides occur. Some mudstones turn to wet soft mud when exposed to air and water. The Murree Formation is a challenging environment to construct a heavy civil engineering project.

As tunneling approached the planned powerhouse location, long rock cores were drilled about three hundred (300) meters ahead of the tunnel face to investigate the rock in the powerhouse excavation. This led to a shift and a rotation of the powerhouse. The Powerhouse location was pushed approximately three hundred (300) meters further inside the mountain and rotated about 15 degrees to fit the powerhouse in the best available mass of rock. This lengthened the 525 kV cables connecting the Transformer Gallery to the Switchyard by about three hundred (300) meters each.

"This design change was authorized and implemented by issuance of a Variation Order (VO-43) costing Rs. 753.764 Million".

Another geological impact of the Project relates powerhouse convergences. Any large underground excavations alters the state of stresses in the surrounding rock. Good geotechnical practice mandates that these be measured and recorded and the supports design be fine-tuned accordingly. During this monitoring and assessment exercise, certain anchors and instruments (extensometers) were added. **T**he length of extensometers was 2-4-8 meters in original specifications which was changed to 5-10-15 meters in the Transformer Hall and 5-15-25 meters in the Power Station. This was because the rock in

the Transformer Hall was not very good but it was better than that in the Powerhouse. The longer extensometers were to have a wide coverage on the rock behavior in both the structures. Some post-tensioned reinforced concrete jackets were added between the draft tube gate chambers. The draft tube excavation sequencing was adjusted so that the last draft tube pit is excavated after the other three have been concreted. This delayed the start of the powerhouse by over six (6) months.

"The installation afore-mentioned multi-point extensometers were authorized and implemented by issuance of a Variation Order (VO-35) costing Rs. 115.93 Million".

5.2.2.1.8 Steel Lining of Headrace Tunnel (HRT) at Jhelum River Crossing

The original design had an inverted syphon under the Jhelum River. After extensive review and discussions, the Engineer, POE and the Sponsor decided to eliminate the inverted syphon under the Jhelum River (Jhelum Dip) and replace it with a free draining tunnel. The tunnel vertical alignment was modified to eliminate the syphon. The need for a Steel Liner was the consequence of this decision. The dip required tunnel slopes of over 14 degrees. Such steep slopes in tunnels pose practical problems, e.g.:

- Much haulers tend to slip or get stuck on steep slopes.
- The Jhelum Dip would need to be pumped out for inspection which shall be a time consuming exercise during maintenance outages.
- The dip could trap sediments, which would prove difficult and time consuming to remove.

These problems led to the conclusion that a shallow, free draining tunnel under the river shall be a preferred option. Because the tunnel in this area carries high pressures, so there is a risk of water escaping the tunnel at the shallow crossing which pressure may jack open the joints in the rock, a phenomenon known as "hydro-jacking". Approximately 800 meters of twin tunnels (total 1600 meters) will be lined with steel in order to avert the risk of hydro-jacking. The scope of work included a new Adit sized for transporting steel liner sections, camps, shops and utilities to support Adit construction. A separate camp, workshop and utilities for the steel fabrication and concrete encasement around the steel liner were also established.

"This design change was authorized and implemented by issuance of a Variation Order (VO-27) costing Rs. 7,480 Million".

5.2.2.2 Supplementary Technical Reasons

Following few major reasons also hampered the physical progress at the Site and contributed in cost and time additions to the Project:

(i) Due to heavy ingress of water under River Jhelum in Headrace and Tailrace tunnels, the excavation works suffered quite badly during the years 2014 & 2015.

(ii) In May 2015, Rock Burst event badly damaged one Tunnel Boring Machine (TBM) due to which it remained under clearance and maintenance from May 2015 to December 2015. This incident caused 03 deaths and 13 injuries. Continuous Rock Burst (earthquake in the tunnel) thereafter caused severe damage to the equipment and tunnel supports.

(iii) Unforeseen rock stresses during the power house excavation in 2014 resulted in cracking of one of the Piers and warranted complex, time consuming and expensive remedial measures.

5.2.2.3 Additional Cost Intensive Procurements During Construction

Following explained two (2) cost intensive procurements, resulting in significant cost additions, were made to recover delays and provision of stable electricity supply at Site.

a. Procurement & Deployment of Tunnel Boring Machines (TBMs)
b. Justification of Procurement

Due to the time lost at the start of the project and the desire to recover the lost time in the project schedule, the initial concept of utilizing the Tunnel Boring Machine (TBM) for excavation of the Headrace Tunnel (HRT) was introduced in July 2009. The Contractor's initial submittal in this regard was very preliminary in nature and was consequently rejected by the Engineer. Further delays to the project made acceleration even more desirable and the Engineer evaluated different ways to expedite the progress of work. In November 2010, it was determined that the most critical element of construction with respect to the schedule was the construction of the headrace tunnel (HRT) between adits A1 and A2, although other areas were also near critical and similarly considered to evaluate possible ways to minimize delay of project completion.

The two possible ways were considered to recover delays in construction for the most critical work of HRT construction between adits A1 and A2 and these were:

- introducing TBM excavation to the project; and
- increasing the production rate of the Drill and Blast (D&B) operation in this section of the HRT.

An increased production rate for the D&B operation was favoured by the consultant and the employer's Panel of Experts because of the flexibility this construction method allows in addressing the challenging geologic conditions and expected incidents of high convergence anticipated along the HRT alignment. The Contractor was reluctant to consider the D&B approach as in his opinion it would not result in recovering the delays deemed necessary for timely completion of the Works. Without the Contractor's buy-in and full support of D&B method it was concluded that the possibility of success of this

option to mitigate delays would be severely reduced. At that stage it was deemed necessary that the TBM option be re-considered in view of:

- the geologic conditions encountered by then in adits; and
- advancement in TBM technology to handle challenging geology and potential convergence.

An evaluation of the available geologic data and observation of underground behavior during and after tunnel excavation in the adits indicated that in general, the rock was of better quality than was indicated in the contract level design. The recorded rock convergence under significant overburden was also within the tolerable limit. These findings of the insitu geologic conditions in the excavated adits were encouraging leading to the next step that necessitated further evaluation of advancements made in the TBM technology that could be applicable to the Neelum Jhelum Project.

For the technological evaluation, several workshops were arranged with TBM manufacturers (primarily M/S Herrenknecht of Germany) and detailed discussions on machine technology and operations were held. The TBM manufacturer identified a machine that has been developed to address most of the geologic concerns applicable to the Neelum Jhelum project. It was further established that this machine was built and field tested in the excavation of Gotthard Base Tunnel in Switzerland which excavation exhibits behavior similar to that expected to be encountered in the Neelum Jhelum tunnels. Both the Engineer and the POE concurred that the machine used at Gotthard utilized technology that is significantly advanced. In the course of a discussion of the risks of TBM usage, the POE expressed a cautiously optimistic view that a TBM similar to that used at Gotthart might be successfully deployed and operated in the geology expected to be encountered during the drive of the HRT from T1 to T2.

- It was expected that the deployment of TBM for the NJHEP will reduce the implementation time by about 18-24 months.

- It is estimated that the benefits from the early operation of the Project will be much more than the additional cost being incurred on the deployment of the TBMs.

- In addition, the use of TBM on NJHP will result in major technology transfer and the TBM can be utilized on future hydropower projects like Diamer Bhasha and Bunji on Indus River.

- Early availability of 969 MW power will help in reduction of load-shedding and enhancement of economic activity and will also help to establish Pakistan's priority rights on Neelum waters over Kishanganga Hydropower Project by India.

- It is worth mentioning that India had awarded a contract, around 2011-2012 to deploy TBM for Kishanganga Project to speed up the construction after facing difficulties in conventional Drill & Blast excavation.

Summarizing the above, two considerations drove the decision to deploy Tunnel Boring Machines (TBMs) at the Project. The first was to mitigate or recover delays that occurred prior to the tender of the Project (e.g. the Earthquake) and others that resulted afterwards (e.g. land acquisition and the 2010 floods). The second was a strategic decision to induct TBM technology in Pakistan. Pakistan has some of the greatest untapped hydropower potential in the world. Initiatives to create a strategic corridor to China will also require tunnels for railways and highways. The TBMs were procured according to an international open tender.

