

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 23/MP/2019

Coram:

**Shri P.K. Pujari, Chairperson
Dr. M.K. Iyer, Member
Shri I. S. Jha, Member**

Date of Order: 9th August, 2019

In the matter of

Petition under Section 38(2) of the Electricity Act, 2003 read with Section 79(1)(c) and Section 79(1)(k) of the Act, along with (i) Central Electricity Regulatory Commission (Grant of Regulatory Approval for execution of Inter-State Transmission Scheme to Central Transmission Utility) Regulations, 2010; (ii) Regulation 111 & 114 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and (iii) Central Electricity Regulatory Commission (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2010 for Grant of Regulatory Approval for execution of the Transmission system for Solar Energy Zones in Rajasthan.

And

In the matter of

Power Grid Corporation of India Limited
B-9, Qutab Institutional Area,
Katwaria Sarai, New Delhi

Corporate office: "Saudamini", Plot No: 2,
Sector-29, Gurgaon (Haryana) - 122 001

.....Petitioner

Vs

1. Delhi Transco Ltd
Shakti Sadan, Kotla Road,
New Delhi-110 002
2. BSES Yamuna Power Ltd
BSES Bhawan, Nehru Place, New Delhi
3. BSES Rajdhani Power Ltd
BSES Bhawan, Nehru Place,
New Delhi
4. Tata Power Delhi Distribution Limited
Power Trading & Load Dispatch Group
Cennet Building, Adjacent to 66/11 kV Pitampura-3
Grid Building, Pitampura, New Delhi – 110034



5. Rajasthan Rajya Vidyut Prasaran Nigam Limited
Vidyut Bhawan,
Vidyut Marg, Jaipur - 302 005

6. Ajmer Vidyut Vitran Nigam Ltd
Vidyut Bhawan, Panchsheel Nagar,
Makarwali Road, Ajmer 305 004

7. Jaipur Vidyut Vitran Nigam Ltd
Vidhyut Bhawan, Janpath
Jaipur – 302005, Rajasthan

8. Jodhpur Vidyut Vitran Nigam Ltd
New Power house, Industrial area
Jodhpur- 342003, Rajasthan

9. Himachal Pradesh State Electricity Board
Vidyut Bhawan
Kumar House Complex Building II
Shimla-171 004

10. Punjab State Transmission Corporation Ltd
The Mall, Patiala 147 001

11. Haryana Vidyut Prasaran Nigam Ltd
Shakti Bhawan, Sector No-6,
Panchkula-134109

12. Power Development Department
Govt. Of Jammu & Kashmir
Mini Secretariat, Jammu

13. Uttar Pradesh Power Corporation Ltd
(formerly Uttar Pradesh State Electricity Board)
Shakti Bhawan, 14, Ashok Marg
Lucknow - 226001

14. Chandigarh Electricity Department
4th Floor, U.T. Secretariat, Sector 9,
Chandigarh – 160017

15. Uttarakhand Power Corporation Ltd.
Urja Bhawan, Kanwali Road, Dehradun

16. North Central Railway
Allahabad

17. New Delhi Municipal Council
Palika Kendra, Sansad Marg,
New Delhi-110002

.....Respondents



Parties Present:

Ms. Manju Gupta, PGCIL
Shri Rajesh Verma, PGCIL
Shri Ashok Pal, PGCIL
Ms. Jyoti Prasad, PGCIL
Dr. V. N. Paranjape, PGCIL
Shri M.G. Ramachandran, Sr. Advocate, Rajasthan Discoms
Ms. Poorva Saigal, Advocate, Rajasthan Discoms
Shri Shubham Arya, Advocate, Rajasthan Discoms
Ms. Tanya Sareen, Advocate, Rajasthan Discoms

ORDER

The present Petition has been filed by the Petitioner, Power Grid Corporation of India Limited (PGCIL) under Section 38(2) of the Electricity Act, 2003 (hereinafter referred to as the '2003 Act') read with Section 79(1)(c) and 79(1)(k) of the said Act for grant of Regulatory approval for execution of the transmission system for Solar Energy Zones in Rajasthan. The Petitioner has made the following prayers;

- '(a) Grant Regulatory approval for taking up implementation of identified transmission system;*
- (b) Grant of approval for recovery of transmission charges of the assets through CERC (Sharing of Transmission charges and losses for ISTS) Regulations, 2010 and its amendment(s) notified by CERC from time to time; and*
- (c) Grant of approval for inclusion of the above system under the TSA notified by CERC."*

Background

2. The Petitioner has submitted as under:

- (a) The Government of India has set a target of establishing 175 GW of renewable capacity by 2022, which includes 100 GW solar and 60 GW wind capacity. In order to identify ISTS connectivity of renewable energy projects from potential solar energy zones and potential wind energy zones, Ministry of New and Renewable Energy (MNRE) constituted a sub-committee to consider ISTS connectivity of renewable energy projects from the potential Solar Energy Zones and potential Wind Energy Zones in seven RE-rich States, namely, Tamil Nadu, Andhra Pradesh, Karnataka, Gujarat, Rajasthan, Maharashtra and Madhya Pradesh.



(b) As per the report of the sub-committee on transmission infrastructure requirement, implementation of transmission infrastructure for above envisaged RE generation has been bifurcated in two phases viz. 20 GW solar and 9 GW wind projects planned in Phase-I (up to December 2020) and 30 GW solar & 7.5 GW wind projects planned for Phase-II (December 2021). Out of above, 20 GW of solar generation potential is envisaged to be developed in Western Rajasthan by December 2021, which includes 10 GW Solar generations in each phase.

(c) The Petitioner has received applications for grant of Stage-II Connectivity/ LTA from solar generators *inter alia* from solar bids (SECI/ MSEDCL, etc.) for injection of power in ISTS in Western Rajasthan. This was in addition to 2500 MW deemed Stage-II Connectivity & LTA granted at 220 kV Bhadla for Solar Power Parks [Saurya Urja (Bhadla-III)-500 MW, Adani RE (Bhadla-IV)-250 MW, Essel-750 MW] and 400 kV Fatehgarh PS for Fatehgarh UMSP (1000 MW). Additionally, Stage-II Connectivity/ LTA has also been granted for 830 MW capacity at under construction Solar Park/ Green Energy Corridor transmission system, namely 765kV Bhadla-Bikaner-Moga/ Ajmer high capacity transmission corridor including 5th ICT at Bhadla sub-station. Therefore, integration and transfer of solar power from total 3330 MW (Bhadla-2330 MW+Fatehgarh-1000 MW) is to be carried out on above under implementation transmission corridor.

(d) CTU has granted Stage-II Connectivity for 3100 MW and has also agreed to grant LTA for 2850 MW as under:

S. No.	LTA quantum and location	Schedule
1	250 MW at Bhadla	September, 2019
2	250 MW at Bikaner	October, 2019
3	500 MW at Bhadla	September, 2020
4	50 MW at Bhadla	October, 2020
5	600 MW at Bikaner	October, 2020
6	1200 MW at Fatehgarh	October ,2020

(e) LTA applications for additional 250 MW of solar capacity (Schedule-August 2019/ July 2019) at Bhadla have been received recently, making a total of new LTA applications for 3100 MW which was also agreed for the grant. Further, additional solar application for Stage-II Connectivity for 1100 MW quantum has also been received in Fatehgarh complex recently. However, its LTA application is awaited.

(f) The Petitioner has identified transmission system for Solar Energy Zones in the State of Rajasthan in order to fulfill the requirement arising from LTA/ Stag- II applicants (3100 MW) as well as to cater to future potential (5800 MW) at the complexes in Fatehgarh, Bhadla/ Phalodi and Bikaner. Therefore, cumulatively, a total of power transfer requirement of 8900 MW Solar generation from Western Rajasthan has been envisaged in the instant Transmission Scheme.



- (g) The Proposed transmission system includes following elements:

Part A

- i) Establishment of 765/400kV, 2x1500MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II PS)**
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers^{\$}
- iv) LILO of both circuits of Ajmer – Bikaner 765kV D/c line at Bhadla-II PS
- v) Bhadla-II PS – Bhadla (PG) 400kV D/c Line (Twin HTLS)
- vi) Bikaner (PG) – Khetri 765kV D/c line
- vii) Khetri – Jhatikara 765kV D/c line
- viii) Khetri – Sikar (PG) 400kV D/c line (Twin AL59)
- ix) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Moga S/s^{\$}
- x) Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s
- xi) Establishment of 765/400kV, 3x1500MVA pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II PS)**
- xii) Fatehgarh-II PS– Bhadla -II 765kV D/c line
- xiii) LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (op. at 400kV) at Fatehgarh-II PS so as to establish Fatehgarh (TBCB) – Fatehgarh -II 765 kV D/c line (to be op. at 400kV) and Fatehgarh-II-Bhadla (PG) 765kV D/c line*
- xiv) Charging of Fatehgarh-II PS –Bhadla section at 765kV level
- xv) Ajmer (PG)– Phagi 765kV D/c line
- xvi) 1x125 MVar (420kV), 2x240 MVar (765kV) Bus Reactor each at Fatehgarh-II PS, Bhadla-II PS & Khetri Substation
- xvii) 1x240 MVAR Switchable Line reactors for each circuit at Jhatikara end of Khetri – Jhatikara 765kV D/c line
- xviii) 1x240 MVar Switchable line reactor for each circuit at each end of Bikaner – Khetri 765kV D/c line
- xix) 1x330 MVar Switchable line reactor for each circuit at Bhadla-II PS end for Ajmer-Bhadla-II PS 765kV line (after LILO)
- xx) 1x240 MVar Switchable line reactor for each circuit at Bhadla-II PS end for Bikaner-Bhadla-II PS 765kV line (after LILO)

