BUSINESS PLAN INCLUDING CAPITAL INVESTMENT PLAN FOR MYT CONTROL PERIOD FROM FY 2020-21 TO FY 2022-23

Submitted by

PUNJAB STATE TRANSMISSION CORPORATION LIMITED

BEFORE THE PUNJAB STATE ELECTRICITY REGULATORY COMMISSION, CHANDIGARH

Case No._____

IN THE MATTER OF: Filing of the Petition for the approval of PSTCL's Business Plan including Capital Investment Plan for MYT Control Period (FY 2020-21 to FY 2022-23) under Regulation 9 of PSERC (Terms and Conditions of Determination of Generation, Transmission, Wheeling and Retail Supply Tariff) Regulations, 2019

AND

IN THE MATTER OF Punjab State Transmission Corporation Limited (hereinafter referred as "PSTCL' or "the Petitioner")

The Petitioner respectfully submits as under: -

1. The Petitioner (interchangeably referred to as PSTCL) is vested with the function of intra-State transmission of electricity in the State of Punjab and the operation of State Load Despatch Centre as notified by the Government of Punjab vide Notification No. 1/9/08-EB(PR) 196 dated April 16, 2010. Further, in terms of Section 39 of the Act, the Government of Punjab declared PSTCL as the State Transmission Utility (STU).
2. The Petitioner is operating under the aegis of Electricity Act 2003 (EA 03) and the regulations notified by the Punjab State Electricity Regulatory Commission (PSERC). The Hon'ble Commission has issued the PSERC (Terms and Conditions of Determination of Generation, Transmission, Wheeling and Retail Supply Tariff) Regulations, 2019 (hereinafter referred to as "PSERC MYT Regulations, 2019") in exercise of powers conferred on it by Section 61 read with Section 181(2) of the Electricity Act 2003 (No. 36 of 2003).
3. As per the aforesaid regulations, PSTCL shall file its Business Plan along with its Capital Investment Plan for the control period i.e. FY 2020-21 to FY 2022-23.

4. Accordingly, in line with the provisions of the PSERC MYT Regulations 2019, the Petitioner is hereby filing the Petition for Approval of Business Plan including Capital Investment Plan for the Control Period from FY 2020-21 to FY 2022-23.

PRAYER TO THE HON'BLE COMMISSION

The Petitioner respectfully prays to the Commission:

a) to admit the Petition seeking approval of Business Plan along with its Capital Investment Plan for FY 2020-21 to FY 2022-23 in accordance with Regulation 9 of the PSERC MYT Regulations, 2019;
b) to approve the Business Plan along with the Capital Investment Plan for Transmission and SLDC Business for FY 2020-21 to FY 2022-23 as proposed by the Petitioner in the above-said Petition;
c) to pass any other order/s as the Hon'ble Commission may deem fit and appropriate under the circumstances of the case and in the interest of justice;
d) to condone any error/ omission and to give opportunity to rectify the same;
e) The filing is being done based on the best available information and in case of any change, the Petitioner may be permitted to make further submissions, addition and alteration to this Petition as may be necessary from time to time.

Date:
Petitioner
PSTCL, Patiala.

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1 Introduction

1.1 Background

In exercise of powers conferred under sub-section 4 of Section 131 of the Electricity Act, 2003 ("the Act" or "EA 03"), the Government of Punjab vide Notification No. 1/9/08-EB(PR) 196 dated April 16, 2010, restructured and unbundled the erstwhile Punjab State Electricity Board, into two successor companies, viz.

a) Punjab State Power Corporation Ltd. (PSPCL), to undertake generation and distribution business,

b) Punjab State Transmission Corporation Ltd. (PSTCL), to undertake transmission of electricity along with operation of SLDC functions.

PSTCL was incorporated as a Company under the provisions of the Companies Act, 1956 having its registered office at The Mall, Patiala. Acting as State Transmission Utility (STU), PSTCL has been entrusted with the transmission business of the erstwhile Punjab State Electricity Board (PSEB). PSTCL is vested with the function of intra-State transmission of electricity in the State of Punjab. Further, in terms of Section 39 of the Act, Government of Punjab declared PSTCL as the State Transmission Utility, which is responsible for undertaking, amongst others, the following main functions:

a) To undertake transmission of electricity through intra-State transmission system.

b) To discharge all functions of planning and co-ordination relating to intra-State transmission system.

c) To ensure development of an efficient, coordinated and economical system of intra-State transmission lines.

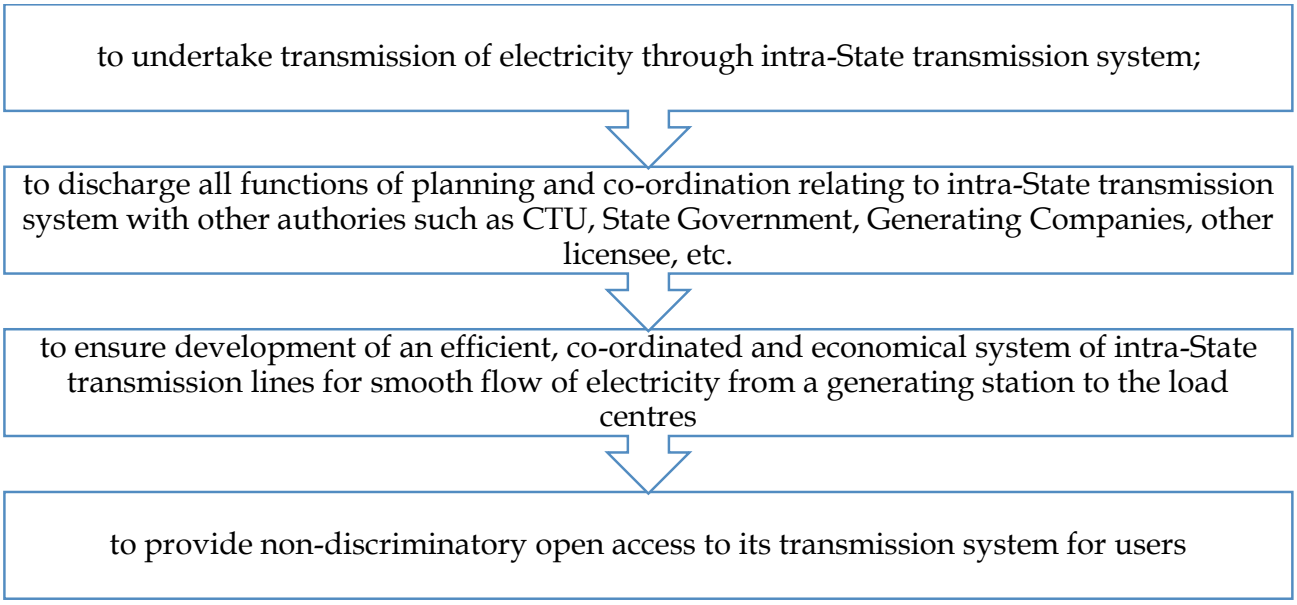
d) To provide open access.

The Hon'ble Punjab State Electricity Regulatory Commission (PSERC or the Hon'ble Commission) have moved to a multi-year tariff (MYT) regime, with an aim to bring about clarity on regulatory principles, to reduce regulatory risks and to incentivize efficient

operations by Utilities. The MYT framework provides greater regulatory certainty by providing Utilities a longer period to plan, forecast and implement their efficiency improvement plan.

1.2 Functions of State Transmission Utility

PSTCL is expected to perform the following functions:



1.3 Vision Statement of Company

The vision statement of PSTCL, specific to the business is as below:

"To be responsive, vibrant, reliable and efficient institution"

1.4 Corporate Mission of the Company

The Mission Statement of PSTCL, specific to the business is as below:

- Manage, upgrade and expand operational boundary on sound 'economic principles'.
- Arrest and bring down transmission losses and attain world class transmission system.
- Optimize revenue generation through alternative use of available resources, adopt cost control measures and explore unconditional revenue path.
- Adapt fair working practices, empower collectives and make PSTCL "a great institution".
- Pursue holistic Corporate Social Responsibilities.
- Make safety a way of life

1.5 Core Values

PSTCL core values have been provided as under:

- Trust, Mutual Respect and Industrial harmony.
- Discipline, Dedication, Commitment & Transparency.
- Dignity, Honesty & Integrity.
- Organizational Pride with Sincerity of purpose.
- Sharing, Caring & Concern.
- Operational Excellence & Professionalism.
- Creativity, Research & Development

1.6 Power Map of State of Punjab

The operating geography along with broad details of its network is provided in the figure below:

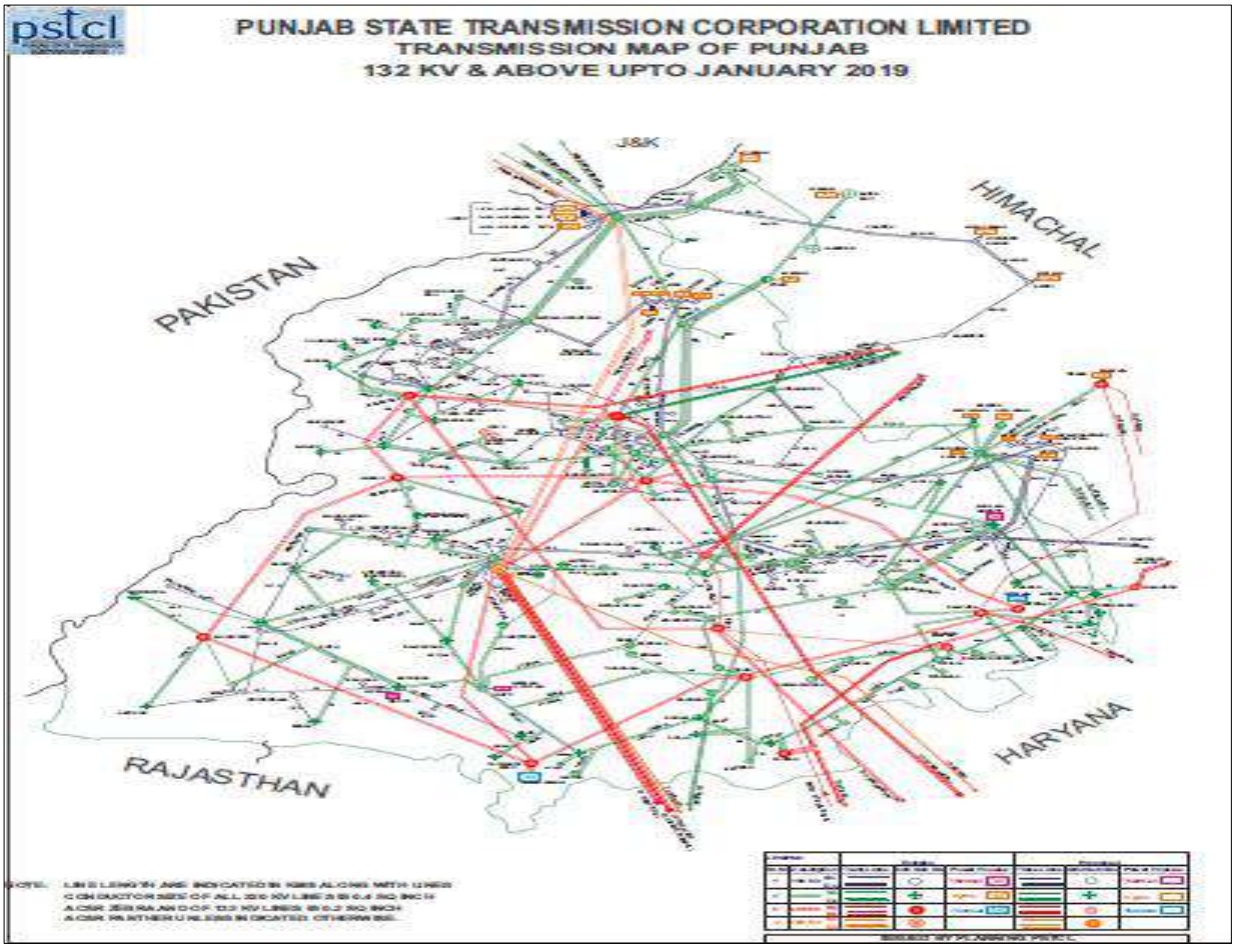


Figure 1: Transmission Map of Punjab as on 31st March, 2019

1.7 Core Activities

PSTCL undertakes the following core activities:

- **Operation & Maintenance (O&M)**
  - All the objectives comprising planning, implementation and control of:
  - Operational activities of EHV Transmission Lines and Substations as per Grid standards.
  - Maintenance activities to ensure their efficient and reliable working.
  - Asset management activities of the Transmission work to ensure commercial viability.
- **Projects**
  - All the activity streams, comprising planning execution and control of engineering design, procurement and construction of EHV Transmission Lines, Substations and other utilities.
- **Load Dispatch (LD)**
  - State Load Dispatch Centre is part of PSTCL. No separate legal entity has been formed for Load Dispatch. The activities comprise:
  - Scheduling and dispatch of electricity within the state
  - Monitoring grid operations
  - Accounting for the quantity of electrical energy transmitted through the State Grid
  - Supervising and controlling inter-state transmission system
  - Carrying out real time operations for grid control and dispatch of electricity within the State

1.8 Key actions taken to fulfil the Mission Statement

a) Maintaining the Transmission System Availability above the normative annual transmission availability factor specified by the Hon'ble Punjab State Electricity Regulatory Commission (Hon'ble PSERC or Hon'ble Commission).

b) Installation of boundary ABT meters at interface points between PSTCL and PSPCL to measure actual transmission loss.

c) Capital Expenditure incurred for upgrading and maintaining the existing transmission infrastructure in the State of Punjab.
d) Capital Expenditure incurred for new schemes and existing schemes where work is in progress.
e) Investments being made in 220 kV and 132 kV transmission works
f) Investments in state of the art oil and diagnostic lab and miscellaneous tools required for operation and maintenance of transmission system
g) Procurement of RTUs for SCADA scheme
h) Pursuing development of Substation Automation for unmanned operations.
i) Procurement of equipment's including voice recording and Islanding scheme in Punjab
j) Periodic filing of MYT petition for determination of tariff and getting approval of the Hon'ble Commission for the capital expenditure works.
k) Formulation of a Corporate Social Responsibility policy to promote sustainable and inclusive development for the benefit of the society at large as a responsible corporate citizen. The focus of CSR initiatives is on geographic areas that are impacted while discharging its statutory responsibilities under the Electricity Act, 2003 and the Rules framed thereunder.
l) Adoption of Safety Manual for safe working practices

1.9 Objective of Business Plan

PSTCL, being the State Transmission Utility, is entrusted with the responsibility of planning, developing, operating and maintaining the State Transmission System to facilitate transmission of electricity from the source to load centres. Being a Transmission Licensee in the State of Punjab, the Aggregate Revenue Requirement (ARR) and Tariff for PSTCL is regulated by the Hon'ble Commission. The Hon'ble Commission is performing various functions as per Section 86(1) of the Act.

Under the powers vested with it under Section 181 of the Act and in compliance to Section 61 of the Act, the Hon'ble Commission notified the PSERC (Terms and Conditions for Determination of Generation, Transmission, Wheeling and Retail Supply Tariff) Regulations, 2019 (herein after referred as "PSERC MYT Regulations, 2019") on May 29, 2019. The effective

date of enforcement of these Regulations is from April 1, 2020 and the three-year Multi Year Tariff ("MYT") Control Period shall be from FY 2020-21 to FY 2022-23.

The Hon'ble Commission has mandated the submission of Business Plan along with Capital investment Plan prior to the approval of Multi Year Tariff Petitions. Regulation 9.1 of the PSERC MYT Regulations, 2019 specifies as under:

> *"The Applicant shall file the Business Plan including the Capital Investment plan for its Generation, Transmission, SLDC and/or Distribution businesses, as the case may be for approval of the Commission on or before 20th August of the year preceding the first year of the Control Period for a duration covering the entire Control Period."*

Further, Regulation 9.4 of the PSERC MYT Regulations, 2019 specifies as under:

> *"The Business Plan for Transmission Business shall be based on proposed generation capacity addition, future load forecasts of the State, planned capacity augmentation by the Central Transmission Utility (CTU) for the State and shall contain among other things the following:*
> *(a) Future plans of the company including efficiency improvement measures proposed to be introduced and technical requirement such as meeting reactive power requirements;*
> *(b) Plan for reduction in transmission losses;*
> *(c)Plan for improvement in quality of transmission service and reliability, metering arrangements and any other new measure to be initiated by the Licensee, e.g. automation, IT initiatives etc.;*
> *(d) Capital Investment Plan based on the above;*
> *(e) Man Power Plan."*

From the above, it is seen that the Business Plan is intended to give a comprehensive and an up-to-date picture of the Company, its market and the impact of new Regulations, and the strategies that PSTCL develops to achieve the Company's goals, carry out its mission and achieve its vision. Accordingly, PSTCL has attempted to develop this Business Plan for the 2nd MYT Control Period with a view to chart out the growth strategy after considering projected revenue and expenses of the Company and evaluating its external business environment.

1.10 Approach and Methodology

PSTCL has prepared the Business Plan including Capital Investment Plan in accordance with the provisions of PSERC MYT Regulations, 2019. The financial projections of PSTCL have been prepared considering that it would be operating as a transmission service provider and the primary source of its revenue would be that earned for providing its service to the users of the transmission network.

The Business Plan for the MYT Control Period considers the following:

- Future plans of the company including efficiency improvement measures proposed to be introduced and technical requirement such as meeting reactive power requirements;
- Plan for reduction in transmission losses;
- Plan for improvement in quality of transmission service and reliability, metering arrangements and any other new measure to be initiated by the Licensee, e.g. automation, IT initiatives etc.;
- Capital Investment Plan based on the above;
- Man Power Plan.

2 Business Overview

2.1 Operational Performance

2.1.1 Existing Transmission Network

After the erstwhile PSEB was unbundled on April 16, 2010, all the transmission related assets were transferred to PSTCL. PSTCL owns the transmission network over diverse topology and has a very old transmission system, which required major up-gradation. The transmission network comprises of transmission assets at voltage level of 400 kV, 220 kV and 132 KV. Post the unbundling, capital investments were made to strengthen and enhance the capacity of the transmission network in the State. The existing network details of PSTCL are summarised as under:

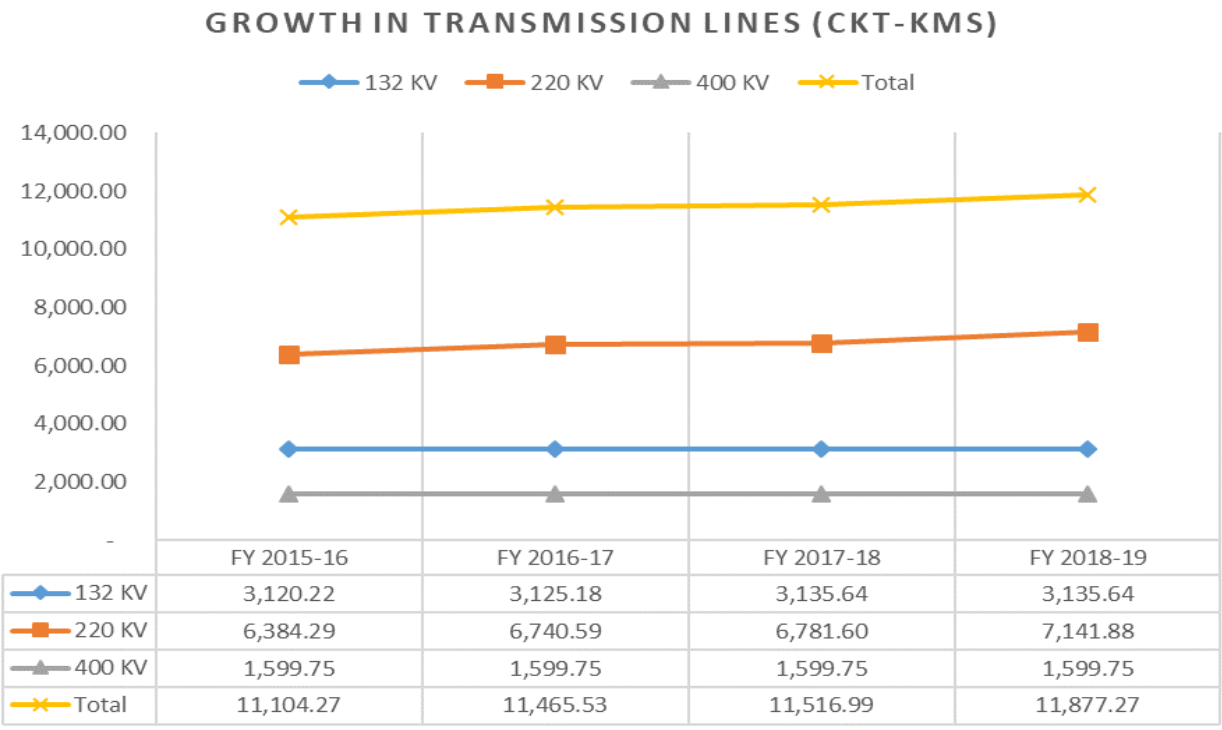
Transmission Lines:

PSTCL has an extensive network of 400 kV, 220 kV, and 132 kV transmission lines to transmit bulk power generated at various generating stations in the State of Punjab and the share of power generated by Central Sector Stations to load centres in the State. The total length of transmission lines was 11,877.27 ckt-km as on March 31, 2019. The details of the Transmission Lines are as under:

Table 1: Transmission Lines as on March 31, 2019

Voltage Level	Single/Double Circuit	Transmission Line Length (ckt-km)
132 KV	Single Circuit	2536.32
	Double Circuit	599.32
220 KV	Single Circuit	4189.79
	Double Circuit	2952.09
400 KV	Single Circuit	329.00
	Double Circuit	1270.75
Total		11877.27

The growth of transmission lines over previous years is depicted in the following Figure. It is observed that overall length of transmission lines has been increased at a CAGR of 2.22% from FY 2015-16 till FY 2018-19.



	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
132 KV	3,120.22	3,125.18	3,135.64	3,135.64
220 KV	6,384.29	6,740.59	6,781.60	7,141.88
400 KV	1,599.75	1,599.75	1,599.75	1,599.75
Total	11,104.27	11,465.53	11,516.99	11,877.27

Figure 2: Growth in Transmission Line (Ckt Kms)

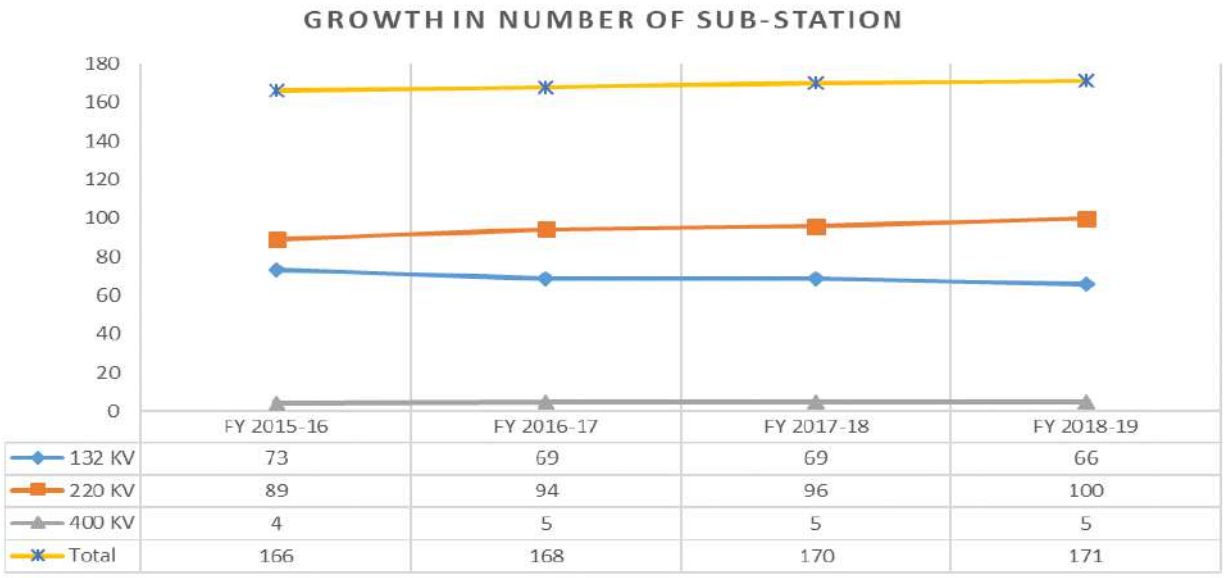
Sub-stations

PSTCL has a large number of sub-stations for transforming power into different voltage levels and to transmit the same to various load centres of the State through the transmission lines. PSTCL had a total of 171 nos. of sub-stations as on March 31, 2019, feeding the load centres through 1236 nos. of incoming & outgoing bays at different voltage levels. The table below summarises the number of sub-stations and number of incoming and outgoing bays at different voltage levels:

Table 2: Number of Sub-stations and bays as on March 31, 2019

Particulars	Voltage Level	Numbers
Sub-Stations	**132 KV**	66
	220 KV	100
	400 KV	5
	Total	**171**
Transmission Bays (Incoming & Outgoing)	**132 KV**	505
	220 KV	669
	400 KV	62
	Total	**1236**

The growth in number of Sub-stations over previous years is depicted in the following Figure. It is observed that number of Sub-stations have been increased at a CAGR of 1% from FY 2015-16 till FY 2018-19.



	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
132 KV	73	69	69	66
220 KV	89	94	96	100
400 KV	4	5	5	5
Total	166	168	170	171

Figure 3: Growth in Number of Sub-Station

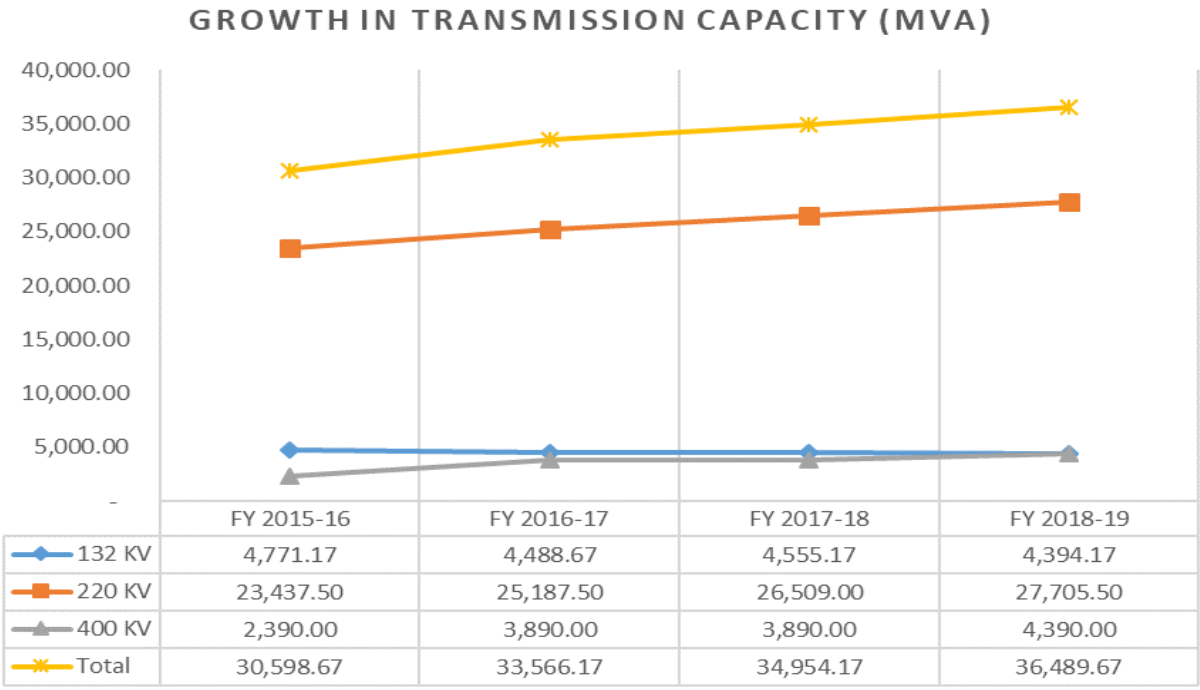
Transmission System Capacity

PSPTCL has been undertaking capital investment under various schemes to augment its transmission system capacity. The total transformation capacity of the system was ~36,490 MVA as on March 31, 2019. The table below depicts the transformation capacity at various voltage levels:

Table 3: System transmission Capacity as on 31st March, 2019

Voltage Level	Transformation Capacity (MVA)
132 kV Sub-Station	4394.17
220 kV Sub-Station	27705.50
400 kV Sub-Station	4390.00
Total	36489.67

The growth in transmission capacity over previous years is depicted in the following Figure. It is observed that transmission capacity has been increased at a CAGR of 6.04% from FY 2015-16 till FY 2018-19.



	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
132 KV	4,771.17	4,488.67	4,555.17	4,394.17
220 KV	23,437.50	25,187.50	26,509.00	27,705.50
400 KV	2,390.00	3,890.00	3,890.00	4,390.00
Total	30,598.67	33,566.17	34,954.17	36,489.67

Figure 4: Growth in Transmission Capacity (MVA)

2.1.2 Transmission System Availability

The Transmission System Availability is an indicator of consistent and reliable operations of the transmission system. Availability of transmission system ensures continuous and uninterrupted supply to the end consumers of the Distribution Company along with providing continuous transmission access to the State Generating Stations, Central Generating Stations and Open Access customers.

PSTCL has strived for better performance for the benefit of the State by continuously improving the system availability. PSTCL has also been undertaking repair and maintenance work as required for optimum system performance. The transmission system availability has consistently been on the higher side over the years. The details of Transmission System Availability are as shown below:

Table 4: Transmission System Availability over past years

Voltage Level	FY 2011-12	FY 2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
132 kV	99.75%	99.89%	99.75%	99.82%	99.84%	99.88%	100.00%	100.00%
220 kV	99.85%	99.86%	99.87%	99.83%	99.95%	99.93%	99.97%	99.79%
400 kV	-	-	99.35%	99.70%	99.91%	99.91%	99.89%	99.95%

2.1.3 Transmission Losses

The actual transmission losses in the network in FY 2018-19 had been 2.86%. The same have reduced by an absolute 0.26% since the last financial year i.e. 2017-18.

2.2 Financial Performance

For projecting the trajectory for the Control Period, the financial performance has also been reviewed. It may be noted that the financial statements of PSTCL and SLDC are combined for past period. The financial performance of PSTCL has been discussed below:

2.2.1 Revenue Statement

A brief synopsis of the audited Profit and Loss Accounts for FY 2015-16 to FY 2018-19 is given below:

Table 5: Profit and Loss Statement of PSTCL (including SLDC)(Rs. Crore)

Particulars	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
INCOME				
Revenue from Operations	1,177.18	1,243.16	1,182.46	1,245.39
Other income	29.9	32.01	132.43*	35.83
Total	1,207.08	1,275.16	1,314.89	1,281.22
EXPENDITURE				
Employee benefit expenses	403.88	441.96	472.17	472.61
Finance costs	476.46	507.4	504.3	466.79
Depreciation expenses	251.38	261.37	268.84	277.03
Other expenses	-	-	-	
i) Repairs & Maintenance	33.80	26.06	22.81	33.53
ii) A & G General expense	16.69	17.98	27.97	25.88
iii) ULDC charges	11.76	9.93	10.73	7.68
iv) Others debits	1.65	4.33	3.07	4.59
Total	1,195.62	1,269.03	1,309.89	1,288.11
Profit/(Loss) before Tax	11.46	6.13	5.00	(6.89)
Tax liability	0.31	1.19	-	-
Profit/(Loss) after tax	11.77	4.94	5.00	(6.89)

**includes one-time Sundry credit balances written back. Rs 99.84 crore is on account of non-refundable and unclaimed credits lying under deposits/contributory works written back during the year.*

The contribution of different elements in the overall expenses have remained fairly constant in a range over the years. In any typical year, the Revenue from Operations remains in the range

of Rs 1150 crore to Rs 1250 crore. On the expense side, the contribution of each element have also remained in the respective ranges as shown in the pie chart below. The same essentially demonstrates the consistent approach of the Hon'ble Commission in approval of expenses that can be recovered from the consumers in the form of tariffs.