Cost: "This procurement was authorized and implemented by issuance of a Variation Order-22 (VO-22) costing Rs. 29,255 Million".

5.2.2.4 Heavy Furnace Oil (HFO) Generators

Insufficient power supplies from the national grid were causing load shedding and voltage variations made it difficult for the Contractor to operate electrical and mechanical construction equipment and utilities at the entire Site of the Project. Extensive research and consultations concluded that the only economical solution for providing uninterrupted, quality power supply was to install generator sets fueled by heavy furnace oil (HFO). Other alternatives considered were diesel generators and gas turbines. Diesel (light fuel oil) generators were more expensive to operate. Gas turbines were not feasible because there is no gas supply at the sites.

The scope of works (VO-37) included procurement, construction of suitable generator houses, and the operation & maintenance of three generators furnished by Wartsila. Operation & maintenance costs are paid for per kilo-watt hour. The furnishing and installation of the generators was by lump sum. The furnishing and installation of generator sets were competitively bid.

"This procurement was authorized and implemented by issuance of a Variation Order -37 (VO-37) costing Rs. 6,475 Million".

5.3 Project Construction Cost Adjustment Factors

Following four (4) types of project cost re-openers & price escalation factors are envisaged in the Construction Contract:

(i) Design Changes/Variation Orders;
(ii) Price Adjustment for Civil Works (Lot C1, C2, C3);
(iii) Price Adjustments for Hydraulic, Electrical & Mechanical (EMH) Works; and
(iv) Exchange Rate Variations (US$ vs. Pak. Rs).

5.3.1 Design changes / VO

As already explained above in 5.2.2

5.3.2 Price Adjustment for Civil Works (Lots C1, C2 & C3)

The sources of indices and the weightings or coefficients for use in the adjustment formula under Clause 70 shall be as follows:

Cost Element	Description	Weighting (%)
A	Non-adjustable portion	20
B	Local Labour (Unskilled)	7
C	Local Labour (Skilled)	4
D	Cement	4
E	Reinforcing Steel Bars and Structural Steel	8
F	Diesel	10
G	Expatriate Staff & Labor	4
H	Provision & Maintenance of Contractor's Equipment	25
I	Miscellaneous materials – Local	8
J	Miscellaneous materials – Imported	10
Total		100

Adjustment Formula

The value of the price adjustment for Lots C1, C2 and C3 shall be calculated each month from the formula:

Price Adjustment = Vn × Pn.

And

Pn = **[**A+b(Ln/Lo)+c(SLn/SLo)+d(Cn/Co)+e+(Rn/Ro)+f(Dn/Do)+g(En/Eo)+h(Mn/Mo)+I(Mln/Mlo) + j(Min/Mio)-1**]**

Where

Vn = the value to be certified for the month n in respect of payments at base value for Works using the rates and prices entered in the Bill of Quantities of the Contract and before deduction of any retention

Pn = an adjustment factor calculated from the following formula to include all weightings and indices as set out above.

A = is a fixed constant representing the nonadjustable portion in contractual payments;

b = For Local Labour (Unskilled), the index shall be the minimum wages for the un-skilled labour as fixed by the Government of Pakistan.

c = For Local Labour (Skilled), the index shall be the wages applicable for the "mason (raj)" for the city of "Rawalpindi" as given under Intercity Price of Construction Input Items and Labour Wages, presently in Table 11.12, of the Monthly Bulletin of Statistics, published by the Federal Bureau of Statistics, Statistics Division, Government of Pakistan.

d = For Cement, the cost index shall be the index number applicable to "cement" as given under Index Numbers of Wholesales Prices by Commodities - Building Materials, presently in Table II .9, of the Monthly Bulletin of Statistics, published by the Federal Bureau of Statistics, Statistics Division, Government of Pakistan.

e = For Reinforcing Steel Bars and Structural Steel, the cost index shall be the index number applicable to "iron bars & sheets" as given under Index Numbers of Wholesales Prices by Commodities-Building Materials, presently in Table 11.9, of the Monthly Bulletin of Statistics, published by the Statistics Division, Federal Bureau of Statistics, Government of Pakistan.

f = For Diesel, the index shall be the index number applicable to "Diesel Oil" as given under Index Number of Wholesale Prices by Commodities-Fuel, Lighting and Lubricants, presently in Table 11.9, of the Monthly Bulletin of Statistics, published by the Statistics Division, Federal Bureau of Statistics, Government of Pakistan.

g = For Expatriate Staff and Labour, the index shall be the index number applicable to "Average Hourly Earnings of Production Workers", NAICS Code 23, Series Id: CES2000000006, given under "Employment, Hours, and Earnings from the Current Employment Statistics Survey (National), published by the U.S. Department of Labour, Bureau of Labour Statistics, Web Address: **www.bls.gov**

h = For Provision & Maintenance of Contractor's Equipment, the index shall be the index applicable to the item "Construction machinery and equipment", Series Id: WPU 112, given under "Producer Price Index- Commodities", published by the U.S. Department of Labour, Bureau of Labour Statistics, Web Address: www.bls.gov

i = For Miscellaneous Materials-Local, the index shall be the index number applicable to "Wholesale Price Index" as given under Price Indices (General) with Percentage Change, presently in Table 11.1, of the Monthly Bulletin of Statistics, published by the Statistics Division, Federal Bureau of Statistics, Government of Pakistan.

j = For Miscellaneous Materials-Imported, the index shall be the index number applicable to "Materials and Components for Construction, Series Id: \VPUSOP2200, given under Producer Price Index-Commodities, published by the U.S Department of Labor, Bureau of Labor Statistics, Web Address: www.bls.gov

Ln, SLn, Cn, Rn, Dn, En, Mn, Mln and Min are the current cost indices or reference prices of the cost elements for the relevant month "n".

Lo = 4000 Rs, SLo = 412.5 Rs, Co = 134.55 Rs, Ro = 163.41 Rs, Do = 239.14 Rs, Eo = 20.04 Rs, Mo = 175.6 Rs, Mlo = 141.21 Rs and Mio = 189.2 Rs are the base cost indices or reference prices corresponding to the above cost elements.

June 2018 Values

Ln = 13000 Rs, SLn = 1250 Rs, Cn = 234.05, Rn = 322.67 Rs, Dn = 397.80 Rs, En = 26.84 Rs, Mn = 219.37 Rs, Mln = 370.86, and Min = 237.50 Rs.

By analyzing the above base values corresponding to June 2006 and values at reference date of June 2016, the average increase of about 63.23% in base costs of construction inputs is evident and this increase translated into an amount of Rs. 48.767 Billion as an additional inflationary cost element incurred till June 2016 whereas for the remaining period till COD (June 2018), an estimated amount of Rs. 24.485 Billion is also made part of the Project cost, so the total increase in Project cost due to escalation in base prices of civil works input items (labour, cement, steel, fuel) from June 2006 till June 2018 is estimated as Rs. 73.252 Billion and is claimed in tariff petition.

5.3.3 Price Adjustments for Civil Works & EMH Packages

Both the Civil Works and EMH packages are subject to price adjustment as per FIDIC Clause 70. FIDIC Clause 70 and the Supplementary Conditions provide provisions for price adjustment according to published indices. The EMH scope has a five percent (5%) per annum cap on the rate of escalation. The civil works scope has no such cap.

5.3.4 Exchange Rate Variation

The Contract currency is the Pakistani Rupee. Contract provisions for partial payment of the Civil Works in US Dollars was reckoned at June 2006 rates (1 US$ = Rs 60.35) which make calculation of dollar equivalents relatively a complex task.

The base price of the Construction Contract (Rs. 90,900,240,404) contains a component of 51.15% (Rs. 46,499,042,057) subject to foreign currency (US$) adjustments with reference to the base exchange rate of Rs. 60.35 = 1US$. The reference exchange rate is Rs. 165.00 = 1US$ (June 30, 2018), which translates into an increase of about 173.47%, and consequential impact of this loss of currency value resulted in addition of Rs. 81.428 Billion to the Project base construction cost.