***Space provision to be kept for 220kV level at Bhadla-II, Fatehgarh -II PS & Khetri S/s for future transformers bays, switchable line/ bus reactors etc.*

Part B

Augmentation works to be taken up in above Part-A scheme after receipt of Stage-II connectivity/ LTA applications at Fatehgarh-II PS, Bhadla-II PS & Bikaner (PG) S/s in Rajasthan (400/220kV ICT shall be taken up in progressive manner commensurate to stage-II connectivity/ LTA applications on above pooling



stations)**

- i) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Bhadla-II PS
- ii) Creation of 220 kV level at Bhadla-II PS with Installation of 400/220kV, 5x500MVA transformers at Bhadla-II PS
- iii) Augmentation with 765/400kV, 1x1500MVA transformer (4th) at Fatehgarh-II PS
- iv) Creation of 220 kV level at Fatehgarh-II with Installation of 400/220kV, 5x500MVA transformers at Fatehgarh-II PS
- v) Creation of 220 kV level at Bikaner (PG) with Installation of 400/220kV, 2x500MVA transformers at Bikaner (PG) \$
- vi) 220kV line bays for interconnection of solar projects at Fatehgarh-II PS (9 nos), Bhadla-II PS (9 nos) and Bikaner (4 nos) S/s

Since Part-B of the scheme is to be taken upon receipt of Stage-II/ LTA application which is part of future potential, future provision at various pooling stations including Part-B scope is as under:

1) 765/400/220kV Bhadla-II pooling station

- 765/400kV ICT along with bays: 2 no.
- 400/220kV ICTs along with bays: 9 nos.
- 765kV line bays: 6 nos
- 400kV line bays: 6 nos.
- 220kV line bays: 16 nos
- 400kV bus reactor along with bays: 1 no.
- 765kV bus reactor along with bays: 1 no.

2) 765/400/220kV Fatehgarh -II pooling station

- 765/400kV ICT along with bays: 3 nos
- 400/220kV ICTs along with bays: 10 nos.
- 765kV line bays: 4 nos
- 400kV line bays: 6 nos.
- 220kV line bays: 18 nos
- 400kV bus reactor along with bays: 1 no
- 765kV bus reactor along with bays: 1 no

3) 765/400kV Khetri substation

- 400/220kV ICTs along with bays: 4 nos.
- 765kV line bays: 4 nos
- 400kV line bays: 4 nos.
- 220kV line bays: 7 nos



(h) The above planned Transmission Scheme associated with Solar Energy Zones (8.9 GW) in Rajasthan was discussed with the stakeholders in the 1st meeting of Northern Region Standing Committee on Transmission (NRSCT) held on 11.9.2018. Subsequently, Transmission Scheme for evacuation of solar power from Bhadla/ Fatehgarh/ Bikaner complexes of Rajasthan was technically agreed in the 2nd meeting of NRSCT held on 13.11.2018 by the stakeholders/ members.

(i) The Transmission Scheme was further discussed in the 2nd meeting of National Committee on Transmission (NCT) held on 4.12.2018, wherein implementation modalities for the above scheme were recommended. In the said meeting, it was also agreed that CTU requires regulatory approval of the Commission for Transmission Scheme.

(j) Estimated cost of transmission system proposed is as under:

- a. Part-A: Rs. 6352 crore (approx.)
- b. Part-B: Rs. 689 crore (approx.)
- c. Total (A & B): Rs. 7041 crore (approx.)

(k) Estimated impact on tariff for next five years is as under:

- a. Part-A: Rs. 1080 crore (approx.)
- b. Part-B: Rs. 117 crore (approx.)
- c. Total (A & B): Rs. 1197 crore (approx.)

(l) Annual transmission charges for the subject Transmission Scheme at an estimated cost of about Rs. 7041 crore would be about Rs. 1197 crore. The above transmission system shall enable transfer of power from 8900 MW solar capacity. Such quantum of power shall translate into annual energy of about 15593 MU [Energy in MU = $(8900 \times 0.20 \times 8760) / 1000$]. If we consider rate of energy as Rs 2.5 per unit on the conservative side, the total annual energy cost works out to be about Rs 3898 crore.

3. The Petitioner has placed on record the Project Inception Report in terms of Regulation 4(2) of the Central Electricity Regulatory Commission (Grant of Regulatory Approval for execution of Inter-State Transmission Scheme to Central Transmission Utility) Regulations, 2010 (hereinafter referred to as 'Regulatory Approval Regulations') covering comprehensive schemes, objective and justification of scheme, cost-benefit analysis, timeframe, consent of beneficiaries, etc.



4. IA No. 15/2019 was filed by the Petitioner for urgent hearing of the matter. The Petition along with IA was heard on 27.2.2019 and notice was issued to the Respondents. Accordingly, the IA was disposed of. Reply to the Petition has been filed by Rajasthan Discoms. The Petitioner, vide Record of Proceedings for the hearing dated 27.2.2019 was directed to submit the following information:

- (a) To Publish the details of the scheme and result of system studies on its website in terms of Regulation 8.3 of the Central Electricity Regulatory Commission (Planning, Coordination and Development of Economic and Efficient Inter-State Transmission System by Central Transmission Utility and other related matters) Regulations, 2018 (hereinafter referred to as the Transmission Planning Regulations);
- (b) Signed copy of the LTAs and PPAs, if any;
- (c) Recommendations of the concerned RPCs, results of system studies carried out by the Petitioner and comments/ suggestions of stakeholders and its treatment as per Regulation 9.1 of the 2018 Planning Regulations;
- (d) As per Regulation 7(1) and 7(2) of the Regulatory Approval Regulations, the Petitioner may clarify the LTTC of the system;
- (e) Details of demand projections, network reliability and design criteria of the planned system;
- (f) Detailed Project Report of the ISTS system and confirm that all the said elements of the instant ISTS system are ISTS in nature;
- (g) Minutes of Meeting of Northern Region Standing Committee on Transmission meeting held on 11.9.2018;
- (h) Calculations of levelized tariff i.e. calculations related to 'Estimated impact of tariff for next five years';
- (i) Funding details of the instant ISTS scheme and Total Transfer Capacity of the whole ISTS system.



Submission of the Petitioner

5. In compliance with the direction of the Commission vide RoP of hearing dated 27.2.2019, the Petitioner vide affidavit dated 29.3.2019 has submitted the details as under:

(a) The details of the scheme and results of the system studies had been attached with the agenda of 1st Northern Region Standing Committee on Transmission, which is available on CEA website since the date of circulation of the said agenda, for deliberations/ comments of the stakeholders. The Transmission Scheme associated with SEZ of 8.9 GW was technically agreed in 2nd meeting of NRSC on Transmission held on 13.11.2018. The above scheme was also taken up in the agenda for 44th NRPC meeting held on 19.3.2019.

(b) Details of Long Term Access Agreements signed with LTA applicant of subject transmission scheme along with the status of Power Purchase Agreements are as under:

Sr. No.	Applicant	Quantum (MW)	Beneficiary	LTTC	Date of Signing of LTAA	Remarks
1	Mahoba Solar (UP) Pvt. Ltd.	200	Target (WR)	Mahoba Solar (UP) Pvt. Ltd.	21.2.2019	PPA signed with MSEDCL (In process of Firming up)
2	ACME Solar Holdings Ltd.	250	Target (WR)	ACME Solar Holdings Ltd.	1.3.2019	PPA signed with MSEDCL (In process of Firming up)
3	Hero Solar Energy Pvt. Ltd.	250	Target (ER)	Hero Solar Energy Pvt. Ltd.	14.2.2019	
4	Mahindra Susten Private Ltd.	250	Target (WR)	Mahindra Susten Private Ltd.	13.2.2019	
5	Azure Power India Private Ltd.	50	Target (WR)	Azure Power India Private Ltd.	15.2.2019	
6	Mahoba Solar (UP) Private Ltd.	50	Target (NR)	Mahoba Solar (UP) Private Ltd.	21.2.2019	
7	ACME Solar Holdings Ltd.	300	Target (NR)	ACME Solar Holdings Ltd.	To be signed	PPA signed with SECI PSA Awaited
8	ACME Solar Holdings Ltd.	300	Target (NR)	ACME Solar Holdings Ltd.		
9	ACME Solar Holdings Ltd.	300	Target (NR)	ACME Solar Holdings Ltd.	To be signed	PPA signed with SECI (In process of Firming up) PSA signed between: SECI & BSES Rajdhani Power Ltd. SECI & BSES Yamuna Power Ltd. SECI & Tata Power Delhi Distribution Ltd.
10	ACME Solar Holdings Ltd.	300	Target (NR)	ACME Solar Holdings Ltd.		