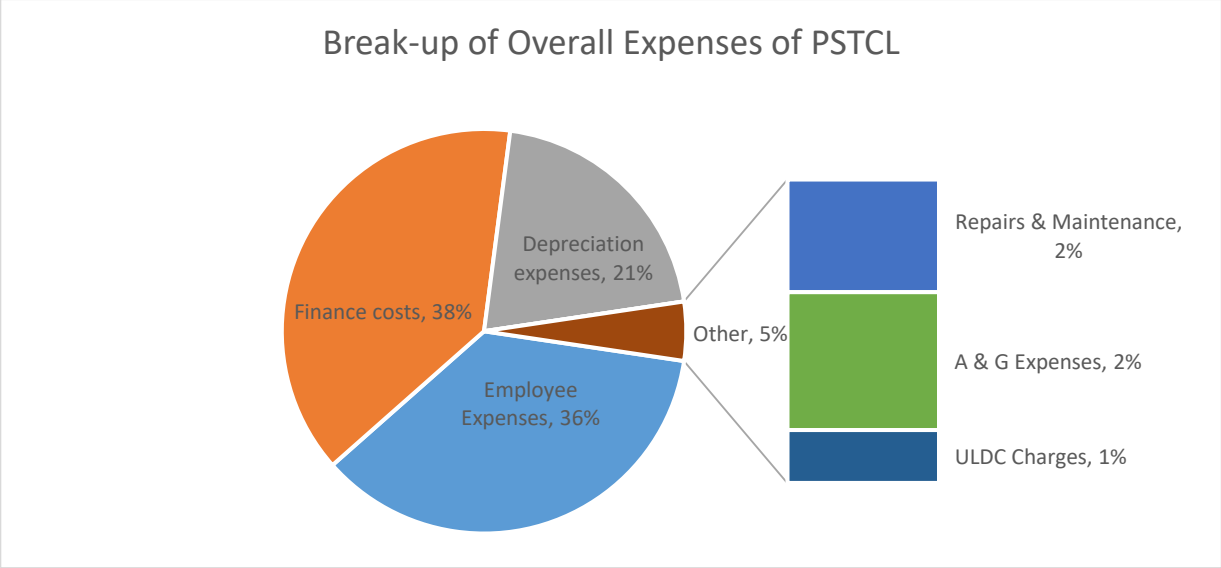


Figure 5: Break-Up of Overall Expenses of PSTCL

The Employee expenses includes salaries and allowances paid to the employees. Apart from this, employee benefit expenses include other terminal benefits such as National Pension Scheme, etc. Besides the above, as per the Transfer Scheme, PSTCL has to contribute 11.36% to the Employee benefit trust for Pension, Gratuity and Leave. This cost is paid on actual basis and accounted for accordingly.

2.2.2 Balance Sheet

The overall balance sheet of PSTCL over the years is summarised below:

Table 6: Profit and Loss Statement of PSTCL (including SLDC)(Rs. Crore)

#	Particulars	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
I	**Assets**				Rs Crore
1	**Non-Current assets**				
	Property, Plant and Equipment	6,527.99	6,761.01	7,067.60	7,142.13
	Capital work in Progress	872.32	791.07	550.48	417.32
	Financial Assets	3.92	3.94	2.35	1.90
	Other Non-current assets	584.41	56.61	57.13	63.52
	Total	**7,612.63**	**7,612.63**	**7,677.56**	**7,624.86**
2	**Current assets**				

#	Particulars	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19
	Inventories	21.52	17.99	17.39	25.93
	Financial Assets	387.73	591.70	338.69	267.08
	Current tax assets (Net)	36.69	38.85	49.02	56.22
	Other current assets	0.28	4.51	0.52	0.33
	Total	**446.21**	**653.05**	**405.61**	**349.57**
3	**Grand Total**	**7,909.06**	**8,265.68**	**8,083.17**	**7,974.43**
II	**Equity And Liabilities**				
1	**Equity**				
	Equity Share capital	605.88	605.88	605.88	605.88
	Other Equity	2,250.12	2,254.90	2,258.93	2,248.36
	Total	**2,856.00**	**2,860.78**	**2,864.81**	**2,854.24**
2	**Liabilities**				
	Non-Current Liabilities				
	Financial liabilities	4,033.73	4,377.24	4,489.21	4,489.21
	Provisions	4.68	9.38	11.20	15.23
	Other non-current liabilities	119.49	132.90	31.94	81.99
	Total	**4,157.91**	**4,519.52**	**4,532.34**	**4,363.17**
3	**Current Liabilities**				
	Financial Liabilities	887.53	880.31	637.34	684.25
	Other current liabilities	7.57	4.99	5.17	8.55
	Provisions	0.05	0.08	0.33	0.43
	Deferred Revenue	-	-	43.19	63.78
	Total	**895.15**	**885.38**	**1,323.36**	**757.02**
4	**Grand Total**	**7,909.06**	**8,265.68**	**8,083.17**	**7,974.43**

From the balance sheet, it is apparent that PSTCL is adding assets of around Rs 200 crore on an annual basis in its Gross Fixed Assets. Besides, there are capital assets under various construction phases to the extent of Rs 500 – 700 crores. The expenditure towards capital expenditure is incurred through deployment of loan funding, equity, internal accruals and also from the grant received from Central/State Governments and Multilateral agencies.

2.3 Health and Safety Management in PSTCL

PSTCL believes that while operating the transmission system, safe and secure operation and safety of employees is of prime concern. PSTCL is committed to identify and assess all types of occupational health and safety risks and takes proactive steps to reduce the significant risk in turn to reduce the occurrences of incidents. Further, Safety Manual for PSTCL has been approved by the BOD and uploaded on website of PSTCL.

In order to promote the good health of the employees, seminars are held at regular intervals with cooperation and coordination with health expert. Further, to facilitate the cashless

treatment to PSTCL's employees, Agenda for adopting suitable policy is under consideration of Board of Directors.

2.4 Corporate Social Responsibility (CSR)

CSR policy has already been adopted by PSTCL and CSR trust has been created to carry out the schemes envisaged under the policy framework.

3 Regulatory Framework and Market Assessment

3.1 Statutory and Regulatory Framework

The Statutory and Regulatory Framework is depicted in following figure:

National Level Framework	State Level Framework
• Electricity Act, 2003 • National Electricity Policy • Tariff Policy	• PSERC MYT Regulations, 2019 • PSERC (Punjab State Grid Code) Regulations, 2013 • PSERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011

Figure 6: Statutory and Regulatory Framework for Punjab

3.1.1 National Level Framework

Electricity Act, 2003: -

The Act requires State Governments to initiate major changes in industry structure and operation of Power Sector in the State. The broad objectives of the Act as incorporated in its preamble is to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and for taking measures conducive to development of electricity industry through way of reforms and restructuring, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto Section 2(73) of the Act defines a Transmission licensee as a licensee authorized to establish and operate transmission lines. Further Section 40 of the Act defines the duties of the transmission licensees as below:

*"**Section 40. (Duties of transmission licensees):***

It shall be the duty of a transmission licensee -

(a) to build, maintain and operate an efficient, co-ordinated and economical inter-State transmission system or intra-State transmission system, as the case may be;

(b) to comply with the directions of the Regional Load Despatch Centre and the State Load Despatch Centre as the case may be;

(c) to provide non-discriminatory open access to its transmission system for use by-

(i) any licensee or generating company on payment of the transmission charges; or

(ii) any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission:

Provided that such surcharge shall be utilised for the purpose of meeting the requirement of current level cross-subsidy"

Also, as discussed earlier, PSTCL is notified as State Transmission Utility and has to undertake the functions of State Transmission Utility as specified in Section 39 of the Act as under:

"***Section 39. (State Transmission Utility and functions):***

(1) The State Government may notify the Board or a Government company as the State Transmission Utility:

Provided that the State Transmission Utility shall not engage in the business of trading in electricity:

Provided further that the State Government may transfer, and vest any property, interest in property, rights and liabilities connected with, and personnel involved in transmission of electricity, of such State Transmission Utility, to a company or companies to be incorporated under the Companies Act,1956 to function as transmission licensee through a transfer scheme to be effected in the manner specified under Part XIII and such company or companies shall be deemed to be transmission licensees under this Act.

(2) The functions of the State Transmission Utility shall be -

(a) to undertake transmission of electricity through intra-State transmission system;

(b) to discharge all functions of planning and co-ordination relating to intra-State transmission system with –

(i) Central Transmission Utility;

(ii) State Governments;

(iii) generating companies;

(iv) Regional Power Committees;

(v) Authority;

(vi) licensees;

(vii) any other person notified by the State Government in this behalf;

(c) to ensure development of an efficient, co-ordinated and economical system of intra-State transmission lines for smooth flow of electricity from a generating station to the load centres;

(d) to provide non-discriminatory open access to its transmission system for use by-

(i) any licensee or generating company on payment of the transmission charges; or

(ii) any consumer as and when such open access is provided by the State Commission under sub-section (2) of section 42, on payment of the transmission charges and a surcharge thereon, as may be specified by the State Commission:

Provided that such surcharge shall be utilised for the purpose of meeting the requirement of current level cross-subsidy:

Provided further that such surcharge and cross subsidies shall be progressively reduced in the manner as may be specified by the State Commission:

Provided also that the manner of payment and utilisation of the surcharge shall be specified by the State Commission:

Provided also that such surcharge shall not be leviable in case open access is provided to a person who has established a captive generating plant for carrying the electricity to the destination of his own use."

National Electricity Policy: -

The National Electricity Policy was notified by GoI as per provisions of the Act on February 12, 2005. This Policy aims at accelerated development of the power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources, technology available to exploit these resources, economics of generation using different resources and energy security issues.

The development of the National Grid is an important feature of the Policy. The Policy states that the Transmission System requires adequate and timely investments and also efficient and coordinated action to develop a robust and integrated power system for the country. It further

recognizes that there is need for adequately augmenting transmission capacity in view of the massive increase planned in generation and also for development of power market.

The Policy notes that in view of the required magnitude of the expansion of the sector, a sizeable part of the investment requirement will need to be brought in from the private sector. In keeping with this, it specifies that special mechanisms would be created to encourage private investment in the transmission sector so that sufficient investments are made for achieving the objective of demand to be fully met by 2012.

The National Electricity Policy notified on 12th February, 2005 inter-alia states that

> *"5.3.1 The Transmission System requires adequate and timely investments and also efficient and coordinated action to develop a robust and integrated power system for the country.*
>
> *5.3.2 Keeping in view the massive increase planned in generation and also for development of power market, there is need for adequately augmenting transmission capacity……..*
>
> *5.3.10 Special mechanisms would be created to encourage private investment in transmission sector so that sufficient investments are made for achieving the objective of demand to be fully met by 2012.*
>
> *5.8.1 ……. Considering the magnitude of the expansion of the sector required, a sizeable part of the investments will also need to be brought in from the private sector. The Act creates a conducive environment for investments in all segments of the industry, both for public sector and private sector, by removing barrier to entry in different segments. Section 63 of the Act provides for participation of suppliers on competitive basis in different segments which will further encourage private sector investment."*

In order to facilitate the smooth and rapid development of transmission capacity in the country as envisaged in the National Electricity Policy, some transmission projects will be identified for tariff based competitive bidding, in which Private Investors and Transmission Utilities, both Central and State, can participate.

National Tariff Policy: -

The Tariff Policy was notified by Ministry of Power (MoP), GoI on 6th January 2006 and revised Tariff Policy was notified on January 28, 2016, deals with several aspects pertaining to Transmission as under –

- Transmission Pricing
- Approach for allocation of Transmission Loss
- Other issues in transmission

The Tariff Policy, as far as transmission is concerned, seeks to achieve the following objectives:

- Ensure optimal development of the transmission network to promote efficient utilization of generation and transmission assets in the country;
- Attract required investments in the transmission sector and provide adequate returns.

It is desirable to move to a system of loss compensation based on incremental losses as present deficiencies in transmission capacities are overcome through network expansion. Further, it is mentioned that, in extraordinary circumstances including threat to security to the State, public order or natural calamity, if the Central Government allocates power out of the unallocated share of the Central Generating Stations or otherwise, such allocation of power will have priority over short-term, medium-term and long-term access in this order.

Revised Tariff Policy also covers the aspect of the ancillary services, wherein Central Commission may introduce norms and framework for ancillary services, including the method of sharing the charges, necessary to support the power system or grid operation for maintaining power quality, reliability and security of the grid. Similar framework shall also be adopted by the State Commission.

Tariff through Competitive Bidding: -

The GoI issued guidelines for encouraging competition in transmission projects on April 17, 2006. The guidelines provide for the identification of some transmission projects for tariff based competitive bidding, in which Private Investors and Transmission Utilities, both Central and State, can participate. This would facilitate the smooth and rapid development of transmission capacity in the country as envisaged in the National Electricity Policy. The guidelines for tariff based competitive-bidding for transmission service are aimed at facilitating competition in this

sector through wider participation in providing transmission services and tariff determination through a process of bidding. The guidelines aim to select a transmission service provider for a new transmission line and to build, own, maintain and operate the specified transmission system elements. The specific objectives of these guidelines are as follows:

- Promote competitive procurement of transmission services;
- Encourage private investment in transmission lines;
- Facilitate transparency and fairness in procurement processes;
- Facilitate reduction of information asymmetries for various bidders;
- Protect consumer interests by facilitating competitive conditions in procurement of transmission services of electricity;

Also, MoP has already considered a stand that from January 2011, all thermal power projects and transmission systems will be awarded on competitive tariff bidding and therefore, in case any STU or CTU need to develop the transmission system, the same has to be through tariff competitive bidding route.

3.1.2 Role of CEA

The Central Electricity Authority (CEA) constituted under Electricity Supply Act 1948, is a body for advising GoI on technical matters and is responsible for preparing National Electricity Plan in accordance with the National Electricity Policy. CEA is also entrusted with the responsibility of preparing the Load Generation Balancing Reports which helps the utilities to prepare their generation and transmission capabilities. CEA also prescribes the Technical Standards for design and development of transmission networks.

3.1.3 State Level Framework

The Hon'ble Commission notified the PSERC MYT Regulations, 2019, to determine the tariff for transmission of electricity in the State. PSTCL has been vested with the function of electricity transmission by the State Government of Punjab post its formation on April 16, 2010. The Business of the Company includes:

- Transmission of electricity in the State
- Providing evacuation arrangement in synchronisation with the capacity addition
- Prepare a Transmission Plan

- ❖ Maintain Grid Stability and Security
- ❖ Manage Load dispatch operation in the state

Apart from this, operation of PSTCL is also governed by PSERC (Punjab State Grid Code) Regulations, 2013, in order to operate the intra-State Transmission System in integration with National Grid.

In order to provide non-discriminatory Open Access, PSERC (Terms and Conditions of Intra-State Open Access) Regulations, 2011 is applicable to PSTCL.

3.2 Industry Scenario

There has been significant capacity addition in the generation sector in the last decade. From an overall energy deficit of ~10% in FY 2010-11, the power sector in India has reached an energy surplus scenario of ~4% in FY 2018-19. On the peak power requirement, the overall shortages of ~15000 MW (13%) have turned around into a surplus of 2.5% as shown in the table below:

Table 7: All India Historical Demand Supply Gap

FY	Energy				Peak			
	Req.	Avl.	Surplus (+)/ Deficit (-)		Req.	Avl.	Surplus (+)/ Deficit (-)	
	MU	MU	MU	%	MW	MW	MW	%
2019-20*	347,771	346,208	-1,563	-0.4	183,673	182,533	-1,140	-0.6
2018-19	1,274,595	1,267,526	-7070	-0.6	177,022	175,528	-1494	-0.8
2017-18	1,213,326	1,204,697	-8,629	-0.7	164,066	160,752	-3,314	-2
2016-17	1,142,929	1,135,334	7,595	-0.7	159,542	156,934	-2,608	-1.6
2015-16	1,114,408	1,090,850	-23,558	-2.1	153,366	148,463	-4,903	-3.2
2014-15	1,068,923	1,030,785	-38,138	-3.6	148,166	141,160	-7006	-4.7
2013-14	1,002,257	959,829	-42,428	-4.2	135,918	129,815	-6103	-4.5
2012-13	995,557	908,652	-86,905	-8.7	135,453	123,294	-12,159	-9
2011-12	937,199	857,886	-79,313	-8.5	130,006	116,191	-13,815	-10.6
2010-11	861,591	7,88,355	-73,236	-8.5	1,22,287	1,10,256	-12,031	-9.8

Source: CEA *Up to June 2019 [Req. – Requirement; Avl. – Availability]

Similarly, region-wise demand supply gap as in June 2019 is shown in the following:

Table 8: Region-wise Demand Supply Gap in June 2019

Region	Energy (MU)			Peak (MW)		
	Req.	Avl.	Surplus (+)/ Deficit (-)	Req.	Avl.	Surplus (+)/ Deficit (-)
Northern	40,978	40,586	-1%	65,950	64,838	-2%
Western	33,248	33,248	0%	56,887	56,768	0%
Southern	28,502	28,485	0%	44,844	44,844	0%
Eastern	13,127	13,127	0%	24,113	24,113	0%

Region	Energy (MU)			Peak (MW)		
	Req.	Avl.	Surplus (+)/ Deficit (-)	Req.	Avl.	Surplus (+)/ Deficit (-)
NER	1,560	1,500	-4%	2,922	2,861	-2%

Source: CEA [Req. – Requirement; Avl. – Availability]

It is seen that Northern Region suffers from minor shortages of ~400 MU which is <1% of the energy requirement in the region. The overall peak shortages were around ~1100 MW which was highest amongst the other regions. The rest of the regions have insignificant peaking shortages in the month.

Further, the demand supply position of State of Punjab is given in the following table:

Table 9: Demand Supply Gap in Punjab for Last Five Years

Year	Energy			Peak		
	Req.	Avl.	Surplus (+)/ Deficit (-)	Req.	Avl.	Surplus (+)/ Deficit (-)
	MU	MU	%	MW	MW	%
2017-18	53098	53098	0%	11408	11408	0%
2016-17	54812	54812	0%	11705	11705	0%
2015-16	49687	49675	0%	10852	10852	0%
2014-15	48629	48144	-1%	11534	10023	-13%
2013-14	47821	47085	-2%	10089	8733	-13%

Source: *CEA LGBR [Req. – Requirement; Avl. – Availability]

As per actual data captured in CEA LGBR reports, there is no shortage in energy terms as also the peak MW requirements in the state. As per actual data, the actual peak demand handled by PSTCL was 12638 MW.

Given the increase in energy availability in the state, it is important that transmission bottlenecks in the system are removed and that the surplus energy could be sold to consumers outside the state.

In the State of Punjab, the distribution licensee, PSPCL is receiving the power through the network of the single transmission licensee, PSTCL. Apart from this, some of the short-term Open Access consumers, which are connected to network of PSPCL and/or PSTCL also share the capacity of transmission network. For safe and secure operation of technical and commercial transactions, after taking into account the network security, it is pertinent to understand the transfer capability of the control area. Further, Punjab State Grid Code specifies that Available Transfer Capability (ATC) of the inter-control area transmission system

available for scheduling commercial transactions (through long-term access, medium-term open access and short-term open access) in a specific direction shall be Total Transfer Capability less Transmission Reliability Margin.

The Transmission Reliability Margin signifies the amount of margin kept in the total transfer capability necessary to ensure that the interconnected transmission network is secure under a reasonable range of uncertainties in system conditions. Earlier, Transmission Reliability Margin for Punjab area was decided as 300 MW, however, it was further considered as 600 MW for the 2019.

Table 10: Available Transfer Capability for Punjab (in MW)

Duration	Total Transfer Capability (MW)	Reliability Margin (MW)	Available Transfer Capability (MW)	Long-Term Access and Medium-Term Open Access (MW)	ATC for Short-Term Open Access (MW)
May 1, 2019	7000	600	6400	4680	1720
May 1, 2018	6700	600	6100	4930	1170
May 1, 2017	6400	500	5900	4102	1798
May 1, 2016	6200	500	5700	4033	1667
Oct 1, 2015	5700	300	5400	3790	1610

Considering the present demand of transmission capacity and Available Transfer Capability, there is no congestion in the intra-State transmission network of PSTCL. Further, PSTCL also aims to plan intra-State network in such a way that it would avoid congestion in network and ensure the smooth operation of technical and commercial transactions.

In light of the foregoing, considering the growing demand in the State and the need to provide secure and safe transmission system for market participants, PSTCL has to maintain and improve its operational performance and capital investment for transmission network.

4 Capital Investment Plan

4.1 Regulatory Provisions for Capital Investment Plan

As per MYT Regulations, Capital Investment Plan for the transmission company is governed by the following regulations:

"9.4 The Business Plan for Transmission Business shall be based on proposed generation capacity addition, future load forecasts of the State, planned capacity augmentation by the Central Transmission Utility (CTU) for the State and shall contain among other things the following:

a) Future plans of the company including efficiency improvement measures proposed to be introduced and technical requirement such as meeting reactive power requirements;

b) Plan for reduction in transmission losses;

c) Plan for improvement in quality of transmission service and reliability, metering arrangements and any other new measure to be initiated by the Licensee, e.g. automation, IT initiatives etc.;

d) Capital Investment Plan based on the above;

e) Man Power Plan.

9.6 Capital Investment in network expansion in Transmission and Distribution shall be based on Load Flow studies and in accordance with the requirements of the State Grid Code.

9.7 The Capital Investment Plan covering the entire MYT Control Period will be submitted in the following two parts:

a) Ongoing schemes of the previous MYT Control Period (i.e. works / schemes which are under construction or where full payments have not yet been made). All spillover works will be included in this;

b) Schemes to be taken up in the order of priority giving the schedule over the full MYT Control Period. In case it is likely to take more than 3 years, the likely date of completion should also be given. This will also include such schemes which were part of the Capital Investment Plan of the previous MYT Control Period but could not be started and which the Applicant considers necessary to take up during the present Control Period.

9.8 The Applicant shall submit the Detailed Project Reports (DPRs) for all the schemes as per Part (a) and (b) above which shall include:

(a) Purpose of investment;

(b) Broad Technical Specifications of the proposed investment and supporting details;

(c) Capital Structure;

(d) Capitalization Schedule;

(e) Financing Plan, including identified sources of investment;

(f) Physical targets;

(g) Cost-benefit analysis;

(h) Prioritization of proposed Investments:

Provided that DPRs will not be necessary for schemes under Rs. 10 Crore for Generation and Transmission Businesses, Rs. 5 Crore for Distribution Business and Rs. 1 Crore for SLDC:

Provided further that the total capital expenditure on non-DPR schemes in any year should not exceed 20% of that for DPR schemes during that year.

9.9 The capital investment plan shall match with:

……(b) For Transmission Business:

i) Nature of investment (evacuation project, system augmentation, system strengthening, IT related projects etc.);

ii) Details of physical parameters of the project such as circuit-kms, capacity in MVA, location of the project etc.;

iii) Break-up of investment in capacitor banks, reduction in reactive power drawal and transmission losses;

9.10 In case of existing Generation and Transmission projects, the capital investment for Renovation and Modernization shall consist of a Detailed Project Report which will include the following elements:

(a) Complete scope and justification;

(b) Estimated life extension;

(c) Improvement in performance parameters;

(d) Cost-benefit analysis;

(e) Phasing of expenditure;

(f) Schedule of completion;

(g) Reference price level;

(h) Estimated completion cost including IDC etc.;

(i) Other aspects.

9.12 In case, the Commission approves lesser amount of capital expenditure than filed by the Applicant for approval, the Commission may allow the respective Applicant to determine the priority of schemes to be considered within the approved amount.

9.13 In the normal course, the Commission shall not revisit the approved capital investment plan during the Control Period. The Licensee shall file details of the capital expenditure incurred for the preceding financial year by 30th June of the current financial year to enable the Commission to monitor and review the progress of the capital expenditure incurred by the Applicant vis-à-vis the approved capital expenditure:

Provided that the capital expenditure incurred shall be only for the schemes as per the approved capital investment plan.

9.14 In case capital expenditure is required for emergency work which has not been approved in the capital investment plan, the Applicant shall submit an application (containing all relevant information along with reasons justifying emergency nature of the proposed work) seeking approval by the Commission. The Applicant may take up the work prior to the approval of the Commission provided that the scheme has been approved by its Board of Directors as being of emergent nature:

Provided that the Applicant shall submit the pending details required as per Regulation 9.8 and 9.9 within 10 days of the submission of the application for emergency work:

Provided further that for the purpose of Regulation 9.11, such approved capital expenditure shall be treated as a part of actual capital expenditure incurred by the Applicant in addition to the capital expenditure already approved by the Commission.

9.15 In case the capital expenditure incurred for approved schemes exceeds the amount as approved in the capital expenditure plan, the balance amount and the incidental cost shall be trued up by the Commission after prudence check after the end of Control Period:

Provided that any additional capital expenditure incurred on account of time over run and/or unapproved changes in scope of approved schemes except for reasons beyond the control of Licensee and duly submitted in writing may not be allowed by the Commission:
Provided that capital expenditure incurred on unapproved schemes and not covered under Regulation 9.11 shall not be allowed by the Commission.

9.16 An Applicant shall provide a copy of the proposed Capital Investment Plan for Generation and/or Distribution Business, as the case may be, to the State Transmission Utility (STU) for carrying out planning for network augmentation/ strengthening at the time of filing of this plan with the Commission. The copy of approved capital investment plan shall also be sent to the STU by the Applicant, immediately after approval by the Commission."

In line with the provisions of the Regulations, PSTCL has undertaken the required studies and based on the above, the capital expenditure plan has been proposed under two verticals viz:

a. Spill over schemes – schemes initiated in the previous control period and will be completed in the ensuing control period.
b. New Schemes comprising of:
    - envisaged/approved under previous control period and will be initiated in the ensuing control period carried forward from previous control periods
    - New Schemes – Schemes to be initiated in the ensuing control period.

4.2 Planning Philosophy

PSTCL undertakes the planning of the intra-State Transmission System based on Planning Criteria and philosophy specified in PSERC (State Grid Code) Regulations 2013 and Transmission Planning Criteria stipulated by Central Electricity Authority, 2013.

The proposed Capital Investment Plan has been planned on the basis of envisaged power requirements as per 19th EPS projections of CEA, inputs received from SLDC and PSPCL related to system constraints, operational constraints and expected load growth & generation addition respectively.

It may be noted that PSTCL transmission network caters to the demand of its transmission system users, which primarily includes demand of PSPCL and demand of Open Access consumers. The following are the key considerations in the proposed capital investment plan:

a) Cater to additional load requirement in the state of Punjab.
b) System Augmentation to remove overloading in transmission lines and substations.
c) To increase the reliability of the equipment and consequently of the transmission system so as to provide consistent availability of network
d) To disperse additional power availability.

The plan aims to meet the requirement of power within the state by ensuring that adequate transmission capacity is available for evacuation of power from outside the state through 400 kV network. Load flow studies have been carried out for the projected loads and the available generation for the time frame covered in the control period for various system operating conditions.

Load Requirement in Punjab

As per 19th EPS data, the energy consumption in the State of Punjab is expected to reach 71508 MUs by FY 25. Similarly, the peak MW requirement in the state in FY 25 is expected to be 17217 MW. The year on year trajectory of growth in energy requirement as also the peak MW is shown in the table below:

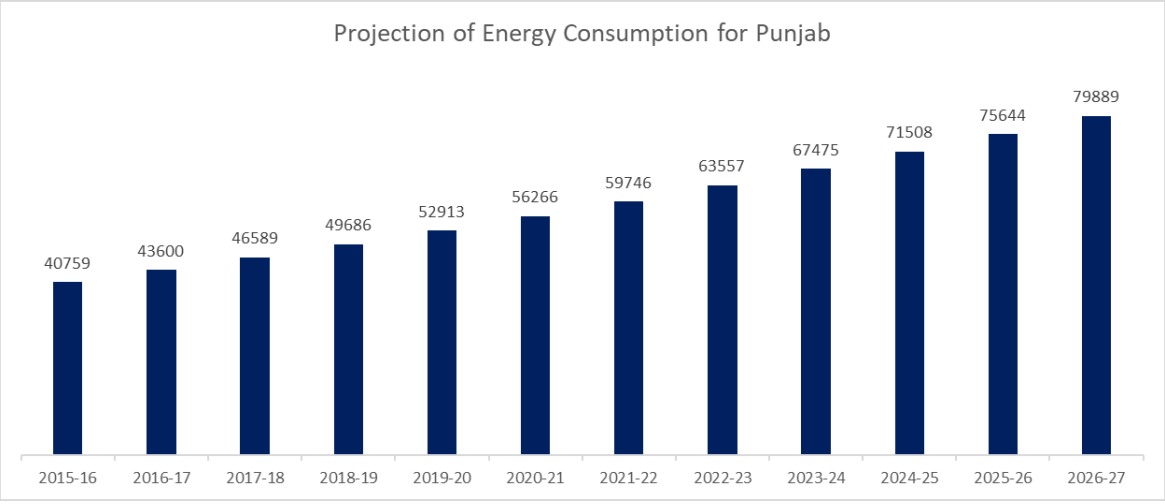


Figure 7: Projection of Enegry Consumption for Punjab
Source: CEA 19th EPS Projections

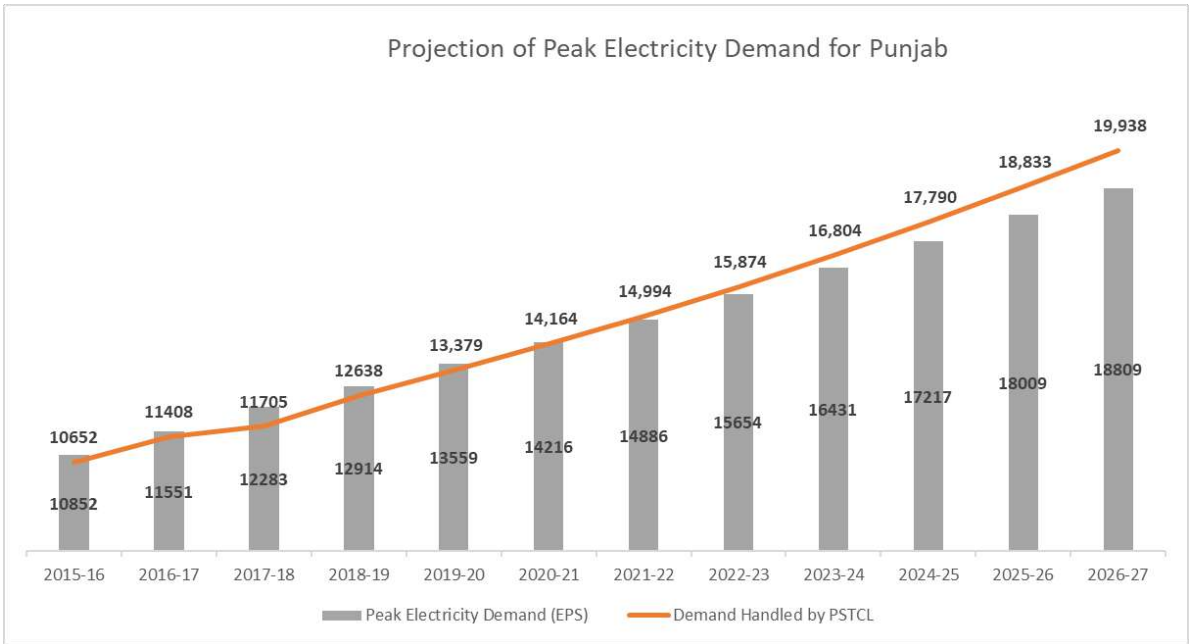


Figure 8: Projection of peak Electricity Demand for Punjab (MW)
Source: CEA 19th EPS ; SLDC. Energy Handled is actual till FY 19 and projections for ensuing years

As per data made available by SLDC, the peak demand already handled in FY 19 had been ~12638 MW. The actual demand is therefore aligned to the 19th EPS projections. The actual demand handled by SLDC over the years FY 2015-16 to FY 2018-19 has increased at a CAGR of ~5.62%. In case this escalation rate is considered on current peak requirements, the projected peak load requirement may supersede the EPS projections in FY 2022-23 as shown in the graph above.