5.4 Physical Contingencies

Contingency is an integral part of the total estimated costs of a project. Contingency percentages are set up to handle unforeseen changes in a project. Changes such as additional work, quantity over-runs, and additional items are some of the contingencies that may be expected in a project. The American Association of Cost Engineers defines the contingency as follows:

"Covers costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties within the defined project scope. The amount of the contingency will depend on the status of design, procurement, and construction, and the complexity and uncertainties of the component parts of the project. Contingency is not to be used to avoid making an accurate assessment of the expected cost".

Inclusion of contingency becomes particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur. So in view of the large & diversified scope of works, design changes leading to variations in construction quantities and other unforeseen cost items expected to be encountered in this mega underground Project, physical contingencies cost at 2.50% of the total construction cost, amounting to Rs. 4.957 Billion has been included in Project cost estimate which is quite reasonable for this highly technically complex Project in view of the industry standards for similar projects. This cost will be used in the final settlement with contractor.

5.5 Engineering and Supervision Cost

In 2005, WAPDA requested proposals from Consultants to prepare detailed drawings and administer the construction contract. The Request for Proposals (RFP) required the Engineer to review the tender design and modify it as required. A Joint Venture (JV) of MWH, NORCONSULT, NESPAK, ACE & NDC responded to the 2005 RFP, however, the contract negotiations did not result in an award.

The Sponsor/WAPDA invited proposals from consulting firms in October 2007 to render services as Engineer for the Project through on International Competitive Bidding (ICB) basis. Following two (2) firms/joint ventures submitted their technical & financial proposals by the closing date:

(i) **Montgomery, Watson, Harza Inc., (USA)**
In association with:

- NORPLAN A.S Norway;
- National Engineering Services Pakistan (Pvt.) Ltd (NESPAK);
- Associated Consulting Engineering (Pvt.) Ltd (ACE) Pakistan; and
- National Development Consultants, Pakistan (NDC).

(ii) **RSW International (Canada) Lead Firm,** with

- BAK Consulting Engineering, Peshawar;
- Engineering Associates, Lahore;
- Designmen Consulting Engineers, Islamabad;
- Infra-D Consultants (IDC), Islamabad;
- AGES Consultant, Peshawar; and
- ZOMA (Pvt.) Ltd., Islamabad.

The JV of MWH, NORPLAN, NESPAK, ACE & NDC (known as Neelum Jhelum Consultants) was awarded the contract for rendering services as the Engineer after detailed analysis of technical and financial ranking of both the above mentioned bidders and eventually the Engineer (Neelum Jhelum Consultants) mobilized in August 2008.

5.5.1 Scope of Work/Terms of Reference

The Engineer, in case of this Project and other public sector hydropower projects, has to perform many diversified and responsibility oriented tasks. In public sector projects, the engineer is responsible for detailed design preparation, construction supervision, issuance of contract changes, measurement of works performed and application of complex escalations formulas and indices, conducting of testing and commissioning etc.

The Terms of Reference for the Neelum Jhelum Consultants/Engineer include, but not limited to, the followings:

- The main assignment of the consultants is to supervise the construction of all civil works, supply, erection, commissioning and testing of hydraulic steel works and electrical and mechanical works in accordance with the specification and drawings and to coordinate and manage various contract lots to ensure timely and successful completion of the project to get the requisite objectives. The consultants shall be vigilant and take timely appropriate action to discourage the claims from the Contractor.

- The consultants shall plan and supervise additional geotechnical investigations to verify the detailed design completed by the consultants.

- Review previous designs of the civil works completed previously for adequacy and standard and assume full responsibility for it and obtain necessary approval of WAPDA/the Employer/the Sponsor (for the purpose of this tariff petition) for any changes required.

- Carry out review of detailed design of each and all elements of the civil works (if required), incorporate proposed changes as required and prepare construction drawings for issuance to the Contractor for implementation.

- Determination or application of new earthquake criteria in the design of project features.

- Client's desired changes.

- Necessary redesign in the event of gross design errors or omissions of others.

- Any services required in connection with environmental impact assessment or resettlement action plan.

- Any services required to assist the Client with acquisition or administration of lands and land rights.

Any services required to make for the inadequacies of cost estimates.

5.5.2 Rationale of Engineer's Cost

- The cost for Engineering & Supervision amounting to Rs. 20.321 Billion is 6.43% of construction cost of Rs. 316,167 million for the purpose of this tariff petition. The base construction cost and engineering & supervision costs reflect the accurate expenditure incurred so far on these accounts and educated guess based on past spending pattern, future project construction requirements and other relevant factors. "This cost estimation is comparatively more accurate and realistic as it has been done while standing in the middle of the construction stage as compared with the Hydro IPPs case where all cost estimations are done upfront well before the start of the construction phase of the project".

- The cost of services of the Engineer has escalated since its hiring mainly because of standard escalation clauses in the services contract and due to many design variations

implemented in the Project. Due to these factors, the man-months of the local & foreign staff not only increased but the situation also necessitated the deployment of more local and foreign staff / expatriates to properly & professionally accomplish the task.

- The initially anticipated services period of the Engineer was about seven (7) years; however, due to major design changes implemented in the Project and other delays caused by floods of 2010 and land acquisition issues, the period of Engineer's services has been lengthened and now it is forecasted that the deployment of Engineer at Project Site might be required till 2021, making the period equivalent to about thirteen (13) years. The period of about thirteen (13) years for the Engineer's presence at site is not a common eventuality and that's why it entails higher costs. Further due to sporadic shelling from indian side of Kashmir and contractor suspended the work at site as well as COViD-19 lockdown this period has further extended.

5.6 Land acquisition, Resettlements and Environment Cost

In case of this Project, land has not been directly acquired by WAPDA/NJHPC, rather the land has been acquired by Government of AJ&K through Land Acquisition Collectors, Muzaffarabad. The details of the land acquired are as under:

•	Private Land Acquired	=	1778 Kanals
•	Government Land Acquired	=	1677 Kanals
•	Total Acquired Land (Government + Private)	=	3455 Kanals
•	Additionally, the Land on Lease	=	1212 Kanals
•	Land under process of award	=	8 Kanals
•	**Total Land for Project**	**=**	**4675 Kanals**

The cost of the land acquired for the Project is Rs. 1,500 million. Apart from this, the Sponsors have to construct schools, basic health units, vocational institutes, water supply schemes, recreation parks, solid water treatment plant, water shed management systems and upgrade roads and bridges on the instructions and demand of Government of AJ&K as part of Corporate Social Responsibility (CSR) measures which shall cost the Sponsors an amount of Rs. 5.237 Billion.

5.7 Project Administration Cost

Administratively, WAPDA is responsible for the administration of the Project through Neelum Jhelum Hydropower Company (NJHPC) specifically established for the Project, which is managed by a Board of Directors (BOD). The Project is not only technically complex, diversified and spread at longer distances, but the quantum of financing involved is also huge, so the Project Sponsor has deployed a team with technical and financial experts along with general administration employees/officers. The cost of administration of the Project is Rs.5,330 Billion which is about 1.24% of the project cost and falls within the range defined by NEPRA for projects of such scale.

5.8 Duties and Taxes

Duties and Taxes on imported plant & equipment include GST at 17% (may apply to 20% of equipment), custom duty at 5% (80% of equipment), port insurance at 1%, handling charges at 1%,

Sindh Government tax at 0.75% and WHT at 6%. Total estimated amount of duties and taxes on import of EMH + Steel Liner + TBMs + Generator, claimed in this head is PKR 6,129 Million.

5.9 Insurance During Construction and Performance Guarantees

The cost claimed in this head is PKR 2,676 Million for the insurance of TBMs and allied equipment.