Sr. No.	Applicant	Quantum (MW)	Beneficiary	LTTC	Date of Signing of LTAA	Remarks
11	ReNew Solar Power Pvt. Ltd.	250	Target (WR)	ReNew Solar Power Pvt. Ltd.	21.02.2019	PPA signed with MSEDCL (In process of Firming up)
12	Azure Power India Pvt. Ltd.	300	Target (ER)	Azure Power India Pvt. Ltd.	15.02.2019	
13	Azure Power India Pvt. Ltd.	300	Target (NR) -100 Target (ER) -200	Azure Power India Pvt. Ltd.	15.02.2019	

(c) The total transmission system transfer capacity is 8900 MW out of which, 3100 MW LTA quantum has been granted and PPA has been signed for 1300 MW.

(d) Based on discussion in 1st NRSCT meeting held on 11.9.2018, a separate meeting was held on 20.9.2018 in Gurgaon, wherein RVPNL and HVPNL had suggested some modifications in their intra-State network. Based on their suggestions, revised studies were carried out. Further, RVPNL vide its letter dated 15.11.2018 again proposed few modifications which was agreed in 2nd NRSCT meeting held on 13.11.2018.

(e) The Transmission Scheme was discussed in the 44th NRPC meeting held on 19.3.2019. However, in the said meeting, NRPC stated that the scheme may not be discussed in NRPC meeting.

(f) The LTA applicants who have applied for LTA on target region basis to NR/WR/ER shall be the LTTCs of the system. Some of the LTA applicants have also submitted copy of PPAs/ PSAs along with NOC from the drawl STU. Since, the Transmission Scheme is being implemented as per MOP order dated 13.2.2018, the transmission charges will be borne by the DICs as per the provisions of 2010 Sharing Regulations if LTA applicants meet waiver conditions.

(g) Planning studies has been carried out for 2020-21 scenarios and all India demand has been considered as per the 19th Electric Power Survey of CEA. Considering the past trends, demands have been considered as 90% and 95% for other regions and Northern Region respectively. Moreover, transmission planning studies have been carried out in line with CEA Manual on Transmission Planning Criteria, 2013.



(h) The Transmission Scheme would be partly developed by the Petitioner under RTM (regulated tariff mechanism) route and partly under TBCB (tariff based competitive bidding) route and the Detailed Project Report is under preparation. With regard to nature of the instant scheme, the major beneficiaries of the scheme are outside the State of Rajasthan mainly WR, ER and NR and hence all the elements of the scheme are ISTS in nature.

(i) The estimated cost of the proposed comprehensive Transmission scheme is Rs. 7041 crore. Further, the tariff for the Transmission Scheme to be implemented through TBCB route shall be finalized as per transmission tariff quoted by successful bidder.

(j) With regard to funding details of the ISTS scheme, the Petitioner has submitted that the scheme is being partly developed by the Petitioner (through regulated tariff mechanism) and partly through TBCB route. Information regarding funding of the scheme to be implemented through TBCB route is to be decided by successful bidder and is outside the purview of the Petitioner. Estimated cost of the scheme assigned to Petitioner is Rs. 2520 crore and same is proposed to be implemented with Debt: Equity ratio as 70:30.

Reply of Respondents 6 to 8 (Rajasthan Discoms)

6. Rajasthan Discoms in their joint reply dated 4.4.2019 have submitted as under:

(a) Implementation of the proposed transmission system may have an adverse financial implication on the Rajasthan Utilities by virtue of the transmission charges or any other charges relating to the transmission system being considered under the 2010 Sharing Regulations.

(b) Due to inter-connections of ISTS network with RVPNL sub-stations, the power which is destined to be used outside the State of Rajasthan might flow through RVPN sub-stations and transmission lines and in such cases, Rajasthan Discoms might be liable to bear the transmission charges by virtue of present PoC mechanism. On the contrary, State utilities which are intended to import the solar power through ISTS system are not subjected to payment of charges and have been allowed free of cost. Due to implementation of the PoC mechanism, the State



of Rajasthan is already in the higher slab of ISTS transmission charges. Implementation of proposed scheme would lead to further increase in transmission charges for the State. The issue was also raised in the SRPC, 39th Commercial sub-committee meeting held on 29.10.2018 and 3rd Meeting of the Committee held on 18.12.2018.

(c) Any financial implications in regard to the system proposed to be constructed based on power flow or load flow studies in respect of the proposed transmission system, which may cause unintended and adverse implications on Rajasthan Utilities should be made payable as a social cost by all the States and the territories of India in proportion to the total consumption of electricity in the respective State in regard to which Renewable Purchase Obligations are to be imposed.

(d) Establishment of inter-State transmission network in Rajasthan may lead to higher charges for Rajasthan and possibly grid instability for Rajasthan. The Commission may consider that renewable energy being used for other States should not burden the State of Rajasthan leading to grid instability or high transmission charges. Therefore, there should be a proper mechanism or methodology to share transmission charges of ISTS assets created for evacuating power from solar rich States like Rajasthan.

(e) Since Rajasthan is power surplus and the proposed ISTS transmission system is not meant to cater to the requirement of Rajasthan, there should be no financial implications to them in regard to the transmission charges or other charges related to inter-State transmission proposed to be constructed by the Petitioner.

Rejoinder of the Petitioner

7. The Petitioner in its rejoinder dated 26.4.2019 to the reply filed by RVPNL (on behalf of Respondents 6 to 8) has stated that the approval for implementation and sharing of applicable transmission charges of the said transmission system shall be decided by the Commission as per the applicable Regulations. Since Rajasthan Discoms are seeking modification of POC mechanism/ 2010 Sharing Regulations for renewable projects, they have the liberty to approach the Commission through a separate Petition.



8. The Petitioner vide its affidavit dated 12.7.2019 has further submitted as under:

(a) As per the direction of Commission, the details of the scheme, its justification, estimated cost & its tariff impact, results of the system studies, study assumptions, stakeholder consultation/ approval details etc. were published on the Petitioner's website on 23.4.2019. Stakeholders (generators, STUs, RLDCs, SLDCs and Distribution Licensees) were also requested vide email dated 23.4.2019 to send their observations. The Petitioner has further submitted as under:

(i) PSTCL vide letters dated 25.4.2019, 26.4.2019 and 30.4.2019 has certain issues regarding PoC charges, downsizing of generations, if any, in Punjab area and augmentation of downlink system. PSTCL has also requested to provide the PSS/E (sav) data file of the base case. The query regarding details of applicable PoC charges related with Punjab area submitted vide letter dated 25.4.2019 was sent to POSOCO for redressal, as for calculation of applicable POC charges.

(ii) Torrent Power sought information regarding SCOD of proposed transmission schemes, extension of bid submission date and inter-dependence of the transmission schemes. The comments were forwarded to CEA and BPC (RECTPCL & PFCCL) for necessary action. Inter-dependence matter has been resolved.

(iii) POSOCO vide letter dated 7.6.2019 forwarded comments on behalf of RLDCs/ NLDC which was addressed in a Joint Study Meeting held on 17-19 June, 2019. In this regard, CTU has provided the PSS/E base file used for transmission planning of potential wind and solar energy zones in WR (Phase-II) and NR as agreed in the WR 2nd Standing Committee Meeting on Transmission held on 21.5.2019 and 3rd Standing Committee Meeting on Transmission held on 24.5.2019. Two files were given to POSOCO by CTU. Study result shown in first file were corresponding to potential wind energy zones in WR (Phase II) and in second file, potential solar energy zones in NR were considered. Difference in both the cases are mainly on account of the following:

- a. Region wise Load Generation balance;
- b. Different RE generation (RAPAR SEZ, Lakadia, Jamnagar, Radha Banas etc);
- c. Topology of the network (Some branches were not found in case or branch On/ Off status different);
- d. Parameters of the transmission lines;
- e. Machine status (some machines were not modelled in once case or machine On/ Off status different)

(iv) In RE generator modelling, whole capacity is modelled in one single generator. There is no equivalent model representation. Most of the RE plants are expected to get connected at 220 kV or below level. Cable/ Line R and X for equivalent model is required to be estimated. In absence of 220 kV level modelling, fault level strength and network connectivity are not known.



(v) A total of 13 STATCOM devices are planned/ under operation for installation across the Indian grid. However, in base files, 29 STATCOM devices have been modelled. The extra STATCOMS have been placed in both ends of HVDC terminal with +/- 9999 VAR limits.

(vi) All the studies were done considering high RE scenario where power from RE pooling station in Western, Northern and Southern Region to Central India and power flows towards East and North East part of India. Low RE scenario has not been studied at planning stage, which can lead to multiple line opening to control over voltage and reversal of power.

(vii) As per CEA transmission planning criterion 2013, "the lines for which angular difference between its terminal buses is more than 20 degree after contingency of one circuit may be selected for performing stability studies." Following 765 kV lines have angular difference around 20 degree or more under N -1 outage.