Catering to the aforesaid demand lead to increase in loading of the transmission system as depicted in the Load flow results annexed as K0-K01. Going forward, PSTCL has envisaged that maximum load enhancement is likely to come from Gobindgarh area (~40%) and Ludhiana area (25%). Considering the load requirement of 15654 MW in FY 2022-23, PSTCL understands that the existing generation from PSPCL units is likely to be in the range of ~6000 MW (including 4X210MW GGSSTP generation and 700MW approx.) as hydel generation of Punjab). Accordingly, the balance power requirement of around ~9950 MW has to be sourced from sources located outside the state of Punjab from 400 kV inter-state grid of PGCIL. Results of load generation balance for this scenario as annexed as K1.

Existing system of PSTCL transmission network has been planned for 2020 system loading conditions. Central Electricity Authority has fixed some inter-state power drawl limit for each state and for Punjab the current limit is 7000MW/6400 MW. Therefore, drawal of 9950 MW of power from outside the state will result over stressing of the 400 kV inter-state grids of PGCIL. In addition to increased losses, the same will result in increased reactive power drawl from the system as well as distributed voltage profile of various buses. The detail of overloaded lines as well as transformers is attached herewith as Annexure- K2-K3. Further, in case the drawal from outside the state is merged with the scenario of outage of GGSSTP, the overload conditions of the lines are provided as Annexure K4-K6.

Proposed Schemes to be undertaken during the Control Period

To meet this growing demand, a reliable, adequate and robust transmission network is required. In view of this, the existing transmission system is required to be strengthened with proper planning to cater to the future demand in a reliable manner.

The overall schemes have been split under two sections as per provisions of the Tariff Regualtions:

a. Spill Over Schemes
b. New Schemes

i) Spill Over Schemes

Under this vertical, all the remaining transmission works of MYT plan 2017-20 have been considered for implementation during the control period FY 2020-23. Besides the above, certain changes have been made to the proposed schemes based on system requirements post issuance of order for the MYT order. The same have been provided in detail in Annexure-1.

Besides, the above, PSTCL is undertaking additional works pursuant to approval of the Board. A summary of the amendments considered in the schemes is provided below for reference:

Table 11: Additional Schemes undertaken based on Board Approval

#	Amendment	Name of The Work	Scope of Work
1	01/ 2019-20	1 (i) 220 KV S/S Beas (new) in the premises of Radha Soami Satsang Beas.	2 x100 MVA, 220/132 KV Auto T/f.
		(ii) 220 KV line bays	2 Nos. ** 2 Nos. 220 KV bays at 400 KV PGCIL Jalandhar fall in the preview of PGCIL.
		(iii) 132 KV Bays	5 Nos. considering Ekalgadda T-off conversion to LILO.
		2. 400 KV PGCIL Jalandhar – 220 KV Beas (New) line.	DC on DC tower, line length= 33 Kms (approx) with 0.4 sq. inch conductor size.
		3. 220 KV Beas (New) – 220 KV Butari line.	SC on DC tower, line length= 14 Kms (approx) with 0.4 sq. inch conductor size.
		4. 132 KV Beas – 132 KV Ekalgada line	SC on DC tower, line length= 28 Kms (approx) with 0.2 sq. inch conductor size.
		5 (i) 2 Nos. 132KV towers dismantlement & 3 Nos. towers to be erected.	For making connectivity of 132KV bus of newly created 220KV S/S Beas to existing 132 KV S/s Beas. (0.2 conductor size DC on DC).
		(ii) Conversion of 132KV Tarn Taran – Butari T-off at Ekalgada into 132 KV Tarn Taran – Butari LILO at 132KV Ekalgada.	Stringing of 2nd Ckt from 132KV Ekalgada to T-off point (~11 km)
2	20/ 2018-19	400 KV S/Stn. Rajpura	1 no. 400 KV ICT bay, 1 no. 400 KV Tie bay, 1 no. 400 KV Future bay, 1 no. 220 KV ICT bay and Design, Engineering, Manu- facture, Supply, Transportation, Erection Testing & Commissioning of 1 no. 500 MVA, 400/220/33 KV Auto T/F.
3	21/ 2018-19	400 KV, 200 MW Permanent Power to Guru Gobind Singh Polymer Addition Project-HPCL Mittal Energy Ltd.	Establishment of 400KV AIS switching station at the premises of M/s HMEL :- through LILO of 400KV Talwandi Sabo-Moga section of Talwandi Sabo- Nakodar 400KV D/C line along with auxiliary required for Phase-I (along with 2no. 400KV line bays for Power Supply to M/s HMEL) like control room, extension provisions etc. [LILO length=10Km (Appx.)] [400KV bays = 4 no.]
			Creation of proposed 400 KV S/s Malkana with 2x500MVA, 400/220KV ICTs for PSTCL.

#	Amendment	Name of The Work	Scope of Work
			a) LILO of 2nd Ckt of 400KV Talwandi Sabo-Nakodar D/C line at proposed 400KV Malkana (Talwandi Sabo-Nakodar is a 400KV D/C line with LILO of one Ckt at 400KV Moga (PGCIL) S/s.) (LILO length appx. 10 Km.) b) 6 Nos. of 220 KV transmission line for PSTCL (future) as detailed below:- (i) LILO of 220KV GNDTP-GHTP DC line at 400KV S/s (220KV bus), (0.4 sq. inch conductor) LILO length = 25Km (approx.) 220 KV bays = 4 Nos. (ii) 220 KV Badal - 400 KV S/s Malkana (proposed) (220KV bus) D/C line having conductor size 0.4 sq. inch. Line length = 30Km approx. 220KV bays 4 Nos. (i.e. 2 bays at each end)
			a) 1x500MVA, 400/220KV ICT (for future) b) 400KV bays=2 No. (for future) c) 220KV = 4 No bay (for future)
4	43/ 2018-19	400 KV Nakoder	1) Replacement of 1x315 MVA 400/220 KV ICT with 1x500 MVA, 400/220 KV ICT. 2) Cost of dismantlement of 1x315 MVA 400/220 KV ICT at 400 KV Nakoder (I.S.)
5	21/ 2018-19	132 kV Faridkot –Kotkapur-2 SC link	132 kV SC line on DC towers - (appx. length = 30 KM) Conductor size = 0.2sq" 2no. 132 kV line bays (one at each end)
		132 kV Sihora-132 kV Seh SC line	132 kV SC line on DC towers - (appx. length = 31 km) Conductor size = 0.2sq" 2no. 132 kV line bays (one at each end)
6	18/ 2018-19	Termination of direct link 220 KV between Lalton Kalan Sahnewal	In order to have 400KV PGCIL Ludhiana - 220KV Sahnewal as D/C (so as to avoid direct link between 220KV Lalton Kalan-Sahnewal), termination shall be done at terminal tower at 220KV Lalton Kalan end.
7	32/ 2018-19	Provision of Second (DC) source of Battery at 220 KV and 132 KV Substations.	
8	13/ 2019-20	400 KV Rajpura-220 KV Bassi-Pathiana DC Link. 1) 220 KV DC line from 400 KV Rajpura to 220 KV Bassi-Pathiana	Line Lengh – 20 Km. D/C on D/C Towers, (conductor size 0.4 sq")
		2) 220 KV Bays – 220 KV Side bus extension arrangement to be made at 400 KV Rajpura.	4 nos. (2 nos. at 400 KV Rajpura & 2 nos. at 220 KV Bassi Pathana.

PSTCL has also undertaken load generation balance studies duly considering the spill over schemes as well as the schemes identified under amendments. The details are placed as Annexure K-8.

ii) New Schemes

Based on the load flow studies considering the peak load requirements in FY 2022-23, the overloading observed in PSTCL lines as well as transformers after considering the impact of implementing the spill over schemes are attached as Annexure K-9 K10. In order to control this overloading as well as for strengthening of system on account of TTC/ATC limit of Punjab, additional transmission works for different voltage levels have planned as summarised in the table below.

Table 12: New Works (220 KV & above) to be undertaken in FY 2020-23

Name of Work	Scope of Work
(A) **400 kV substation Ropar**	**Phase-I**
	(a) (i) Establishment of 400 KV AIS station along with auxiliary, control room building, Gantry structure, extension provision etc. (ii) 2 x 500 MVA, 400/220 kV ICTs (iii) 400 KV Bays (4 Nos.) (iv) 220 KV Bays (10 Nos.) (v) Connectivity of 220 kV bus of 400 kV Ropar with existing 220 kV bus of GGSTP Ropar with 4 Nos. twin Moose ckts. (Approx. Length 1 km)
	(b) (i) LILO of one ckt of 400 kV Ludhina PGCIL–Koldam at proposed 400 kV S/s Ropar, LILO Length = 15 km (approx.), Triple Conductor (Snowbird)
	Phase-II
	(a) (i) LILO of 2nd ckt of 400 kV Ludhina PGCIL–Koldam at proposed 400 kV S/s Ropar, LILO Length = 15 km (approx.), Triple Conductor (Snowbird)
	(b) (i) 400 KV Bays (2 Nos.)
(B) **400 kV substation Dhanansu**	LILO of one ckt of 400 kV Jallandhar–Kurukshetra D/c line at Dhanansu (Quad Moose), LILO length = 5 km (approx.)
	400 KV Bays (2 Nos.)
(C) **400 kV Nakodar**	2nd 500 MVA, 400/220 kV ICT at 400 kV Nakodar
	400 kV bays (1 No.) 220 kV bays (1 No.)

Table 13: Proposed Works at 220 kV to be undertaken in FY 2020-23

#	Name of Work	Scope of Work	Remarks
1	220 KV Kharar	Replacement of 2x20MVA, 132/11 KV with 2x20MVA, 66/11KV T/F.	2x40 MVA, 132/66 KV T/F's can be lifted.
2	220 KV Banga	a) Addl. 1x100 MVA, 220/66 KV T/F.	
		b) Replacement of 2x20MVA, 132/11 KV T/F with 2x20 MVA, 66/11KV T/F.	
3	220KV G.T. Road Ludhiana (New G.I.S.) or (in Ludhiana area) (Including SAS of Rs. 1 crore)	a) 220 KV S/s G.T. Road Ludhiana (New G.I.S. Grid in the premises of existing 66 KV S/s G.T. Road Ludhiana)) or (in Ludhiana area) with 2x160MVA, 220/66 KV T/F.	66 KV side of 220 KV Grid shall be connected to existing 66 KV G.T. Road Ludhiana through four 66 KV circuits of 0.4sq" each. Cost of 2Nos bays included in 3 (a).
		b) LILO of 220 KV Ladowal - Gaunsgarh (DC) lines both ckts. at 220 KV G.T. Road Ludhiana. LILO Length = 7KM (appx.),conductor size 0.4sq" (2xDC lines).	
		c) 220 KV bays = 4 Nos.	
		d) 66 KV bays = 4 Nos.	
4	220 KV Gobindgarh S/s (New Grid in the nearby area of existing 220 KV S/s Gobindgarh-I) (Including SAS of Rs. 1 crore)	a) 220 KV S/s Gobindgarh (New) with 2x160MVA, 220/66 KV T/F.	Suitable connectivity of existing nearby 66 KV grids shall be planned/erected by PSPCL. Cost of 2Nos bays included in 4 (a).
		b1) LILO of 220 KV Gobindgarh-I - Bassi Pathana at 220 KV Gobindgarh, LILO length appx. 7KM (DC on DC) with 0.4sq" conductor.	
		b2) LILO of 220 KV GGSSTP - Gobindgarh-I at 220 KV Gobindgarh (new), LILO lengths 7 KM (appx.) 0.4sq" conductor, DC on DC.	
		c) 220 KV bays = 4 No.	
		d) 66 KV bays = 6 No.	
5	220 KV Nawanpind (new grid in the premises of 66 KV S/s Nawanpind) (Including SAS of Rs. 1 crore)	a) a) 2x 100 MVA, 220/132 KV auto T/F.	
		b) b) LILO of both ckts of 220 KV Verpal – Wadala Granthian DC line at proposed 220 KV S/s Nawanpind. 2xDC, conductor size 0.4sq", LILO length 1 KM	
		c1) 220 KV bays = 4 Nos.	
		c2) 132 KV bays = 2 Nos.	
6	**Additional link**	Stringing of IInd ckt. Of 220KV Mukatsar-Ghubaya line. conductor size 0.4sq", Line length 40.3 KM	
7	220KV Double bus – bar at 220KV S/s Ghubaya		

#	Name of Work	Scope of Work	Remarks
8	a)Augmentation/additions of transformers at 220 KV /132 KV	For augmentation and addition of 220 KV as well as 132 KV transformers, as per the unforeseen/emergent loading requirements, an approximate provision of 5 crores per year (i.e. 3 transformers per year) has been made.	
	b) Augmentation of bus bars, extension in control room building etc.	For strengthening of bus – bar arrangement, extension in control room building for the existing 220/132 KV grids of PSTCL, as per the requirement of P&M from time to time, a provision of about 20 crores (i.e. 7,7,6 crores per year) has been made.	
	c) Additional 220/132/66 KV line bays related with feasibility cases or as per requirement of PSPCL.	As per the requirement of PSPCL, for the load released through feasibility cases, a provision of about 25 crores per year has been made for erection of 66/132/220 KV bays at various grids of PSTCL. (i.e. 8,8,9 crores per year)	
9	220 KV Sighawal	Addl. 1x100 MVA, 220/66 KV T/F.	Subject to availability of space
10	220 KV Abohar	Addl. 12.5 MVA, 66/11 KV T/F	
11	220 KV Passiana	Addl. 12.5 MVA, 66/11 KV T/F.	
12	220 KV Dhuri	Aug. of 12.5 MVA, 66/11 KV to 20 MVA, 66/11 KV T/F.	
13	220 KV Mohali – I	Replacement of 1x100 MVA, 220/66 KV to 1x160 MVA, 220/66 KV T/F.	
14	220 KV Banur	Addl. 20 MVA, 66/11 KV T/F	
15	220 KV Khassa	Aug. of 12.5 MVA, 66/11 KV to 20 MVA, 66/11 KV T/F.	
16	220 KV Algon	Aug. of 12.5 MVA, 66/11 KV to 20 MVA, 66/11 KV T/F.	
17	220 KV Mahilpur	Addl. 12.5 MVA, 66/11 KV T/F.	
18	220 KV Kartarpur	Addl. 12.5 MVA, 66/11 KV T/F.	
19	220 KV Badsahpur	Addl. 1x100 MVA, 220/66 KV T/F.	
20	220 KV Butari	Addl. 12.5 MVA, 66/11 KV T/F.	
21	220 KV Udhoke	Addl. 1x100 MVA, 220/66 KV T/F	
22	220 KV Pakhowal	Replacement of 1x100 MVA, 220/66 KV to 1x160 MVA, 220/66 KV T/F.	
23	220 KV Jagraon	Aug. of 12.5 MVA, 66/11 KV to 20 MVA, 66/11 KV T/F.	
24	220 KV Himmatpura	Aug. of 12.5 MVA, 66/11 KV to 20 MVA, 66/11 KV T/F.	
25	220 KV Kohara	Addl. 12.5 MVA, 66/11 KV T/F.	
26	220 KV Doraha	Addl. 12.5 MVA, 66/11 KV T/F.	
27	220 KV Baghapurana	Addl. 12.5 MVA, 66/11 KV T/F.	
28	Replacement of existing conductor of 220 KV Gobindgarh - 400KV Rajpura (DC), 220 KV Kohara - 400 KV Dhanansu (DC) proposed link, 220 KV Kohara - Sahnewal (SC)	Replacement of existing conductor zebra with equivalent HTLS conductor (on same towers) having a capacity of at least 1200A. line length = 120 ckt Km (approx.)	

#	Name of Work	Scope of Work	Remarks
	existing line with HTLS of suitable capacity.		
29	Addition of 14 No T/f on account of making (N-1) compliant system for those grids where only one T/f is existing (Annexure-C).	A provision of Rs. 25 Cr. for 2020-21, Rs 25 Cr. for 2021-22 & Rs 20 Cr. For 2022-23 have been made. Augmentation shall be made for grid stations as per the space availability & loading conditions.	
30	CE/ P&M Agenda No. 145/2017-18 dt. 20.09.17. Best Practices recommended by Protection Sub Committee of NRPC in operation & construction of Sub Stations	Installation of 999 Nos. CVTs at various 220kv lines for Distance Relay protection	
31	OPGW link between SKPP-RSD- 220kv Sarna & SKPP-220kv Sarna		
32	Misc Works		
33	220 kv Patti	Replacement of 1x100 MVA, 220/66 KV with 1x160 MVA, 220/66 KV T/F.	
34	220 kv Ferozepur road Ludhaiana	Replacement of 1x100 MVA, 220/66 KV with 1x160 MVA, 220/66 KV T/F.	
35	New 220 kv Giaspura (Including SAS)	under study	
36	New 220 kv Jhoke Harihar (Including SAS)	under study	
37	220 kv Gurdaspur (Including SAS of Rs. 1 crore)	a)2x100 MVA, 220/66 KV T/F. including 2 no. 220 kv bays	
		b)LILO of one ckt of 220 KV Wadala Granthian - Sarna line DC on DC, conductor size 0.4sq", LILO length 5 km(approx)	
38	220 kv Dhaleke(GIS) (Including SAS of Rs. 1 crore)	a)2x100 MVA, 220/132 KV T/F. including 4 no. 220 kV bays	Subject to availability of space
		b)LILO of both ckts of 220 KV Talwandi Bhai Dharmkot, conductor size 0.4sq", LILO length ~10 km	
		c)132 kv Moga I - Dhaleke DC link arrangement by making use of existing network, conductor size 0.2sq", LILO length 7 km(approx)	
39	220 kv Dhandari Kalan – 2 (Aug.)	Dismantlement of 2x100 MVA T/F for creating space for double bus bar	
		interconnecting 66 kv double bus bar of of Dhandari Kalan 1 - Dhandari Kalan 2	

#	Name of Work	Scope of Work	Remarks
40	(a) Implementation of Grid connected rooftop solar power plant having a total capacity of 1599 kW for 39 No. substations		TS(D) Works
	(b) Implementation of OPGW based reliable communication at 132 kV and above substations		
	(c) 90 Nos. PSTCL grids (220 kV) to be provided with SAS.		
	(d) Digitization of 220 kV substation Passiana		
41	Infrastructure at various existing substations as per requirement from time to time.		

Table 14: Proposed Works at 132 kV to be undertaken in FY 2020-23

#	Name of Work	Scope of Work
1	132 KV S/s Kotkapura-I	Addl. 1x20 MVA, 132/11KV T/F
2	132 KV works Bilaspur (Aug)	Replacement of 1x12.5 MVA, 132/11 KV with 1x20 MVA, 132/11 KV T/F
3	132 KV Nawanshahar (Aug)	Addl. 1x20 MVA, 132/11 KV T/F
4	132 KV Kapurthala (Aug)	Addl. 1x20 MVA, 132/11 KV T/F
5	132 KV Susan (Aug)	Replacement of 1x12.5 MVA, 132/11 KV with 1x20 MVA, 132/11 KV T/F
6	132 KV Panjgraian (Aug)	
7	132 Baluana (Aug)	
8	IGC Bathinda (Aug)	Replacement of 2x12.5 MVA, 132/11 KV with 2x20 MVA, 132/11 KV
9	132 KV Gholian Kalan (Aug).	Addl. 1x20 MVA, 132/11 KV T/F
10	132KV Smadh Bhai	Addl. 12.5 MVA, 132/11 KV T/F.
11	132KV Faridkot	Aug. of 12.5 MVA, 132/11 KV to 20 MVA, 132/11 KV T/F.
12	132KV Ferozshah	
13	132KV Manasingh Wala	
14	132KV Jallabadh	
15	132KV Kathunangal	
16	132KV Bhikhiwind	
17	132KV Shri Hargobindpur	Addl. 20 MVA, 132/11 KV T/F.
18	132KV Phillour	Aug. of 12.5 MVA, 132/11 KV to 20 MVA, 132/11 KV T/F.
19	132KV Bilaspur	
20	132KV Tangra	Addl. 12.5 MVA, 132/11 KV T/F.

#	Name of Work	Scope of Work
21	a) LILO of 132 KV Verka – Mal mandi SC line at 220 KV S/s Nawanpind (132 KV bus) LILO length = 1 KM appx. DC on DC.	Replacement of existing conductor of 0.25sq" with equivalent HTLS conductor (on the same supporting structure), having a minimum capacity of at least 800A.
22	b) Augmentation of 132 KV Nawanpind - Verka, 5 KM (0.2sq") and 132 KV Nawanpind - Malmandi (5KM 0.2sq") with suitable HTLS conductor.	Replacement of existing conductor of line with suitable HTLS conductor (on same towers) having a capacity of at least 800A.
23	Augmentation of 132 KV GGSSTP - Asron) 6 KM 0.2sq") and 132 KV GGSSTP - Ropar (19.76 KM) 0.2sq".	LILO of 2nd ckt of 132KV Jamalpur-Moga 1 at 220 kv Swadi Kalan DC on DC ,conductor size 0.2sq", LILO length 1 km(approx) 2 no. 132 kv bays
24	132 kv Swadi Kalan	
25	132 kV link between GT Road Amritsar and 132 kV Sakatri Bagh through 132 kV underground cable	

With the additions of these transmission works, the system is expected to normalise as the load flow analysis depicts nil overloading on the system. The load flow analysis for the aforesaid observations is provided as Annexure K-13 – K15.

Besides, PSTCL based on its operational experience has planned the following capital interventions:

a) For augmentation/addition of transformers 220/66 KV & 66 /11 KV at 220 KV grids from loads and feasibility points of view
b) For augmentation of bus bars, extension in control room buildings, and other works relating with system strengthening and as per the field requirement
c) For additional 220/132/66 KV line bays related with feasibility cases
d) Provision for replacement of existing conductor with HTLS conductor, wherever required
e) Certain 220 KV grids of PSTCL have only single 100 MVA, 220/66 KV T/F. Keeping in view the space availability these shall be augmented with additional 100 MVA, 220/66 KV T/F in the control period. Thus a provision for additional T/fs on account of making (n-1) complaint system have also been made

f) To provide alternative 220 KV/132 link to various existing 220/132 kV grids of PSTCL to make these (N-1) complaint, under contingent conditions, some additional links have also been included in the list.

It is submitted that the aforesaid transmission works for the period 2020-23 are subject to full availability of GGSSTP generation (i.e. 4 210 MW). In case GGSSTP generation is reduced or even made as 'NIL', the below mentioned 220 links are likely to get overloaded as is apparent from load flow studies placed at Annexure K16-17:

- 220 KV Ganguwal – Dehar(DC)
- 220 KV Gobindgarh – 400KV Rajpura (DC)
- 220 KV Kohara – 400 KV Dhanansu (DC)
- 220 KV Kohara – Sahnewal (B) (SC)
- 220 KV Bahadurgarh – Devigarh (SC)

In order to control the overloading of 220 KV Gobindgarh –I-400 KV Rajpura (DC), 220 KV Kohara – 400KV Dhanansu (DC) and 220 KV Kohara – Sahnewal links, the said links shall have to be made as HTLS links of a minimum capacity of 1200 Amp, as the ROW (as well as space availability for bays) for erecting new 220 KV links may not be available. Therefore, strengthening of these links and provisions for the same has also been made in the list. Loading on remaining 220 KV links such as 220 KV Bahadurgarh – Devigarh is expected to remain within limits.

It is further submitted that studies are being undertaken for improvement in Ludhiana area evacuation the cases of 220 KV S/S Giaspura (New) and 220 kV Gill Road (New). PSTCL will share the details of the same and any proposed expenditure on this account in its subsequent filings. It is requested that such submissions may kindly be considered by the Hon'ble Commission.

Renewable Capacity Addition

Further, it may be noted that as per the Renewable capacity addition targets set by MNRE, the State of Punjab is expected to have ~4772 MW of installed solar capacity, ~50 MW of small hydro and ~244 MW of projects of 1000 MW capacity are estimated during the period of Control Period. PSTCL submits that as and when the connectivity of such projects is finalised (apart from the ones already identified to be connected at 132/220 kV level), it will approach the Hon'ble Commission in its subsequent filings. PSTCL humbly requests Hon'ble Commission to allow the submission of such schemes for approval of the Hon'ble Commission once the capacity and location of such upcoming solar projects are identified.

Schemes pertaining to SLDC

For the SLDC functions, majority of schemes pertain to installation of Remote Terminal Units spread across the state. The RTUs are to be installed on various substations and are to be integrated with the SCADA system. Besides, the RTUs are likely to complete their useful life of 15 years have been proposed for replacement.

Keeping in view the aforesaid considerations, various schemes for development of new elements, augmentation and system strengthening works have been proposed by PSTCL. The details of the schemes along with necessary justifications are enclosed as Annexure-1.

PSTCL submits that bulk of the schemes proposed under this capital investment plan pertain to envisaged load growth, improvement of system reliability and prevention of overload conditions. In case required, PSTCL will showcase live simulations of the load flow studies conducted for the purpose of justification of the proposed schemes to the Hon'ble Commission.

4.3 Capital Investments for Transmission Segment

The Capital Investment Plan is being submitted in accordance with Regulation 9 of the PSERC MYT Regulations, 2019 for the Control Period from FY 2021-22 to FY 2022-23. During this Control Period, PSTCL will be completing spill-over works as submitted in the true-up petition for 2017-18 along with the schemes submitted in the previous capital investment plan. Besides, the new schemes will also be undertaken for system strengthening schemes to augment its capacity and operational performance. Considering the various 400 kV, 220 kV, and 132 kV

transmission works, the capital investment excluding IDC and IEDC proposed for the Control Period is as under:

Table 15: Summary of Capital Investment proposed for Control Period (Rs. Crore)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Spill Over schemes	194.30	155.07	115.41
New Development Schemes	444.97	473.40	463.76
Total Schemes	639.27	628.47	579.17

4.4 Capitalization schedule for Transmission Investments

As per the completion target for the various capital works, the capitalization schedule (including IDC and IEDC) for each year of the Control Period is as under:

Table 16: Capitalisation Schedule including IDC and IEDC for the Control Period (Rs. Crore)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Capital Investment	710.17	738.19	685.75
Capitalisation	270.67	169.22	1336.67

4.5 Capital Investment Plan for SLDC

PSTCL has included the schemes to be implemented by SLDC under the present Capital Investment Plan of transmission works. PSTCL humbly requests the Hon'ble Commission to approve the Capital Investment Plan for SLDC as submitted in the present Petition. The details of the schemes to be undertaken by SLDC is provided as Annexure-2.

The summary of proposed capital investment and capitalization schedule including IDC and IEDC for SLDC works is as under:

Table 17: Proposed Capital Investment and Capitalisation for SLDC (Rs. Crore)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Capital Investment	21.25	11.39	7.58
Capitalisation	13.72	3.55	41.16

Based on the above proposed capital investment for transmission works and SLDC, PSTCL proposes the following Capital Investment Plan (including IDC and IEDC) for spill over works and new development work during the Control Period.

Table 18: Capital Investment Plan proposed for Control Period (Rs. Crore)

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
1	**Transmission**			
1.1	Opening CWIP	181.57	621.06	1190.03
1.2	Capital Expenditure	710.17	738.19	685.75
1.3	Capitalisation	270.67	169.22	1336.67
1.4	Closing CWIP	621.06	1190.03	539.11
2	**SLDC**			
2.1	Opening CWIP	18.21	25.75	33.59
2.2	Capital Expenditure	21.25	11.39	7.58
2.3	Capitalisation	13.72	3.55	41.16
2.4	Closing CWIP	25.75	33.59	0.00
3	**Transmission + SLDC**			
3.1	Opening CWIP	199.78	646.81	1,223.62
3.2	Capital Expenditure	731.42	749.58	693.32
3.3	Capitalisation	284.39	172.77	1,377.84
3.4	Closing CWIP	646.81	1,223.62	539.11

The Petitioner further submits that annual accounts of 2018-19 have been finalized which reflect the overall closing Capital Expenditure for 2018-19. While division wise CWIP is also available, however, the exercise of scheme-wise CWIP as required by the Hon'ble Commission for tariff purposes is currently under compilation. The CWIP currently shown in petition shows the gross capital expenditure incurred in the scheme, including works which are partly capitalized in the past. Therefore, to avoid any double counting of capitalization amount, for the purpose of this petition, the overall capitalization projected in 2019-20 has been reduced by the difference in closing CWIP (as per details in Annexure-1 for 2018-19 vis-a-vis the closing CWIP as per accounts for 2018-19). Petitioner submits that segregation of actual scheme wise capitalization may be considered by the Hon'ble Commission during the true-up exercise.

5 Business Plan Projections FY 21-23

5.1 Segregation of Transmission and SLDC Business

As regards the segregation of Transmission and SLDC Business, Regulation 7 of PSERC MYT Regulations, 2019 specifies as under:

> ***"7. SEGREGATION OF ARR OF SLDC AND TRANSMISSION BUSINESS***
>
> *7.1. The STU shall have separate accounts for SLDC and transmission business. The STU, based on segregated accounts, shall submit separate ARR for SLDC and transmission businesses. The ARR for SLDC shall be used to determine SLDC Charges and the ARR for transmission business shall be used to determine transmission charges.*
>
> *7.2. Until accounts are segregated, STU shall prepare an Allocation Statement to apportion costs and revenues to respective businesses.*
>
> *7.3. The Allocation Statement shall be considered by the Commission only if it is certified by the Statutory Auditor/Cost Auditor and approved by the Board of Directors of the STU, and it shall be accompanied with an explanation of the methodology which shall be consistent over the Control Period"*

In this regard, PSTCL submits that separate ARR for Transmission and SLDC business is being submitted. PSTCL is submitting the separate ARR for Transmission and SLDC business on the basis of allocation considered in previous years.

5.2 Projections of Operational Parameters

The two most critical factors for transmission business include its transmission losses and the availability of transmission network.

5.2.1 Trajectory of Transmission Availability

As per historical trends, the availability of transmission network of PSTCL has always remained higher than 99%. The MYT Regulations 2019, prescribe that the normative transmission availability for recovery of fixed cost (NATAF) should be 98.5% for AC system and 99% for incentives shall be payable for availability above 99%. Further, no incentive shall be payable for availability beyond 99.75%.

Considering the above, PSTCL submits that the availability of the network will be aligned to the normative limits set as per Regulation 52.1 of Tariff Regulations as mentioned above.

5.2.2 Trajectory of Transmission Losses

PSTCL has made a comparison of the prevalent transmission losses in other State Transmission Utilities in 2017-18. A comparative of the STU losses in different states is summarized below for reference:

Table 19: Comparison of Transmission Losses for FY 2017-18:

S. No	State	Transmission Loss (%) Approved in the tariff order
1	Andhra Pradesh	3.17 %
2	Gujrat	3.72 %
3	Haryana	3.08 %
4	Maharashtra	3.30 %
5	Rajasthan	3.37 %
6	Telangana	3.08 %

As may be observed from the table above, the transmission losses in the states are in a varying range and are higher than the actual transmission losses in the state of Punjab (3.12% for 2017-18 and 2.86% in FY 19).