5.10 Interest During Construction

Loans	Interest During Construction
IDB- I&II	15,825,340,446
OFID-I & II	4,183,644,624
Saudi Fund-I & II	4,775,914,953
Kuwait Fund-I & II	3,596,662,845
Exim Bank -I	22,721,010,036
Exim Bank -II	5,395,915,516
Sukuk	9,818,927,848
CDL-I	7,077,502,998
CDL-II	820,224,144
CDL-III	6,824,279,326
Adj (Interest Income)	(6,255,309,774)
Total	**74,784,112,965**

The cost of Interest during construction claimed has already booked in financial statements under the head of IDC amounting to PKR 74,784 Million as of 30 June 2018. This include markup cost of all Cash Development Loans (CDL) and Foreign Relent Loans (FRL) during the construction period from their date of disbursement. The details of the cost booked under this head is as under:

The company in this tariff petition requested to only redemption of IDC with 2% markup rate as the FRL loan has plenty of 1% for each year delay on principal amount. Currently delayed payment surcharge is around 3% against each loan.

SECTION 6. THIRD PARTY VALIDATION (TPV)

6.1 NEPRA in its determination for NJHPP dated !9-11-2018 at para 5.2 showing its inability to proceed further with the regulatory audit of the project costs. Despite this observation the Authority through exercise of its powers given under Rule 16(2) Tariff Rules decided to make its assessment. Although the Authority is empowered to decide the case on the basis of available record it is considered appropriate to apprise the Authority of efforts made for third party validation as required by the Ministry of Planning & Development and Reforms. Following is the brief of the efforts made for third party validation:

6.1.1 Background

When 3rd Revised of Neelum Jhelum Hydropower Project was submitted for the approval in 2015, the Executive Committee of the National Economic Council (ECNEC) considered the Summary dated 30th November 2015 submitted by the Ministry of Planning, Development & Reforms (PD&R) on NJHPP and approved the said PC-I of the project at a rationalized cost of Rs. 404,321.1 million subject to compliance of CDWP's directions dated 29th October 2015. Para (ii) & (v) of the CDWP's directions dated 29th October 2015 provides that:

i. To ensure transparency of cost estimates, third party panel for review / validation of cost estimates of PC-I may be carried out within three months after the approval of project by ECNEC.

ii. The outcome of TPV and thereby cost variation, if any, will be apprised to the ECNEC.

Further, when 4th revised PC-1 of the Project was approved, the Office Memorandum issued on 11-6-2020 (4th Revised PC-1), also contained the condition of TPV through Planning Commission.

6.1.2 Implementation for Third Party Validation (3rd Revised PC1)

As per ECNEC approval, TPV was to be carried out through appointment of the Consultants. The issued for appointment of Consultants was discussed in a meeting held in the Planning Commission on 11th May 2016. As per minutes of said meeting, the following TORs were approved:

i. Compare contract payments on per unit basis with market rates for payments made in the last 1.5 years for the activities of civil works of various grades and steel fabrication works,

ii. To examine the adequacy of escalation formulae and their applications

iii. To examine the Foreign exchange payments, exchange rate and contract provisions thereof, suggest alternative cost saving measures and estimate the impact on costs of projects.

iv. To evaluate cost-effectiveness of payments made to engineering and supervision consultants (local and foreign).

v. To make comparative evaluation of contracts made for NJHPP with Ghazi Barotha, Tarbela-IV Ext and Golen Gol HPPs.

vi. To evaluate the contact award system and practices of WAPDA including NJHPP and make recommendations thereof.

In the said meeting, it was also decided that in order to review the ECNEC decision regarding TPV, a brief will be prepared for the approval of Minister, PD&R's having the proposal that the TPV may be carried out by the Planning Commission with its own funding and supervision.

6.1.3 Clarification by WAPDA / NJHPC on Cost Escalation for Third Party Validation

With reference to the TOR approved for TPV, NJHPC/WAPDA apprised its position to the concerned Ministry of Water & Power, now Ministry of Water Resources as follows:

i. To implement each Hydropower Project, WAPDA gets the tender documents prepared by engaging reputed consultants and have its own a very sound and robust system of evaluation of bids for award of contracts.

ii. NJHPC/WAPDA has awarded construction project through International competitive Bidding (ICB) and has issued VOs on the recommendations of the Engineer / Consultants.

iii. NJHPC/WAPDA is making payments to the Contractor on per unit basis certified by the "Engineer" in line with the items approved in the schedule of BOQ of the contract signed with the Contractor subject to applying escalation formulae provided in the contract.

iv. The escalation formulae contained in NJHPP is in line with PEC guidelines and FIDIC practices and the pattern of escalation formulae is quite in consonance of escalation formulae provided in the contracts of Ghazi-Baoratha, Tarbela-IV Extension and Golen Gol Hydel Power Projects.

v. The annual accounts of NJHPC have been audited by one of the renowned four Chartered Accountant Firms namely EY Ford Rhodes Pakistan.

vi. The annual audited accounts have been examined in the BOD Audit Committee critically as PSE Corporate Governance Rules of SECP, before their approval by the BOD.

The Ministry of Water & Power / Ministry of Water Resources before endorsing the aforesaid NJHPC/WAPDA's position to the Planning Commission testified the same through different inter-ministerial and intra-ministerial special purpose enquiry committees.

6.1.4 Efforts Made by WAPDA / NJHPC for Expediting Third Party Validation:

Pursuant to meeting held in Planning Commission on 11th May 2016, the TPV was to be conducted by the Planning Commission through appointment of Consultants,which have not yet been appointed. For expediting the process WAPDA/NJHPC raised the issue at different forums as below:-

i. CFO, NJHPC through letter No. CFO/NJHPC/Tariff/2018/1615-18 dated 07-8-2018, in response to comments of Syed Akhtar Ali in the NEPRA public hearing meeting, stressed the need for early completion of the process. The letter was addressed to Registrar NEPRA and also copied to CEO, CPPA-G.

ii. Chairman, WAPDA vide letter No. C/SO/812-13, dated 30-11-2018 addressed to Secretary, ministry of Water Resources, also highlighted the need for TPV while commenting on the conditional approval by ECNEC of 4th Revised PC-1. Chairman also pointed out that Prime Minister in the ECNEC meeting approved the PC-1 without the condition of TPV and termed the Minutes of Meeting issued thereon as unfaithful recording.

iii. CFO, NJHPC vide letter No. CFO/NJHPC/PC-1/2019/2276-77dated 08-1-2019 addressed to Chief (Energy), Ministry of Planning, Development and Reforms stressed the need for early finalization of TPV inview of the Pending Tariff Finalization by NEPRA.

iv. Further, CFO NJHPC vide letter No. CFO/NJHPC/2019/2611-14 dated 12-2-2019 addressed to Chief (Energy), Ministry of Planning, Development and Reformsagain stressed for finalization of the TPV.

v. Since no action was being taken and project was heading for final Tariff, the Member (Infrastructure) was contacted by the CEO and a briefing was given to him on 02 March 2020. It was to be followed by a site visit by in April 2020 which could not take place due to COVID 19.

vi. Again on 15 Sep 2020, the CEO requested the Member (Infrastructure) on telephone for the meeting on TPV, which was scheduled on 22nd Sep 2020 but it could not be held due to reasons not know to NJHPC.

6.1.5 Present Status and Issue of Pending Power Sale Tariff:

The task of TPV by Planning Commission, Ministry of Planning, Development and Reforms through appointment of Consultants is not yet completed which is perhaps at TOR level. The TPV may not be able to see the expensive part of project, (the water way system) as it is pressurized. NJHPC will facilitate the consultant as and when it is appointed by the Planning Commission. The NJHPP is substantially completed and has entered into operation phase. NJHPC needs to get determined its COD stage power sale tariff urgently to enable generating revenue for meeting O&M expenses and repayment of loans, therefore determination of its power sale tariff should not be held up any longer waiting for conducting 3th party validation by the consultant to be appointed particularly in view of the detailed scrutiny, which will be carried out by NEPRA on the basis of documentary evidence

SECTION 7. FINANCING ARRANGEMENT

7.1 Project Financing

The total project cost of PKR 428,296 million is estimated to be funded based on a Debt: Equity: Grant ratio of (74:10:16). For this Petition, a debt: equity ratio has been assumed and may vary from the anticipated (74:10:16) due to any variation in the estimated costs.