- a. 765 kV Bikaner New- Moga (long line of 350 Km more than 30 degree separation in steady state.
- b. 765 kV Vadodra Lakadia
- c. 765 kV Jaipur Ajmer New
- d. 765 kV Chittorgarh- Banaskantha
- e. 765 kV Bikaner Bhadla – PG
- f. 765 kV Dharamjaigarg Ranchi New

(b) The Transmission Scheme was discussed in 44th NRPC meeting held on 19.3.2019, wherein representatives of Punjab and Rajasthan raised concerns about the financial implications of the proposed transmission system. It was agreed in the meeting that the concerns may be referred back to the Standing Committee for further deliberations. Accordingly, the scheme was once again discussed in 3rd NRSCT Meeting held on 24.5.2019 wherein it was deliberated that the Transmission Scheme has already been technically agreed in 2nd NRSCT meeting held on 13.11.2018. During the 2nd NRSCT meeting, it was inter alia also discussed that an additional space for 2 nos. of 765 bays was to be provided by RVPN for 765kV D/C Ajmer-Phagi transmission line. The representatives of RVPN informed that since space is available only for 1 no. of 765kV AIS bay at Phagi, for other bay, option of GIS bay may be considered. After deliberations, it was agreed that one bay may be implemented as AIS and for second bay, complete dia may be implemented as GIS. Further, 1x240 MVar Bus reactor at Phagi may be installed in second GIS bay. Accordingly, the Transmission Scheme was technically agreed in the 3rd NRSCT meeting held on 24.5.2019.



(c) In the 3rd NRSCT meeting, the representatives of Punjab raised their concerns about overloading of 400/220kV ICTs and high short circuit at Moga (PG). It was then decided to convene a separate meeting to deliberate aforesaid issues at Moga (PG) and the outcome of the meeting shall be informed in next NRPC Meeting.

(d) In the 45th NRPC meeting held on 8.6.2019, Rajasthan Discoms reiterated their concern that the integration of renewable power in such a huge quantum in their State may lead to an increase in the PoC charges and losses to be paid by Rajasthan. Further, PSPCL was of the view that capital cost for creating green corridor should be borne by the Central Government or through PSDF (Power System Development Fund) so that the burden of the same may not fall on the consumer. After detailed deliberations at the 45th NRPC meeting, the scheme except 1x1500MVA (765/400kV) ICT at Moga, was approved and agreed by NRPC including the provisions of spare ICT and Reactors for the scheme. Based on the aforesaid, the Revised Transmission Scheme (8.9 GW) is as under:

Part A

- i) Establishment of 765/400kV, 2x1500MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II PS)*
- ii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri
- iii) Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers
- iv) LILO of both circuits of Ajmer – Bikaner 765kV D/c line at Bhadla-II PS
- v) Bhadla-II PS – Bhadla (PG) 400kV D/c Line (Twin HTLS)
- vi) Bikaner (PG) – Khetri 765kV D/c line
- vii) Khetri – Jhatikara 765kV D/c line
- viii) Khetri – Sikar (PG) 400kV D/c line (Twin AL59)
- ix) Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s
- x) Establishment of 765/400kV, 3x1500MVA pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II PS)*
- xi) Fatehgarh-II PS– Bhadla -II 765kV D/c line
- xii) LILO of both circuits of Fatehgarh (TBCB) – Bhadla (PG) 765 kV D/c line (op. at 400kV) at Fatehgarh-II PS so as to establish Fatehgarh (TBCB) – Fatehgarh -II 765 kV D/c line (to be op. at 400kV) and Fatehgarh-II-Bhadla (PG) 765kV D/c line
- xiii) Charging of Fatehgarh-II PS –Bhadla section at 765kV level
- xiv) Ajmer (PG)– Phagi 765kV D/c line
- xv) 1x125 MVar (420kV), 2x240 MVar (765kV) Bus Reactor each at Fatehgarh-II PS, Bhadla-II PS & Khetri Substation



- xvi) 1x240 MVAR Switchable Line reactors for each circuit at Jhatikara end of Khetri – Jhatikara 765kV D/c line
- xvii) 1x240 MVAR Switchable line reactor for each circuit at each end of Bikaner – Khetri 765kV D/c line
- xviii) 1x330 MVAR Switchable line reactor for each circuit at Bhadla-II PS end for Ajmer-Bhadla-II PS 765kV line (after LILO)
- xix) 1x240 MVAR Switchable line reactor for each circuit at Bhadla-II PS end for Bikaner-Bhadla-II PS 765kV line (after LILO)
- xx) 1x240 MVAR (765kV) bus reactor at Phagi (RVPN)

**Space provision to be kept at Bhadla-II, Fatehgarh –II PS & Khetri S/s for future transformers bays, switchable line/bus reactors etc.*

Part B

Augmentation works to be taken up in above Part-A scheme after receipt of Stage-II connectivity/ LTA applications at Fatehgarh-II PS, Bhadla-II PS & Bikaner (PG) S/s in Rajasthan (400/220kV ICT shall be taken up in progressive manner commensurate to Stage-II connectivity/LTA applications on above pooling stations)**

- i) Augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Bhadla-II PS
- ii) Creation of 220 kV level at Bhadla-II PS with Installation of 400/220kV, 5x500MVA transformers at Bhadla-II PS
- iii) Augmentation with 765/400kV, 1x1500MVA transformer (4th) at Fatehgarh-II PS
- iv) Creation of 220 kV level at Fatehgarh-II with Installation of 400/220kV, 5x500MVA transformers at Fatehgarh-II PS
- v) Creation of 220 kV level at Bikaner (PG) with Installation of 400/220kV, 2x500MVA transformers at Bikaner (PG)
- vi) 220kV line bays for interconnection of solar projects at Fatehgarh-II PS (9 nos), Bhadla-II PS (9 nos) and Bikaner (4 nos) S/s

(e) The applications are being received from applicants in a progressive manner and based on the applications received at Fatehgarh-II, Bhadla-II & Bikaner substations, the scope of works mentioned under Part-B of the Transmission System for Solar Energy Zones in Rajasthan (8.9 GW) would need to be taken up in a progressive manner. The same has been approved in 45th NRPC meeting held on 8.6.2019.

(f) Since Part-B of the Transmission Scheme is to be taken upon receipt of Stage-II/ LTA application, future provision at various pooling stations including Part-B scope is as under:

- 1) 765/400/220kV Bhadla-II pooling station
 - 765/400kV ICT along with bays: 2 no.
 - 400/220kV ICTs along with bays: 9 nos.



- 765kV line bays: 6 nos.
 - 400kV line bays: 6 nos.
 - 220kV line bays: 16 nos.
 - 400kV bus reactor along with bays: 1 no.
 - 765kV bus reactor along with bays: 1 no.
- 2) 765/400/220kV Fatehgarh -II pooling station
- 765/400kV ICT along with bays: 3 nos.
 - 400/220kV ICTs along with bays: 10 nos.
 - 765kV line bays: 4 nos.
 - 400kV line bays: 6 nos.
 - 220kV line bays: 18 nos.
 - 400kV bus reactor along with bays: 1 no.
 - 765kV bus reactor along with bays: 1 no.
- 3) 765/400kV Khetri substation
- 400/220kV ICTs along with bays: 4 nos.
 - 765kV line bays: 4 nos.
 - 400kV line bays: 4 nos.
 - 220kV line bays: 7 nos.

**With Charging of Fatehgarh-II – Bhadla section at 765kV level, 2 nos. of 400kV bays would be spared at Bhadla S/s, which could be utilized for Bhadla-II – Bhadla (PG) 400kV D/c line*

*** Augmentation works to be taken up in above scheme after receipt of Stage-II connectivity/LTA applications at Fatehgarh-II PS, Bhadla-II PS & Bikaner (PG) S/s in Rajasthan (400/220kV ICT shall be taken up in progressive manner commensurate to Stage-II connectivity/LTA applications on above pooling stations)*

Provision of spare ICT and Reactors:

Bhadla-II PS:

- 1x500 MVA, 765/400 kV, 1-ph ICT (spare unit)
 - 1x80 MVAR, 765kV , 1-ph Reactor (spare unit)
- (for both - 1x240MVAR bus reactor and 2x240MVAR line reactor on Bikaner – Bhadla-II 765kV D/c line (after LILO))
- 1x110 MVAR, 765kV, 1-ph Reactor (spare unit)
- (for both 330MVAR line reactor on Ajmer-Bhaldla-II 765kV D/c line (after LILO))

Fatehgarh-II PS:

- 1x500 MVA, 765/400 kV, 1-ph ICT (spare unit)
- 1x80 MVAR, 765kV, 1-ph Reactor (spare unit)

Khetri PS:

- 1x500 MVA, 765/400 kV, 1-ph ICT (spare unit)
- 1x80 MVAR, 765kV , 1-ph Reactor (spare unit)



(for both - 1x240MVAR bus reactor and 2x240MVAR line reactor on Bikaner – Khetri 765kV D/c line)

Jhatikara Sub-station:

- 1x80 MVAR, 765kV, 1-ph Reactor (spare unit)

(for 2x240MVAR line reactor on Khetri - Jhatikara 765kV D/c line)

Bikaner Substation:

- 1x80 MVAR, 765kV, 1-ph Reactor (spare unit)
- (for 2x240MVAR line reactor on Khetri - Bikaner 765kV D/c line)

Additional Submissions by the Petitioner

9. The matter was again heard on 23.7.2019 and the Petitioner was directed to submit the following information:

- (a) Detail status of transmission schemes approved so far for the envisaged renewable projects;
- (b) Corresponding cost of such Transmission Schemes;
- (c) Renewable capacity which has actually been commissioned against such schemes; and
- (d) Since regulatory approval has been sought under Regulation 3(1)(i) of the Regulatory Approval Regulations, latest status of LTA applications/ LTA grant/ PPAs for transmission system under the instant Petition, may be furnished. Besides on such status, asset covered in the instant Petition may be segregated as LTA with PPA, LTA without PPA and without LTA & PPA.