In this regard, it is important to appreciate the loss levels in Extra high Voltage networks of Power Grid are in the range of 4-5% and varies cross seasons. A compilation of weekly losses in Northern Grid as per NRLDC is submitted below for reference:

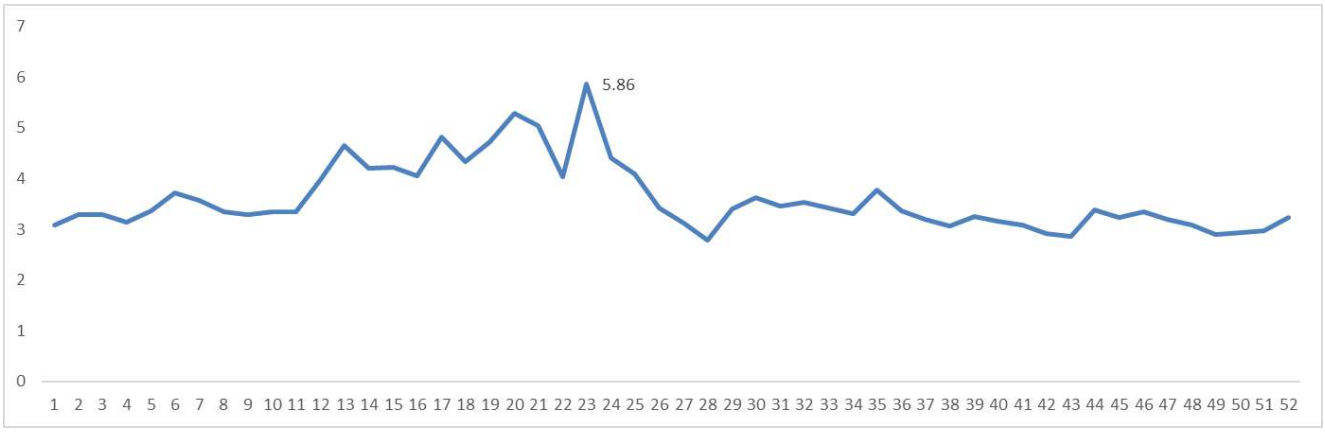


Figure 9: Weekly Losses in Northern Grid (Aug 2018 to Aug 2019)
Source: NRLDC

It is important to note that despite being on extra high voltage levels, the loss levels in Powergrid are significantly higher in comparison to the lower voltage networks operated by PSTCL. Given the voltage levels, loading conditions and other constraints, the loss levels in PSTCL network are relatively better than similarly placed transmission companies as depicted in the table above. Further, with the addition in the proposed network, the overall losses in the system are likely to remain in the range of 3-3.50%.

Further, the transmission system is being developed for n-1 compliance in accordance with the CEA standards. Accordingly, some lines will remain underutilized which may lead to increase in no load losses thereby increasing transmission losses. Given the different schemes envisaged under the capital expenditure plan, PSTCL has proposed a constant loss level of 3% over the control period.

Table 20: Transmission Losses Trajectory for Control Period

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission Loss (%)	3.00%	3.00%	3.00%

5.3 Components of ARR for Transmission and SLDC Business

PSTCL submits that adequate care has been taken to ensure that probable schemes that are likely to be taken up during the ensuing control period are covered under the Capital Investment Plan. However, there may be some additional schemes that may have to be undertaken and accordingly the ARR projections submitted in this section may undergo a change under the MYT petition and ARR petitions to be submitted subsequent to filing this petition. PSTCL craves leave to update its investment portfolio and the ARR accordingly.

Regulation 15.1 of PSERC MYT Regulations, 2019 specifies the components of ARR of Transmission and SLDC Business as under:

> *"15.1. The ARR of the Transmission business and SLDC business shall comprise of the following components:*
>
> *(a) Return on Equity;*
>
> *(b) Interest and Finance Charges on Loan Capital;*

(c) Interest Charges on Working Capital;

(d) Depreciation;

(e) Operation and Maintenance Expenses;

(f) ULDC Charges;

(g) Statutory levies and taxes, if any."

PSTCL has projected the components of ARR for the Control Period in subsequent sections.

5.3.1 Capital Expenditure and Capitalisation

PSTCL has considered the capital expenditure and capitalisation for its Transmission and SLDC Business in line with the Capital Investment Plan as submitted in the earlier sections of this petition. The capital expenditure and capitalisation for the Control Period is again summarised as under:

Table 21: Projection of Capital Expenditure and Capitalisation (Rs Crore)

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission				
1	Capital Expenditure	710.17	738.19	685.75
2	Capitalisation	270.67	169.22	1336.67
SLDC				
3	Capital Expenditure	21.25	11.39	7.58
4	Capitalisation	13.72	3.55	41.16

5.3.2 Means of Finance

Regulation 19 of PSERC MYT Regulations, 2019 specifies as under:

*" 19.1. **Existing Projects -** In case of the capital expenditure projects having Commercial Operation Date prior to the effective date, the debt-equity ratio shall be as allowed by the Commission for determination of tariff for the period prior to the effective date:*

Provided that the Commission shall not consider the increase in equity as a result of revaluation of assets (including land) for the purpose of computing return on equity.

*19.2. **New Projects –** For capital expenditure projects declared under commercial operation on or after the effective date:*

(a) A Normative debt-equity ratio of 70:30 shall be considered for the purpose of determination of Tariff;

(b) In case the actual equity employed is in excess of 30%, the amount of equity for the purpose of tariff determination shall be limited to 30%, and the balance amount shall be considered as normative loan;

(c) In case, the actual equity employed is less than 30%, the actual debt-equity ratio shall be considered;

(d) The premium, if any raised by the Applicant while issuing share capital and investment of internal accruals created out of free reserve, shall also be reckoned as paid up capital for the purpose of computing return on equity subject to the normative debt-equity ratio of 70:30, provided such premium amount and internal accruals are actually utilized for meeting capital expenditure of the Applicant's business."

The above said regulation provides a normative debt: equity ratio as 70:30. PSTCL has been borrowing funds from SBI, PFC, REC, Bank of India and Indian Overseas Bank. Appropriate tie-ups will be made with these banks/Financial institutions along with others to make good the investments required for the capital investment plan.

5.3.3 Return on Equity

Regulation 20 of PSERC MYT Regulations, 2019 specifies as under:

"20. RETURN ON EQUITY

Return on equity shall be computed at the base rate of 15.5% for thermal generating stations, Transmission Licensee, SLDC and run of the river hydro generating stations and at the base rate of 16.5% for the storage type hydro generating stations and run of river generating stations with pondage and 16% for Distribution Licensee on the paid up equity capital determined in accordance with Regulation 19:

Provided that Equity invested in foreign currency shall be converted to rupee currency based on the exchange rate prevailing on the date(s) it is subscribed:

Provided further that assets funded by consumer contributions, capital subsidies/Govt. grants shall not form part of the capital base for the purpose of calculation of Return on Equity."

PSTCL has computed Return on Equity for the Control Period in view of the above said Regulations as given in the following table:

Table 22: Projection of Return on Equity for the Control Period (Rs Crore)

S. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission				
1	Opening Equity for the year	884.50	1097.55	1319.01
2	Addition of Equity during the year	213.05	221.46	205.72
3	Closing Equity for the year	1097.55	1319.01	1524.73
4	Average Equity	991.03	1208.28	1421.87
5	Rate of RoE	15.5%	15.5%	15.5%
6	Return on Equity	153.61	187.28	220.39
SLDC				
1	Opening Equity for the year	6.49	12.87	16.28
2	Addition of Equity during the year	6.38	3.42	2.27
3	Closing Equity for the year	12.87	16.28	18.56
4	Average Equity	9.68	14.58	17.42
5	Rate of RoE	15.5%	15.5%	15.5%
6	Return on Equity	1.50	2.26	2.70

5.3.4 Income Tax

Regulation 23 of PSERC MYT Regulations, 2019 has allowed recovery of Income Tax, as part of ARR, as under:

> *"23.1. Obligatory taxes, if any, on the income of the Generating Company or the Licensee or the SLDC from its core/licensed business shall be computed as an expense and shall be recovered from the customers/consumers:*
>
> *Provided that tax on any income other than return on equity shall not constitute a pass through component in the tariff and tax on such other income shall be payable by the Generating Company or the Licensee or the SLDC:*
>
> *Provided that income tax shall be allowed as per actual income tax paid or income tax payable on return on equity, whichever is lower.*
>
> *23.2. The benefits of tax holiday and the credit for carrying forward losses applicable as per the provision of the Income Tax Act, 1961 shall be fully passed on to the customers/consumers.*
>
> *23.3. The penalty, if any, arising on account of delay in deposit of tax or short deposit of tax amount shall not be claimed by the Generating Company or the Licensee or the SLDC, as the case may be."*

PSTCL submits that under ideal scenario, the tax payable in any year should be restricted to the ROE earned during the year. However, the actual tax paid during the year may get influenced on account of the following:

- Efficiency of operations leading to gains in comparison to normative expenses
- Recovery of additional amounts from consumers on account of recovery of revenue gap of previous years

On account of the above, the overall income tax liability in any year could be higher than tax only on the ROE component allowed during the year. It is therefore requested that the actual income tax liability on such additional revenue allowed during the year should be allowed on actuals. PSTCL craves leave to submit such actual tax liability in the true-up petitions and requests the Hon'ble Commission to allow the same on actual basis.

In line with the provisions of the Regulations, the overall income tax projections assuming a tax rate of 21.55% over the control period (currently considered only on the ROE component) are provided in the table below:

Table 23: Income Tax projections over the control period (Rs Crore)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission	33.10	40.36	47.49
SLDC	0.32	0.49	0.58

5.3.5 Depreciation

Regulation 21 of the PSERC MYT Regulations, 2019 specifies as under:

"21.1. The value base for the purpose of depreciation shall be the capital cost of the assets admitted by the Commission:

Provided that the depreciation shall be allowed after reducing the approved original cost of the retired or replaced or decapitalized assets:

Provided that the land, other than the land held under lease and land for reservoir in case of hydro generating station, shall not be a depreciable asset and its cost shall be excluded from the capital cost while computing depreciable value of the assets:

Provided further that Govt. grants and consumer contribution shall also be recognized as defined under Indian Accounting Standard 20 (IND AS 20) notified by the Ministry of Corporate Affairs.

21.2. The residual/salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of historical capital cost of the asset:

Provided that I.T. Equipment and Software shall be depreciated 100% with zero salvage value.

21.3. The Cost of the asset shall include additional capitalization.

21.4. The Generating Company, Transmission and Distribution Licensee shall provide the list of assets added during each Year of the Control Period and the list of assets completing 90% of depreciation in the Year along with Petition for Annual Performance Review, true-up and tariff determination for ensuing Year.

21.5. Depreciation for Distribution, generation and transmission assets shall be calculated annually as per straight line method over the useful life of the asset at the rate of depreciation specified by the Central Electricity Regulatory Commission from time to time:

Provided that the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date of commercial operation/ put in use of the asset shall be spread over the balance useful life of the assets:

Provided further that in case of hydro generating stations, the salvage value shall be as provided in the agreement signed by the developers with the State Government for creation of the asset.

21.6. Depreciation shall be chargeable from the first year of commercial operation/asset is put in use. In case of commercial operation of the asset/put in use of asset for part of the year, depreciation shall be charged on pro rata basis."

PSTCL has computed the depreciation in accordance with the above said Regulations considering the closing GFA as approved by the Hon'ble Commission for True-up for 2017-18 in its order dated May 27, 2019 (Petition no. 3 of 2019). Further the actual capitalization has been considered for 2018-19 (Rs 334.48 Crore for Transmission and Rs -1.13 Crore for SLDC). Based on the progress made on the capital expenditure schemes, the overall outlay on schemes during the control period is submitted below for reference:

Further, PSTCL has considered the scheduled depreciation rate of 5.28% on the transmission assets (excluding cost of land and assets funded through grants) for Transmission and SLDC business.

Accordingly, PSTCL submits the depreciation for the Control Period as under:

Table 24: Projection of Depreciation Charges (Rs Crore)

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission				
1	Opening GFA	7344.21	7614.89	7784.11
2	Addition of GFA	270.67	169.22	1336.67

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
3	Closing GFA	7614.89	7784.11	9120.79
4	Depreciation	394.92	406.53	446.29
SLDC				
5	Opening GFA	35.93	49.65	53.20
6	Addition of GFA	13.72	3.55	41.16
7	Closing GFA	49.65	53.20	94.36
8	Depreciation	2.26	2.72	3.90

5.3.6 Interest and Finance Charges on Loan Capital

Regulation 24 of the PSERC MYT Regulations, 2019 specifies as under:

"24.1. For existing loan capital, interest and finance charges on loan capital shall be computed on the outstanding loans, duly taking into account the actual rate of interest and the schedule of repayment as per the terms and conditions of relevant agreements. The rate of interest shall be the actual rate of interest paid/payable (other than working capital loans) on loans by the Licensee.

24.2. Interest and finance charges on the future loan capital for new investments shall be computed on the loans, based on one (1) year State Bank of India (SBI) MCLR / any replacement thereof as notified by RBI as may be applicable as on 1st April of the relevant year, plus a margin determined on the basis of current actual rate of interest of the capital expenditure loan taken by the Generating Company, Licensee or SLDC and prevailing SBI MCLR.

24.3. The repayment for each year of the tariff period shall be deemed to be equal to the depreciation allowed for the corresponding year. In case of de-capitalisation of assets, the repayment shall be adjusted by taking into account cumulative depreciation made to the extent of de-capitalisation.

24.4. The Commission shall allow obligatory taxes on interest, finance charges (including guarantee fee payable to the Government) and any exchange rate difference arising from foreign currency borrowings, as finance cost.

24.5. The interest on excess equity treated as loan shall be serviced at the weighted average interest rate of actual loan taken from the lenders.

Provided also that if there is no actual loan for a particular Year but normative loan is still outstanding, the last available weighted average rate of interest for the actual loan shall be considered."

For the purpose of projecting the interest and finance charges, PSTCL has currently considered the closing loan balances for 2017-18. Further addition in assets in 2018-19 are considered as per actuals and are assumed to be funded in a debt-equity ratio of 70: 30 as per regulations.

The investments in ensuing years are also considered to be funded at the normative debt equity ratio of 70:30. PSTCL submits that the interest on loan has been calculated at the rate of 11% on an average basis. However, the actual rate of interest may vary based on tie-up of loans in the future years. PSTCL will submit the details of such actual rate of interest at the time of true-up in the subsequent petitions. Based on the above considerations, the overall loan portfolio and interest expenses of Transmission and SLDC business over the years is projected in the table below:

Table 25: Projection of Interest Expenses for the Control Period (Rs Crores)

#	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission Business				
1	Opening Loan Balance	3430.06	3615.84	3735.41
2	Addition of loan during year	497.12	516.74	480.02
3	Repayment of loan during year	311.34	397.16	397.16
4	Closing Loan Balance	3615.84	3735.41	3818.28
5	Average Loan	3522.95	3675.62	3776.84
6	Interest Rate (%)	11%	11%	11%
7	Gross Interest and Finance Charges	387.52	404.32	415.45
8	Less IDC	30.90	69.73	66.57
9	Interest Expenses	356.62	334.59	348.88
SLDC				
1	Opening Loan Balance	21.25	35.47	42.60
2	Addition of loan during year	14.88	7.97	5.30
3	Repayment of loan during year	0.66	0.84	0.84
4	Closing Loan Balance	35.47	42.60	47.06
5	Average Loan	28.36	39.03	44.83
6	Interest Rate (%)	11%	11%	11%
7	Gross Interest and Finance Charges	3.12	4.29	4.93
8	Less IDC	1.69	2.28	1.29
9	Interest Expenses	1.43	2.01	3.64

5.3.7 O&M Expenses

Regulation 26 of the PSERC MYT Regulations, 2019 specifies as under:

"26.1. The O&M expenses for the nth year of the Control Period shall be approved based on the formula shown below:

$$O\&M_n = (R\&M_n + EMP_n + A\&G_n) \times (1-X_n)$$

Where,

- *$R\&M_n$ –Repair and Maintenance Costs of the Applicant for the nth year;*
- *EMP_n –Employee Cost of the Applicant for the nth year;*
- *$A\&G_n$ –Administrative and General Costs of the Applicant for the nth year;*

It should be ensured that all such expenses capitalized should not form a part of the O&M expenses being specified here. The above components shall be computed in the manner specified below:

(i) $R\&M_n = K*GFA*WPI_n/WPI_{n-1}$

Where,

- *'K' is a constant (expressed in %) governing the relationship between R&M costs and Gross*
- *Fixed Assets (GFA) for the nth year. The value of 'K' will be specified by the Commission in the MYT order.*
- ***'GFA'** is the average value of the gross fixed assets of the nth year.*
- ***WPI_n** means the average rate (on monthly basis) of Wholesale Price Index (all commodities) over the year for the nth year.*

(ii) $EMP_n + A\&G_n = (EMP_{n-1} + A\&G_{n-1}) *(INDEX_n/INDEX_{n-1})$

$INDEX_n$ - Inflation Factor to be used for indexing the Employee Cost and Administrative and General Costs for nth year. This will be a combination of the Consumer Price Index (CPI) and the Wholesale Price Index (WPI) of nth year and shall be calculated as under: -

$INDEX_n = 0.50*CPI_n + 0.50*WPI_n$

'WPI_n' means the average rate (on monthly basis) of Wholesale Price Index (all commodities) over the year for the nth year.

'CPI_n' means the average rate (on monthly basis) of Consumer Price Index (Industrial workers) over the year for the nth year.

Note 1: The O&M expenses of BBMB for the entire Control Period shall be projected separately based on the latest actual payout. The Commission shall true-up the O&M expenses of BBMB during the Annual Performance Review based on the actual payout. The O&M expense of BBMB

shall be treated as uncontrollable cost item. However, when CERC determines the tariff in respect of generating plants/units of BBMB, the Commission shall consider the same

Note 2: For the purpose of estimation, the same WPI_n and CPI_n values shall be used for all years of the Control Period. However, the Commission will consider the actual values of the WPI_n and CPI_n at the end of each year during the Annual Performance Review exercise and True-up the R&M Expenses, Employee Cost and A&G Expenses on account of this variation.

Note 3: O&M expense shall be allowed on normative basis and shall be trued-up only to the account of variation in Wholesale Price Index and Consumer Price Index.

Note 4: Terminal Liabilities such as death-cum-retirement gratuity, Ex-Gratia, pension including family pension, commuted pension, leave encashment, LTC, medical reimbursement including fixed medical allowance in respect of the State PSU / Government pensioners will be approved as per the actuals paid by the Applicant.

Note 5: O&M expenses made on account of extraordinary situations (if any) shall be submitted to Commission for its approval. Such expenses shall be filed separately and will not be subjected to provisions of Regulation 30. The amount approved by the Commission shall be trued up in the Annual Performance Review.

Note 6: Exceptional increase in employee cost on account of Pay Commission based revision for State PSU / Government employees will be considered separately by the Commission.

Note 7: Any expenditure on account of license fee, initial or renewal, fee for determination of tariff and audit fee shall be allowed on actual basis, over and above the A&G expenses approved by the Commission.

Note 8: O&M expenses of assets taken on lease/hire-purchase and those created out of the consumers' contribution shall be considered in case the Generating Company or the Licensee has the responsibility for its operation and maintenance and bears O&M expenses.

Note 9: With regard to unfunded past liabilities of pension and gratuity, the Commission will follow the principle of 'pay as you go'. The Commission shall not allow any other amount towards creating fund for meeting unfunded past liability of pension and gratuity.

Note 10: O&M expenses for gross fixed assets added during the year, if not accounted already, shall be considered from the date of commissioning on pro-rata basis.

(iii) Xn is an efficiency factor for nth year

The Value of Xn shall be determined by the Commission in it MYT order for the Control Period."

5.3.7.1 *Human Resource Development*

A strong, vibrant and motivated work force is critical for efficient, effective and consistently reliable operations of PSTCL. By employing competent professionals, the organization can not only achieve higher levels of efficiency, but also bring down costs and become more profitable. Employees are the most precious asset of an organization and a conducive environment is necessary to encourage creativity, innovation and performance excellence amongst them. The Company has focused its efforts to enhance the capabilities of employees to develop competent, trained and multi-disciplinary human capital. PSTCL has a satisfactory performance in recruitment, selection, training and development of the employees.

Training need analysis has been carried out in all the areas as the basis for devising the necessary 'Training System'. Due to fast changes in technology, there is a need to acquaint staff with the latest trends in field, in addition to the regular refresher courses.

Specific areas are identified on the basis of performance appraisal and individuals' feedback such as EHV Operation & Maintenance, Load Management, System Studies and Network Planning, EHV Construction of Sub-stations & Lines, Design & Engineering, Project Tendering, Procurement, Survey & Investigation, Project clearances, Testing and equipment's, Civil works, Commercial & Regulatory affairs, Project Management, Information Technology, Finance & Accounts, Human Resources, General Management, Public Relation & Communication, Fire & Safety etc.

As the electricity industry is highly capital intensive, it necessitates the operation of the plant /substation equipment's / Transmission line in the safest and efficient manner to minimize the cost of operation and a competitive spirit to achieve higher productivity and customer satisfaction. PSTCL believes that every employee should be trained to build the required skills for superior performance on the job.

It may be noted that during unbundling of erstwhile PSEB, all training infrastructure have been retained by PSPCL. With an objective to build capacity in the organisation and enhance the skill sets of its employees at different levels, annual Training calendars are being prepared and adhered to by PSTCL.

At present, short-term courses are being arranged at regular intervals for staff by making arrangement with the outside agencies. Further, Executives and Staff have been sent to various training programmes and conferences to enrich their knowledge and experience.

Awards for Best Managed Substation and Transmission Line have been implemented for promoting competition in upkeep of the Substations and Transmission Lines. Efficient employees of various offices are also rewarded for promoting efficiency and competition amongst themselves.

PSTCL submits that the sanctioned employee strength for the organization is 5138. As against the same, as on March 31, 2019, the overall employee strength is 4483 which includes around 862 security staff deployed at various installations of PSTCL. The same is shown in the table below.

It is submitted that several new installations are under development phase, A typical 400 kV substation would require deployment of 22 personnel and ~15 personnel are required for a new 220 kV sub-station. Accordingly, the regular employee strength is likely to increase in the initial years and will have marginal reduction in the ensuing years on account of retirements. The overall number of employees envisaged in the organization are summarized below:

Table 26: Projections of Employee strength for the Control Period*

#	Particulars	FY 2018-19 (Actual)	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
1a	Gazette	373	-	-	-	-
1b	Non-Gazette	2561				
	Recruitment	-	*763*	*106*	*104*	*103*
	Retirement	-	*171*	*150*	*149*	*174*
1	Subtotal	2934	3526	3482	3437	3366
2	Re-employed	153	153	153	153	153
3	Outsourced against regular posts	479	479	479	479	479
4	Work Charged	46	46	46	46	46

#	Particulars	FY 2018-19 (Actual)	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
5	Contingent	9	9	9	9	9
6	Security	862	862	862	862	862
7	Total	4483	5075	5031	4986	4915

**Tentative. Actual details to be submitted at the time of final true-up for respective years.*

The employee expenses have been considered in the following manner:

- The total employee expenses incurred by PSTCL in 2018 -19 were Rs 472.6 Crores. Out of this, Rs 6.25 Crores was on account of SLDC while Rs 466.35 Crores was on account of transmission
- PSTCL has considered the actual Terminal benefits in 2018-19 for SLDC and Transmission separately which includes elements such Pension and Gratuity, Leave encashment, Medical Reimbursement, etc., separately, under the employee expenses. PSTCL has not considered any escalation in such expenses since the same will be allowed at actuals.
- The balance employee expenses have been escalated with an escalation factor of 3.6% as per principles defined in the regulations. The working is as follows:

Table 27:Indexation Rates

	2014	2015	2016	2017	2018
WPI	114.20	120.20	126.00	130.90	136.50
CPI	114.30	109.90	107.70	113.20	116.30
Indexation	114.25	115.05	116.85	122.05	126.40
Increase in indexation		0.7%	1.6%	4.5%	3.6%

In this regard, PSTCL submits that rules of engagement of personnel by PSTCL is governed by the Transfer scheme and the average increase in dearness allowances are defined as per defined notifications. Therefore, the overall employee expenses should not be restricted to increase in CPI/WPI indices. Such indices are influenced by a variety of factors and even become negative in relative periods. However, it is apparent that the salaries and overall expenses in an organization are likely to increase on a year to year basis. Therefore, in any particular year, the

CPI/WPI indices may not be able to cover the actual increase in employee/A & G expenses. PSTCL therefore requests the Hon'ble Commission to kindly consider true-up of such expenses in the subsequent petitions based on actuals.

Table 28: Projection for Employee Expenses for the Control Period (Rs Crore)

#	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission				
1	Terminal Benefits	286.91	286.91	286.91
2	Other Employee Costs	192.46	199.32	206.42
3	Total Employee Costs	479.37	486.23	493.33
SLDC				
4	Terminal Benefits	0.13	0.13	0.13
5	Other Employee Costs	6.70	6.94	7.19
6	Total Employee Costs	6.83	7.07	7.32

PSTCL has not considered impact of wage revision of 7th Pay Commission during the Control Period. PSTCL craves leave to submit these expenses on actual basis, since these expenses are being allowed on actual basis as per Regulations.

Projection of A&G Expenses

The A&G expenses have been considered in the following manner:

- The total A&G expenses incurred by PSTCL in 2018 -19 were Rs 25.87 Crores. Out of this, Rs 6.25 Crores was on account of SLDC while Rs 24.95 Crores was on account of transmission
- The A&G expenses have been escalated with an escalation factor of 3.6% as per the methodology defined above

Accordingly, A&G Expenses for the Control Period are projected as follows:

Table 29: Projection of A&G Expenses for the Control Period (Rs Crore)

#	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission				
1	A&G Expenses	25.84	26.76	27.71
2	Escalation	103.6%	103.6%	103.6%
3	Total A&G Expenses	26.76	27.71	28.70
SLDC				

#	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
4	A&G Expenses	0.95	0.99	1.02
5	Escalation	103.6%	103.6%	103.6%
6	Total A&G Expenses	0.99	1.02	1.06

Projection of R&M Expenses

- PSTCL has determined the K-Factors for its transmission business and SLDC business as follows:
  - The total R&M and A&G for SLDC in the year 2018-19 is Rs 1.32 Crores while average GFA is Rs 17.98 Crores. Accordingly, K-Factor is 7.34% (1.32/17.98)
  - Similarly, the total R&M and A&G for SLDC in the year 2018-19 is Rs 58.08 Crores while average GFA is Rs 9611.5 Crores. Accordingly, K-Factor is 0.6% (58.08/9611.5)
- The escalation factors have been assumed in a similar manner as described in the previous sections. The R&M expenses are accordingly calculated in a manner consistent with the regulations.

Table 30: Projection of R&M Expenses for Control Period (Rs. Crore)

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission Business				
1	Opening GFA	10294.55	10565.22	10734.44
2	Closing GFA	10565.22	10734.44	12071.12
3	Average GFA	10429.88	10649.83	11402.78
4	K factor	0.60%	0.60%	0.60%
5	Escalation factor	103.6%	103.6%	103.6%
6	R&M Expenses	65.27	66.65	71.36
SLDC				
7	Opening GFA	35.93	49.65	53.20
8	Closing GFA	49.65	53.20	94.36
9	Average GFA	42.79	51.43	73.78
10	K factor	7.34%	7.34%	7.34%
11	Escalation factor	103.6%	103.6%	103.6%
12	R&M Expenses	3.25	3.91	5.61

5.3.8 Interest on Working Capital

Regulation 51 of the PSERC MYT Regulations, 2019 specifies as under:

*"51.1. **Components of Working Capital***

The Working Capital shall cover the following:

(a) O&M Expenses for 1 month;

(b) Maintenance spares @ 15% of the O&M expenses;

(c) Receivables equivalent to two (2) months of fixed cost calculated on normative target availability.

*51.2. **Rate of Interest***

The rate of interest on working capital shall be as per Regulation 25.1."

Table 31: Projection of Interest on Working Capital for the Control period (Rs Crore)

#	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission Business				
1	Receivables for two months	255.18	261.96	280.20
2	Maintenance spares @15% of O&M	47.62	48.38	49.45
3	O&M Expenses for one month	85.71	87.09	89.01
4	Total Working Capital	388.51	397.43	418.66
5	Rate of Interest (%)	11%	11%	11%
6	Interest on Working Capital	42.74	43.72	46.05
SLDC				
1	Receivables for two months	4.26	4.81	5.77
2	Maintenance spares @15% of O&M	0.92	1.00	1.17
3	O&M Expenses for one month	1.66	1.80	2.10
4	Total Working Capital	6.85	7.61	9.03
5	Rate of Interest (%)	11%	11%	11%
6	Interest on Working Capital	0.75	0.84	0.99

5.3.9 ULDC Charges

The actual ULDC charges as per books of accounts for 2018-19 had been Rs 7.67 crore. The said charges are approved by the CERC and are payable by SLDC. For the purpose of projection, the said actual charges for 2018-19 are projected to increase at 3.60% for the control period as shown in the table below:

Table 32: Projection of ULDC charges for the Control period (Rs Crore)

#	FY 2020-21	FY 2021-22	FY 2022-23
SLDC	8.23	8.53	8.83

5.3.10 Non-Tariff Income

The actual non-tariff income for 2018-19 had been Rs 21.30 Crore for transmission segment and Rs 0.61 Crore for SLDC function. While the projections for Non –tariff Income have been provided as per Regulation 28 of PSERC MYT Regulations, 2019, however no sharing has been considered in the elements as provided in the regulations. The Petitioner proposed to

undertake the same at the time of true-up based on actual income received during any financial year in the ensuing control period.

Table 33: Projection of Non-Tariff Income for the Control Period (Rs Crores)

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
1	Transmission Business	21.3	21.3	21.3
2	SLDC	0	0	0

5.3.11 Summary of ARR

The summary of ARR for Transmission and SLDC Business for Control Period is summarised as under:

Table 34: Projection of ARR for the Control Period (Rs Crore)

Sr. No.	Particulars	Transmission Business			SLDC			Combined Transmission + SLDC		
		FY 2020-21	FY 2021-22	FY 2022-23	FY 2020-21	FY 2021-22	FY 2022-23	FY 2020-21	FY 2021-22	FY 2022-23
1	Repair and Maintenance	65.27	66.65	71.36	3.25	3.91	5.61	68.52	70.56	76.97
2	A&G	26.76	27.71	28.70	0.99	1.02	1.06	27.75	28.74	29.76
3	Employee Expenses	479.37	486.23	493.33	6.83	7.07	7.32	486.20	493.30	500.65
4	Return on Equity	153.61	187.28	220.39	1.50	2.26	2.70	155.11	189.54	223.09
5	Depreciation	394.92	406.53	446.29	2.26	2.72	3.90	397.18	409.25	450.18
6	Interest and finance charges on Loan Capital	356.62	334.59	348.88	1.43	2.01	3.64	358.05	336.60	352.52
7	Interest on Working Capital	42.74	43.72	46.05	0.75	0.84	0.99	43.49	44.55	47.05
8	ULDC Charges				8.23	8.53	8.83	8.23	8.53	8.83
9	Income Tax	33.10	40.36	47.49	0.32	0.49	0.58	33.43	40.85	48.08
10	**Aggregate Revenue Requirement (ARR)**	**1,552.39**	**1,593.08**	**1,702.50**	**25.57**	**28.84**	**34.63**	**1,577.96**	**1,621.91**	**1,737.13**
11	Less: Non-Tariff Income	21.3	21.3	21.3	-	-	-	21.30	21.30	21.30
12	**Net ARR**	**1,531.09**	**1,571.78**	**1,681.20**	**25.57**	**28.84**	**34.63**	**1,556.66**	**1,600.61**	**1,715.83**

5.4 Projection of Financial Statement

PSTCL has projected the Financial Statements for the Control Period with the following assumptions:

a) Financial Statements has been projected combined for Transmission Business and SLDC.

b) The approved values for 2017-18 in the true-up order have been considered as base for projecting the P&L for the control period.

c) No prior period gap has been considered as part of the Business plan and the same shall be considered in the MYT petition or ARR petitions to be filed subsequently.

d) The projected financial statements are based on the projected ARR for individual years. However, these statements are indicative in nature and will depend on the detailed MYT submissions to be filed by the Petitioner and considerations of the same in the orders to be passed by the Hon'ble Commission.