Project Financing		Percentage	PKR Million
1	Debt	74.10%	317,327
2	Equity	9.72%	41,663
3	Grant (Neelam Jhelum Surcharge)	16.18%	69,306
	Total Project Cost	**100.0%**	**428,296**

7.1.1 Debt

For financing the project, NJHPC has utilized multiple sources of debt. The debt portion consists of Foreign Relent Loans from GoP, cash development loans and local commercial financing detail of which are set out as below:

7.1.1.1 Foreign Relent Loans

Foreign Relent Loans are raised by the Government of Pakistan and relent to NJHPC at a fixed rate set by Economic Affairs Division of Pakistan. Foreign Relent Loans received by NJHPC consist of Islamic Development Bank Loans IDB Istisna I &II of US$ 311 Million, China Exim Bank Loan I and II of US$ 815 Million, Kuwait Fund for Arabic Economic Development KFD loan I and ll of US$ 74 Million, Saudi Fund for Development SFD Loan I and II of US$ 156 Million and OPEC Fund for International Development OFID Loan I and II of US$ 76 Million.

Loans	Relending Rate	Loan Amount USD	Redemption period
IDB	15.00%	311,000,000	5+10 years
China EXIM Bank I	15.00%	448,000,000	10 years
China EXIM Bank II	12.00%	366,800,372	10 years
Kuwait Fund (KFD)	15.00%	74,000,000	5+15 years
Saudi Fund (SFD)	15.00%	156,000,000	5+10 years
OPEC Fund (OFID)	15.00%	76,000,000	5+10 years

The grace period of the above loans has been expired and payment of principal + interest has been due on all loan as on 30.06.2018. The terms of the loans vary from each other but for the **tariff calculation a standard ten (10) years annuity-based repayment on respective relending rate with no grace period has been assumed**.

7.1.1.2 Cash Development Loans

NJHPC has received three cash development loans CDL-1 (2006-07) of PKR 5,270 Million, CDL- 2 (2012-13) of PKR 1,500 Million and CDL-3 (2014-15) of PKR 14,000 Million from the GoP and raised a commercial loan of PKR 100,000 Million from National Bank of Pakistan out of which PKR 25,000 million has been paid by NJHPC hence balance PKR 75,000 million has been taken for this petition.

	Rate of Interest	Loan Amount	Redemption period
CDL-1 (2006-07)	11.78%	5,270,027,000	5 + 20 years
CDL-2 (2012-13)	10.65%	1,500,000,000	5 + 20 years
CDL-3 (2013-14)	11.79%	14,000,000,000	5 + 20 years

The grace period of the above loans has been expired and payment of principal + interest has been due on all loan as on 30.06.2018. The terms of the loans vary from each other but for the **tariff calculation a standard twenty (20) years annuity-based repayment on respective relending rate with no grace period has been assumed**.

7.1.1.3 SUKUK Financing

The company has issued SUKUK of Rs. 100,000 million in the year 2016. These SUKUK were issued with the GoP guarantee with a markup rate of KIBOR + 1.13. The term of loans was (2+8) years i.e. 2 years grace period and 8 years for redemption of the sukuk units. The company has paid Rs. 25,000 milion of its principal amount with remaining balance of Rs.75,000 million as on 30.06.2020. The company is requested for the redemption of Rs.75,000 million for this tariff petition.

7.2 Equity

Water & Power Development Authority (WAPDA) being the sole/main sponsor of NJHPC has injected an equity of PKR 41,663 Million from 2010-11 to 2014-15. NJHPC is herby requested to allow Return on Equity (ROE) and Return on Equity During Construction (ROEDC) at 10%.

7.2.1 Return on Equity (ROE), ROE During Construction and Equity Redemption

Equity of PKR 41,663 Million injected by WAPDA from 2010-15 as per following:

Equity Injection table

	Years					
	2010-11	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**Total**
WAPDA Equity	0.00	5,650.00	9,050.00	20,327.00	6,636.46	41,663.46
Total PKR Million	**0.00**	**5,650.00**	**9,050.00**	**20,327.00**	**6,636.46**	**41,663.46**
Cumulative ROE	**0.00**	**5,650.00**	**14,700.00**	**35,027.00**	**41,663.46**	

NJHPC hereby requests the Authority to please allow:

- ROE of 10% (IRR based) return on invested equity net of withholding tax;
  - 5% ROE in first ten (10) years to unload upfront tariff
  - 15% ROE from eleven (11) to twenty (20) years
  - 10% ROE from twenty one (21) years onward
  - No Equity redemption is requested as project is on BOO basis

7.2.2 Return on Equity During Construction (ROEDC)

Accrual of ROEDC commencing from 72 months prior to COD at a rate of 10% and payment thereafter (i.e. after COD) over the remaining life of the Project ensuring an ROEDC of 10% (IRR based) net of withholding tax. Authority is hereby requested to allow ROEDC from 72 months prior to start of construction date till COD based on the actual equity injection;

ROEDC Calculation

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
ROEDC on WAPDA Equity	565.00	1,526.50	3,711.85	4,746.68	5,221.35	5,743.48
Total ROEDC	565.00	2,091.50	5,803.35	10,550.03	15,771.38	21,514.86
Cumulative ROEDC	**565.00**	**2,091.50**	**5,803.35**	**10,550.03**	**15,771.38**	**21,514.86**

- ROEDC of 10% (IRR based) return on invested equity net of withholding tax;
  - 5% ROEDC in first ten (10) years to unload upfront tariff
  - 15% ROEDC from eleven (11) to twenty (20) years
  - 10% ROEDC from twenty one (21) years onward
  - No ROEDC redemption is requested as project is on BOO basis

7.3 Neelum Jehlum Surcharge (NJS)

NJS allowed to NJHPC as per decision of the Ministry of Water & Power notification No.P-II-2(361/891) Dated: 04.01.2008. As per this notification the DISCOs collected Rs 0.10 surcharge per kWh on the consumption of electricity by every category of electricity consumer except lifeline domestic consumer and K-electric from 1st January 2008. The year wise details of the collection of NJS is as under;

Year	Neelum Jehlum Surcharge
2007-08	2,228
2008-09	5,616
2009-10	5,821
2010-11	6,159
2011-12	6,133
2012-13	6,041
2013-14	6,599
2014-15	4,689
2015-16	8,975
2016-17	8,069
2017-18	8,881
Upto 3rd July 2018	94
Total	**69,306**

The company in this tariff petition assume this surcharge as grant and did not claim any return on it and its redemption.

SECTION 8. OPERATIONS COST

8.1 The operational cost of the project includes operations and maintenance expenses split in variable and fixed component with a sub component of Local and Foreign cost, Water Usage Charges, and Insurance cost per annum.

Description	PKR Million
Local	**2,800**
Foreign	**700**
Water Use Charges	**5,093**
Insurance Cost	**1,600**
Total Operations Cost	**10,193**

8.1.1 O&M Cost

Local portion of O&M costs consists of all the costs expected to be incurred by the project locally i.e. salaries and wages, administrative expenses, audit and corporate fees, local component of the O&M operator fee, etc.

Foreign component of the Fixed O&M cost is predominately comprised of the fee payable to the O&M operator for routine maintenance related expenditures included but not limited to the procurements of routine replacement components, cost associated rendering the services of foreign experts, etc.

Fixed O&M cost will be incurred in both local and foreign (80:20) ratio roughly, therefore Authority is requested to please allow the following indexation for the same.

Fixed O&M Component (*90% of total O&M*)	**Percentage**	**Indexation**
Local	**80%**	• Pakistan CPI (General)
Foreign	**20%**	• US CPI (All Urban Consumers) • PKR/USD Indexation
Variable O&M Component *(10% of total O&M)*		
Local	**80%**	• Pakistan CPI (General)
Foreign	**20%**	• US CPI (All Urban Consumers) • PKR/USD Indexation

Operating Expenses	Amount PKR Million
Fixed O&M local	**2,520**
Fixed O&M Foreign	**630**
Variable O&M local	**280**
Variable O&M Foreign	**70**
Total	**3,500**

NEPRA has already observed in the original/first provisional determination of tariff for NJHPCL to benchmark the World Bank study of average operations cost of a hydroelectric power project, and determined that PKR 3,500 million per annum is allowed to NJHPCL. The same is requested to allow in this tariff petition.