10. In response, the Petitioner vide its affidavit dated 25.7.2019 has submitted the information as under:

- a) With regard to detail status of transmission schemes approved so far for the envisaged renewable projects, corresponding cost of such transmission schemes and renewable capacity which has actually been commissioned against such schemes, the information is as under:



Status of Transmission System approved for Renewable Generation						
SI No	Name of Scheme	Associated Transmission System	Transmission System Status	Estimated Cost (Rs. Cr.)	RE Capacity (MW)	Capacity Commissioned (MW)
1	REWA Solar Park (750MW)	Establishment of 400/220kV, 3x500 MVA Pooling Station at Rewa LILO of Vindhyaachal - Jabalpur 400 kV 2nd D/C line (Circuit-3k4) at Rewa Pooling Station 1x125 MVAR bus reactor at Rewa Pooling Station	Commissioned	305	750	735
2	N.P Kunta Solar Power Park (Andhra Pradesh Solar Power Corporation Pvt. Ltd.)	400/220kV, 3X500 MVA NP Kunta Pooling station along with 1X125 MVAR Bus Reactor LILO of 400kV S/C Cudappah - Kolar TL at NP Kunta 100MVAR Statcom at NP Kunta Loop-in of Cuddapah-Hindupur 400kV D/C Quad at 400 kV NP Kunta Loop-out of Cuddapah- Hindupur 400kV D/C Quad at 400 kV NP Kunta Extn of 400/220kV NP Kunta S/S (for 4 nos. of 220kV line bays) Extn of 400/220kV NP Kunta S/S including supply of 1x500MVA, 400/220kV Autotransformer Extn of 400/220kV NP Kunta S/S (with 4 nos. of 220kV line bays)	Commissioned	453	Part-A (250MW) Part-B (750MW) Part-C (500MW)	250 NIL 400
3	Pavagada Solar Park (Karnataka Solar Power Development Corporation Ltd.)	Establishment of 3x500 MVA, 400/220KV Pooling Station at Tumkur(Pavagada) along with 1x125 War Bus Reactor Augmentation of 2x500 MVA, 400/220KV transformer at Tumkur(Pavagada) Pooling station LILO of 400kV Gooty - Tumkur (Vasantnarsapur) D/c at Tumkur	Commissioned	1311	Phase-I: 1000MW Phase-II: 1000MW	1400



		<p>Tumkur (Pavagada) - Hiriya 400 kV D/c</p> <p>LILO of 400kV Bellary Pool - Tumkur (Vasantnarsapur) D/c (Quad)(both circuits)(KPTCL line) at Tumkur (Pavagada) PS</p> <p>220kV bays (8 nos.) at Tumkur (Pavagada) PS</p> <p>Hiriya - Mysore 400 kV D/c line</p> <p>1x125MVAR bus reactor (2nd) at Tumkur (Pavagada) Pooling Station</p> <p>Third 400/220 kV, 1x500 MVA transformer at Tumkur (Vasantnarsapur)</p> <p>1x80 MVAR switchable Line reactor at Mysore end of Hiriya-Mysore D/c .</p> <p>FSC (40%) on 400kV Tumkur (Pavagada) - Tumkur (Vasantnarsapura) D/c (Quad) line at Tumkur(Pavagada) PS end</p>	<p>Expected by Sep'19</p> <p>Commissioned</p> <p>Ready and Charged</p> <p>Expected by Sep,19</p> <p>Expected by Sep'19</p>			
4	Bhadla Solar Park	<p>Establishment of 765/400/220kV (765/400kV, 3x1500MVA, 400/220kV, 3x500 MVA) Pooling Station at Bhadla (PG)</p> <p>400 kV Bhadla (PG)- Bhadla (RVPN) D/c (Quad)</p> <p>4 nos. 220 kV line bays & 02 nos. 400 kV at Bhadla (PG) for interconnection of solar plants through their internal transmission system</p> <p>765 kV Bhadla (PG) - Bikaner (PG) D/C</p> <p>Associated Reactive compensation (both 765 kV bus & line reactors)</p>	<p>3x500 MVA, 400/220kV ICTs Commissioned</p> <p>Commissioned</p> <p>Completed</p> <p>Expected by Aug'19</p> <p>Expected by Aug'19</p>	1409	1500	400



5	Banaskantha (Radhanesda) Solar Park	Banaskantha (Radhanesda) PS - Bansakantha (PG) S/Stn 400 kV D/C (twin AL 59) line and 2 nos. of 400 kV line bays at Banaskantha (PG) S/Stn	Expected by Sep'19	193	700	Nil
		Establishment of 2x500 MVA, 400/220KV Pooling station at Banaskantha (Radhanesda) along with 1x125MVar bus reactor				
		4 nos 220 kV line bays at 400/220 kV at Banaskantha (Radhanesda) PS for Solar Park Interconnection				
		2 nos. -of 400 kV line bays each at Bankashantha (Radhanesda) PS				
6	Fatehgarh Solar Power Park (Under TBCB)	Establishment of 400 kV PS at Fatehgarh Fatehgarh PS - Bhadla (PG) 765kV D/C line (to be operated at 400kV) 2 Nos. 400 kV line bays at Fatehgarh PS 1 x125 MVAR Bus reactor at 400kV Fatehgarh PS along with associated bay Space for future 220kV (12Nos.) line bays Space for future 400kV (8Nos.) line bays along with line reactors at Fatehgarh PS Space for future 400kVbus reactor (2Nos.) along with associated bays	Under Implementation	536 (Empowered Committee Cost)	1000 MW	NIL
Total				4207	7450	3185

b) Total LTA applications for 5.72 GW renewable generation capacity have been received so far, out of which 4 GW LTA has been granted/ agreed for grant against transmission scheme associated with Solar Energy Zone (SEZ), Rajasthan for which regulatory approval has been filed in the instant Petition. Balance applications are under process. Out of 4 GW for which LTA has been granted/ agreed for grant, PPAs have been received for about 2 GW. Substation-wise status of LTA applications/ LTA grant/ PPAs is as under:



S. No	Substation	LTA		PPA (MW)
		Received (MW)	Granted/Agreed (MW)	
1	Bhadla PS	1050	1050	500
2	Bhadla-II PS	980	-	-
3	Bikaner	1200	850	550
4	Fatehgarh	1200	1200	1000
5	Fatehgarh-II	1290	900	-
Total		5720	4000	2050

c) Transmission assets under the transmission scheme associated with SEZ, Rajasthan have been segregated as LTA with PPA/ without PPA and without LTA & PPA as under:

Details of LTA granted with transmission System for Solar Energy Zone in Rajasthan

Transmission System	LTA with PPA	LTA without PPA	Without LTA & PPA
Part-A			
Establishment of 765/400kV, 3X1500MVA, pooling station at suitable location near Fatehgarh in Jaisalmer Distt (Fatehgarh-II PS) with 1x125 MVAR (420 kV), 2x240 MVAR (765 kV) Bus Reactor	600	600	
LILO of both circuits of Fatehgarh (TBCB) - Bhadla (PG) 765 kV D/c line (operating at 400kV) at Fatehgarh-II PS so as establish Fatehgarh (TBCB)-Fatehgarh-II 765kV D/c line (to be operated at 400kV) and Fatehgarh-II - Bhadla (PG) 765kV D/c line	600	600	
Charging of Fatehgarh-II PS - Bhadla section at 765kV level	600	600	
Augmentation of transformation capacity at Bhadla (PG) by 400/220kV, 2x500MVA (6th & 7th) transformers	500	550	
Establishment of 765/400kV, 2x1500MVA pooling station at suitable location near Phalodi/ Bhadla in Jodhpur (Bhadla-II PS) with 1x125 MVAR (420 kV), 2x240 MVAR (765 kV) Bus Reactor	1100	1150	
LILO of both ckts of 765kV Ajmer - Bikaner D/c line at Bhadla-II PS with 1x330 MVAR Switchable Line Reactor for each ckt of Ajmer-Bhadla-II 765 kV line (After LILO) at Bhadla-II and 1x240 MVAR Switchable line reactor for each ckt of Bikaner- Bhadla-II 765 kV line at Bhadla -II (After LILO)	1100	1150	