The Projected P&L Statement for the Control Period is as under:

Table 35: Projected P&L Statement for PSTCL for Control Period (Rs. Crore)

Sr. No.	Particulars	FY 2020-21	FY 2021-22	FY 2022-23
1	**Revenue**			
2	Revenue from operations	1,577.96	1,621.91	1,737.13
3	Non-tariff income	21.30	21.30	21.30
4	**Total Revenue**	**1,556.66**	**1,600.61**	**1,715.83**
5	**Expenditure**			
6	Repair and Maintenance Cost	68.52	70.56	76.97
7	Administration Expenses	27.75	28.74	29.76
8	Employee Expenses	486.20	493.30	500.65
9	ULDC Charges	8.23	8.53	8.83
10	Depreciation and Related debits	397.18	409.25	450.18
11	Interest & Finance Charges	401.54	381.16	399.57
12	**Total Expenditure**	**1,389.43**	**1,391.53**	**1,465.96**
13	**PBT**	**167.24**	**209.09**	**249.87**
14	Tax	33.43	40.85	48.08
15	**PAT**	**133.81**	**168.24**	**201.79**

5.5 Submission to the Hon'ble Commission

PSTCL submits that the performance of the transmission system is a function of several input parameters, viz., energy transactions, vintage and technological advancement across its network etc. PSTCL has made sustained efforts to streamline its processes over the years as inherited from the erstwhile PSEB period.

PSTCL humbly submits that it has prepared the Business Plan considering the factors which are within control of PSTCL, however, PSTCL further requests the Hon'ble Commission to allow submission of further information and/or revision due to change in any accountable and non-accountable or uncontrollable parameters for future years as part of the subsequent submissions.

6 Prayers

The Petitioner respectfully prays to the Hon'ble Commission:

a) Condone the delay in submission of this petition
b) to admit the Petition seeking approval of Business Plan along with its Capital Investment Plan for FY 2020-21 to FY 2022-23 in accordance with Regulation 9 of the PSERC MYT Regulations, 2019;
c) to approve the Business Plan along with the Capital Investment Plan for Transmission and SLDC Business for FY 2020-21 to FY 2022-23 as proposed by the Petitioner in the above-said Petition;
d) to pass any other order/s as the Hon'ble Commission may deem fit and appropriate under the circumstances of the case and in the interest of justice;
e) to condone any error/ omission and to give opportunity to rectify the same;
f) The filing is being done based on the best available information and in case of any change, the Petitioner may be permitted to make further submissions, addition and alteration to this Petition as may be necessary from time to time.

7 Annexures

Annexures - K Series

ANNEXURE- Ko

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E TUE, JUN 25 2019 9:26
PUNJAB POWER SYTEM ACTUAL2012-13

AREA TOTALS
IN MW/MVAR

X-- AREA --X	FROM GENE-RATION	------AT AREA BUSES------- FROM IND GENERATN	TO IND MOTORS	TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS	DESIRED NET INT
1 PUNJAB	5412.1 1153.5	0.0 0.0	0.0 0.0	12800.0 5107.2	0.0 -2680.4	0.0 0.0	0.0 1215.4	0.0 6309.7	181.0 3186.0	-7568.9 635.1	-7568.9 635.1	0.0
2 HARYANA	5314.7 817.0	0.0 0.0	0.0 0.0	10796.6 3547.8	0.0 3058.1	0.0 0.0	0.0 989.8	0.0 6757.2	57.2 1719.4	-5539.2 -1740.8	-5539.2 -1740.8	0.0
3 RAJSTHAN	11976.5 1333.1	0.0 0.0	0.0 0.0	12468.0 3601.3	0.0 2438.0	0.0 0.0	0.0 2017.6	0.0 10727.0	209.0 4031.2	-700.5 -28.0	-700.5 -28.0	0.0
4 J&K	3960.7 242.7	0.0 0.0	0.0 0.0	2978.0 1167.3	0.0 289.7	0.0 0.0	0.0 0.0	0.0 1300.7	32.7 576.9	950.0 -490.5	950.0 -490.5	0.0
5 HIMACHAL	9313.3 -431.4	0.0 0.0	0.0 0.0	1140.9 275.9	0.0 302.7	0.0 0.0	0.0 0.0	0.0 2490.9	109.7 1044.2	8062.8 436.7	8062.8 436.7	0.0
6 U.P	23546.1 -1369.3	0.0 0.0	0.0 0.0	24960.3 2639.1	0.0 8437.8	0.0 0.0	0.0 19625.4	0.0 40249.3	410.7 8484.7	-1824.9 -306.9	-1824.9 -306.9	0.0
7 UTTRAKHAND	5965.2 136.1	0.0 0.0	0.0 0.0	2516.6 867.8	0.0 522.1	0.0 0.0	0.0 872.1	0.0 3202.8	43.7 1106.7	3404.9 -29.7	3404.9 -29.7	0.0
8 DELHI&AROUND	2754.4 1212.3	0.0 0.0	0.0 0.0	584.6 192.1	0.0 0.0	0.0 0.0	0.0 0.0	0.0 314.9	6.0 98.0	2163.8 1237.2	2163.8 1237.2	0.0
9 CHANDIGARH	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 1.0	0.0 0.0	-0.0 1.0	-0.0 1.0	0.0
11 BBMB GEN.	1065.0 292.3	0.0 0.0	0.0 0.0	11.2 4.6	0.0 0.0	0.0 0.0	0.0 0.0	0.0 3.5	1.8 5.3	1052.0 286.0	1052.0 286.0	0.0
COLUMN TOTALS	69308.0 3386.4	0.0 0.0	0.0 0.0	68256.2 17403.0	0.0 12368.0	0.0 0.0	0.0 24720.3	0.0 71357.1	1051.7 20252.3	0.0 0.0	0.0 0.0	0.0

ACTUAL LOAD CATERED DURING
PADDY 2018 = 12800 MW.

Annexure- K01

ANNEXURE-K0

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E TUE, JUN 25 2019 9:38

PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]

SUBSYSTEM LOADING CHECK (INCLUDED: LINES) (EXCLUDED: BREAKERS AND SWITCHES; TRANSFORMERS)

CURRENT LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS				TO BUS						
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING PERCENT
101065	SRN1	132.00	1	101064	GDSP	132.00*	1	1	79.3	72.0 110.1
101065	SRN1	132.00	1	101064	GDSP	132.00*	1	2	79.3	72.0 110.1
102017	KRTP2	220.00*	1	102098	JLNDR42	220.00	1	1	369.3	215.0 171.8
102026	GNG2	220.00	1	502001	DEHR42	220.00*	5	1	223.9	215.0 104.1
102026	GNG2	220.00	1	502001	DEHR42	220.00*	5	2	223.9	215.0 104.1
102029	MOH2	220.00	1	502003	NLGR42	220.00*	5	1	224.2	215.0 104.3
102029	MOH2	220.00	1	502003	NLGR42	220.00*	5	3	224.2	215.0 104.3
102034	BDG2	220.00*	1	102096	PTA42	220.00	1	1	230.4	215.0 107.2
102045	LLK2	220.00*	1	102099	LDHN42	220.00	1	2	255.3	215.0 118.8

ANNEXURE-K1

...ACTIVE POWER SYSTEM SIMULATOR--PSS/E ... THU, JUN 20 2019 12:38
...R POWER SYSTEM ACTUAL2012-13

AREA TOTALS
IN MW/MVAR

X-- AREA --X	FROM GENE-RATION	-----AT AREA BUSES------ FROM IND GENERATN	TO IND MOTORS	TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS	DESIRED NET INT
1 PUNJAB	6000.3 2470.2	0.0 0.0	0.0 0.0	15648.7 6243.5	0.0 -3096.5	0.0 0.0	0.0 1226.1	0.0 6127.1	309.4 5855.8	-9957.8 -1733.5	-9957.8 -1733.5	0.0
2 HARYANA	5314.7 -214.2	0.0 0.0	0.0 0.0	10807.4 4028.1	0.0 826.4	0.0 0.0	0.0 608.9	0.0 6547.3	66.8 1939.5	-5559.4 -1069.9	-5559.4 -1069.9	0.0
3 RAJASTHAN	9254.8 -2634.3	0.0 0.0	0.0 0.0	11018.0 3050.3	0.0 612.9	0.0 0.0	0.0 1585.4	0.0 11303.9	108.5 2728.8	-1871.7 492.3	-1871.7 492.3	0.0
4 J&K	3960.7 522.3	0.0 0.0	0.0 0.0	2978.0 1167.3	0.0 523.2	0.0 0.0	0.0 0.0	0.0 1075.9	39.2 664.0	943.5 -756.3	943.5 -756.3	0.0
5 HIMACHAL	9313.3 -302.4	0.0 0.0	0.0 0.0	990.9 230.9	0.0 -1.0	0.0 0.0	0.0 0.0	0.0 2645.1	118.5 1133.7	8203.8 959.1	8203.8 959.1	0.0
6 U.P	23281.8 -1593.3	0.0 0.0	0.0 0.0	23512.9 6847.6	0.0 5939.0	0.0 0.0	0.0 18227.8	0.0 42626.2	404.7 8459.6	-665.8 1559.0	-665.8 1559.0	0.0
7 UTTRAKHAND	5965.2 42.8	0.0 0.0	0.0 0.0	2516.6 1393.0	0.0 300.0	0.0 0.0	0.0 901.7	0.0 3222.3	44.1 1137.2	3404.5 -466.9	3404.5 -466.9	0.0
8 DELHI&AROUND	5055.4 656.1	0.0 0.0	0.0 0.0	584.6 243.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 316.0	18.5 240.3	4452.2 488.8	4452.2 488.8	0.0
9 CHANDIGARH	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 1.4	0.0 0.0	-0.0 1.4	-0.0 1.4	0.0
11 BBMB GEN.	1065.0 536.0	0.0 0.0	0.0 0.0	11.2 4.6	0.0 0.0	0.0 0.0	0.0 0.0	0.0 3.0	3.1 8.5	1050.7 526.0	1050.7 526.0	0.0
COLUMN TOTALS	69181.2 -836.9	0.0 0.0	0.0 0.0	68068.2 23208.2	0.0 5104.0	0.0 0.0	0.0 22552.0	0.0 73868.4	1112.8 22167.4	0.0 0.0	0.0 0.0	0.0

EXISTING SYSTEM WITH 2023 LOADING CONDITIONS

ANNEXURE - K2

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 12:39
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES) (EXCLUDED: BREAKERS AND SWITCHES; TRANSFORMERS)
CURRENT LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS				TO BUS						
BUS# X-- NAME	BASKV	AREA	BUS# X-- NAME	BASKV	AREA	CKT	LOADING	RATING	PERCENT
101002 MKSR1	132.00*	1	101008 MK21	132.00	1	1	132.4	128.0	103.4
101002 MKSR1	132.00*	1	101008 MK21	132.00	1	5	132.4	128.0	103.4
101012 BTD1	132.00	1	101092 BLNA1	132.00*	1	1	92.8	73.0	127.1
101012 BTD1	132.00	1	101093 IGC1	132.00*	1	1	101.3	87.0	116.4
101017 RNG1	132.00*	1	101100 MHLP1	132.00	1	1	109.4	87.0	125.8
101017 SRN1	132.00	1	101064 GDSP	132.00*	1	1	106.3	72.0	147.7
101017 SRN1	132.00	1	101064 GDSP	132.00*	1	2	106.3	72.0	147.7
101032 ASRN1	132.00*	1	101101 GSTP1	132.00	1	1	89.5	87.0	102.8
101045 NKDR1	132.00*	1	101116 NKDR21	132.00	1	1	97.5	87.0	112.1
101056 PCA1	132.00*	1	101094 CIV1	132.00	1	1	92.0	87.0	105.7
101062 MLM1	132.00*	1	101095 VRP1	132.00	1	1	130.9	87.0	150.4
101070 BKWD1	132.00*	1	101071 PTI1	132.00	1	1	118.6	87.0	136.3
101078 MOG1	132.00*	1	101079 MOG21	132.00	1	1	102.5	87.0	117.8
101078 MOG1	132.00*	1	101079 MOG21	132.00	1	2	102.5	87.0	117.8
101090 GDBF1	132.00*	1	101092 BLNA1	132.00	1	1	87.9	87.0	101.0
102004 WG72	220.00	1	102005 KSM2	220.00*	1	1	217.5	215.0	101.1
102017 KRTP2	220.00	1	102054 NKD2	220.00*	1	1	216.5	215.0	100.7
102017 KRTP2	220.00*	1	102098 JLNDR42	220.00	1	1	463.1	215.0	215.4
102026 GNG2	220.00*	1	502001 DEHR42	220.00	5	1	242.8	215.0	113.0
102026 GNG2	220.00*	1	502001 DEHR42	220.00	5	2	242.8	215.0	113.0
102027 GST2	220.00	1	102042 GHULAL2	220.00*	1	1	314.0	240.9	130.3
102027 GST2	220.00	1	102051 GUNS2	220.00*	1	1	359.6	240.9	149.3
102029 MOH2	220.00*	1	502003 NLGR42	220.00	5	1	260.0	215.0	121.0
102029 MOH2	220.00*	1	502003 NLGR42	220.00	5	3	260.0	215.0	121.0
102033 RJP2	220.00*	1	102096 PTA42	220.00	1	1	218.2	215.0	101.5
102034 BDG2	220.00*	1	102096 PTA42	220.00	1	1	279.6	215.0	130.0
102038 CB12	220.00*	1	102094 RAJPR42	220.00	1	1	276.7	215.0	128.7
102038 CB12	220.00*	1	102094 RAJPR42	220.00	1	2	276.7	215.0	128.7
102041 MOH2	220.00*	1	102051 GUNS2	220.00	1	1	278.2	240.9	115.5
102044 DDP2	220.00*	1	102045 LLK2	220.00	1	1	253.4	215.0	117.9
102044 DDP2	220.00*	1	102099 LDHN42	220.00	1	1	257.7	215.0	119.9
102045 LLK2	220.00*	1	102099 LDHN42	220.00	1	2	346.9	215.0	161.3
102045 LLK2	220.00*	1	102099 LDHN42	220.00	1	3	241.3	240.9	100.2
102054 NKD2	220.00*	1	102098 JLNDR42	220.00	1	1	256.2	215.0	119.2
102072 MNS2	220.00*	1	102081 SUN2	220.00	1	1	259.3	215.0	120.6
102072 MNS2	220.00*	1	102119 DHNAULA2	220.00	1	1	294.0	215.0	136.7
102[illegible]	220.00*	1	102095 DHURI42	220.00	1	1	283.4	215.0	131.8
102[illegible]	220.00*	1	102095 DHURI42	220.00	1	2	283.4	215.0	131.8
102083 PTRN2	220.00*	1	102138 PTRNPG42	220.00	1	1	230.0	215.0	107.0
102[illegible]	220.00*	1	102138 PTRNPG42	220.00	1	2	230.0	215.0	107.0
102091 BHR2P42	220.00	1	102103 MLOT2	220.00*	1	1	222.8	215.0	103.6
102099 LDHN42	220.00	1	102173 LLTKLNB2	220.00*	1	1	241.5	215.0	112.3

ANNEXURE-K3

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 12:39
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: TRANSFORMERS) (EXCLUDED: LINES; BREAKERS AND SWITCHES)
MVA LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS BUS#	NAME	BASKV	AREA	TO BUS BUS#	NAME	BASKV	AREA	CKT	LOADING	RATING	PERCENT
101000	PHR1	132.00*	1	105045	KHR11	11.000	1	1	22.1	20.0	110.3
101000	PHR1	132.00*	1	105045	KHR11	11.000	1	2	22.1	20.0	110.3
101004	PGWR1	132.00*	1	103002	PGWR13	33.000	1	1	20.2	20.0	101.2
101004	PGWR1	132.00*	1	103002	PGWR13	33.000	1	2	20.2	20.0	101.2
101004	PGWR1	132.00*	1	103002	PGWR13	33.000	1	3	20.2	20.0	101.2
101004	PGWR1	132.00*	1	105028	PGWR11	11.000	1	1	21.5	20.0	107.4
101007	MKSR1	132.00*	1	105028	PGWR11	11.000	1	2	13.4	12.5	107.4
101007	MKSR1	132.00*	1	106130	MKS16	66.000	1	1	62.1	50.0	124.3
101015	BGPR1	132.00*	1	106130	MKS16	66.000	1	2	21.5	20.0	107.6
101016	BNGA1	132.00*	1	106113	BGPR16	66.000	1	1	55.9	50.0	111.8
101016	BNGA1	132.00*	1	105041	BNGA11	11.000	1	1	24.1	20.0	120.4
101031	RPR1	132.00*	1	105041	BNGA11	11.000	1	2	15.0	12.5	120.4
101031	RPR1	132.00*	1	106121	RPR16	66.000	1	1	59.2	50.0	118.4
101041	NWSR1	132.00*	1	106121	RPR16	66.000	1	2	16.4	16.0	102.5
101041	NWSR1	132.00*	1	105040	NWSR11	11.000	1	1	23.8	20.0	118.9
101045	NKDR1	132.00*	1	105040	NWSR11	11.000	1	2	14.9	12.5	118.9
101045	NKDR1	132.00*	1	105026	NKDR11	11.000	1	1	23.1	20.0	115.4
101046	SCTY1	132.00	1	105026	NKDR11	11.000	1	2	14.4	12.5	115.4
101049	ALWPR1	132.00*	1	102107	SCTY2	220.00*	1	1	117.5	100.0	117.5
101056	PCA1	132.00*	1	105032	ALWP11	11.000	1	1	20.8	20.0	103.8
101056	PCA1	132.00*	1	105008	PCA11	11.000	1	1	22.7	20.0	113.5
101061	GTRA1	132.00*	1	105008	PCA11	11.000	1	2	14.2	12.5	113.5
101061	GTRA1	132.00*	1	105012	GTRA11	11.000	1	1	20.6	20.0	103.1
101070	BKWD1	132.00*	1	105012	GTRA11	11.000	1	2	20.6	20.0	103.1
101070	BKWD1	132.00*	1	105013	BKWD11	11.000	1	1	13.2	12.5	105.6
101079	MOG21	132.00	1	105013	BKWD11	11.000	1	2	13.2	12.5	105.6
101079	MOG21	132.00	1	102055	MOG2	220.00*	1	1	127.7	100.0	127.7
101079	MOG21	132.00	1	102055	MOG2	220.00*	1	2	127.7	100.0	127.7
101084	BDFI1	132.00*	1	102055	MOG2	220.00*	1	3	127.7	100.0	127.7
101084	BDKL1	132.00*	1	105060	BDKL11	11.000	1	1	20.3	20.0	101.4
101093	IGC1	132.00*	1	105060	BDKL11	11.000	1	2	12.7	12.5	101.4
101093	IGC1	132.00*	1	105078	IGC11	11.000	1	1	13.2	12.5	105.4
101102	BGPN1	132.00*	1	105078	IGC11	11.000	1	2	13.2	12.5	105.4
101102	BGPN1	132.00*	1	105071	BGPN11	11.000	1	1	23.6	20.0	118.1
101104	KRT1	132.00	1	105071	BGPN11	11.000	1	2	14.8	12.5	118.1
101114	PIMS1	132.00*	1	102017	KRTP2	220.00*	1	1	121.1	100.0	121.1
102005	TIB2	220.00*	1	105023	PIMS11	11.000	1	1	13.0	12.5	103.7
102005	KSM2	220.00*	1	106038	TIB26	66.000	1	1	119.4	100.0	119.4
102012	RSHANA2	220.00*	1	106045	KSM26	66.000	1	1	130.1	100.0	130.1
102019	JLD2	220.00*	1	106047	RSHN26	66.000	1	1	119.8	100.0	119.8
102019	JLD2	220.00*	1	106019	JLD26	66.000	1	1	105.4	100.0	105.4
102036	DEVIGARH2	220.00*	1	106019	JLD26	66.000	1	2	105.4	100.0	105.4
102044	DDK2	220.00*	1	106083	DEVGR26	66.000	1	1	100.1	100.0	100.1
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	1	126.1	100.0	126.1
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	2	126.1	100.0	126.1
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	3	126.1	100.0	126.1
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	4	126.1	100.0	126.1
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	1	146.0	100.0	146.0
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	2	146.0	100.0	146.0
102072	MNS2	220.00*	1	106035	MNS26	66.000	1	3	146.0	100.0	146.0
102072	MNS2	220.00*	1	106035	MNS26	66.000	1	1	132.6	100.0	132.6
102072	MNS2	220.00*	1	106035	MNS26	66.000	1	2	132.6	100.0	132.6
102081	SUN2	220.00*	1	106026	SUN26	66.000	1	3	212.2	160.0	132.6
102081	SUN2	220.00*	1	106026	SUN26	66.000	1	1	169.0	160.0	105.6
102081	SUN2	220.00*	1	106026	SUN26	66.000	1	2	105.6	100.0	105.6
102094	RAJPR42	220.00	1	104009	RAJPURA4	400.00*	1	3	105.6	100.0	105.6
102094	RAJPR42	220.00	1	104009	RAJPURA4	400.00*	1	1	515.3	500.0	103.1
102101	ASP42	220.00	1	104006	AMRTSR4	400.00*	1	2	515.3	500.0	103.1
102101	ASP42	220.00	1	104006	AMRTSR4	400.00*	1	1	315.6	315.0	100.2
102113	TLWNDSABC2	220.00*	1	106086	TLWNDSB26	66.000	1	2	315.6	315.0	100.2
							1	1	123.5	100.0	123.5

ANNEXURE-K4

PSI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 12:33
PUNJAB POWER SYTEM ACTUAL2012-13

AREA TOTALS
IN MW/MVAR

X-- AREA --X	FROM GENE-RATION	FROM IND GENERATN	TO IND MOTORS	TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS	DESIRED NET INT
1	5216.0	0.0	0.0	15562.6	0.0	0.0	0.0	0.0	390.6	-10737.6	-10737.6	0.0
PUNJAB	2670.9	0.0	0.0	6208.1	-2753.1	0.0	1210.4	5901.8	7101.7	-3194.3	-3194.3	
2	5314.7	0.0	0.0	10802.3	0.0	0.0	0.0	0.0	77.2	-5564.8	-5564.8	0.0
HARYANA	180.0	0.0	0.0	4027.0	821.0	0.0	602.4	6466.5	2070.7	-874.6	-874.6	
3	9254.8	0.0	0.0	11018.0	0.0	0.0	0.0	0.0	108.6	-1871.8	-1871.8	0.0
RAJSTHAN	-2769.1	0.0	0.0	3050.3	608.9	0.0	1574.5	11216.3	2746.5	467.2	467.2	
4	3960.7	0.0	0.0	2978.0	0.0	0.0	0.0	0.0	43.2	939.4	939.4	0.0
J&K	784.8	0.0	0.0	1167.3	515.2	0.0	0.0	1064.1	702.8	-536.4	-536.4	
5	9313.3	0.0	0.0	990.9	0.0	0.0	0.0	0.0	130.8	8191.3	8191.3	0.0
HIMACHAL	597.9	0.0	0.0	230.9	-0.9	0.0	0.0	2598.3	1269.6	1696.6	1696.6	
6	23251.8	0.0	0.0	23512.9	0.0	0.0	0.0	0.0	407.9	-669.0	-669.0	0.0
U.P	-1481.4	0.0	0.0	6847.6	5923.9	0.0	18156.7	42483.7	8498.5	1575.7	1575.7	
7	5965.2	0.0	0.0	2516.6	0.0	0.0	0.0	0.0	44.1	3404.5	3404.5	0.0
UTTRAKHAND	145.7	0.0	0.0	1393.0	300.0	0.0	897.7	3211.3	1138.5	-372.1	-372.1	
8	5868.7	0.0	0.0	584.6	0.0	0.0	0.0	0.0	24.9	5259.2	5259.2	0.0
DELHI&AROUND	956.3	0.0	0.0	243.0	0.0	0.0	0.0	313.7	311.4	715.6	715.6	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0
CHANDIGARH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	1.2	1.2	
11	1065.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	4.7	1048.8	1048.8	0.0
BBMB GEN.	536.0	0.0	0.0	4.6	0.0	0.0	0.0	2.5	12.7	521.2	521.2	
COLUMN	69210.3	0.0	0.0	67977.1	0.0	0.0	0.0	0.0	1232.1	0.0	0.0	0.0
TOTALS	1621.1	0.0	0.0	23171.8	5415.0	0.0	22441.6	73259.5	23852.6	0.0	0.0	

EXISTING SYSTEM PROJECTED WITH 2023
LOADING CONDITIONS
(WITHOUT GGSSTP GENERATION)

ANNEXURE-K5

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 12:35
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES) (EXCLUDED: BREAKERS AND SWITCHES; TRANSFORMERS)
CURRENT LOADINGS ABOVE 100.0 % OF RATING SET A:

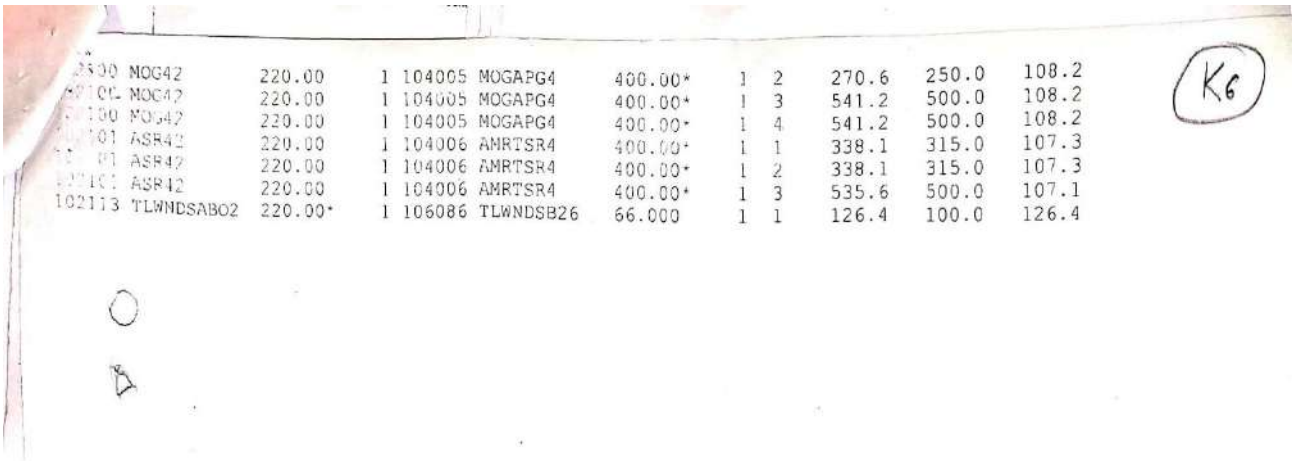
FROM BUS				TO BUS							
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
101034	JMP1	132.00*	1	101034	JMP1	132.00	1	1	74.2	73.0	101.7
101034	JMP1	132.00*	1	101034	JMP1	132.00	1	2	74.2	73.0	101.7
101004	PGWR1	132.00*	1	101043	JLD1	132.00	1	1	103.6	87.0	119.0
101007	MKSR1	132.00*	1	101008	MK21	132.00	1	1	143.4	128.0	112.0
101007	MKSR1	132.00*	1	101008	MK21	132.00	1	5	143.4	128.0	112.0
101007	MKSR1	132.00	1	101089	MLOT1	132.00*	1	1	89.9	87.0	103.3
101012	BTD1	132.00	1	101092	BLNA1	132.00*	1	1	100.2	73.0	137.3
101012	BTD1	132.00	1	101093	IGC1	132.00*	1	1	109.1	87.0	125.3
101016	BNGA1	132.00*	1	101100	MHLP1	132.00	1	1	132.7	87.0	152.5
101017	SRN1	132.00	1	101064	GDSP	132.00*	1	1	115.8	72.0	160.9
101017	SRN1	132.00	1	101064	GDSP	132.00*	1	2	115.8	72.0	160.9
101045	NKDR1	132.00*	1	101116	NKDR21	132.00	1	1	117.4	87.0	135.0
101056	PCA1	132.00*	1	101094	CIV1	132.00	1	1	105.0	87.0	120.7
101057	PCNG	132.00*	1	101059	BTLA	132.00	1	1	72.7	72.0	101.0
101062	MLP1	132.00*	1	101095	VRP1	132.00	1	1	145.5	87.0	167.3
101070	BKWD1	132.00*	1	101071	PTI1	132.00	1	1	131.7	87.0	151.4
101078	MOG1	132.00*	1	101079	MOG21	132.00	1	1	117.8	87.0	135.4
101078	MOG1	132.00*	1	101079	MOG21	132.00	1	2	117.8	87.0	135.4
101078	MOG1	132.00	1	101084	BDKL1	132.00*	1	1	68.4	66.5	102.8
101090	GDBH1	132.00*	1	101092	BLNA1	132.00	1	1	94.9	87.0	109.1
102004	NGT2	220.00	1	102005	KSM2	220.00*	1	1	236.4	215.0	109.9
102017	PRTP2	220.00	1	102054	NKD2	220.00*	1	1	259.9	215.0	120.9
102017	PRTP2	220.00*	1	102098	JLNDR42	220.00	1	1	518.1	215.0	241.0
102018	JMSP2	220.00	1	102052	GRY2	220.00*	1	1	279.2	215.0	129.9
102026	GNG2	220.00*	1	502001	DEHR42	220.00	5	1	269.8	215.0	125.5
102026	GNG2	220.00*	1	502001	DEHR42	220.00	5	2	269.8	215.0	125.5
102027	GST2	220.00	1	102042	GHULAL2	220.00*	1	1	358.4	240.9	148.8
102027	GST2	220.00	1	102051	GUNS2	220.00*	1	1	400.2	240.9	166.1
102028	KHP2	220.00*	1	102029	MOH2	220.00	1	1	339.0	215.0	157.7
102029	MOH2	220.00*	1	502003	NLGR42	220.00	5	1	332.2	215.0	154.5
102029	MOH2	220.00*	1	502003	NLGR42	220.00	5	3	332.2	215.0	154.5
102033	KTP2	220.00*	1	102096	PTA42	220.00	1	1	292.1	215.0	135.9
102034	BDN2	220.00*	1	102096	PTA42	220.00	1	1	375.2	215.0	174.5
102035	JPL2	220.00*	1	102094	RAJPR42	220.00	1	1	446.5	215.0	207.7
102038	GBL2	220.00*	1	102094	RAJPR42	220.00	1	2	446.5	215.0	207.7
102041	LDH2	220.00*	1	102051	GUNS2	220.00	1	1	303.9	240.9	126.2
102042	GHL2	220.00*	1	102045	LLK2	220.00	1	1	316.5	215.0	147.2
102045	LLK2	220.00*	1	102099	LDHN42	220.00	1	1	317.5	215.0	147.7
102048	MHP2	220.00*	1	102099	LDHN42	220.00	1	2	381.8	215.0	177.6
102054	NKD2	220.00*	1	102099	LDHN42	220.00	1	3	265.6	240.9	110.3
102057	ROD2	220.00	1	102098	JLNDR42	220.00	1	1	301.3	215.0	140.1
102058	MOG2	220.00	1	102058	TDBH2	220.00*	1	1	229.5	215.0	106.8
102078	MNS2	220.00*	1	102058	TDBH2	220.00*	1	2	229.5	215.0	106.8
102080	MNS4	220.00*	1	102081	SUN2	220.00	1	1	278.7	215.0	129.6
102080	MLK1	220.00*	1	102119	DHNAULA2	220.00	1	1	315.1	215.0	146.5
102080	MLK1	220.00*	1	102097	MLK42	220.00	1	1	236.1	215.0	109.8
102081	SUN2	220.00*	1	102097	MLK42	220.00	1	2	236.1	215.0	109.8
102081	SUN2	220.00*	1	102095	DHURI42	220.00	1	1	298.3	215.0	138.8
102083	PTRN2	220.00*	1	102095	DHURI42	220.00	1	2	298.3	215.0	138.8
102083	PTRN2	220.00*	1	102138	PTRNPG42	220.00	1	1	249.3	215.0	115.9
102091	MUKSR42	220.00	1	102138	PTRNPG42	220.00	1	2	249.3	215.0	115.9
102093	NKDR42	220.00	1	102103	MLOT2	220.00*	1	1	238.9	215.0	111.1
102099	DEHN42	220.00	1	102111	RHNJT2	220.00*	1	1	241.0	215.0	112.1
				102173	LLTKLNB2	220.00*	1	1	254.4	215.0	118.3