8.1.2 Water Usage Charge

This component represents the use of water charges payable to Government of AJ&K. The same are determined as a function of the electricity generated (in per kWh) by the complex. Water Use Charge is included in tariff at the rate of PKR 1.1 kWh.

Executive Committee of Cabinet (ECC) in its meeting dated 20.3.2019 considered the case No.ECC-76/11/2019. The decision was communicated vide cabinet division letter No.F.I/11/2019 dated 25.03.2019.

The decision was "Water Use Charges (WUC) @ Rs 1.10/KWh should be allowed on Mangla Hydropower Project prospectively as well as Neelum Jhelum Hydropower Project and any future public sector hydropower project to AJK at par with Net Hydel Profit (NHP) paid to the provinces. Any future revision in rate of NHP for provinces shall also apply WUC for AJK".

"Ministry of Water Resources to issue necessary guidelines to NEPRA. WAPDA shall accordingly file tariff application to the regulator".

"WUC at the revised rate of Rs.1.10/KWh shall be paid prospectively only, once the recovery through tariff begins, after tariff determination by NEPRA. This arrangement shall not have retrospective effect."

NJHPC vide letter No.CFO/NJHPC/Tariff/2019/2911-17 dated 03.04.2019 applied through CPPA-G to NEPRA for allowing the WUC. CPPA-G vide their letter No. CTO/CPPA-G)/DGMT® /MT(H&S)/12296-98, forwarded NJHPC application to NEPRA for allowing WUC to AJK. The case has yet not been decided.

It is requested that NEPRA should allow WUC as per the decision of ECC in view of tariff determination of NJHPC dated 19.11.18 para 5.7 of the determination in case No. NEPRA/IPT-03/NJHPC-2018.

8.1.3 Insurance Cost & ERP cost

The insurance cost consists of the insurance for all the operational risks of the project, as well as the business interruption insurance. The risks to be covered through insurance will include machinery breakdown, all natural calamities, sabotage, and consequential business interruption, etc.

The above mentioned insurances are required to be maintained throughout the life of the project. Since, the national insurance companies are not capable to provide insurance for such a huge

project single handedly therefore a mix of local and international insurance companies has been engaged to insure the risks faced by the project.

NJHPC request's NEPRA to allow the annual insurance cost to be 0.368% of the total project base cost.

Insurance is essentially required for the protection of assets of the project from Property Damage, accident, war and terror and keeping in view the complexity risk of hydrology. Insurance cover is also required for entire assets of the company along with loss of revenue from business interruption.

NJHPC has obtained insurance cover on part of its assets from WAPDA Equipment Protection Scheme as an interim arrangement and currently secure comprehensive insurance cover from National Insurance Corporation Ltd. Pakistan RE-Insurance Company by floating an international Tender for insurance of NJHPCL Project assets.

Annual insurance charge is around Rs. 1,600 million which is below 0.4% of the total value of project assets. NEPRA is requested to allow us insurance during operations.

The expected Insurance Cost is as under

Insurance Component	Value of Risk PKR Million	Rate for Insurance	Amount PKR Million
Property Damage	**314,240**	**0.368%**	**1,157**
Machinery Breakdown	**106,760**	**0.368%**	**393**
Business Interruption	**42,000**		
Subtotal			**1,550**
ERP Cost			**50**
Grand Total			**1,600**

ERP is very essential in now a days and company is planning to implement ERP for the automation of all the relevant modules to generate run time reports against it. The company assume around Rs.50 million annual cost for the procurement and maintenance of the ERP in future.

SECTION 9. REFERENCE TARIFF

9.1 The requested Tariff is a typical two -part tariff comprising of Energy Purchase Price and Capacity Purchase Price.

9.1.1 Energy Purchase Price

The Energy Purchase Price ("**EPP**") of tariff covers the Variable O&M expenses component and Water Usage Charge and 10% of operation cost. The EPP is payable against each kWh (Kilo Watt Hour's) of energy produced and delivered to the Power Purchaser as measured by the Metering System at the Interconnection point.

9.1.2 Capacity Purchase Price

The Capacity Purchase Price ("**CPP**"), specified in kWh is based on the net plant capacity specified under the petition 969 MW. The monthly billable amount of CPP will be determined based on the tested capacity determined during annual capacity test. This is a fixed monthly payment payable to NJHPC irrespective of the actual hydrology i.e. hydrological risk shall be borne by the power purchaser. The CPP will comprise of:

- Operations Cost – 90%
- Return on Equity (ROE);
- Return on Equity During Construction (ROEDC);
- Insurance During Operation; and
- Debt Servicing (Interest and Principle Repayment).

REFERENCE TARIFF

Year	Energy Charge				Capacity Charge									
	Variable O&M (Local)	Variable O&M (Foreign)	Water Use Charge	Total Energy Charge	Fixed O&M (Local)	Fixed O&M (Foreign)	Insurance	Return on Equity (ROE)	ROE During Construction (ROEDC)	Withholding Tax @7.5%	Loan Repayment	Interest Charges	Total Capacity Charge	Total Tariff
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh
1	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	3.4570	6.6923	11.8575	**13.0331**
2	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	3.8071	6.3422	11.8575	**13.0331**
3	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	4.2009	5.9484	11.8575	**13.0331**
4	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	4.6444	5.5049	11.8575	**13.0331**
5	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	5.1445	5.0049	11.8575	**13.0331**
6	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	5.7087	4.4406	11.8575	**13.0331**
7	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	6.3461	3.8032	11.8575	**13.0331**
8	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	7.0667	3.0826	11.8575	**13.0331**
9	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	7.8822	2.2671	11.8575	**13.0331**
10	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.4499	0.2323	-	8.8057	1.3436	11.8575	**13.0331**
11	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.0034	0.5657	4.6419	**5.8174**
12	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.0430	0.5261	4.6419	**5.8174**
13	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.0857	0.4834	4.6419	**5.8174**
14	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.1318	0.4373	4.6419	**5.8174**
15	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.1818	0.3873	4.6419	**5.8174**
16	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.2362	0.3330	4.6419	**5.8174**
17	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.2952	0.2739	4.6419	**5.8174**
18	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.3596	0.2095	4.6419	**5.8174**
19	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.4300	0.1392	4.6419	**5.8174**
20	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	1.3498	0.6970	-	1.5069	0.0622	4.6419	**5.8174**
21	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
22	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
23	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
24	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
25	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
26	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
27	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
28	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
29	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
30	0.0605	0.0151	1.1000	1.1756	0.5443	0.1361	0.3456	0.8999	0.4647	-	-	-	2.3905	**3.5661**
Levelized Tariff	**0.0605**	**0.0151**	**1.1000**	**1.1756**	**0.5443**	**0.1361**	**0.3456**	**0.7197**	**0.3716**	**-**	**3.7268**	**3.2829**	**9.1270**	**10.3026**