Bhadla-II PS - Bhadla (PG) 400kV D/c Line (Twin HTLS)	1100	1150	
Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Khetri with 1x125 MVAR (420 kV), 2x240 MVAR (765 kV) Bus Reactor	1650	2350	
Bikaner(PG) - Khetri 765kV D/c line with 1x240 MVAR Switchable Line Reactor for each ckt at each end	1650	2350	
Khetri - Sikar (PG) 400kV D/c line (twin HTLS)	1650	2350	
Khetri - Jhatikara 765kV D/c line with 1x240 MVAR Switchable Line Reactor at Jhatikara	1650	2350	
Ajmer (PG) - Phagi 765kV D/c line with 1x240 MVAR Switchable Line Reactor at Phagi (RVPN)	1650	2350	
Augmentation with 765/400kV, 1x1000MVA transformer (3rd) at Bhiwani (PG).	1650	2350	
Fatehgarh-II PS - Bhadla-II 765kV D/c line		900	
Part-B			
Augmentation with 765/ 400kV, 1x1500MVA transformer (3rd) at Bhadla-II PS			✓
Creation of 220kV level at Bhadla-II PS with installation 400/ 220kV, 5x500MVA transformer			✓
Augmentation with 765/ 400kV, 1x1500MVA transformer (4th) at Fatehgarh-II PS	300		
Creation of 220kV level at Fatehgarh-II PS with installation 400/ 220kV, 2x500MVA transformer	900		
Creation of 220kV level at Fatehgarh-II PS with installation 400/ 220kV, 3x500MVA transformer			✓
Creation of 220kV level at Bikaner (PG) with installation 400/ 220kV, 2x500MVA transformer			✓

d) Green Energy Corridors (GEC) in Western/ Northern Region and Southern Region along with augmentation of transformation capacity at Bhuj, Tuticorin-II and Bhadla is being implemented. About 6000 MW Renewable generation capacity LTA has been granted with these corridors, out of which about 1400 MW have already been commissioned. List of Assets under Green Energy Corridors (GEC) and Augmentation of transformation capacity at Bhuj, Tuticorin-II and Bhadla is as under:

Commissioned

- Ajmer (New)- Ajmer (RVPN) 400kV D/c (Quad)
- Chittorgarh (New)- Chittorgarh (RVPN) 400kV D/c (Quad)



- Establishment of 2x1500 MVA, 765/400kV S/s at Chittorgarh
- Establishment of 2x1500 MVA, 765/400kV S/s at Ajmer (New)
- Associated reactive compensation (Bus reactor at 765kV Ajmer & 765kV Chittorgarh S/s)
- Tuticorin-II Pooling Station - Tuticorin Pooling Station 400 kV 2xD/c (Quad) –
- Establishment of 2x500 MVA, 400/230kV S/s at Tirunelveli Pooling Station
- Chittorgarh - Ajmer (New) 765kV D/c
- Establishment of 2x1500 MVA, 765/400kV S/s at Banaskantha
- Banaskantha - Chittorgarh 765kV D/c
- Banaskantha-Sankhari 400 kV D/c.
- Establishment of 765/400/220kV (765/400 kV-2x1500 MVA & 400/220kV-2x500MVA) sub-station at Bhuj Pool
- Bhuj Pool - Banaskantha 765kV D/c
- Associated reactive compensation

Part Completed

- Ajmer (New) - Bikaner (New) 765 kV D/c - Completed
- Bikaner (New) - Moga (PG) 765 kV D/c - Expected by Oct'19
- LILO of one circuit of 400kV Bhadla - Bikaner (RVPN) line at Bikaner (New) - Expected by Oct'19
- Establishment of 2x1500 MVA, 765/400 kV S/s at Bikaner (New) - Completed

Total estimated cost: about Rs. 11370 crore

Augmentation of transformation capacity at Bhuj (765/400kV, 2x1500MVA & 400/220kV, 6x500MVA), Tuticorin-II (400/220kV, 500MV A) and Bhadla (400/220kV, 2x500MVA)

Total estimated cost: about Rs. 570 crore

Analysis and Decision

11. We have considered the submissions of the Petitioner and the Respondents, Rajasthan Discoms and PSPCL. We note that the Government of India (GoI) has set a target of installing 175 GW of Renewable Energy capacity by the year 2022, which includes 100 GW from solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small hydro-power. In this endeavor, GoI has taken the initiative for development of Solar Power Parks in various States such as Karnataka, Andhra Pradesh, Madhya Pradesh, Gujarat and Rajasthan. The large quantum of Renewable Energy getting connected to ISTS would require sufficient transmission capacity to ensure evacuation of power without constraint. The Petitioner has stated that transmission schemes for Ultra Mega



Solar Power Parks and Green Energy Corridor have already been planned by the Petitioner and have been commissioned/ are under advance stages of implementation. The Petitioner has also submitted that to achieve the target of integration of 175 GW capacity, it has planned transmission capacity for 66.5 GW Renewable Energy in 7 RE-rich States identified by SECI/ MNRE. The scheme involves transmission system for 20 GW solar generation in Rajasthan, 28 GW wind and solar generation in Western Region and 18.5 GW wind and solar generation in Southern Region. These schemes are envisaged to be implemented in two phases progressively.

12. Out of aforementioned 66.5 GW, the present Petition involves the execution of the Transmission System associated with 8.9 GW of RE potential in Solar Energy Zones in Rajasthan. The Petitioner has submitted that out of the 8.9 GW potential, LTA application has been received only for approximately 5.7 GW and LTA has been granted for approximately 4 GW. It has further submitted that approximately 2 GW of PPA has also been signed in respect of these generation projects.

13. The Petitioner has submitted that the proposed Transmission Scheme associated with Solar Energy Zones (8.9 GW) in Rajasthan was discussed with the stakeholders in the 1st meeting of Northern Region Standing Committee on Transmission (NRSCT) held on 11.9.2018. The proposed Transmission Scheme in Rajasthan was further discussed and was technically agreed in the 2nd meeting of NRSCT held on 13.11.2018 by the stakeholders/ members. The Transmission Scheme was subsequently discussed in the 2nd meeting of National Committee on Transmission (NCT) held on 4.12.2018, wherein implementation modalities for the above scheme were recommended. The said scheme was also taken up in the agenda for 44th NRPC meeting held on 19.3.2019, wherein, the representatives of the States of Punjab and Rajasthan raised concerns about the financial implications of the proposed transmission system. It was agreed in the meeting



that the concerns may be referred back to the Standing Committee for further deliberations. Accordingly, the scheme was once again discussed in 3rd NRSCT Meeting held on 24.5.2019, wherein it was deliberated that the Transmission Scheme has already been technically agreed in 2nd NRSCT meeting held on 13.11.2018. The transmission scheme was also discussed in the 45th meeting of Northern Region Power Committee (NRPC) held on 8.6.2019, which has approved the instant scheme.

14. The Petitioner has further submitted that it has complied with all the regulatory requirements and the details of the scheme, along with other relevant documents, have been uploaded on its website for comments/ suggestions of the stakeholders. The Petitioner has informed that it has published notice in newspapers in accordance with the Regulatory Approval Regulations.

15. As stated, the Petitioner has approached the Commission for Regulatory approval under the provisions of Regulation 3(1)(i) of the Regulatory Approval Regulations. The relevant provisions of Regulation 3(1) are extracted under:

“3. Scope and applicability

(1) These regulations shall apply to:

(i) an ISTS Scheme proposed by Central Transmission Utility, for which generators have sought long-term access as per the Central Electricity Regulatory Commission (Grant of Connectivity, Long-Term Access and Medium Term Open Access to the Inter-State Transmission and Related Matters) Regulations, 2009, and for which consultation with Central Electricity Authority and beneficiaries if already identified has been held for setting up the ISTS Scheme, but for which Power Purchase Agreements with all the beneficiaries have not been signed on the date of application.

(ii) an ISTS Scheme for system strengthening/up-gradation, identified by Central Transmission Utility to enable reliable, efficient, co-ordinated and economical flow of electricity within and across the region for which consultation with Central Electricity Authority and beneficiaries if identified has been held.

(iii) ISTS Scheme proposed by CTU, for which the Central Government authorised Solar Power Park Developer has sought long term access, and for which consultation with CEA and beneficiaries wherever identified has been held for setting up the ISTS scheme and the Solar Power Park Developer



undertakes to bear all liabilities on behalf of the solar power generators to be set up in the Solar Park.

(2) These regulations shall not apply to ISTS Scheme, for which all the beneficiaries/ respective STUs have signed Bulk Power Transmission Agreement to share the transmission charges."

16. Regulation 3(1)(i) provides that the Regulatory Approval Regulations shall apply to the ISTS scheme proposed by the Petitioner for which the generators have sought LTA. However, for the identified transmission system proposed to be constructed by the Petitioner, full quantum of LTA has not been sought by the generators. As submitted by the Petitioner, out of 8.9 GW potential, LTA applications have been sought only for 5.7 GW. Recognizing that the Petition is not covered under Regulation 3 (1) (i), the representative of the Petitioner prayed that the Commission, in exercise of its power under Regulation 8 of the Regulatory Approval Regulations, relax the provisions of the said regulations and grant the reliefs prayed for. The Petitioner has also submitted that the proposed transmission system/line has been envisaged keeping in view the generation potential as assessed by MNRE/ agencies of MNRE.

17. In the meanwhile, the Ministry of Power, GoI on 11.7.2019 has issued directions under Section 107 of the 2003 Act with regard to the Regulatory approval of the transmission schemes envisaged for RE resources, as under:

"Subject: Direction to the Central Electricity Regulatory Commission under Section 107 of the Electricity Act, 2013 in regard to regulatory approval of the transmission schemes identified for 68.5.GW of RE projects-Regarding

Sir,

As a part of the steps necessary to fulfill the commitment made by India under the Nationally Determined Contribution pursuant to the Paris Agreement on Environment, Government of India have decided to set up 175 GW of RE capacities in the country by the year 2022. As of May 2019 about 80 GW of RE generation has already been commissioned and the balance 95 GW has to come up in the next 3 years. In order to achieve above targets, MNRE in consultation with CEA and CTU has identified transmission schemes for around 66.5 GW of RE generation, comprising around 28 GW under Phase-I and around 38.5 GW under Phase-II as part of National Renewable Energy Mission of setting up of 175 GW of RE capacity.