ANNEXURE – K6

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 12:36
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: TRANSFORMERS) (EXCLUDED: LINES; BREAKERS AND SWITCHES)
MVA LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS BUS#	X-- NAME	--X BASKV	AREA	TO BUS BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
101003	KHR1	132.00*	1	105045	KHR11	11.000	1	1	22.4	20.0	112.2
101003	KHR1	132.00*	1	105045	KHR11	11.000	1	2	22.4	20.0	112.2
101004	PGWR1	132.00*	1	103002	PGWR13	33.000	1	1	20.6	20.0	103.0
101004	PGWR1	132.00*	1	103002	PGWR13	33.000	1	2	20.6	20.0	103.0
101004	PGWR1	132.00*	1	103002	PGWR13	33.000	1	3	20.6	20.0	103.0
101004	PGWR1	132.00*	1	105028	PGWR11	11.000	1	1	22.0	20.0	110.1
101004	PGWR1	132.00*	1	105028	PGWR11	11.000	1	2	13.8	12.5	110.1
101007	MKSR1	132.00*	1	106130	MKS16	66.000	1	1	63.0	50.0	126.0
101007	MKSR1	132.00*	1	106130	MKS16	66.000	1	2	21.8	20.0	109.0
101015	BGPR1	132.00*	1	106113	BGPR16	66.000	1	1	57.0	50.0	114.0
101016	BNGA1	132.00*	1	105041	BNGA11	11.000	1	1	24.6	20.0	123.1
101016	BNGA1	132.00*	1	105041	BNGA11	11.000	1	2	15.4	12.5	123.1
101031	RPR1	132.00*	1	106121	RPR16	66.000	1	1	61.0	50.0	122.1
101031	RPR1	132.00*	1	106121	RPR16	66.000	1	2	16.9	16.0	105.7
101041	NWSR1	132.00*	1	105040	NWSR11	11.000	1	1	24.1	20.0	120.6
101041	NWSR1	132.00*	1	105040	NWSR11	11.000	1	2	15.1	12.5	120.6
101041	NWSR1	132.00*	1	106118	NWSR16	66.000	1	2	50.9	50.0	101.8
101041	NWSR1	132.00*	1	106118	NWSR16	66.000	1	3	50.9	50.0	101.8
101045	NKDR1	132.00*	1	105026	NKDR11	11.000	1	1	23.7	20.0	118.5
101045	NKDR1	132.00*	1	105026	NKDR11	11.000	1	2	14.8	12.5	118.5
101046	SCTY1	132.00	1	102107	SCTY2	220.00*	1	1	127.0	100.0	127.0
101048	KPTL1	132.00*	1	105021	KPTL11	11.000	1	1	20.2	20.0	101.2
101048	KPTL1	132.00*	1	105021	KPTL11	11.000	1	2	20.2	20.0	101.2
101049	ALWPP1	132.00*	1	105032	ALWP11	11.000	1	1	21.2	20.0	105.9
101056	PCA1	132.00*	1	105008	PCA11	11.000	1	1	23.2	20.0	116.1
101056	PCA1	132.00*	1	105008	PCA11	11.000	1	2	14.5	12.5	116.1
101061	GTRA1	132.00*	1	105012	GTRA11	11.000	1	1	21.1	20.0	105.3
101061	GTRA1	132.00*	1	105012	GTRA11	11.000	1	2	21.1	20.0	105.3
101062	MLM1	132.00*	1	105011	MLM11	11.000	1	1	20.3	20.0	101.6
101062	MLM1	132.00*	1	105011	MLM11	11.000	1	2	20.3	20.0	101.6
101070	BKWD1	132.00*	1	105013	BKWD11	11.000	1	1	13.5	12.5	107.7
101070	BKWD1	132.00*	1	105013	BKWD11	11.000	1	2	13.5	12.5	107.7
101079	MOG2	132.00	1	102055	MOG2	220.00*	1	1	136.6	100.0	136.6
101079	MOG2	132.00	1	102055	MOG2	220.00*	1	2	136.6	100.0	136.6
101079	MOG2	132.00	1	102055	MOG2	220.00*	1	3	136.6	100.0	136.6
101093	IGC1	132.00*	1	105078	IGC11	11.000	1	1	13.3	12.5	106.7
101093	IGC1	132.00*	1	105078	IGC11	11.000	1	2	13.3	12.5	106.7
101102	BGPN1	132.00*	1	105071	BGPN11	11.000	1	1	24.0	20.0	120.1
101102	BGPN1	132.00*	1	105071	BGPN11	11.000	1	2	15.0	12.5	120.1
101108	KRTP2	132.00	1	102017	KRTP2	220.00*	1	1	131.4	100.0	131.4
101109	PIMS1	132.00*	1	105023	PIMS11	11.000	1	1	13.2	12.5	105.4
102003	TIB2	220.00*	1	106038	TIB26	66.000	1	1	121.1	100.0	121.1
102005	KSM2	220.00*	1	106045	KSM26	66.000	1	1	133.6	100.0	133.6
102012	RASHIANA2	220.00*	1	106047	RSHN26	66.000	1	1	121.5	100.0	121.5
102019	JL12	220.00*	1	106019	JLD26	66.000	1	1	107.2	100.0	107.2
102019	JL12	220.00*	1	106019	JLD26	66.000	1	2	107.2	100.0	107.2
102028	KHR2	220.00*	1	106008	KHR26	66.000	1	1	100.8	100.0	100.8
102028	KHR2	220.00*	1	106008	KHR26	66.000	1	2	100.8	100.0	100.8
102036	DEVIGARH2	220.00*	1	106083	DEVGR26	66.000	1	1	101.4	100.0	101.4
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	1	128.8	100.0	128.8
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	2	128.8	100.0	128.8
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	3	128.8	100.0	128.8
102044	DDK2	220.00*	1	106016	DDK26	66.000	1	4	128.8	100.0	128.8
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	1	150.3	100.0	150.3
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	2	150.3	100.0	150.3
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	3	150.3	100.0	150.3
102072	MNS2	220.00*	1	106035	MNS26	66.000	1	1	135.1	100.0	135.1
102072	MNS2	220.00*	1	106035	MNS26	66.000	1	2	135.1	100.0	135.1
102072	MNS2	220.00*	1	106035	MNS26	66.000	1	3	216.2	160.0	135.1
102081	SUN2	220.00*	1	106026	SUN26	66.000	1	1	170.9	160.0	106.8
102081	SUN2	220.00*	1	106026	SUN26	66.000	1	2	106.8	100.0	106.8
102081	SUN2	220.00*	1	106026	SUN26	66.000	1	3	106.8	100.0	106.8
102092	MKHU42	220.00	1	104007	MAKHU4	400.00*	1	1	323.7	315.0	102.8
102092	MKHU42	220.00	1	104007	MAKHU4	400.00*	1	2	323.7	315.0	102.8
102094	RAJPR42	220.00	1	104009	RAJPURA4	400.00*	1	1	650.0	500.0	130.0
102094	RAJPR42	220.00	1	104009	RAJPURA4	400.00*	1	2	650.0	500.0	130.0
102095	DHURI42	220.00	1	104011	DHURI4	400.00*	1	2	526.2	500.0	105.2
102095	DHURI42	220.00	1	104011	DHURI4	400.00*	1	3	526.2	500.0	105.2
102096	PTA42	220.00	1	104002	PTLA4	400.00*	1	1	327.2	315.0	103.9
102096	PTA42	220.00	1	104002	PTLA4	400.00*	1	2	327.2	315.0	103.9
102096	PTA42	220.00	1	104002	PTLA4	400.00*	1	3	518.4	500.0	103.7
102099	LDHN42	220.00	1	104003	LUDHN4	400.00*	1	1	315.2	315.0	100.1
102099	LDHN42	220.00	1	104003	LUDHN4	400.00*	1	2	315.2	315.0	100.1
102099	LDHN42	220.00	1	104003	LUDHN4	400.00*	1	3	315.2	315.0	100.1
102100	MOG42	220.00	1	104005	MOGAPG4	400.00*	1	1	341.7	315.0	108.5



[illegible]00	MOG42	220.00	1	104005	MOGAPG4	400.00*	1	2	270.6	250.0	108.2
[illegible]100	MOG42	220.00	1	104005	MOGAPG4	400.00*	1	3	541.2	500.0	108.2
[illegible]100	MOG42	220.00	1	104005	MOGAPG4	400.00*	1	4	541.2	500.0	108.2
[illegible]101	ASR42	220.00	1	104006	AMRTSR4	400.00*	1	1	338.1	315.0	107.3
[illegible]01	ASR42	220.00	1	104006	AMRTSR4	400.00*	1	2	338.1	315.0	107.3
[illegible]101	ASR42	220.00	1	104006	AMRTSR4	400.00*	1	3	535.6	500.0	107.1
102113	TLWNDSAB02	220.00*	1	106086	TLWNDSB26	66.000	1	1	126.4	100.0	126.4

K6

ANNEXUREK8

INTERACTIVE POWER SYSTEM SIMULATION--PSS/E-33.7 THU, JUN 20 2019 16:44
POWER SYTEM ACTUAL2012-13

AREA TOTALS
IN MW/MVAR

X-- AREA --X	FROM -----AT AREA BUSES------ GNE- ATION	FROM IND GENERATN	TO IND MOTORS	TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS	DESIRED NET INT
1	6000.3	0.0	0.0	15694.0	0.0	0.0	0.0	0.0	216.7	-9870.4	-9870.4	0.0
PUNJAB	1802.2	0.0	0.0	5151.3	-2656.2	0.0	1212.4	6422.9	4124.1	393.5	393.5	
2	5314.7	0.0	0.0	10212.0	0.0	0.0	0.0	0.0	55.4	-4952.7	-4952.7	0.0
HARYANA	687.6	0.0	0.0	3355.7	3064.3	0.0	990.2	6764.3	1598.5	-1556.9	-1556.9	
3	11976.5	0.0	0.0	11784.9	0.0	0.0	0.0	0.0	207.9	-16.2	-16.2	0.0
RAJASTHAN	965.4	0.0	0.0	3403.9	2458.3	0.0	2026.1	10800.7	3851.6	26.1	26.1	
4	3960.7	0.0	0.0	2814.8	0.0	0.0	0.0	0.0	37.3	1108.6	1108.6	0.0
J&K	235.1	0.0	0.0	1103.3	289.8	0.0	0.0	1301.0	591.2	-448.1	-448.1	
5	9313.3	0.0	0.0	1078.4	0.0	0.0	0.0	0.0	111.6	8123.4	8123.4	0.0
H.P&OTHRS.	-428.6	0.0	0.0	260.8	301.4	0.0	0.0	2482.0	1052.7	438.6	438.6	
6	23546.1	0.0	0.0	23592.7	0.0	0.0	0.0	0.0	414.1	-460.7	-460.7	0.0
U.P	-1661.3	0.0	0.0	2494.5	8471.3	0.0	19683.8	40380.8	8349.7	-279.7	-279.7	
7	5965.2	0.0	0.0	2378.7	0.0	0.0	0.0	0.0	44.2	3542.3	3542.3	0.0
UTTRAKHAND	33.3	0.0	0.0	820.2	523.3	0.0	873.5	3207.6	1093.1	-69.2	-69.2	
8	2034.1	0.0	0.0	552.6	0.0	0.0	0.0	0.0	6.4	1475.1	1475.1	0.0
DELHI&AROUND	1092.4	0.0	0.0	181.6	0.0	0.0	0.0	315.1	99.3	1126.6	1126.6	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0
CHANDIGARH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3	1.3	
11	1065.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	3.9	1050.5	1050.5	0.0
BBMB GEN.	379.2	0.0	0.0	4.4	0.0	0.0	0.0	8.2	15.1	367.9	367.9	
COLUMN	69176.0	0.0	0.0	68078.6	0.0	0.0	0.0	0.0	1097.4	0.0	0.0	0.0
TOTALS	3105.2	0.0	0.0	16775.7	12452.1	0.0	24786.0	71683.9	20775.3	0.0	0.0	

WITH ADDITION OF ALL PENDING WORKS OF MYT 2017-20, AND WORKS ADDED THROUGH AMMENDMENTS

ANNEXURE-K9

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 16:44
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES) (EXCLUDED: BREAKERS AND SWITCHES; TRANSFORMERS)
CURRENT LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS				TO BUS							
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
101017	STD1	132.00	1	101092	BLNA1	132.00*	1	1	109.3	73.0	149.8
101017	SRN1	132.00	1	101064	GDSP	132.00*	1	1	95.6	72.0	132.7
101017	SRN1	132.00	1	101064	GDSP	132.00*	1	2	95.6	72.0	132.7
101032	JSRN1	132.00*	1	101101	GSTP1	132.00	1	1	87.7	87.0	100.9
101034	TNGR1	132.00*	1	101134	BUTARI1	132.00	1	1	104.2	87.0	119.8
101037	PCA1	132.00*	1	101094	CIV1	132.00	1	1	92.3	87.0	106.1
101077	BKWD1	132.00*	1	101071	PTI1	132.00	1	1	106.6	87.0	122.5
101096	GDBH1	132.00*	1	101092	BLNA1	132.00	1	1	94.5	87.0	108.6
102026	GNG2	220.00	1	502001	DEHR42	220.00*	5	1	224.1	215.0	104.3
102026	GNG2	220.00	1	502001	DEHR42	220.00*	5	2	224.1	215.0	104.3
102029	MOH2	220.00	1	502003	NLGR42	220.00*	5	1	221.3	215.0	102.9
102029	MOH2	220.00	1	502003	NLGR42	220.00*	5	3	221.3	215.0	102.9
102034	BDG2	220.00*	1	102096	PTA42	220.00	1	1	218.1	215.0	101.4
102038	GB12	220.00*	1	102094	RAJPR42	220.00	1	1	220.0	215.0	102.3
102038	GB12	220.00*	1	102094	RAJPR42	220.00	1	2	220.0	215.0	102.3
102099	LDHN42	220.00	1	102173	LLTKLN82	220.00*	1	1	277.9	242.0	114.8

ANNEXURE-K10

PTI-INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUN 20 2019 16:47
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: TRANSFORMERS) (EXCLUDED: LINES; BREAKERS AND SWITCHES)
MVA LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS BUS#	X-- NAME	--X BASKV	AREA	TO BUS BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
101003	HR1	132.00*	1	105045	KHR11	11.000	1	1	20.4	20.0	102.1
101003	HR1	132.00*	1	105045	KHR11	11.000	1	2	20.4	20.0	102.1
101004	PGWR1	132.00*	1	105028	PGWR11	11.000	1	1	22.8	20.0	113.8
101004	PGWR1	132.00*	1	105028	PGWR11	11.000	1	2	14.2	12.5	113.8
101006	KTKP1	132.00*	1	105069	KTKP11	11.000	1	1	13.7	12.5	109.2
101006	KTKP1	132.00*	1	105069	KTKP11	11.000	1	2	13.7	12.5	109.2
101007	KTKPR1	132.00*	1	105070	KTKPR11	11.000	1	1	21.5	20.0	107.5
101011	SMDB1	132.00*	1	105062	SMDB11	11.000	1	1	20.0	20.0	100.1
101011	SMDB1	132.00*	1	105062	SMDB11	11.000	1	2	12.5	12.5	100.1
101016	BNGA1	132.00*	1	105041	BNGA11	11.000	1	1	24.6	20.0	122.8
101016	BNGA1	132.00*	1	105041	BNGA11	11.000	1	2	15.3	12.5	122.8
101037	RPR1	132.00*	1	106121	RPR16	66.000	1	1	52.5	50.0	104.9
101038	BLSPR1	132.00*	1	105048	BLSPR11	11.000	1	1	12.6	12.5	100.9
101038	BLSPR1	132.00*	1	105048	BLSPR11	11.000	1	2	12.6	12.5	100.9
101041	NWSR1	132.00*	1	105040	NWSR11	11.000	1	1	24.3	20.0	121.6
101041	NWSR1	132.00*	1	105040	NWSR11	11.000	1	2	15.2	12.5	121.6
101045	NKDR1	132.00*	1	105026	NKDR11	11.000	1	1	22.5	20.0	112.4
101045	NKDR1	132.00*	1	105026	NKDR11	11.000	1	2	14.1	12.5	112.4
101048	KPTL1	132.00*	1	105021	KPTL11	11.000	1	1	20.4	20.0	102.1
101048	KPTL1	132.00*	1	105021	KPTL11	11.000	1	2	20.4	20.0	102.1
101056	PCA1	132.00*	1	105008	PCA11	11.000	1	1	21.9	20.0	109.6
101056	PCA1	132.00*	1	105008	PCA11	11.000	1	2	13.7	12.5	109.6
101070	BKWD1	132.00*	1	105013	BKWD11	11.000	1	1	14.9	12.5	119.2
101070	BKWD1	132.00*	1	105013	BKWD11	11.000	1	2	14.9	12.5	119.2
101079	MOG21	132.00	1	102055	MOG2	220.00*	1	1	111.1	100.0	111.1
101079	MOG21	132.00	1	102055	MOG2	220.00*	1	2	111.1	100.0	111.1
101079	MOG21	132.00	1	102055	MOG2	220.00*	1	3	111.1	100.0	111.1
101085	SUSN1	132.00*	1	105056	SUSN11	11.000	1	1	19.0	12.5	152.3
101085	PNJGR1	132.00*	1	105068	PNJGR11	11.000	1	1	12.7	12.5	101.2
101085	PNJGR1	132.00*	1	105068	PNJGR11	11.000	1	2	12.7	12.5	101.2
101092	BLNA1	132.00*	1	105080	BLNA11	11.000	1	1	13.9	12.5	111.1
101093	IGC1	132.00*	1	105078	IGC11	11.000	1	1	15.3	12.5	122.3
101093	IGC1	132.00*	1	105078	IGC11	11.000	1	2	15.3	12.5	122.3
101102	BGPN1	132.00*	1	105071	BGPN11	11.000	1	1	22.8	20.0	113.8
101102	BGPN1	132.00*	1	105071	BGPN11	11.000	1	2	14.2	12.5	113.8
101106	KHNPR1	132.00	1	105031	KHNP11	11.000*	1	1	21.8	20.0	108.8
101107	GHLKLN1	132.00*	1	105061	GHLK11	11.000	1	1	21.8	20.0	109.1
101108	PIMS1	132.00*	1	105023	PIMS11	11.000	1	1	21.5	12.5	171.7
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	1	127.9	100.0	127.9
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	2	127.9	100.0	127.9
102046	JMP2	220.00*	1	106017	JMP26	66.000	1	3	127.9	100.0	127.9

ANNEXURE-K.13

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E MON, AUG 05 2019 11:59
PUNJAB POWER SYTEM : 2020-23
AREA TOTALS
IN MW/MVAR

--- AREA --X	FROM GENE-RATION	FROM IND GENERATN	TO IND MOTORS	TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS	DESIRED NET INT
1	6030.3	0.0	0.0	15654.0	0.0	0.0	0.0	0.0	199.4	-9853.1	-9853.1	0.0
PUNJAB	1550.2	0.0	0.0	5145.3	-2687.7	0.0	1214.7	6315.0	3755.7	437.2	437.2	
2	5314.7	0.0	0.0	10212.3	0.0	0.0	0.0	0.0	54.9	-4952.5	-4952.5	0.0
HARYANA	665.3	0.0	0.0	3355.8	3067.3	0.0	991.5	6706.3	1586.5	-1629.5	-1629.5	
3	11976.5	0.0	0.0	11784.9	0.0	0.0	0.0	0.0	207.8	-16.2	-16.2	0.0
RRVPNL	957.7	0.0	0.0	3403.9	2459.0	0.0	2027.0	10804.7	3849.8	22.6	22.6	
4	3960.7	0.0	0.0	2814.8	0.0	0.0	0.0	0.0	37.9	1108.0	1108.0	0.0
J&K	225.8	0.0	0.0	1103.3	290.0	0.0	0.0	1301.6	597.1	-462.9	-462.9	
5	9313.3	0.0	0.0	1078.4	0.0	0.0	0.0	0.0	112.7	8122.3	8122.3	0.0
HIMACHAL	-373.0	0.0	0.0	260.6	301.8	0.0	0.0	2631.3	1076.4	619.3	619.3	
6	23546.1	0.0	0.0	23592.7	0.0	0.0	0.0	0.0	414.0	-460.6	-460.6	0.0
U.P	-1673.8	0.0	0.0	2494.5	8474.3	0.0	19693.3	40395.4	8348.8	-289.3	-289.3	
7	5965.2	0.0	0.0	1378.7	0.0	0.0	0.0	0.0	44.2	3542.4	3542.4	0.0
UTTRAKHAND	22.9	0.0	0.0	820.2	523.4	0.0	873.9	3208.7	1092.5	-78.5	-78.5	
8	2017.1	0.0	0.0	552.6	0.0	0.0	0.0	0.0	6.4	1458.1	1458.1	0.0
DELHI&AROUND	1068.0	0.0	0.0	191.6	0.0	0.0	0.0	315.2	99.2	1102.4	1102.4	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0
CHANDIGARH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3	1.3	
11	1065.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	2.8	1051.6	1051.6	0.0
BBMB GEN.	285.3	0.0	0.0	4.4	0.0	0.0	0.0	8.3	11.8	277.4	277.4	
COLUMN	69159.0	0.0	0.0	68078.9	0.0	0.0	0.0	0.0	1080.1	0.0	0.0	0.0
TOTALS	2728.3	0.0	0.0	16769.8	12428.1	0.0	24800.5	71667.8	20417.8	0.0	0.0	

WITH ADDITION OF PROPOSED TRANSMISSION WORKS
FOR THE YEAR 2020-23.
{WITH FULL 4x 210 MW GENERATION AVAILABLE FROM GGSSTP}

ANNEXURE – K15

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E MON, AUG 05 2019 12:17
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: TRANSFORMERS) (EXCLUDED: LINES; BREAKERS AND SWITCHES)
MVA LOADINGS ABOVE 100.0 OF RATING SET A:

FROM BUS				TO BUS							
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
101015	BGPR1	132.00*	1	106113	BGPR16	66.000	1	1	50.3	50.0	100.6
102005	KSM2	220.00*	1	106045	KSM26	66.000	1	1	100.2	100.0	100.2

ANNEXURE - K16

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E MON, AUG 05 2019 12:19
PUNJAB POWER SYTEM 20-23

AREA TOTALS
IN MW/MVAR

X-- AREA --X	FROM GENE-RATION	FROM IND GENERATN	TO IND MOTORS	TO LOAD	TO BUS SHUNT	TO GNE BUS DEVICES	TO LINE SHUNT	FROM CHARGING	TO LOSSES	-NET INTERCHANGE- TO TIE LINES	TO TIES + LOADS	DESIRED NET INT
1	5216.0	0.0	0.0	15654.0	0.0	0.0	0.0	0.0	201.0	-10639.0	-10639.0	0.0
PUNJAB	1434.9	0.0	0.0	5145.3	-2618.6	0.0	1210.5	6262.8	3935.1	25.4	25.4	
2	5314.7	0.0	0.0	10211.7	0.0	0.0	0.0	0.0	58.1	-4955.1	-4955.1	0.0
HARYANA	722.7	0.0	0.0	3355.6	3057.9	0.0	988.9	6685.5	1632.3	-1626.5	-1626.5	
3	11976.5	0.0	0.0	11784.9	0.0	0.0	0.0	0.0	208.1	-16.5	-16.5	0.0
RAJST[illegible]	974.9	0.0	0.0	3403.9	2457.6	0.0	2024.9	10796.5	3856.5	28.5	28.5	
4	3960.7	0.0	0.0	2814.8	0.0	0.0	0.0	0.0	38.8	1107.0	1107.0	0.0
J&K	267.3	0.0	0.0	1103.3	289.3	0.0	0.0	1298.9	605.8	-432.2	-432.2	
5	9313.3	0.0	0.0	1078.4	0.0	0.0	0.0	0.0	115.4	8119.5	8119.5	0.0
HIMACHAL	-165.4	0.0	0.0	260.8	300.5	0.0	0.0	2622.0	1106.4	788.8	788.8	
6	23546.1	0.0	0.0	23592.7	0.0	0.0	0.0	0.0	415.0	-461.6	-461.6	0.0
U.P	-1643.8	0.0	0.0	2494.5	8467.7	0.0	19673.0	40363.6	8355.8	-271.2	-271.2	
7	5965.2	0.0	0.0	2378.7	0.0	0.0	0.0	0.0	44.1	3542.4	3542.4	0.0
UTTRAKHAND	53.0	0.0	0.0	820.2	523.1	0.0	872.9	3205.8	1091.6	-49.0	-49.0	
8	2815.2	0.0	0.0	552.6	0.0	0.0	0.0	0.0	9.9	2252.7	2252.7	0.0
DELHI&AROUND	1119.3	0.0	0.0	181.6	0.0	0.0	0.0	314.7	137.7	1114.7	1114.7	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.0	-0.0	0.0
CHANDIGARH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3	1.3	
11	1065.0	0.0	0.0	10.6	0.0	0.0	0.0	0.0	3.9	1050.5	1050.5	0.0
BBMB GEN.	431.3	0.0	0.0	4.4	0.0	0.0	0.0	8.1	14.7	420.3	420.3	
COLUMN	69172.7	0.0	0.0	68078.3	0.0	0.0	0.0	0.0	1094.3	0.0	0.0	0.0
TOTALS	3194.1	0.0	0.0	16769.6	12477.6	0.0	24770.3	71559.2	20735.9	0.0	0.0	

WITH ADDITION OF PROPOSED TRANSMISSION WORKS
FOR THE YEAR 2020-23
{WITHOUT GGSSTP generation}

ANNEXURE-K17

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E FRI, JUN 21 2019 12:20
PUNJAB POWER SYTEM ACTUAL2012-13

OUTPUT FOR AREA 1 [PUNJAB]
SUBSYSTEM LOADING CHECK (INCLUDED: LINES) (EXCLUDED: BREAKERS AND SWITCHES; TRANSFORMERS)
CURRENT LOADINGS ABOVE 100.0 % OF RATING SET A:

FROM BUS				TO BUS							
BUS#	X-- NAME	--X BASKV	AREA	BUS#	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATING	PERCENT
10202[illegible]	NG2	220.00	1	502001	DEHR42	220.00*	5	1	223.7	215.0	104.1
10202[illegible]	NG2	220.00	1	502001	DEHR42	220.00*	5	2	223.7	215.0	104.1
102034	BDG2	220.00*	1	102096	PTA42	220.00	1	1	221.6	215.0	103.1
102038	GB12	220.00*	1	102094	RAJPR42	220.00	1	1	243.3	215.0	113.2
102038	GB12	220.00*	1	102094	RAJPR42	220.00	1	2	243.3	215.0	113.2
10204[illegible]	KOH2	220.00*	1	102129	DHNANSU42	220.00	1	1	248.5	215.0	115.6
10204[illegible]	KOH2	220.00*	1	102129	DHNANSU42	220.00	1	2	248.5	215.0	115.6
102041	KOH2	220.00	1	102174	SAHNEWLB2	220.00*	1	1	271.6	240.9	112.7

Annexure-1: Scheme Details (Transmission)

Annexure-2: Scheme Details (SLDC)

Annexure-3: IDC and IEDC details

(34)

pstcl
PUNJAB STATE TRANSMISSION CORPORATION LIMITED

PUNJAB STATE TRANSMISSION CORPORATION LIMITED
Regd. Office: PSEB Head Office, The Mall Patiala-147001,Punjab, India.
Corporate Identity Number: U40109PB2010SGC033814 (www.pstcl.org)
(O/o CAO/F&A (Commercial & Regulatory Cell) 3rd Floor, Shakti Sadan, Patiala)
Fax/Ph.No.0175-2970183 Email : fa@pstcl.org

To

The Secretary,
Punjab State Electricity Regulatory Commission,
Site No.3, Sector-18-A, Madhya Marg,
Chandigarh.

Memo No. 3081 /FA/Comml.-803
Dated: 25/9/19

Subject: **Petition for the approval of PSTCL's Business Plan including Capital Investment Plan for 2nd Control Period from FY2020-21 to FY 2022-23- Deficiencies thereof.**

Please refer to your office Letter No. PSERC/Tariff/Pet.19 of 2019/1337 dated 11.09.2019 on above cited subject.

PSTCL's replies/submission on the deficiencies pertaining to Business Plan including Capital Investment Plan from FY 2020-21 to FY 2022-23 and a draft public notice for inviting objections/suggestions on the same are attached herewith for the kind consideration of the Hon'ble Commission.

DA/As above (12 Copies)

CAO/Finance & Audit,
PSTCL, Patiala.

26-9-19
Despatcher
Pb. State Electricity Regulatory Commission
Plot No. 3, Sector 18-A
Chandigarh

PSTCL Business Plan and Capital Investment Plan- Deficiencies

1. PSTCL to submit the following **data in excel/xlsx format**:

a. **Prescribed Transmission formats duly filled;**

PSTCL reply: Will be submitted subsequently.

b. **Annual Audited accounts from FY 2015-16 to FY 2017-18 and Provisional Accounts for FY 2018-19 (along with Annexures);**

PSTCL Reply: The Annual Audited accounts for the period FY 16 to FY 19 in excel format are provided in the enclosed CD.

c. **Month-wise peak and average demand from FY 2013-14 to FY 2018-19 and 1st quarter of FY 2019-20, along with PSTCL's projections for the same during the 2nd Control Period;**

PSTCL Reply: Provided in enclosed CD.

d. **Actual substation-wise and month-wise transmission loss from FY 2016-17 to FY 2018-19, along with energy input;**

PSTCL Reply: Provided in enclosed CD.

e. **A breakup of scheme-wise financing plan i.e. the breakup between debt, equity, Govt. grants and consumer contribution for each of the ongoing/ spillover/deferred and new schemes;**

PSTCL Reply: Will be submitted subsequently

f. **Actual Government grants received (if any) for the ongoing/ spillover schemes (as on March 2019) and an estimate of Government grants expected to be received from FY 2019-20 to FY 2022-23;**

PSTCL Reply: Will be submitted subsequently.

g. **Breakup of capital expenditure involved i.e. IDC, employee cost, A&G expenses etc. for each scheme proposed for the 2nd Control Period.**

PSTCL Reply: Will be submitted subsequently.

2. **Regulation 9.4 of the MYT Tariff Regulations, 2019 specifies that the business plan of the transmission business should include the following:**

"a) Future plans of the company including efficiency improvement measures proposed to be introduced and technical requirement such as meeting reactive power requirements;

(b) Plan for reduction in transmission losses;
(c) Plan for improvement in quality of transmission service and reliability, metering arrangements and any other new measure to be initiated by the Licensee, e.g. automation, IT initiatives etc.;
(d) Capital Investment Plan based on the above;
(e) Man Power Plan."

It is observed that the Business Plan submitted by PSTCL for its Transmission and SLDC business does not contain Future plans, Loss Reduction Plan, Man Power Plan etc. PSTCL is required to submit the details of various components of the business plan in line with the above Regulation.