Interest and Principal Repayment Schedule

Year Sr.No	F Y ending on June 30	INTEREST						REPAYMENT						Total DSL
		C D L	F R L	EXIM	NBP	Other	Total	C D L	F R L	EXIM	NBP	Other	Total	
0	2018-19	2,423	16,089	4,967	6,026	1,480	**30,985**	287	5,200	2,350	5,095	3,075	**16,006**	**46,991**
0	2019-20	2,388	15,280	4,677	5,601	1,419	**29,364**	321	6,009	2,640	5,520	3,137	**17,627**	**46,991**
1	2020-21	2,350	14,345	4,350	5,141	1,356	**27,541**	360	6,944	2,967	5,980	3,200	**19,450**	**46,991**
2	2021-22	2,306	13,264	3,984	4,642	1,291	**25,488**	403	8,025	3,333	6,478	3,264	**21,504**	**46,991**
3	2022-23	2,258	12,016	3,572	4,102	1,226	**23,172**	452	9,273	3,745	7,019	3,330	**23,819**	**46,991**
4	2023-24	2,203	10,572	3,109	3,517	1,159	**20,560**	506	10,717	4,208	7,604	3,396	**26,431**	**46,991**
5	2024-25	2,143	8,905	2,588	2,883	1,090	**17,609**	567	12,384	4,728	8,238	3,465	**29,383**	**46,991**
6	2025-26	2,074	6,977	2,004	2,196	1,021	**14,272**	636	14,312	5,313	8,924	3,534	**32,719**	**46,991**
7	2026-27	1,998	4,750	1,347	1,452	950	**10,497**	712	16,539	5,970	9,668	3,605	**36,495**	**46,991**
8	2027-28	1,912	2,176	610	646	877	**6,221**	798	19,113	6,707	10,474	3,678	**40,771**	**46,991**
9	2028-29	1,816	0	0	0	803	**2,619**	894	0	0	0	3,752	**4,646**	**7,265**
10	2029-30	1,708	0	0	0	728	**2,436**	1,002	0	0	0	3,827	**4,829**	**7,265**
11	2030-31	1,587	0	0	0	651	**2,238**	1,122	0	0	0	3,904	**5,027**	**7,265**
12	2031-32	1,452	0	0	0	573	**2,025**	1,258	0	0	0	3,983	**5,240**	**7,265**
13	2032-33	1,301	0	0	0	492	**1,793**	1,409	0	0	0	4,063	**5,472**	**7,265**
14	2033-34	1,131	0	0	0	411	**1,542**	1,579	0	0	0	4,144	**5,723**	**7,265**
15	2034-35	941	0	0	0	328	**1,268**	1,769	0	0	0	4,228	**5,997**	**7,265**
16	2035-36	727	0	0	0	243	**970**	1,983	0	0	0	4,313	**6,295**	**7,265**
17	2036-37	488	0	0	0	156	**644**	2,221	0	0	0	4,399	**6,621**	**7,265**
18	2037-38	221	0	0	0	67	**288**	2,489	0	0	0	4,488	**6,977**	**7,265**
19	2038-39	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
20	2039-40	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
21	2040-41	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
22	2041-42	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
23	2042-43	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
24	2043-44	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
25	2044-45	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
26	2045-46	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
27	2046-47	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**
28	2047-48	0	0	0	0	0	**0**	0	0	0	0	0	**0**	**0**

SECTION 10. INDEXATIONS & ADJUSTMENTS

The following indexations shall be applicable to the reference tariff:

10.1 Indexation applicable to O&M

The Variable O&M is based on 80% Local and 20% Foreign expense. The Fixed O&M is based on 80% Local and 20% Foreign expense. The Local part of O&M expense will be adjusted on account of Inflation (WPI), whereas the foreign part of O&M will be adjusted on account of Rupee/Dollar exchange rate variation and US CPI. Quarterly adjustment for local inflation, foreign inflation, and exchange rate variation will be made on 1st July, 1st October, 1st January and 1st April respectively on the basis of latest available information with respect to WPI (or alternative index as may be determined by the Authority), US CPI (notified by US Bureau of Labour Statistics) and revised TT & OD Selling rate of US Dollar (notified by the National Bank of Pakistan). The mode of Indexation will be as under:

a. Fixed O&M

$$F\ O\&M_{(LREV)} = O\&M_{(LREF)} * WPI_{(REV)} / WPI_{(REF)}$$
$$F\ O\&M_{(FREV)} = O\&M_{(FREF)} * USCPI_{(REV)} / 239.842 * ER_{(REV)} / 165$$

Where:

$F\ O\&M_{(LREV)}$ = The revised applicable Fixed O&M local component of tariff indexed with WPI
$F\ O\&M_{(FREV)}$ = The revised applicable Fixed O&M foreign component of tariff indexed with UPI & exchange rate variation
$O\&M_{(LREF)}$ = The reference Fixed O&M local component of tariff for the relevant period
$O\&M_{(FREF)}$ = The reference Fixed O&M foreign component of tariff for the relevant period
$WPI_{(REV)}$ = The revised Wholesale Price Index (Manufacturers) / or alternative index as determined by the Authority.
$WPI_{(REF)}$ = Wholesale Price Index (Manufacturers) of July 2018 i.e. 123.08 or alternative Index as determined by the Authority and notified by the Federal Bureau of Statistics
$USCPI_{(REV)}$ = The revised US Consumer Price Index (All Urban Consumers) notified by Bureau of Labour Statistics for the month prior to the month in which indexation is applicable
$ER_{(REV)}$ = The revised TT & OD Selling rate of US Dollar as notified by the National Bank of Pakistan

b. Variable O&M

$$V\ O\&M_{(LREV)} = O\&M_{(LREF)} * WPI_{(REV)} / WPI_{(REF)}$$
$$V\ O\&M_{(FREV)} = O\&M_{(FREF)} * USCPI_{(REV)} / 239.842 * ER_{(REV)} / 165$$

Where:

$V\ O\&M_{(LREV)}$ = The revised applicable Variable O&M local component of tariff indexed with WPI
$V\ O\&M_{(FREV)}$ = The revised applicable Variable O&M foreign component of tariff indexed with UPI & exchange rate variation

$O\&M_{(LREF)}$ = The reference Variable O&M local component of tariff for the relevant period
$O\&M_{(FREF)}$ = The reference Variable O&M foreign component of tariff for the relevant period
$WPI_{(REV)}$ = The revised Wholesale Price Index (Manufacturers) / or alternative index as determined by the Authority.
$WPI_{(REF)}$ = Wholesale Price Index (Manufacturers) of July 2018 i.e. 123.08 or alternative Index as determined by the Authority and notified by the Federal Bureau of Statistics
$USCPI_{(REV)}$ = The revised US Consumer Price Index (All Urban Consumers) notified by Bureau of Labour Statistics for the month prior to the month in which indexation is applicable
$ER_{(REV)}$ = The revised TT & OD Selling rate of US Dollar as notified by the National Bank of Pakistan

Insurance Cost

Insurance Cost component of tariff, in case insurance is denominated in foreign currency, will be adjusted on account of PKR/US$ exchange variation on an annual basis at actual subject to the maximum of 0.368% of the cost on the basis of documentary evidence, according to the following formula:

$Ins_{(REV)} = Ins_{(REF)} * ER_{(REV)} / ER_{(REF)}$
$Ins_{(REV)}$ = Revised insurance cost component of tariff adjusted with the exchange rate Variation (PKR/US$)
$Ins_{(REF)}$ = Reference insurance cost component of tariff of the relevant period
$ER_{(REV)}$ = The revised TT & OD Selling rate of US Dollar as notified by the National Bank of Pakistan
$ER_{(REF)}$ = The reference TT & OD Selling rate of US Dollar

Return on Equity

Return on Equity (RoE) as well as Return on Equity During Construction (RoEDC) component of tariff shall be adjusted for variation in PKR/US$ exchange rate according to the following formula:

$RoE_{(REV)} = RoE_{(REF)} * ER_{(REV)} / ER_{(REF)}$
$RoEDC_{(REV)} = RoEDC_{(REF)} * ER_{(REV)} / ER_{(REF)}$
$RoE_{(REV)}$ = Revised Return on Equity component of tariff expressed in Rs. 0.8999 /kWh adjusted with exchange rate variation (PKR/US$)
$RoEDC_{(REV)}$ = Revised Return on Equity during Construction (RoEDC) component of tariff expressed in Rs.0.4647/kWh adjusted with exchange rate variation (PKR/US$)

$RoE_{(REF)}$ = Reference Return on Equity component of tariff of the relevant period
$RoEDC_{(REF)}$ = Reference Return on Equity during Construction component of tariff of the relevant period
$ER_{(REV)}$ = The revised TT & OD Selling rate of US Dollar as notified by the National Bank of Pakistan
$ER_{(REF)}$ = The reference TT & OD Selling rate of US Dollar

10.2 Water Use Charge

The reference Water Use Charge Cost Component shall be increase as per notification of GoP and GoAJ&K.