2. As the gestation period of RE projects is much shorter in comparison to the



implementation period of the transmission facilities, and significant quantum of RE capacity targeted to be tendered out in the current financial year, it is necessary that the present system of transmission planning and implantation of RE projects need to be carried out in Mission Mode. The transmission activities need to be started much ahead of the generation so that both of them are completed in matching time-frame to achieve the target set up Govt. of India. Thus, in the said background, it has been decided by the Government to accord the identified schemes for aforementioned 66.5 GW of RE generation, comprising around 28 GW under Phase-I AND 38.5 GW under Phase-II as "Projects of National Importance". Accordingly, the Central Government, in exercise of the powers conferred under Section 107 of the Electricity Act, 2003 hereby issues following directions to the Central Electricity Regulatory Commission in respect of these projects of national importance:

(i) To accord Regulatory approval for the transmission system associated with 12.5 GW of RE capacity in Phase-I for which CTU has already applied to CERC for regulatory approval;

(ii) To give regulatory approval expeditiously, for balance 15.5 GW under phase-I and 38.5 GW under phase-II on submission of the application by CTU for the regulatory approval.

(iii) Prior requirement of LTA applications and associated Bank Guarantees, to be deferred for the interim period till the RE project is awarded to successful bidder, for taking up the implementation of associated transmission systems for balance RE capacity under 66.5 GW of RE. It is however, clarified that the due regulatory procedure of LTA and Connectivity will be followed by the successful bidder."

18. Section 107 of the 2003 Act is extracted under:

"Section 107. (Directions by Central Government): --- (1) In the discharge of its functions, the Central Commission shall be guided by such directions in matters of policy involving public interest as the Central Government may give to it in writing.

(2) If any question arises as to whether any such direction relates to a matter of policy involving public interest, the decision of the Central Government thereon shall be final."

19. Therefore, in matters of policy involving public interest, the Commission is guided by the directions issued by the Central Government under the said section. Similar provisions are contained in Section 108 of the 2003 Act. With regard to the directions of the State Government under Section 108 of the 2003 Act, we take note of the observations of the Appellate Tribunal in its judgment dated 4.10.2012 in Appeal No. 200 of 2011 (*M/s Maruti Suzuki India Ltd. vs Haryana Electricity Regulatory Commission & Ors.*) as under:

"28. Section 78A of Electricity (Supply) Act 1948 and Section 12 of DERA 2000 were similar to Section 108 of the 2003 Act. These sections are set out as under:

.....



108. Directions by State Government.—(1) In the discharge of its functions, the State Commission **shall be guided** by such directions in matters of policy involving public interest as the State Government may give to it in writing.

(2) If any question arises as to whether any such direction relates to a matter of policy involving public interest, the decision of the State Government thereon shall be final.

29. The Hon'ble Supreme Court in the case of APTRANSCO vs Sai Renewable Energy Pvt. Ltd. [(2011)11SCC 34] has held that State Commission is not bound by any policy directions issued by the Government under the Act if such directions hamper the statutory functions of the Commission. The relevant extracts of the Hon'ble Supreme Court's judgment dated 8.7.2010 is quoted below:

"27. The Reform Act, 1998 was enacted, primarily, with the object of constituting two separate corporations; one for generation and other for transmission and distribution of electrical energy. The essence was restructuring, so as to achieve the balance required to be maintained in regard to competitiveness and efficiency on the one part and the social objective of ensuring a fair deal to the consumer on the other. This Act is also intended for creation of a statutory regulatory authority. Section 3 of the Act requires the State Govt. to establish by notification a Commission to be known as Andhra Pradesh Electricity Regulatory Commission. This was done by notification dated 3rd April, 1999. As already noticed, Section 11 detailed the functions of the Regulatory Commission and primarily it had advisory as well as regulatory functions. In terms of Section 11(1)(c) it was required to issue licenses in accordance with the provisions of the Act and determine the conditions to be included in the license. However, 11(1)(e) gave it much wider power and duty to regulate the purchase, distribution, supply and utilization of electricity, the quality of service, the tariff and charges payable keeping in view both the interest of the consumer as well as the consideration that the supply and distribution cannot be maintained unless the charges for the electricity supplied are adequately levied and duly collected. In terms of Section 11(1)(l) it was to undertake all incidental or ancillary things to the functions assigned to it under the provisions of the Act. Section 12 of the Act vests the State Govt. with the power to issue policy directions on matters concerning electricity in the State including the overall planning and co- ordination. All policy directions shall be issued by the State Govt. consistent with the objects sought to be achieved by this Act and, accordingly, shall not adversely affect or interfere with the functions and powers of the Regulatory Commission including, but not limited to, determination of the structure of tariffs for supply of electricity to various classes of consumers. The State Govt. is further expected to consult the Regulatory Commission in regard to the proposed legislation or rules concerning any policy direction and shall duly take into account the recommendation by the Regulatory Commission on all such matters. Thus the scheme of these provisions is to grant supremacy to the Regulatory Commission and the State is not expected to take any policy decision or planning which would adversely affect the functioning of the Regulatory Commission or interfere with its functions. This provision also clearly implies that fixation of tariff is the function of the Regulatory Commission and the State Govt. has a minimum role in that regard. Chapter VII of this Act deals with tariff. In terms of Section 26(2), the Regulatory Commission, in addition to its power of issuing licence, is entitled to fix terms and conditions for determination of the licensee's revenue and tariffs by regulations which are to be duly published. The expression 'tariff' has not been defined in any of the Acts, with which we are concerned in the present appeals, despite the fact that the expression 'tariff' has been used repeatedly in both the Acts. Under the Electricity Act, 2003 'tariff' has neither been



defined nor explained in any of the provisions of the Act. Explanation (b) to Section 26 of the Reform Act, 1998 states what is meant by 'tariff'. This provision states that 'tariff' means a schedule of standard price or charges or specified services which are applicable to all such specified services provided to the type or types of customers specified in the 'tariff' notification. This is an explanation to Section 26 which deals with licenses, revenues and tariffs. In other words, this explanation may not be of greater help to the Court in dealing with the case of generating companies. Similarly, the expression 'purchase price' has neither been defined nor explained in any of the afore-stated Acts." {Emphasis added}.

30. Thus, the judgments cited by the Appellant as above have been overruled by the Hon'ble Supreme Court in *APTRANSCO vs Sai Renewable Energy Pvt. Ltd.* [(2011)11SCC 34].

31. Further, this Tribunal in *Polyplex Corporation vs Uttrakhand Electricity Regulatory Commission* in Appeal no. 41, 42 and 43 of 2010 has held that

"The State Commission is independent statutory body. Therefore the policy directions issued by the State Government are not binding on the State Commission, as those directions cannot curtail the power of the State Government (sic Commission) in the matter of determination of tariff. The State Government may have given any such policy direction in order to cater to the popular demand made by the public but while determining tariff the State Commission may take those directions or suggestions for consideration but it is for the State Commission which has statutory duty to perform either to accept the suggestion or reject those directions taking note of the various circumstances. It is purely discretionary on the part of the State Commission on acceptability of the directions issued by the State Government in the matter of determination of tariff."

20. Thus, the directions issued under section 107 or 108, as the case may be, shall be in matters of policy involving public interest and for the implementation of the provisions of the Act.

21. The Commission while specifying the terms and conditions of tariff, shall be guided by provisions of Section 61 of the 2003 Act which is extracted below:

"Section 61. (Tariff regulations):

The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:-

- (a) the principles and methodologies specified by the Central Commission for determination of the tariff applicable to generating companies and transmission licensees;*
- (b) the generation, transmission, distribution and supply of electricity are conducted on commercial principles;*
- (c) the factors which would encourage competition, efficiency, economical use of the resources, good performance and optimum investments;*
- (d) safeguarding of consumers' interest and at the same time, recovery of the cost of electricity in a reasonable manner;*



- (e) the principles rewarding efficiency in performance;
 - (f) multi year tariff principles;
 - (g) that the tariff progressively reflects the cost of supply of electricity and also, reduces cross-subsidies in the manner specified by the Appropriate Commission;
 - (h) the promotion of co-generation and generation of electricity from renewable sources of energy;
 - (i) the National Electricity Policy and tariff policy:
- xxxx”

22. Section 178 of the 2003 Act provides with the powers of the Central Commission to make regulations, Section 79 of the said Act provides for the following functions of the Commission:

- “79. (1) The Central Commission shall discharge the following functions, namely:-*
- (a) to regulate the tariff of generating companies owned or controlled by the Central Government;*
 - (b) to regulate the tariff of generating companies other than those owned or controlled by the Central Government specified in clause (a), if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one State;*
 - (c) to regulate the inter-State transmission of electricity;*
 - (d) to determine tariff for inter-State transmission of electricity;*
 - (e) to issue licenses to persons to function as transmission licensee and electricity trader with respect to their inter-State operations.*
 - (f) to adjudicate upon disputes involving generating companies or transmission licensee in regard to matters connected with clauses (a) to (d) above and to refer any dispute for arbitration;*
 - (g) to levy fees for the purposes of this Act;*
 - (h) to specify Grid Code having regard to Grid Standards;*
 - (i) to specify and enforce the standards with respect to quality, continuity and reliability of service by licensees;*
 - (j) to fix the trading margin in the inter-State trading of electricity, if considered, necessary;*
 - (k) to discharge such other functions as may be assigned under this Act,”*

23. Accordingly, the Commission, in exercise of its powers under Section 79(1)(c) read with subsection (1) and clause (ze) of subsection (2) of Section 178 of the 2003 Act has notified the Regulatory Approval Regulations. In terms of Section 61(h) of the 2003 Act, the Commission has taken a number of regulatory initiatives for the development of RE sources and for the smooth integration of RE in the grid. In order to facilitate effective



integration of variable and uncertain RE generation, the Commission has specified Roadmap for Reserves, framework for Ancillary Services Operation besides amending the IEGC, which provides for technical minimum of 55% in case of thermal generating units aimed at providing flexibility to respond to the needs of variation in demand, RE generation etc. Besides the above, the Commission has also brought in several regulatory interventions for promoting renewable energy generation, which *inter alia* include, notification of Renewable Energy Certificate Mechanism, Framework for Scheduling, Forecasting & Deviation Settlement of RE generation, specifying Relaxation in Deviation Settlement Mechanism for RE generation etc.