PSTCL reply:

PSTCL understands that the CIP is based on the following:

"a) *Future plans of the company including efficiency improvement measures proposed to be introduced and technical requirement such as meeting reactive power requirements;*

(b) *Plan for reduction in transmission losses;*

(c) *Plan for improvement in quality of transmission service and reliability, metering arrangements and any other new measure to be initiated by the Licensee, e.g. automation, IT initiatives etc.;*

It is only after consideration of all the points above, that PSTCL has framed its extensive Capital expenditure requirements. The said CIP gives timelines for completion of spillover schemes. Apart from the above, PSTCL has given its entire philosophy/considerations of future load growth in the state, intra-state generation capacity and requirement of power to be procured from inter-state generating station. Keeping the above in mind, PSTCL has undertaken load flow studies wherein system constraints have been identified and augmentation/strengthening/ upgradation has been proposed appropriately in due consideration of technical standards prescribed by CEA/Hon'ble PSERC. The Load flow simulation results had already been enclosed as the part of main submission.

So far as some of the specific elements are concerned, PSTCL submits the following:

- Loss Reduction measures: Transmission losses of PSTCL were within 3% limit against an average of 3.5% of Northern India. As such no capital layout has been planned to reduce transmission losses. However, in case pursuant to development of the proposed network in case there is any need for undertaking such measures, PSTCL craves leave to submit such schemes in its subsequent petitions.
- Meeting Reactive Power requirement: With respect to balance reactive power requirement, CBIP is currently working out its requirements. Pursuant to receipt of such requirements, PSTCL will propose the schemes and submit the same for kind consideration by the Hon'ble commission. In this regard, Minutes of NRPC meeting attached as **Annexure-1.**
- Automation/IT initiatives: The MYT plan includes the works with respect to provision of SAS at substations and also a prototype digital substation. However, these capital plans have been linked with PSDF funding at this moment. In case funding is refused, works shall be taken up from own funding for which commission shall be intimated timely.
- Manpower Plan: PSTCL submits that it has provided detailed submission on its manpower requirements in section "5.3.7.1- Human resource development" in its original submission. In the said section, PSTCL has elaborated on the future manpower requirement together with envisaged retirements. The same may kindly be refereed by the Hon'ble Commission.

3. **PSTCL has not submitted the Detailed Project Reports (DPRs) of the various schemes/ works included in the CIP as per Regulation 9.8 of the MYT Tariff Regulations, 2019 which specifies as under:**

"9.8 The Applicant shall submit the Detailed Project Reports (DPRs) for all the schemes as per Part (a) and (b) above which shall include:
(a) Purpose of investment;
(b) Broad Technical Specifications of the proposed investment and supporting details;
(c) Capital Structure;

(d) Capitalization Schedule;
(e) Financing Plan, including identified sources of investment;
(f) Physical targets;
(g) Cost-benefit analysis;
(h) Prioritization of proposed Investments:

Provided that DPRs will not be necessary for schemes under Rs. 10 Crore for Generation and Transmission Businesses, Rs. 5 Crore for Distribution Business and Rs. 1 Crore for SLDC:

Provided further that the total capital expenditure on non-DPR schemes in any year should not exceed 20% of that for DPR schemes during that year."

PSTCL Reply:

PSTCL submits that the envisaged capital expenditure is proposed to be funded through borrowings from financial institutions. Such institution mandatorily requires submission of DPR for the proposed schemes. The DPRs as submitted to such financial institutions are enclosed as **Annexure-2**. Besides this, DPRs for the works included under PSDF funding are enclosed herewith as **Annexure-3.** PSTCL is in the process of preparing the DPR for the balance schemes and the same will be shared with the Hon'ble Commission shortly. However, it is submitted that the gist of requirement of such schemes and proposed outlay based on past expenditure on similar schemes has already been provided in the petition. Therefore, PSTCL request the Hon'ble Commission to kindly considered the CIP and approve the same as proposed in the petition.

4. Regulation 9.18 of the MYT Tariff Regulations, 2019 provides as under:

"The STU shall also provide a copy of its capital investment plan to the Distribution Licensee, at the time of filing of this plan with the Commission. The copy of approved capital investment plan shall also be sent to the Distribution Licensee by the STU, immediately after approval by the Commission"

PSTCL to submit the documentary evidence of compliance of the above Regulation.

PSTCL Reply:

The Business plan has been shared with PSPCL vide Memo No.2997 dated 18.09.2019 copy of the same is enclosed as **Annexure-4.**

5. **PSTCL has submitted that its actual transmission losses was 2.86% in FY 2018- 19. However, a higher transmission loss i.e. 3.00% has been projected for all the years of the 2nd Control Period despite the substantial capital expenditure being proposed during the same period. This needs to be explained.**

PSTCL Reply:

The actual transmission losses for 2018-19 are 2.86%. The transmission losses of 3% have been projected in all 3 years. As number of new works have been added in Capital plan which are required to meet the load flow and load growth requirement in Punjab. The transmission losses of 3% have been projected keeping in view the addition of new transmission elements which may marginally add to the losses.

6. **The Transmission Map of Punjab (Figure 1) provided by PSTCL is not legible. PSTCL to submit a legible higher resolution image of the Transmission Map updated for 2019 alongwith single line diagram, having distinct colour coded representation for existing, overloaded and proposed transmission network.**

PSTCL Reply:

The map is on a scale that cannot be accommodated on a single page, the soft copy of map (updated up to August 2019) is provided in CD.

7. **PSTCL in its Petition has submitted CIP of Rs. 710.17 Crore, Rs. 738.19 Crore and Rs. 685.75 Crore for FY 2020-21, FY2021-22 and FY 2022-23 respectively for its transmission business which is not commensurate with its CIP for the 1st Control Period. PSTCL to provide justification for the same;**

PSTCL Reply:

PSTCL submits that in the previous CIP the component of spillover schemes was barely ~Rs. 50 crores. However, in current CIP the spillover schemes from previous CIP are getting implemented across the MYT period i.e. FY 21 to FY 23. The cumulative outlay on such schemes is around ~Rs. 450 crores. For new schemes the capital investment is ~Rs. 500 crores for each year of control period. Besides the

rationale for proposed capital expenditure, as already explained in the petition as also in the replies above, it is submitted that Punjab has been refused the required ATC/TTC limit during paddy 2019 due to inadequacy of transmission network (copy of letter enclosed as **Annexure-5**). NRLDC had adopted strict norms of N-1 availability while approving ATC/TTC limits and the works have been planned to meet such limits and load growth/load projections and the resultant capital outlay has been balanced in 3 years. The increase in capital outlay is due to the fact that the transmission system which was created at the inception of 400 kV system and was having spare capacity have been utilized in past years and now there is hardly any margin in the transmission system to accommodate more load which is evident from the refusal of ATC/TTC limit to Punjab.

8. **PSTCL to submit detailed technical justification alongwith cost benefit analysis for capital expenditure proposed in respect of network addition, system strengthening and system augmentation, with details of existing network capacity (as on March 2019) and network capacity projected to be achieved by the end of 2nd Control Period;**

PSTCL Reply:

PSTCL has already provided the technical justification of the proposed schemes in the petition along with load flow details as per **Annexure-K**. Further the DPRs for some of the schemes are enclosed in this reply. Based on the proposed capital expenditure the envisaged network capacity at the end of Control period is provided in the table below:

Line Length (ckm)	As on 31.03.19	FY 2019-20	FY 2020-21	FY 2021-22	FY2022-23
132KV	3135.640	-	30.000	30.000	30.000
220KV	7141.875	150.000	150.000	150.000	150.000
400KV	1599.754	30.000	34.000	10.000	30.000
765KV	-	-	-	-	-
Total	11,877.269	180.000	214.000	190.000	210.000

9. **PSTCL to provide scheme-wise technical and financial justification for each new scheme proposed.**

PSTCL Reply:

PSTCL has already provided the technical justification of the proposed schemes in the petition along with load flow details as per **Annexure-K**. Further the DPRs for some of the schemes are enclosed in this reply. It is humbly submitted that all works have been planned as per Load Flow studies and it is difficult to project such studies in hard copy. However, PSTCL shall present the load flow studies as and when asked by the Hon'ble commission on PSSE software and data files.

10. **PSTCL has submitted that drawal of ~9950 MW of power by FY 2022-23 from outside the state will result in over stressing of the 400 kV inter-state grids of POWERGRID. However, PSTCL has not submitted how this is going to affect its intra-state network.**

PSTCL Reply:

It is clarified that a reference has been made by PSTCL to inter-state grid at 400kV in light of the following:

i. Overloading of 400 kV Balachak which is an ISTS element of PGCIL, but being in Punjab is affecting ATC/ TTC limit of Punjab.
ii. The ISTS element i.e. 765 kV substation at Moga becomes overstressed in case RE injection is not limited with bus split at Moga and in case bus split is not done at Moga, the entire system of PSTCL shall get jeopardized.

11. **PSTCL has proposed capital expenditure of ~Rs. 680 Cr. for Transmission works in FY 2019-20 against the approved capital expenditure of Rs. 227.28 Cr in the Commission's Order dated 27 May 2019. PSTCL to provide justification for the same.**

PSTCL Reply:

PSTCL submits that the estimated capital expenditure in FY 2019-20 is ~Rs 370 Crore which is in line with the approved capital expenditure in commissions order dated 27 May 2019. The variation in capital expenditure is on account of:

i. Spill over of works from 2017-18 to 2018-19 and 2019-20.

ii. Due to addition of some new works of emergent nature as approved by BODs of PSTCL as emergent works and need to be started in 2019-20 itself.

PSTCL humbly submits that the amount of capital expenditure i.e. Rs. 680 Crore communicated in PSERC letter No. PSERC/Tariff/ Pet. 19 of 2019/ 1337 dated 11.09.2019 may kindly be corrected.

12. **The Commission has provisionally approved CIP of Rs. 800.163 crore (including Rs. 321.48 Crore for FY 2017-18, Rs. 251.403 Crore for FY 2018-19 and Rs. 227.28 Crore for FY 2019-20) for the 1st Control Period. PSTCL in its Business Plan and CIP Petition has submitted capex for spillover works of Rs. 464.78 Crore for the second control period (including Rs. 194.30 Crore for FY 2020-21, Rs. 155.07 Crore for FY 2021-22 and Rs. 115.41 Crore for FY 2022-23) which is around 58% of the total capex approved by the Commission for 1st Control Period. PSTCL to submit justification for the following:**

a. **Scheme-wise justifications for delay and spillover and why IDC should be allowed for delay in execution of these schemes;**

b. **Substantial capital expenditure proposed under new schemes during the 2nd Control Period while the spillover and deferred schemes from the 1st Control Period are still pending;**

c. **Reasons/ bottlenecks for consistent delay of schemes started from FY 2014-15 onwards.**

d. **Prioritization of capital expenditure to be incurred in 2nd Control Period.**

PSTCL reply:

PSTCL submits that MYT plan for FY 2017-20 did not include the IDC and IEDC attributed to Capital works. The CIP proposed in this petition includes the envisaged outlay on IDC and IEDC. For transmission schemes, besides the technical studies and approvals for implementation the major issue is towards acquiring the right-of-way for development of transmission lines. Delay in development of such lines is therefore a known phenomenon to all the developers including power grid which has the largest network in the country. Besides the above, selection of suppliers and establishment of reasonability of their quotes increase the lead time in initialization of the projects.

From a system perspective, development of all the proposed schemes have to be undertaken on a priority for the secure and reliable operations of state grid.

13. **PSTCL has considered IEDC of Rs. 120 Crore and Rs. 3.46 Crore in the 2nd Control Period for its Transmission and SLDC business respectively. PSTCL to submit the rationale and detailed calculation along with documentary evidence to substantiate its claim of IEDC during the 2nd Control Period.**

PSTCL Reply:

The estimated amount of IEDC during the second control period is based on the actual costs incurred during previous years.

14. **PSTCL to submit bifurcation of spillover works and new works for the capital investment plan proposed for its SLDC business, in line with Regulation 9.7 of the MYT Tariff Regulations, 2019.**

PSTCL Reply:

Revised Capital Investment Plan after segregating spilled over works and new future planned works is attached as **Annexure-6**.

15. **It is observed that capital expenditure in respect of Remote Terminal Units (RTUs) forms a substantial part of the capital expenditure proposed by SLDC for the 2nd Control Period. The Commission is of the opinion that capital expenditure for works related RTUs has already been approved as part of the SAMAST scheme. Also, separately SAMAST scheme amounting to Rs. 24.44 Crores has been sought. PSTCL to provide justification for capital expenditure proposed in respect of RTU works and also ensure no duplication of works/schemes is there.**

PSTCL Reply:

It is being clarified that the SAMAST scheme is for Scheduling, Accounting, Metering and Settlement of Transactions in electricity and under this scheme, meters are to be procured (RTUs are not being procured under SAMAST Scheme) and these are to be installed at various metering points all over Punjab. Also, BOD in its 55th meeting held at VIP Guest House, Mohali on 07.08.2019 has accorded the administrative approval for implementation of SAMAST scheme in Punjab and has approved the remaining funds (apart from Rs. 12.22 Cr. through PSDF funding) to be met through ARR/PSTCL.

Accordingly, Capital expenditure to be incurred for works related to RTU is not approved as part of SAMAST scheme. However, it is stated that this office is under process

of tendering for procurement of RTUs for remaining substations of PSTCL and justification of capital expenditure to be incurred is as per attached DPR. Further, the budget for expenditure to be incurred towards procurement of RTUs shall be sought by CE/TS in its MYT plan, as per BODs decision.

16. **PSTCL to submit actual scheme-wise capital expenditure and capitalisation from FY 2015-16 to FY 2018-19 and projected capital expenditure and capitalisation for FY 2019- 20 for Transmission works. PSTCL to submit actual scheme-wise capital expenditure and capitalisation from FY 2015-16 to FY 2018-19 and projected capital expenditure and capitalisation for FY 2019-20. Further, PSTCL to also provide the proportion of Govt. grants and consumer contribution in the proposed capitalisation.**

PSTCL Reply:

PSTCL submits that the Hon'ble Commission has already undertaken the details exercise of verification of capital expenditure and capitalization for the year FY 2015-16 to FY 2017-18 as part of the truing up orders. Scheme-wise details of previous years are therefore already available with the Hon'ble Commission. Therefore, recompilation of details for all such previous years will be a very time consuming exercise. However, in case the Hon'ble Commission desires the same, PSTCL would submit such details shortly.

For FY 2018-19, PSTCL will be sharing the details as part of truing up petition to be filed shortly.

17. **Annexure K series submitted by PSTCL is not legible. PSTCL to re-submit a legible copy of the same;**

PSTCL Reply:

Annexure-K in soft copy is provided in enclosed CD. However, it is again submitted that load flow studies can be presented to the Hon'ble commission as and when it is asked.

18. **It is observed that the Sales projections in Figure 7 of the Business Plan and Capital Investment Plan Petition do not match with that submitted by PSPCL in its Business Plan and Capital Investment Plan. PSTCL to re-submit the reconciled sales projections.**

PSTCL Reply:

Will be submitted subsequently.

19. **PSTCL is required to provide details of augmentation of no. of transformers (eg. 12.5 MVA to 20 MVA, 100MVA to 160 MVA etc) being undertaken. PSTCL needs to intimate the strategy for utilization of the dismantled material such as transformers etc. where it has proposed augmentation.**

PSTCL Reply:

The requirement of augmentation of power transformers has been provided in capital works. Transformer augmentation is purely based on the maximum demand recorded at any substation or as per requirement on real time basis. Augmentation is also undertaken in case a new connection is applied requiring augmentation of system.

- All 100 MVA transformers which are dismantled are likely to be used within the system and no new procurement of 100 MVA transformers is being undertaken. Replacement of 100 MVA transformers are undertaken only when such transformers are removed from the system because of age considerations.

- With respect to 12.5 MVA, 66/11kv or 132/11kv transformers, every effort is being made to use such transformers at new locations to the extent possible. However, due to space constraint at new locations, the possibility of utilisation of such transformers gets skewed. Further, with the enhancement/growth in load, the 12.5 MVA transformers are augmented with 20 MVA transformers. The retirement of transformers is undertaken based on age consideration and possibility of utilisation in the system.

CAO/Finance & Audit,
PSTCL, Patiala.

Annexure-1

ANNEXURE-1

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

सं. उक्षेविस/ वाणिज्यिक/ 209/ आर पी सी (45 वीं)/2019/7152-7246
No. NRPC/ Comml/ 209/ RPC (45th)/2019/

दिनाँक : 09 जुलाई, 2019
Dated: 09th July, 2019

सेवा में / To,

उ.क्षे.वि.स. के सभी सदस्य
Members of NRPC/TCC

विषय: उत्तरी क्षेत्रीय विद्युत समिति की 45वीं तथा तकनीकी समंवय उप-समिति की 42 वीं बैठक का कार्यवृत्त ।

Subject: 45th meeting of Northern Regional Power Committee and 42nd meeting of TCC – Minutes.

महोदय / Sir,

उत्तरी क्षेत्रीय विद्युत समिति की 45 वीं बैठक दिनांक 08 जून, 2019 को तथा तकनीकी समंवय उप-समिति की 42 वीं बैठक दिनांक 07 जून, 2019 को गंगटोक सिक्किम में आयोजित की गयी थी । इन बैठकों के कार्यवृत की एक प्रति आपकी सूचना व आवश्यक कार्यवाही हेतु इस पत्र के साथ संलग्न है।

The 45th meeting of Northern Regional Power Committee was held on 08th June, 2019 and 42nd meeting of TCC was held on 07th June, 2019 at Gangtok, Sikkim. A copy of the minutes of the meetings is enclosed herewith for favour of information and necessary action.

भवदीय/Yours faithfully,

-sd-
(नरेश भंडारी)
(Naresh Bhandari)
सदस्य सचिव
Member Secretary

A-4

	Amendment of the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006.	Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006.

Members confirmed the last TCC and NRPC minutes along with the abovementioned amendments.

B. OPERATIONAL ISSUES

B.1 Revised System Protection Scheme (SPS) for 765 kV Agra-Gwalior line

TCC Deliberation

B.1.1 POWERGRID informed that revised scheme has been implemented and Mock testing of the SPS was carried out on 01.05.19. In the meeting, members were apprised about the outcome of the mock testing of revised SPS for 765 KV Agra–Gwalior line.

B.1.2 The testing of the scheme was, by and large OK with following observations:

- Communication problem at Nara **(Issue has been resolved on the same day of mock testing)**
- Non-increment of counter at Jamsher & Narwana **(POWERGRID agreed for necessary action)**
- Non-radial nature of mapped feeder **(Wrongly reported, most of the feeders are radial in nature)**
- Less than planned load observed during testing **(Utilities agreed to review the load relief on the connected feeders and present the details in 160th OCC meeting)**

B.1.3 TCC agreed to the procedure for calculation of MW relief of particular feeders, such as, take the yearly data and calculate the average of 30 days of minimum load period of that particular feeder for calculation of MW relief on the feeder.

NRPC Deliberation

B.1.4 NRPC noted the deliberations of TCC.

B.2 System Study for Capacitor Requirement in NR for the year 2019-20

TCC Deliberation

B.2.1 Members were sensitized about the inordinate delay in the submission of data by the state utilities. It was stated that even after pursuing the matter since long, even sample data (of any one substation) has not been received from states like UP, Uttarakhand, Rajasthan, J&K and Chandigarh.

B.2.2 Representative of UPPCL stated that the information which was required to be compiled in the provided format was huge and was also very cumbersome. As a case in point, he stated that the format required the information of reactive load shedding at 11 kV level, the data for which is not maintained at DISCOM level.

B.2.3 Representative of Punjab stated that the data to be furnished to CPRI in the desired format, required for creation of the same afresh. As the states were not being able to

submit the data in the format, appointment of some third party specialized agency for collection of the data may be explored as was also deliberated in previous meeting.

B.2.4 Members were of the view that if the states are not able to provide the data, the study should not be allowed to linger on and a call should be taken for hiring a third party (like CPRI itself) for the collection of data and the cost shall be booked to each state separately.

B.2.5 MS, NRPC stated that the study was pending since past year and 3 months of FY 2019-20 has also passed. In view of the same it is high time to complete the study at the earliest and requested states to submit the data in a time bound manner latest by 30.06.2019. For the states not able to submit the data by 30.06.2019, CPRI would be approached for collection of data of their states and if proposal is acceptable to CPRI then the costing would be booked to the respective states.

B.2.6 Rajasthan representative stated that as the data was pertaining to the DISCOMS, they were pursuing for the submission of the same but to no effect. He requested to intimate the higher management of DISCOMs for submission of the data as it would pressurize them for early submission of the same.

B.2.7 In the end MS, NRPC informed that the efforts being put by individual states would not be left to go in vain because of non-submission of data by some other state; and CPRI would be requested to explore for the separate study of each state (whosoever submits the data in time).

B.2.8 TCC advised all states to submit the data by 30.06.2019. For the states not able to submit the data by 30.06.2019, CPRI would be approached for collection of data of their states and if proposal is acceptable to CPRI then the costing would be booked to the respective states.

NRPC Deliberation

B.2.9 Chairman, NRPC advised for formation of a whats app group wherein all the members of NRPC shall be made a part of so that the top official of the utilities could be sensitized about such data submission and other agenda items regularly. He further advised to make one admin from each utility who could further add the officer responsible for any particular issue.

B.2.10 NRPC noted the deliberations of TCC and advised the states for ensuring the submission of data by 30.06.2019.

B.3 Reactive compensation at 220/400 kV level

TCC Deliberation

B.3.1 MS, NRPC informed that following reactors were approved in the 39th meeting of SCPSPNR and thereafter in 37th TCC and 40th NRPC meeting:

a) TCR of capacity 500 MVAr at Kurukshetra 400 kV bus.
b) Bus Reactors at 30 Nos. 220 kV sub-stations and 18 Nos. 400 kV level sub-stations subject to the availability of space.

It was also agreed that these reactors shall be provided by the owner of the substations.

B.3.2 **POWERGRID** - 500 MVAr TCR at Kurukshetra: Award placed in January 2019 with completion schedule of 22 months. PGCIL representative informed that 11 no. of 400 kV Bus Reactor and 6 no. of 220 kV Bus Reactor, which were earlier informed to be executed through TBCB project has been allotted to PGCIL for execution. Further, NIT for the said reactors has already been floated and Bid Evaluation is under Process. LoA is likely to be placed by end of June 2019.

B.3.3 **PSTCL** – Sanction of PSDF funding has been accorded. Retendering has been done with the Bid opening date of 08.07.19.

B.3.4 **Uttarakhand - 125 MVAr reactors at Kashipur:** Technical Bid for 125 MVAr reactor at Kashipur has been opened and is being evaluated. Further it was informed that funding for the reactor will be done through PSDF and the proposal is under DPR formation stage.

B.3.5 **DTL** – The updated status of the reactors is presented below:

S. No.	Sub Station	Voltage level (kV)	Reactor (MVAr)	Updated status
1	Peeragarhi	220	1x50	NIT to be floated by end of June 2019.
2	Mundka	400	1x125	
		220	1x25	
3	Harsh Vihar	220	2x50	
4	Electric Lane	220	1x50	Approval from the competent authority expected to be obtained by July 2019.
5	Bamnauli	220	2x25	
6	Indraprastha	220	2x25	
TOTAL			450	

B.3.6 **Rajasthan:**

Item	Background	Status
3 Nos. each of 25 MVAr (220 kV) reactors for Akal, Bikaner & Suratgarh.		PSDF funding sanctioned. Tendering under process.
1 No. of 25 MVAr (220 kV) reactor for Barmer& 125 MVAr (400 kV) reactor for Jodhpur included in 450 MVAr (13x25 + 1x125 MVAr) proposal	Revised DPR for 450 MVAr approved Reactor after separating STATCOM was submitted vide letter dt. 12.10.2018 to POSOCO for approval.	RVPN submitted reply to the sought clarifications. TESG has examined the same and put up for approval of Appraisal Committee.

B.3.7 Representative of NLDC informed that CERC has uploaded draft notification of Central Electricity Regulatory Commission (Power System Development Fund) Regulations, 2019 in which certain amendments in the procedure of approval of PSDF funding has been proposed. that the proposal shall now be sent directly to Ministry of Power after the approval of Appraisal committee, Monitoring Committee and not to CERC. He requested all the utilities to go through the draft procedure available on

CERC website and submit their comments on the same.

NRPC Deliberation

B.3.8 NRPC noted the deliberations of TCC and appreciated the efforts of CERC by bringing draft notification of Central Electricity Regulatory Commission (Power System Development Fund) Regulations, 2019 so as to reduce the delays in the release of PSDF funding.

B.4 Database of Protection settings

TCC Deliberations

B.4.1 MS, NRPC informed that even after going with the tendering process three times, no bidder has been found to be suitable in the Technical evaluation due to lack of competition. He further stated that in the 8th NPC meeting held on 30.11.2018, the efforts of WRPC for in-house development of the database was appreciated and NRPC was suggested to seek assistance of WRPC in case no bidder comes up after retendering.

B.4.2 In view of the above it was proposed that rather than going for an external agency for creating the database of Protection setting, NRPC should proceed as being done by WRPC.

B.4.3 He brought out to the forum two options in view of the non-selection of third party and the advice of NPC.

B.4.4 **First option** was that all the STUs shall submit the protection setting data in a time bound manner so as to comply with the recommendations of Enquiry Committee on grid disturbance of 30th & 31st July 2012, 'Task Force on Power System Analysis under Contingencies'. Further it was informed that 13 utilities have already submitted the above data and others could also provide the same in a time bound manner. However, all utilities were requested to furnish the data afresh so as to cater to any changes made in the settings. For the first option, all the states were requested to appoint some nodal officers (SE level or above) for facilitating the collection of protection setting data. To facilitate manpower, it was also proposed that the States may depute their one or two officers in NRPC for some period on rotation basis.

B.4.5 **Second option** was to approach to any central agency like CPRI without any change in scope of work as already approved so that the approved PSDF funding could also be utilized. MS, NRPC clarified that NRPC so far has not discussed the matter with CPRI.

B.4.6 UP stated that the protection setting data was subject to changes with the changes in the network and it was necessary that the representative of the utilities should be able to extract the setting and accordingly update the same in the centralized database.

B.4.7 Members also stated that a portal may also be made on which the changes made in the protection settings could be updated in real time.

B.4.8 TCC was of the view that the Protection setting are already available with the substation personnel and any third party engaged would also require the help of the substation personnel for extracting the settings from the relay. Also, in case of some changes in the setting, the substation personnel shall have the responsibility of reflecting the changes accordingly in the centralized database and for that he should be well aware of how to extract the settings and getting it reflected in the centralized database.

Annexure-4

(16)

PUNJAB STATE TRANSMISSION CORPORATION LIMITED
Regd. Office: PSEB Head Office, The Mall Patiala-147001,Punjab, India.
Corporate Identity Number: U40109PB2010SGC033814 (www.pstcl.org)
(O/o CAO/F&A (Commercial & Regulatory Cell) 3rd Floor, Shakti Sadan, Patiala)
Fax/Ph.No.0175-2970183 Email : fa@pstcl.org

To

Chief Engineer/ARR & TR,
PSPCL, Patiala.

Memo No. 2997 /FA/Comml.-803
Dated: 18/9/19

Subject: **Petition for the approval of PSTCL's Business Plan including Capital Investment Plan for MYT Control Period from FY2020-21 to FY2022-23.**

Enclosed please find herewith PSTCL Petition for the approval of Business Plan including Capital Investment Plan for MYT Control period from FY 2020-21 to FY 2022-23, as filed at PSERC for information.

DA/ As above

CAO/Finance & Audit,
PSTCL, Patiala.
18/9/19

Recd. as above.
18/9/19

Annexure-5

पावर सिस्टम आपरेशन कारपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Govt. of India Enterprise)
उत्तरी क्षेत्रीय भार प्रेषण केन्द्र / NORTHERN REGIONAL LOAD DESPATCH CENTRE
कार्यालय : 18-ए, शहीद जीत सिंह सनसनवाल मार्ग, कटवारिया सराय, नई दिल्ली- 110016
OFFICE : 18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi- 110016
C.N. U40105DL2009GOI188682, Website : www.nrldc.org, www.nrldc.in, Tel : 011-26519406, 26523869, Fax : 011-26852747

संदर्भ: उ क्षे भा प्रे के\ पंजाब\ टी एस-03 बी\ 903 दिनांक: 14 जून, 2019

सेवा में,

मुख्य अभियंता एसएलडीसी
220/66 केवी अबलोवल उपकेंद्र,
पटियाला, पंजाब

विषय : **Revision of Total Transfer Capability (TTC) /Available Transfer Capability (ATC) limit of Punjab state control area for Summer/Monsoon 2019**

References:

1. NRLDC letter Punjab/TS 3B/632 dated 21.05.2019
2. Punjab SLDC letter 645/T-257 dated 12.06.2019

Sir,

This is in reference to the above letters and meeting held between Punjab Planning department, SLDC and NRLDC officials on 12.06.2019. Punjab SLDC vide letter 645/T-257 dated 12.06.2019 has submitted that generation at M/s TSPL, Talwandi Saboo shall be restricted to 1620MW instead of 1830MW as given earlier. It was also submitted that other generation in Punjab state control area would remain same.

Punjab Planning department, SLDC and NRLDC jointly carried out simulation studies to assess TTC/ ATC limits of Punjab state control area for paddy 2019 based on new generation scenario. TTC/ATC limit for Punjab state control area has been assessed as:

Punjab Own Generation (MW)	Total Import Capability (MW)	Reliability Margin (MW)	Available Transfer Capability (MW)	Punjab load (MW) [State Gen+ ATC] (MW)
6035 (1830MW generation considered at Talwandi Saboo)	6800	600	6200	~12200
5805 (1600MW generation considered at Talwandi Saboo)	7000	600	6400	~12200

If generation at Talwandi is more than 1600MW, then ATC shall be reduced by quantum by which generation is more than 1600 MW. For example, if all three machines at Talwandi Saboo are in service with generation as 1700MW), then ATC/TTC would reduce as 6300/6900MW.

Note: The above TTC/ATC limits are subject to the condition that SLDC Punjab would maintain loading of 400/220kV ICTs at Amritsar, Rajpura, Nakodar, Ludhiana, and Muktsar during normal operation within N-1 contingency limits as given below.

Station	Amritsar ICTs	Rajpura ICTs	Nakodar ICTs	Ludhiana ICTs	Muktsar ICTs
Capacity (MVA)	2*315+1*500	2*500	2*315	3*315+1*500	2*315
N-1 limit (MW)	700	680	450	1080	420

*the above contingency limits have been determined as per network details provided by Punjab and already available with NRLDC

Limiting constraint observed as loading of 400/220kV ICTs at Amritsar, Rajpura and Muktsar. Based on assumption that SLDC Punjab would keep antecedent loadings at these stations such that remaining elements will not be loaded above 100% under N-1 condition, other contingencies were studied.

Following are observations for import (TTC/ATC) of 7000/6400MW from the grid:

- Under N-1 contingency of ICT, the loading of other ICTs are coming out as Amritsar (112%), Rajpura (110%), Muktsar (104%), Nakodar (101%), Ludhiana (99%).
- 220kV Voltages at Sahnewal, Ghulal, Kohara, Gaunsgarh are coming around 190kV.
- Underlying network at 220kV Amritsar (PG) and Ludhiana (PG) is overloaded.

Actions for Punjab SLDC:

- As mentioned by Punjab SLDC in letter 645/T-257 dated 12.06.2019, they need to submit action plan for load management at constrained ICTs (Amritsar, Rajpura, Muktsar, Nakodar, Makhu and Ludhiana) to meet N-1 reliability criteria.
- SLDC Punjab should monitor closely and control the loading of likely highly loaded 400/220kV Amritsar, Rajpura, Muktsar, Nakodar and Ludhiana ICTs and 220kV lines such as:

  Amritsar-Verpal D/C, Dhuri-Dhanaula D/C, Rajpura-Gobindgarh D/C, Ludhiana-Lalтokalan, Ludhian-Dhandharikalan, Jalandhar-Nakodar, Jalandhar-Kartarpur, Ropar-Ghulal, Ropar-Gaunsgarh etc.
- Further, Punjab SLDC should manage loadings at 220kV and below voltage level network and ensure N-1 compliance at 220kV level also.
- More generation at Goindwal TPS would help to reduce constraints at Amritsar ICTs and underlying network. Thus, Punjab SLDC shall try to maximize generation at Goindwal TPS so as to reduce loadings and improve voltage profile in that area.