10.3 Debt Repayment and Interest Charges

The company has utilized multiple loans to fund the project and since the servicing of all these loans is in local currency, no indexation of exchange rate is required. Interest on all the loans carry a fixed mark-up rate, with exception of local commercial loan/sukuk. No indexation is required for the loans carrying fixed mark-up rate but for the floating rate loan the adjustment of any variation in the 6 months KIBOR shall be made as per the following formula:

$$\Delta I = P(Rev) \times (KIBOR(Rev) - KIBOR(Ref)) / 2$$

Where:

- **ΔI =** the variation in interest charges applicable corresponding to variation in six-month KIBOR. Δ 1 can be positive or negative depending upon whether KIBOR (Rev) > or < KIBOR (Ref). The interest payment obligation will be enhanced or reduced to the relevant of Δ 1 for each period under adjustment applicable on annual basis.
- **P (Rev) =** the outstanding principal on a semi-annual basis at the relevant calculation dates.
- **KIBOR (Rev) =** the 6-month Kibor (Offer/Selling rate) at the relevant calculation date as notified by State Bank of Pakistan.
- **KIBOR (Ref) =** the 6-month Kibor (Offer/Selling rate) as notified by State Bank of Pakistan on 29th June 2018 i.e. 6.79%.

SECTION 11. ONE TIME ADUSTMENT

11.1. Adjustments due to variation in Project Cost Components

The Tariff being determined at Commercial Operations Date onetime adjustment is required for the below items:

- Adjustment for the Civil Works Cost Escalation including costs associated with Steel, cement, labor, and Fuel in accordance with the Construction Contract of the Project. The procedure of such adjustments is, in essence, acknowledged in NEPRA approved mechanism for hydel projects;

- Adjustment for variation in cost of Land Acquisition and Resettlement;

- Return on Equity and Return on Equity during Construction based on actual equity investment, pattern of equity injections and variation in PKR/USD exchange rate during period 96 months prior to construction end date and during construction period as per the GoP Policy;

- US$/PKR exchange rate variations during the construction period for any project related cost;

- Adjustment of the financial cost due to the arrangement, commitment and other fees charged by the lenders of the Project based on final rates agreed with lenders, NEPRA approved debt at COD and variation in withholding rate on such payments to financiers and variation in USD/PKR exchange rate;

- Adjustment due to: (a) any changes in rates of duties and taxes paid or withheld in relation to the project and, (b) any duties and taxes paid (including as a tax gross up obligation) or withheld and not taken into account/assumed with respect to calculating any project cost in the reference tariff including without limitation any payments to EPC contractor;

- Adjustment of the interest during construction including change in the interest base rate (LIBOR/KIBOR), final agreed margin, variation in pattern of Loan drawdown, PRK-USD exchange rate and withholding tax rate;

- Adjustment of the costs associated with hydraulic steel structure and hydro-mechanical and electrical works;

- Adjustment of the costs associated with the Engineer/NJHPP Consultants and other consultants including financial and legal consultants as per actual based on documentary evidence;

- Adjustment of the costs of Project Administration as per actual incurred till COD;

- Adjustments due to the costs associated with the resettlement of habitants of the area affected by the construction of the Project; and

- Adjustment of insurance cost incurred during construction to be adjusted based on actual cost incurred including changes in PKR-USD exchange rate and withholding tax.

SECTION 12. PASS THROUGH ITEMS & ASSUMPTIONS

12.1. Pass through Cost Items

The Authority is requested to allow the following Cost Components as pass through items based on actual costs reasonably incurred by NJHPC:

- No Tax on the income of NJHPC has been assumed. Any Corporate Tax, turn over tax, general sales Tax / provincial sales tax and all other taxes, excise duty, levies, fees etc. by any federal/ provincial entity including local bodies and when imposed, shall be treated as pass through item.

- Any federal or provincial sales tax, value added tax or other tax payable by NJHPC for its operation and maintenance cost, on invoices of its consultants or for its insurance during operation phase shall be treated as Pass Through.

- No withholding Tax on the Dividend has been included in the Tariff. Authority is requested to allow payment of withholding tax on dividend as pass through at the time of actual payment of withholding tax as per the prevailing policy approved by the competent authority.

- Any water use charge payable in excess of what has been assumed.

- Any other item that is set out as a pass-through item in the power purchase agreement.

- Any increase in cost borne by the NJHPC on account of a change in tax or change in law including changes in the method of assessment or calculation of taxes.

- The payments to workers welfare fund and Workers Profit Participation Fund have not been accounted for in the Project Budget and have been assumed to be reimbursed as Pass through at actual by the Power Purchaser.

- Zakat deduction on the Dividends as required under Zakat Ordinance is considered as a Pass Through;

- No AJK taxes have been assumed in the tariff petition. In case the project is required to pay any such taxes, same shall be treated as a pass through;

- Any costs incurred by the project company, which are required to be incurred by Power Purchaser pursuant to provisions of the PPA, shall also be treated as pass through.

- Any cost payable on account of a change in the assumptions set out in 12.2.

- any other taxes, duties, levies and charges that have not been factored into the tariff calculation shall be treated as pass through.

12.2. Assumptions

The proposed reference Tariff is based on the following assumptions. A change in any of these assumptions will necessitate corresponding adjustment in project cost and the Reference tariff:

- The levelized Tariff is applicable for the period of 30 years; the debt shall be serviced (repayment of principal and interest charges) in first 20 years and equity shall be not be redeemed;
- Debt for the project consists of foreign relent loans and cash development loans by GoP and local commercial loans;
- Debt to equity ratio of [74:26];
- An exchange rate of PKR 165/USD has been assumed. Indexation against PKR/ USD variations shall be permitted for all the project costs denominated in the foreign currency. Tariff components shall be respectively indexed for exchange rate variations as discussed in Section 10;
- The Power Purchaser will compensate for the energy delivered prior to before effective date of tariff determined vide case No. NEPRA/IPT-03/NJHPC-2018. Payments will be invoiced to the Power Purchaser as per the mechanism specified in the PPA; otherwise NEPRA may instruct to Power Purchaser for adjustment of such EXPORT of Power against of IMPORT of Power by the Power seller.
- The Power Purchaser will be solely responsible for the financing, engineering, procurement, construction, testing and commissioning of the interconnection and transmission facilities. The Facilities will be made available to the Project at least on or before the deadline set in the Power Purchase Agreement and in any event at such time that it does not delay COD of any unit. Furthermore, the Power Purchaser will be solely responsible for the operation and maintenance of the interconnection and transmission facilities;
- The Power Purchaser will bear hydrological risk;
- The PPA will be structured as a take or pay contract whereby the Capacity Purchase Price will be payable to the Project company regardless of the actual dispatch levels;
- Water Use Charge and its indexation will be charged at the same rate as provided for in the approval of ECC letter No. F.I/11/2019 dated 25.03.2019 and Tripartite Agreement signed between WAPDA, Government of Pakistan and the Government of AJK;
- Customs duties for import of plant, materials and spares and parts is assumed at 5% and not other import duties have been assumed;
- Only 6% withholding tax on EPC onshore works has been assumed; withholding tax on O&M cost is not assumed; and no assumptions has been made for any other taxes including sales tax and value added taxes on the EPC contract (both onshore and offshore works) and for the O&M cost.

In case there is any change in taxes etc. or additional taxes, fees, excise duty, levies etc. are imposed, the project cost and reference tariff shall be adjusted accordingly;

- In case of any unintentional error or omissions, typographic errors, and any genuine assumption being overlooked, the same will be corrected/ incorporated and advised to the Power Purchaser as soon as NJHPC becomes aware of it;

- Cost of working capital has not been assumed;

- On the closing of the project costs after submission of final bill by the contractor, reference tariff will be adjusted to account for one – time adjustments to commensurate the depreciation component with final/closing costs of the project; and

- Any additional indexation or concession allowed by the GOP, NTDC/CPPAG/ NEPRA or any other government entity to any IPP will be allowed to NJHPC without any discrimination.