24. The Central Government has, as a part of 175 GW, set a target for addition of 66.5 GW of RE and there is an immediate need to construct transmission lines for evacuation of RE power. In terms of this, the CTU/ CEA have accordingly prepared a plan for immediate development of transmission lines that should precede the RE generation projects. These have been placed before the respective Standing Committees and Regional Power Committees for consideration and approval. Out of projected 66.5 GW RE generation, the development of transmission system associated with 8.9.GW is involved in the State of Rajasthan.

25. We acknowledge the concerns expressed by the Central Government on the need to implement the transmission system ahead of the Renewable Energy generation in the State of Rajasthan so that the Renewable Energy capacity does not get stranded. The GOI in its letter dated 11.7.2019 has amply clarified that it has identified the construction of the proposed Transmission System for evacuation of 66.5 GW as schemes of 'National Importance'.



26. On a cogent reading of the submissions of the CTU and the direction of GOI in para 2(iii) of letter dated 11.7.2019, it can be inferred that the requirements of LTA applications are required to be deferred for the interim period till the RE project is awarded to the successful bidder and that due regulatory procedure of LTA and connectivity will be followed by the successful bidder.

27. While we take note of the submissions of the Petitioner for grant of regulatory approval with deferred requirement of LTA applications and associated BGs, the issues raised by the various stakeholders, especially, the Rajasthan discoms and PSPCL in this regard cannot be lost sight of. On perusal of the Minutes of Meeting of the 44th NRPC meeting held on 19.3.2019 and the 45th NRPC meeting held on 7.6.2019, it has been recorded as follows:

“44th NRPC meeting

TCC deliberation

B.30.4 Representative of Punjab proposed that financial implications on PoC should be highlighted well in advance before finalizing or approving large scheme.

B.30.5 As Rajasthan and Punjab objected to the scheme, TCC recommended that proposal shouldn't be approved.

NRPC Deliberation

B.30.6 NRPC was apprised regarding objections of Rajasthan and Punjab. It was agreed that issue may be referred back to Standing Committee.

45th NRPC meeting

TCC Deliberations

...

B.19.8 Rajasthan stated that a lot of RE generators are coming in their state and meeting the RPO obligations of other states, it was leading to degradation of quality of power and other related issues in their state. Same concerns were stated in the NRSC meeting which were not recorded citing the Technical mandate of the said committee. He expressed concern that this integration of renewable power in such a huge quantum may lead to an increase in the PoC charges and losses to be paid by Rajasthan.

B.19.9 He further stated that Rajasthan is of the opinion that there should be a separate corridor for evacuation of renewable power which is not being used by Rajasthan and it should not be connected with their system. PSPCL suggested that the capital cost for creating green corridor should be borne by the central government or through PSDF so that the burden of the same do not fall on the consumer.

B.19.10 TCC approved the scheme as presented by PGCIL except the augmentation with 765/400kV, 1x1500MVA transformer (3rd) at Moga S/s mentioned at ix in Part-A.



B.19.11 TCC noted the concerns as expressed by PSTCL & Rajasthan and advised PSTCL, POSOCO and CTU to finalise the operational measures in a separate meeting before the commissioning of the Bikaner-Moga line.

NRPC Deliberations

B.19.12 NRPC approved the proposal of POWERGRID as per the deliberations held in TCC meeting. “

28. The Rajasthan Discoms have submitted that the proposed transmission system is for the evacuation of solar power from the State of Rajasthan primarily for consumption and thereupon fulfillment of RPOs of other States. It has also submitted that in terms of 2010 Sharing Regulations, the construction of transmission lines is likely to increase its transmission charges. It has pointed out that since the proposed system is inter-connected with the intra-State network of Rajasthan, the power flow might cause grid instability and lead to higher charges. The Rajasthan discoms have further submitted that there should be an equitable mechanism for sharing of transmission charges of the proposed assets and that the charges should be socialized amongst the States which procure Solar power for fulfillment of their respective RPOs. The Respondent PSPCL has in the 45th NRPC meeting suggested that the capital cost for creating green corridor should be borne by the Central Government or should be funded through PSDF so that the burden of the same does not fall on the consumer.

29. In this context, the additional information furnished by the Petitioner vide its affidavit dated 25.7.2019 is extremely noteworthy. It points out that large part of transmission system already commissioned for RE generation at Rewa Solar Park, N. P Kuntha Solar Park, Pavagada Solar Park, Bhadla Solar Park, Banaskantha Solar Park and Fatehgarh Solar Park are lying idle due to absence of RE generation capacity. In the Green Energy Corridors (GEC) in Western/ Northern Region and Southern Region along with augmentation of transformation capacity at Bhuj, Tuticorin-II and Bhadla about 6000 MW Renewable generation capacity LTA has been granted, out of which only about 1400



MW has been commissioned. Thus, large part of transmission system developed/ commissioned are not being put to use, as a result of which discoms/ consumers are being burdened with transmission charges without any commensurate benefit of getting RE power.

30. We take note of the concerns expressed by Rajasthan & Punjab in the 44th & 45th NRPC meetings regarding burden falling on the consumers. We also take note of the information submitted by the Petitioner vide affidavit dated 25.7.2019 which shows that large part of the transmission system already developed/ commissioned for RE generation have not yet been put to use, thus burdening the consumers with transmission charges. We further take note of the submissions of the Petitioner that the transmission charges at an estimated cost of Rs 7041 crore would be Rs 1197 crore, which works out to approximately Rs 0.77/ unit.


31. As stated earlier, the Petition for grant of Regulatory approval does not squarely fall under the provisions of Regulation 3(1)(i) of the Regulatory Approval Regulations. However, the Petitioner during hearing on 23.7.2019 prayed that the Commission may exercise the Power to relax under Regulation 8 of the Regulatory Approval Regulations. Therefore, considering the fact that the scheme is of national importance as mentioned by the Ministry of Power in its letter dated 11.7.2019 and with due regard to the guiding principle of promoting renewable energy as enshrined under Section 61(h) of the 2003 Act, we, in exercise of our Powers under Regulation 8 of the Regulatory Approval Regulations, relax the provisions of Regulation 3(1)(i) of the Regulatory Approval Regulations and grant Regulatory approval for execution of the proposed transmission system identified in this Petition. Having done so, the issues and concerns expressed by the discoms and other stakeholders are also required to be balanced while granting such



relief, especially when the Ministry of Power, GOI has accorded the said transmission system the status of national importance. The Commission is also guided by the principles, as provided under Section 61(d) of the 2003 Act – of balancing consumers' interest and recovery of cost of electricity. Accordingly, the Commission would have to ensure that such decisions do not entail any financial burden on the distribution companies and consumers if the transmission assets remained unutilized or under-utilized. Also, as the cost involved is huge, the CTU, as far as possible, shall endeavor to match the construction of transmission system with the COD of the generators. If required, the CTU may even defer the construction of such systems, in consultation with MOP and MNRE, so that no transmission capacity remains unutilized. Accordingly, the Regulatory approval granted above is subject to the condition that the distribution companies and consumers shall be liable for tariff corresponding to the RE generation capacity commissioned and the transmission system put to use. With due regard to the submissions of Punjab and Rajasthan in the 45th NRPC meeting, CTU shall ensure that the cost of implementation shall not be passed on to the consumers in any way till the solar generators are commissioned. CTU may seek other remedies such as grants & subsidies from GOI/ State Governments in this regard.

32. CTU shall submit quarterly progress report as regards execution of the approved Transmission Scheme to the Ministry of Power, GOI and CEA. The report shall contain pace of construction of transmission systems and the extent of LTAs granted & the PPAs signed.

33. Petition No. 23/MP/2019 is disposed of in terms of the above.


SANJAY SINHA / संजय सिन्हा
GENERAL MANAGER / महाप्रबन्धक
POWERGRID KHEIN TRANSMISSION SYSTEM LIMITED
बलशक्ति केरली प्रसारित सिस्टम लिमिटेड
KHETRI / खेरी

Sd/-
(I.S.Jha)
Member

Sd/-
(Dr. M.K. Iyer)
Member

Sd/-
(P.K. Pujari)
Chairperson