- When generation at Ropar/ Lehramohabbat is reduced, then loading of Rajpura, Moga and Ludhiana ICTs increases. Thus, full generation at Ropar and Lehramohabbat is necessary to maintain this TTC/ATC limit for Punjab. Increased generation at 220 kV level (Ropar, Lehramohabbat) will help in meeting the high demand, expected at the time of paddy season as well as improvement in reliability due to increased voltage support.

- Punjab SLDC needs to monitor continuously the voltage profile, load power factor and availability of shunt compensation. Punjab Planning division/ SLDC has to reassess its import capability for any change in the Punjab control area from the assumed scenario.

- If generation of Punjab is different from scenario considered for TTC/ ATC calculations, TTC/ATC limits shall change accordingly. (Also described in study report attached (Annexure-1)).

Based on details of likely generation scenario submitted by Punjab (~5800MW), above TTC/ATC computation and latest LTA/allocation details provided by Punjab (PSPCL), the margins for Short-term Open Access (STOA) would be as under:

Duration	Time Period (in hours)	Total import capability of Punjab (MW)	Reliability Margin (MW)	ATC for open access and operating limit (MW)	Long term Access + Medium term open access (as on June 2019)*	Margin for short term open access (MW)
Jun'19-Sep'19	00-24	7000	600	6400	4580	1820

In case of change in allocation or/and change in LTA, MTOA, these figures would change accordingly

**Detailed breakup of LTA+ MTOA quantum*
Allocation from ISGS + LTA quantum of Punjab = 5384 MW (as per data provided by PSPCL)
(after reducing Aux. consumption%)
Assume availability of @ 85%, the likely schedule — 4580 MW.

Thanking you.

भवदीय

एस एस बड़पंडा 14/6/19
(एस एस बड़पंडा)
कार्यकारी निदेशक

प्रतिलिपि विनम्र सूचनार्थ:

1. अध्यक्ष एवं प्रबंध निदेशक PSTCL PSEB मुख्य कार्यालय द मॉल, पटियाला-147001
2. सदस्य सचिव, उत्तर क्षेत्रीय विद्युत समिति, दिल्ली
3. अध्यक्ष एवं प्रबंध निदेशक, पोसोको, दिल्ली

Annexure-6

Details of Ongoing or New Projects of SLDC (PSTCL)

Sr. No.	Location / Zone / District	NAME OF PROJECT/ASSET / SCHEME	Nature of Investment/ Asset*	Total Project Cost (Rs. crore)	Loan Amount (Rs. crore)	Internal Source/Equity Amount (Rs. crore)	Grant if Any (Rs. crore)	Approval Date	Project Start Date / Zero Date	Actual / Anticipated Year of Completion	Actual Expenditure FY 2018-19 (as per trial balance of Accounts)	Actual Expenditure upto FY 2018-19 (as per trial balance of Accounts)	Projected Expenditure in Rs. crore				Remarks
													FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	
1. RTU Schemes																	
Spillover Works																	
a)	All over Punjab	Scheme for providing additional RTUs for SCADA system at 47nos. 220 KV substations of PSTCL in Punjab state		6.89	(loan amount sanctioned from REC: Rs 5.12)				01.06.2012	2019-20	-0.23	6.38	0.50	0.00	0.00	0.00	1. Out of 47 nos. RTUs, 46 nos. have been commissioned. The project was extended due to additional work of mapping of UFR, df/dt relays and mapping of DO points at 66 Kv feeders level as per the requirement of CERC . Data from all the RTUs is available in SLDC & one no. RTU is expected to get commissioned by 2019-20. Any additional works shall be got executed during 2019-20. Actual expenditure for this scheme is from FY 2012-13 onwards. 2. Expenditure amount in scheme of 47 nos. RTUs is -0.23 due to misclassification in FY 2017-18 and FY 2018-19.
b)	All over Punjab	Scheme for providing 45 nos. Remote Terminal Units for SCADA/EMS system at 220 & 132 KV Substations of PSTCL in Punjab		7.42	(loan amount sanctioned from REC: Rs 6.52 Cr.) with taxes				01.02.2018	2019-20	4.42	4.42	3.00	0.00	0.00	0.00	The implemenation schedule of this project is 10 months from the start date. At present, 36 nos. RTUs under this project are under installation and commissioning stage. Further 9 nos. RTUs have been confirmed to the firm. This project has extended mainly due to non- availability of communication connectivity at some of the PSTCL substations. It is expected that project may get commissioned during 2019-20
c)	All over Punjab	Replacement of S-900 Make 09 Nos. RTUs from M/s. PGCIL in lieu of the MoU signed among M/s. PGCIL and PSTCL.		1.36	0	0	0		20.03.2019	2019-20	1.36	1.36	Nil	0.00	0.00	0.00	9 nos. RTU are being replaced with the new RTUs as these RTUs have completed their life span of 15 years . Advance payment for replacement of S-900 Make 09 Nos. RTU from M/s. PGCIL has already been made. So, no further budget is required. Accordingly, Nil Amount has been specified under the current budget requirement.

Sr. No.	Location / Zone / District	NAME OF PROJECT/ASSET / SCHEME	Nature of Investment/ Asset*	Total Project Cost (Rs. crore)	Loan Amount (Rs. crore)	Internal Source/Equity Amount (Rs. crore)	Grant if Any (Rs. crore)	Approval Date	Project Start Date / Zero Date	Actual / Anticipated Year of Completion	Actual Expenditure FY 2018-19 (as per trial balance of Accounts)	Actual Expenditure upto FY 2018-19 (as per trial balance of Accounts)	Projected Expenditure in Rs. crore				Remarks
													FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	
2	All over Punjab	Scheme for implementation of Intrastate Boundary Metering cum Transmission Level Energy Audit using ABT Type & Conventional		9.52	(loan amount sanctioned from REC: 8.57)				01.07.2013	2020-21	0.2663	5.28	3.00	2.72	0.00	0.00	As per decision of BOD, this project was foreclosed in Mar-2018. However, due to urgency of instantaneous data requirement from interstate boundary meters, efforts are being made to revive this project. As this may help to identify and reduce the gap of SEM/SCADA difference in UI. Actual Expenditure for this scheme is from FY 2013-14 onwards.
3	SLDC, Ablowal	Centralised AC system, Furniture & Fixtures (including office ACs)		1.56							0.0257	0.0416	0.10	1.20	0.10	0.12	The projected expenditure in FY 2020-21 has been prepared as new centralised AC may be required, keeping in view the upcoming electronic equipment related to SAMAST scheme, solar plants and additional communication/OPGW equipment. Actual Expenditure specified is for FY 2017-18 and and upto FY 2018-19.
4	SLDC, Ablowal	IT equipments inlcuding Server, computer, Displays, software etc. for SLDC, Web site and its offices		0.81							0.0058	0.0058	0.50	0.10	0.10	0.10	Replacement/upgradation of existing hardware and software to host Punjab SLDC web site independently, since the existing hardware has completed its operational life. Further, the projected expenditure is for providing additional display for conference room as per the requirement of o/o SE/ SLDC(Operation), PSTCL, Ablowal. Actual expenditure is for FY 2017-18 and and upto FY 2018-19.

Sr. No.	Location / Zone / District	NAME OF PROJECT/ASSET / SCHEME	Nature of Investment/ Asset*	Total Project Cost (Rs. crore)	Loan Amount (Rs. crore)	Internal Source/Equity Amount (Rs. crore)	Grant if Any (Rs. crore)	Approval Date	Project Start Date / Zero Date	Actual / Anticipated Year of Completion	Actual Expenditure FY 2018-19 (as per trial balance of Accounts)	Actual Expenditure upto FY 2018-19 (as per trial balance of Accounts)	Projected Expenditure in Rs. crore				Remarks
													FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	
Upcoming new works/Future plans:																	
5	All over Punjab	Implementation of SAMAST scheme in Punjab (Procurement of meters, communication equipments and Harware and software for Scheduling, Accounting, Metering and settlement of transaction of		24.44	12.22		90% of 13.58 (Expected approval through PSDF) i.e. 12.22		DPR of SAMAST scheme is already approved. Funding through PSDF is awaited. Administrative approval of BODs for implementation of SAMAST Scheme in Punjab has been obtained.	2022-23			7.00	9.00	5.00	3.44	Funding through PSDF is awaited. Expected grant through PSDF funding is Rs 12.22 Cr. Total estimated cost of the project is Rs 24.44 Cr. The remaining funds i.e. Rs 12.22 Cr shall be required through ARR.
6	*All over Punjab*	*Procurement/ Replacment of RTUs for various substations of PSTCL **		*8.00*					*2019-20*	*2021-22*			*2.00*	*2.00*	*2.00*	*2.00*	*These RTUs are required to be procured for providing telemetry for various upcoming substations of PSTCL. Further, it is expected that approx. 20 RTUs, which may outlive their lives, may be required to be replaced with new RTUs by the end of 2022-23.*
7	SLDC, Ablowal	Extension of SLDC Building		3					Yet to approve				0.00	2.00	1.00	0.00	Under the SAMAST report, additional manpower for SLDC has been specified and even funds for capacity building has been allocated. The present SLDC building is not having the capacity to accommodate more officers/ staff. Accordingly, additional infrastructure i.e. extension of SLDC building shall be required to accomodate additional manpower.
8	SLDC, Ablowal	Roof Top Solar system for SLDC		0.6					Yet to approve				0.00	0.60	0.00	0.00	Procurement action for this project is to be taken by TS organisation.
Total Capex Required											**5.8478**	**17.4874**	14.10	15.62	6.20	3.66	

Note:

* It is submitted that as per BOD decision dt. 07.08.2019 against CE/TS Agenda No. 45 regarding telemetry of substations, Procurement/ Replecement of RTUs at 45 nos. substations of PSTCL will be done by CE/SLDC, while CE/TS shall ensure that the expenditure required to be incurred for procurement of RTUs shall be included in MYT to be submitted to PSERC for its approval. Therefore , the scheme for procurement/replacement of RTUs for various substations of PSTCL has been shown against Sr. No. 6, however, the projected expenditure for the same has been excluded from the total Capex required. Also, it is pertinent to mention here that the DPR for the same shall be submitted after necessary approvals from PSERC.

PUNJAB STATE TRANSMISSION CORPORATION LIMITED
THE MALL, PATIALA

Public Notice in respect of
Petition for Business Plan including Capital Investment Plan for MYT Control Period from FY 2020-21 to FY 2022-23 filed by Punjab State Transmission Corporation Limited before Punjab State Electricity Regulatory Commission

1. Notice is hereby given to all that the Punjab State Transmission Corporation Limited (PSTCL) engaged in electricity transmission, functioning as State Load Dispatch Centre, State Transmission Utility and related activities, has filed before the Punjab State Electricity Regulatory Commission (Commission) the subject cited Petition under Regulation 9 of Punjab State Electricity Regulatory Commission (Terms and Conditions for Determination of Generation, Transmission, Wheeling and Retail Supply Tariff) Regulations, 2019 (PSERC MYT Regulations 2019).

   The Hon'ble Commission conveyed some deficiencies in the petition vide letter no. 1337 dated 11.09.2019. PSTCL submitted its reply to the Hon'ble Commission vide letter No. 3081 dated 25.09.2019. The case has been taken on record by the Hon'ble Commission on 10.10.2019 as Petition No. 19 of 2019.

2. Copies of the Petition, deficiencies pointed out by the Commission and replies to the deficiencies are available in the office of the CAO (Finance & Audit), PSTCL, 3rd Floor, Shakti Sadan, Opp. Kali Mata Mandir, The Mall, Patiala, Liaison Officer, PSTCL Guest House, Near Yadvindra Public School, Phase-8, Mohali, Chief Engineer/P&M, PSTCL, Ludhiana and SE/P&M Circles, Ludhiana/Patiala/ Jalandhar/ Amritsar/Bathinda. Soft copies of the same are also available on the website www.pstcl.org of PSTCL and www.pserc.gov.in and can be downloaded there from.

3. Interested persons may inspect and peruse the said Petition and take notes thereof during office hours at the above said offices free of charge.

4. Copies of the above documents can also be obtained from the above offices on payment of Rs. 300/- for each set.

5. Objections to the said petition filed by PSTCL, if any, together with supporting material, may be filed with the Secretary, Punjab State Electricity Regulatory Commission, Site No. 3, Madhya Marg, Sector 18-A, Chandigarh, in person or through Registered Post, so as to reach her within 21 days of the publication of this notice. Copy of the same must also be sent to the CAO (Finance & Audit), PSTCL, 3rd Floor, Shakti Sadan, Opp. Kali Mata Mandir, The Mall, Patiala and proof of service of the same must be enclosed with the filing made to the Secretary, Punjab State Electricity Regulatory Commission.

6. The objections as above should be filed in ten number copies and should carry signature, full name, postal address and telephone/mobile number/email ID of the person sending the objections. All the objectors may also send a soft copy of their objections to the Secretary/PSERC at email id "secretarypsercchd@gmail.com". If the objection is filed on behalf of any organization or any class of consumers, it should be so mentioned. It may also be specifically mentioned if the person putting in objections/comments also wants to be heard in person.

7. The Punjab State Electricity Regulatory Commission, after perusing the written objections received in response to this notice may invite such objector(s) as it considers appropriate for a hearing on dates which will be notified by the Commission in due course. The public hearing in the petition shall be held on 06.11.2019 at 11 AM in the office complex of the Commission.

8. For the information of general public/stakeholders, the summary of the Capital Investment Plan as contained in the Petition is as under:

a) Summary of Capital Investment Plan for MYT Control Period from FY 2020-21 to FY 2022-23

(Rs. Crore)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Spillover			
400kV Schemes	63.58	58.85	87.19
220kV Schemes	130.28	120.14	48.68
132kV Schemes	0.23	0.00	0.00
Other Works / Miscellaneous	22.63	3.53	1.19
Total	**216.73**	**182.52**	**137.05**
New Developmental Schemes			
400kV Schemes	95.32	149.46	146.71
220kV Schemes	252.07	249.22	254.74
132kV Schemes	47.25	43.11	37.31
Other Works / Miscellaneous	93.89	107.17	101.49
Total	**488.53**	**548.96**	**540.25**
400kV Schemes	315.65	208.31	233.90
220kV Schemes	177.54	369.36	303.42
132kV Schemes	47.49	43.11	37.31
Other Works / Miscellaneous	116.52	110.70	102.68
Total	**705.26**	**731.48**	**677.30**

b) Summary of Capital Investment Plan for MYT Control Period from FY 2020-21 to FY 2022-23

(Rs. Crore)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission			
Capital Investment	705.26	731.48	677.30
Capitalisation	292.86	182.40	1305.97
SLDC			
Capital Expenditure	21.44	11.62	7.69
Capitalisation	12.88	3.85	44.24

CAO/ (Finance & Audit), PSTCL, 3rd Floor, Shakti Sadan, Opposite Kali Mata Mandir, The Mall, Patiala

ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਂਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ
ਮਾਲ ਰੋਡ, ਪਟਿਆਲਾ

ਜਨਤਕ ਨੋਟਿਸ

ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮੀਸ਼ਨ ਸਨਮੁੱਖ ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਂਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ ਦੁਆਰਾ ਐਮ. ਵਾਈ. ਟੀ ਸਮਾਂ ਵਿੱਤੀ ਸਾਲ 2020-21 ਤੋਂ ਵਿੱਤੀ ਸਾਲ 2022-23 ਲਈ ਬਿਜਨਸ ਪਲੈਨ ਸਮੇਤ ਕੈਪੀਟਲ ਇੰਨਵੈਸਟਮੈਂਟ ਪਲੈਨ ਸਬੰਧੀ ਦਾਇਰ ਕੀਤੀ ਪਟੀਸ਼ਨ ਦੇ ਸਬੰਧ ਵਿਚ

1. ਇਸ ਰਾਹੀਂ ਸਾਰਿਆਂ ਨੂੰ ਨੋਟਿਸ ਦਿੱਤਾ ਜਾਂਦਾ ਹੈ ਕਿ ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ (PSTCL) ਜ਼ੋ ਕਿ ਬਿਜਲੀ ਦਾ ਸੰਚਾਲਨ ਅਤੇ ਸਬੰਧਤ ਪ੍ਰਕਿਰਿਆਵਾਂ ਕਰ ਰਹੀ ਹੈ, ਵੱਲੋਂ ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮਿਸ਼ਨ(ਜਨਰੇਸ਼ਨ, ਟਰਾਂਸਮਿਸ਼ਨ, ਵੀਲਿੰਗ ਅਤੇ ਰੀਟੇਲ ਸਪਲਾਈ ਟੈਰਿਫ ਨਿਰਧਾਰਤ ਕਰਨ ਲਈ ਬਾਨਾਂ ਅਤੇ ਸ਼ਰਤਾਂ) ਵਿਨਿਯਮ, 2019 ਦੇ ਰੈਗੂਲੇਸ਼ਨ 9 ਅਧੀਨ ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮਿਸ਼ਨ ਸਨਮੁੱਖ, ਵਿੱਤੀ ਸਾਲ 2020-21 ਤੋਂ ਵਿੱਤੀ ਸਾਲ 2022-23 ਲਈ ਬਿਜਨਸ ਪਲੈਨ ਸਮੇਤ ਕੈਪੀਟਲ ਇੰਨਵੈਸਟਮੈਂਟ ਪਲੈਨ ਸਬੰਧੀ ਪਟੀਸ਼ਨ ਦਾਇਰ ਕੀਤੀ ਹੈ।

   ਮਾਣਯੋਗ ਕਮਿਸ਼ਨ ਨੇ ਪੱਤਰ ਨੰ: 1337 ਮਿਤੀ 11.09.2019 ਦੁਆਰਾ ਕੁੱਝ ਕਮੀਆਂ ਸੂਚਿਤ ਕੀਤੀਆਂ ਸਨ। ਜਿਨ੍ਹਾਂ ਦਾ ਜਵਾਬ ਪੀਐਸਟੀਸੀਐਲ ਵਲੋਂ ਪੱਤਰ ਨੰ:3081 ਮਿਤੀ 25.09.2019. ਮਾਣਯੋਗ ਕਮਿਸ਼ਨ ਰਾਹੀਂ ਮਾਨਯੋਗ ਕਮਿਸ਼ਨ ਨੂੰ ਪੇਸ਼ ਕਰ ਦਿੱਤਾ ਗਿਆ। ਮਾਣਯੋਗ ਕਮਿਸ਼ਨ ਦੁਆਰਾ ਇਸ ਨੂੰ ਪਟੀਸ਼ਨ ਨੰ: 19 ਸਾਲ 2019 ਰਾਹੀਂ 10.10.2019 ਨੂੰ ਰਿਕਾਰਡ ਤੇ ਲੈ ਲਿਆ ਗਿਆ ਹੈ।

2. ਪਟੀਸ਼ਨ ਦੀਆਂ ਕਾਪੀਆਂ, PSERC ਵਲੋਂ ਸੂਚਿਤ ਕੀਤੀਆਂ ਕਮੀਆਂ ਅਤੇ ਕਮੀਆਂ ਦੇ ਦਿੱਤੇ ਗਏ ਜਵਾਬ ਦੀਆਂ ਕਾਪੀਆਂ ਮੁੱਖ ਲੇਖਾ ਅਫਸਰ (ਵਿੱਤ ਅਤੇ ਆਡਿਟ), ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ, ਤੀਜੀ ਮੰਜਿਲ, ਸ਼ਕਤੀ ਸਦਨ, ਸਾਹਮਣੇ ਕਾਲੀ ਮਾਤਾ ਮੰਦਿਰ, ਦੀ ਮਾਲ, ਪਟਿਆਲਾ, ਤਾਲਮੇਲ ਅਫਸਰ, ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਂਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਿਟਡ, ਗੈਸਟ ਹਾਉਸ, ਨਜਦੀਕ ਯਾਦਵਿੰਦਰਾ ਪਬਲਿਕ ਸਕੂਲ, ਫੇਜ਼-8, ਮੁਹਾਲੀ ਦੇ ਦਫਤਰਾਂ ਅਤੇ ਮੁੱਖ ਇੰਜੀਨੀਅਰ/ਪੀ ਤੇ ਐਮ, ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਂਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ, ਲੁਧਿਆਣਾ, ਨਿਗਰਾਨ ਇੰਜੀਨੀਅਰ/ਪੀ ਤੇ ਐਮ ਸਰਕਲ, ਲੁਧਿਆਣਾ/ਪਟਿਆਲਾ/ਜਲੰਧਰ/ਅੰਮ੍ਰਿਤਸਰ/ਬੱਠਿੰਡਾ ਦੇ ਦਫ਼ਤਰਾਂ ਵਿੱਚ ਵੀ ਉਪਲਬੱਧ ਹਨ ਅਤੇ ਇਸ ਦੀ ਸੋਫਟ ਕਾਪੀ PSTCL ਦੀ website www.pstcl.org ਅਤੇ PSERC ਦੀ website www.pserc.gov.in ਤੇ ਉਪਲਬੱਧ ਹੈ ਅਤੇ ਉਥੋਂ download ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ।

3. ਚਾਹਵਾਨ ਵਿਅਕਤੀ ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਂਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ ਦੀ ਪਟੀਸ਼ਨ ਦਾ ਨਿਰੀਖਣ ਅਤੇ ਘੋਖ-ਪੜਤਾਲ ਉਪਰੋਕਤ ਦੱਸੇ ਗਏ ਦਫਤਰਾਂ ਵਿਚ ਦਫ਼ਤਰੀ ਸਮੇਂ ਦੌਰਾਨ ਬਿਨਾਂ ਕਿਸੀ ਖਰਚ ਤੋਂ ਮੁਫਤ ਵਿਚ ਕਰ ਸਕਦੇ ਹਨ।

4. ਉਪਰੋਕਤ ਦਸਤਾਵੇਜ਼ਾਂ ਦੀਆਂ ਕਾਪੀਆਂ ਉਪਰ ਦਰਸਾਏ ਗਏ ਦਫਤਰਾਂ ਤੋਂ 300/- ਰੁਪਏ ਪ੍ਰਤੀ ਕਾਪੀ ਪ੍ਰਾਪਤ ਕੀਤੀਆਂ ਜਾ ਸਕਦੀਆਂ ਹਨ।

5. ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ ਦੀ ਉਕਤ ਪਟੀਸ਼ਨ ਲਈ ਇਤਰਾਜ਼, ਜ਼ੇਕਰ ਕੋਈ ਹੋਣ, ਤਾਂ ਦਸਤਾਵੇਜ਼ਾਂ ਸਹਿਤ ਸਕੱਤਰ, ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮਿਸ਼ਨ, ਸਾਇਟ ਨੰ. 3, ਸੈਕਟਰ-18 ਏ,ਮੱਧਿਆ ਮਾਰਗ, ਚੰਡੀਗੜ੍ਹ ਵਿੱਚ ਵਿਅਕਤੀਗਤ ਰੂਪ ਵਿੱਚ ਜਾਂ ਰਜਿਸਟਰਡ ਡਾਕ ਰਾਹੀਂ ਦਾਇਰ ਕੀਤੇ ਜਾ ਸਕਦੇ ਹਨ, ਇਤਰਾਜ ਇਸ ਨੋਟਿਸ ਦੇ ਪ੍ਰਕਾਸ਼ਨ ਤੋਂ 21 ਦਿਨ੍ਹਾਂ ਦੇ ਅੰਦਰ-2 ਪਹੁੰਚ ਜਾਣੇ ਚਾਹੀਦੇ ਹਨ। ਇਸ ਦੀ ਕਾਪੀ ਮੁੱਖ ਲੇਖਾ ਅਫਸਰ (ਵਿੱਤ ਅਤੇ ਆਡਿਟ),ਪੰਜਾਬ ਸਟੇਟ ਟਰਾਸਮਿਸ਼ਨ ਕਾਰਪੋਰੇਸ਼ਨ ਲਿਮਟਿਡ, ਤੀਜੀ ਮੰਜਿਲ, ਸ਼ਕਤੀ ਸਦਨ, ਸਾਹਮਣੇ ਕਾਲੀ ਮਾਤਾ ਮੰਦਿਰ, ਦੀ ਮਾਲ, ਪਟਿਆਲਾ ਨੂੰ ਵੀ ਜਰੂਰ ਭੇਜੀ ਜਾਵੇ ਅਤੇ ਇਸ ਦੇ ਭੇਜੇ ਜਾਣ ਦਾ ਸਬੂਤ ਸਕੱਤਰ, ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮਿਸ਼ਨ ਨੂੰ ਇਤਰਾਜ ਦਾਇਰ ਕਰਨ ਲਗਿਆਂ ਜਰੂਰ ਨਾਲ ਨੱਥੀ ਕੀਤਾ ਜਾਵੇ।

6. ਉਪਰੋਕਤ ਅਨੁਸਾਰ ਇਤਰਾਜ਼ ਦਸ(10) ਕਾਪੀਆਂ ਵਿੱਚ ਦਾਇਰ ਕੀਤੇ ਜਾਣੇ ਚਾਹੀਦੇ ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਉਪਰ ਇਤਰਾਜ ਭੇਜਣ ਵਾਲੇ ਵਿਅਕਤੀ ਦੇ ਦਸਤਖਤ, ਪੂਰਾ ਨਾਮ, ਪੂਰਾ ਡਾਕ ਦਾ ਪਤਾ ਅਤੇ ਟੈਲੀਫੋਨ/ਮੋਬਾਇਲਨੰ:/ਈ ਮੇਲ ਆਈ ਡੀ ਲਿਖਿਆ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ। ਸਾਰੇ ਇਤਰਾਜ਼ਕਾਰ, ਵਿਅਕਤੀਗਤ ਇਤਰਾਜਕਾਰ ਤੋਂ ਇਲਾਵਾ, ਆਪਣੇ ਇਤਰਾਜ਼ਾਂ ਦੀ ਸੋਫਟ ਕਾਪੀ ਸਕੱਤਰ, ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮਿਸ਼ਨ ਨੂੰ ਉਹਨਾਂ ਦੀ ਈ ਮੇਲ ਆਈ ਡੀ "secretarypsercchd@gmail.com ਤੇ ਵੀ ਭੇਜ਼ ਸਕਦੇ ਹਨ। ਜੇਕਰ ਇਤਰਾਜ ਕਿਸੇ ਸੰਗਠਨ ਜਾਂ ਖਪਤਕਾਰ ਦੀ ਕਿਸੇ ਸ਼੍ਰੇਣੀ ਦੀ ਤਰਫੋਂ ਦਾਇਰ ਕੀਤੇ ਜਾਦੇ ਹਨ ਤਾਂ ਇਹ ਦੱਸਿਆ ਜਾਣਾ ਚਾਹੀਦਾ ਹੈ। ਜੇਕਰ

ਇਤਰਾਜ਼/ਟਿਪਣੀਆਂ ਪੇਸ਼ ਕੀਤੇ ਜਾਣ ਵਾਲਾ ਵਿਅਕਤੀ ਚਾਹੁੰਦਾ ਹੈ ਕਿ ਉਸ ਨੂੰ ਵਿਅਕਤੀਗਤ ਰੂਪ ਵਿੱਚ ਸੁਣਿਆ ਜਾਵੇ ਤਾਂ ਇਹ ਖਾਸ ਤੌਰ ਤੇ ਦੱਸਿਆ ਜਾਣਾ ਚਾਹੀਦਾ ਹੈ।

7. ਪੰਜਾਬ ਰਾਜ ਬਿਜਲੀ ਰੈਗੂਲੇਟਰੀ ਕਮਿਸ਼ਨ, ਇਸ ਨੋਟਿਸ ਦੀ ਪ੍ਰਤੀਕਿਰਿਆ ਵਿੱਚ ਪ੍ਰਾਪਤ ਕੀਤੇ ਲਿਖਤੀ ਇਤਰਾਜ਼ਾਂ ਨੂੰ ਵਾਚਣ ਤੋਂ ਮਗਰੋਂ, ਅਜਿਹੇ ਇਤਰਾਜ਼ਕਾਰ (ਇਤਰਾਜ਼ਕਾਰਾਂ) ਨੂੰ ਸੁਣਵਾਈ ਲਈ ਇਹਨਾਂ ਨੂੰ ਉਚਿਤ ਸਮਝਦਿਆਂ ਉਹਨਾਂ ਤਾਰੀਖਾਂ ਨੂੰ ਜਿਹੜੀਆਂ ਉਚਿਤ ਸਮੇਂ ਦੌਰਾਨ ਕਮਿਸ਼ਨ ਦੁਆਰਾ ਸੂਚਿਤ ਕੀਤੀਆਂ ਜਾਣਗੀਆਂ, ਸੱਦਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਕਮਿਸ਼ਨ ਦੇ ਦਫਤਰ ਦੇ ਕੰਪਲੈਕਸ ਵਿੱਚ ਪਟੀਸ਼ਨ ਸਬੰਧੀ ਜਨਤਕ ਸੁਣਵਾਈ ਮਿਤੀ 06.11.2019 ਨੂੰ ਸਵੇਰੇ 11 ਵਜੇ ਹੋਵੇਗੀ।

8. ਆਮ ਪਬਲਿਕ/ਸਟੇਕ ਹਾਲਡਰਾਂ ਦੀ ਜਾਣਕਾਰੀ ਲਈ ਪਟੀਸ਼ਨ ਵਿੱਚ ਦਰਜ ਕੈਪੀਟਲ ਇਨਵੈਸਟਮੈਂਟ ਪਲੈਨ ਦੀ ਸੂਚਨਾ ਸੰਖੇਪ ਵਿੱਚ ਹੇਠ ਲਿਖੇ ਅਨੁਸਾਰ ਹੈ:-

(ੳ) ਵਿੱਤੀ ਸਾਲ 2020-21 ਤੋਂ ਵਿੱਤੀ ਸਾਲ 2022-23 ਦੇ ਕੈਪੀਟਲ ਇਨਵੈਸਟਮੈਂਟ ਪਲੈਨ ਦੀ ਸਾਰਣੀ

(ਰੁਪਏ ਕਰੋੜਾਂ ਵਿੱਚ)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Spillover			
400kV Schemes	63.58	58.85	87.19
220kV Schemes	130.28	120.14	48.68
132kV Schemes	0.23	0.00	0.00
Other Works / Miscellaneous	22.63	3.53	1.19
Total	**216.73**	**182.52**	**137.05**
New Developmental Schemes			
400kV Schemes	95.32	149.46	146.71
220kV Schemes	252.07	249.22	254.74
132kV Schemes	47.25	43.11	37.31
Other Works / Miscellaneous	93.89	107.17	101.49
Total	**488.53**	**548.96**	**540.25**
400kV Schemes	315.65	208.31	233.90
220kV Schemes	177.54	369.36	303.42
132kV Schemes	47.49	43.11	37.31
Other Works / Miscellaneous	116.52	110.70	102.68
Total	**705.26**	**731.48**	**677.30**

(ਅ) ਵਿੱਤੀ ਸਾਲ 2020-21 ਤੋਂ ਵਿੱਤੀ ਸਾਲ 2022-23 ਦੇ ਕੈਪੀਟਲ ਇਨਵੈਸਟਮੈਂਟ ਪਲੈਨ ਦੀ ਸਾਰਣੀ

(ਰੁਪਏ ਕਰੋੜਾਂ ਵਿੱਚ)

Particulars	FY 2020-21	FY 2021-22	FY 2022-23
Transmission			
Capital Investment	705.26	731.48	677.30
Capitalisation	292.86	182.40	1305.97
SLDC			
Capital Expenditure	21.44	11.62	7.69
Capitalisation	12.88	3.85	44.24

ਮੁੱਖ ਲੇਖਾ ਅਫਸਰ (ਵਿੱਤ ਅਤੇ ਆਡਿਟ),
ਪੀਐਸਟੀਸੀਐਲ, ਤੀਜੀ ਮੰਜਿਲ, ਸ਼ਕਤੀ ਸਦਨ, ਪਟਿਆਲਾ।