

I/7249/2019



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण
Central Electricity Authority
विद्युत प्रणाली योजना एवं मूल्यांकन - I प्रभाग
Power System Planning & Appraisal - I Division

सेवा में/To

1.	Chairperson, Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	2.	Member (Power System), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.
3.	Member (Economic & Commercial), Central Electricity Authority Sewa Bhawan, R.K. Puram, New Delhi – 110 066.	4.	Director (Trans) Ministry of Power Shram Shakti Bhawan, New Delhi-110001.
5.	Chief Operating Officer, Central Transmission Utility POWERGRID, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122 001.	6.	Manoj Kumar Upadhyay Deputy Adviser NITI Aayog, Parliament Street, New Delhi – 110 001.
7.	Shri P. K. Pahwa, Ex. Member (GO&D), CEA 428 C, Pocket -2, Mayur Vihar, Phase -1, Delhi – 110091.	8.	Shri Prabhakar Singh, Ex. Director (Projects), POWERGRID D 904, Tulip Ivory, Sector-70, Gurgaon – 122 001.

Subject: 6th meeting of "National Committee on Transmission" (NCT) held on 30th September, 2019 – Minutes of Meeting

Sir/Madam,

6th meeting of the "National Committee on Transmission" (NCT) was held on 30th September, 2019 at 3:30 pm under the chairmanship of Shri P. S. Mhaske, Chairperson, CEA in conference Room of CEA (Chintan), 2nd Floor, Sewa Bhawan, R.K. Puram, New Delhi. Minutes of the meeting are available on CEA website <http://www.cea.nic.in>. (path to access: Home Page-Wing-Power System-PSPA I-National Committee on Transmission)

Yours faithfully,

(Goutam Roy)

Chief Engineer(PSPA-I) & Member Secretary (NCT)

I/7249/2018
Copy to:

- (i) Joint Secretary (Trans), Ministry of Power, Shram Shakti Bhawan, New Delhi-110001
- (ii) Chief Engineer (PSPA-II), CEA
- (iii) CEO, RECTPCL, ECE House, 3rd Floor, Annexe - II, [28A, KG Marg, New Delhi - 110001](#)
- (iv) PFC Consulting Ltd, First Floor, "Urjanidhi", 1, Barakhmba Lane, Connaught Place, New Delhi -110001

I/7249/2019

Minutes of the 6th meeting of National Committee on Transmission (NCT)**Date and Time: 30.09.2019, 15:30 hrs****Venue: Conference Room of CEA (Chintan), 2nd Floor, Sewa Bhawan, R.K. Puram, New Delhi**List of Participants is enclosed as **Annexure-I**Chairperson, CEA welcomed the participants to the 6th meeting of the NCT and requested Chief Engineer (PSPA-I), CEA to take up the agenda for discussion.**1.0 Confirmation of the minutes of 5th meeting of National Committee on Transmission (NCT)**

1.1 CEA stated that minutes of 5th meeting of National Committee on Transmission held on 21.08.2019 were issued vide CEA letter No. CEA-PS-11-15(11)/1/2018-PSPA1 dated 28.08.2019. It was informed that in a meeting held on 29.8.2019 (copy of the minutes enclosed) under the chairmanship of Hon'ble Minister for Power & RE, wherein, it was viewed that in the system for evacuation of 8.1 GW RE power, the proposal for HVDC line from Bhadla II to Modipuram would be too costly and will unnecessarily burden the consumer. Further, given the short timeframe for commissioning i.e. December 2021, it would not be possible to complete the project matching with the time frame of the RE generation in Rajasthan. CEA & CTU were advised to consider AC alternative, which would be less expensive and could be commissioned by December 2021 time frame. Therefore, item no. 5.1 of the minutes of 5th meeting of NCT held on 21.08.2019 (Transmission scheme for solar energy zones in Rajasthan (8.1GW) under Phase-II) was reviewed in the 5th NRSCT meeting held on 13.09.2019 considering the high cost of the HVDC system and difficulty in implementation of the VSC based HVDC transmission system by 21-22.

CEA further stated that CTU suggested some correction in the minutes of 5th NCT and the following modification was agreed:

Item No.	Name of the Scheme	As recorded in minutes of 5th NCT	Modification agreed
5.3 Page 24	Construction of 2 nos. of 400 kV bays under ISTS at 765/400 kV PGCIL substation, Varanasi	2 nos. of 400 kV bays (GIS) at 765/400 kV Varanasi (PGCIL) substation for Jaunpur-Varanasi (PGCIL) 400 kV D/c line.	2 nos. of 400 kV bays (GIS/Hybrid) at 765/400 kV Varanasi (PGCIL) substation for Jaunpur-Varanasi (PGCIL) 400 kV D/c line.
		Capacity /km 400 kV line bays – 2 (GIS)	Capacity /km 400 kV line bays – 2 (GIS/Hybrid)

1.2 The Minutes of the 5th NCT meeting (except item no. 5.1 of the minutes) along with modifications in item 5.3 were confirmed by the members.

I/7249/2019

2.0 Status of transmission schemes under bidding process - briefing by BPCs

BPCs - PFCCL and RECTPCL presented the status of the transmission schemes under bidding process. The same is enclosed at **Annexure-II**.

3.0 Cost estimates for the transmission projects to be implemented through tariff based competitive bidding (TBCB)

Sl. No.	Independent Transmission Projects	Estimated Cost of the Project as per Empowered Committee (in Rs. Crore)	Estimated Cost of the Project as per Cost Committee (including RoW compensation) (in Rs.Crore)
1.	Transmission system associated with RE generation at Bhuj-II , Dwarka and Lakadia	1075	1052.54
2.	Jam Khambaliya Pooling Station and interconnection of Jam Khambaliya Pooling station for providing connectivity to RE projects (150MW) in Dwarka (Gujarat) and installation of 400/220 kV ICT along with associated bays at M/s CGIL Switchyard	435	394.49

3.1 Members noted the same.

4.0 New Inter-State Transmission Schemes in Northern Region :

4.1 The transmission system for solar potential of 8.1 GW (Ramgarh/Kuchheri (1.9 GW), Bikaner (2.95 GW), Bhadla (1.05GW) & Fatehgarh (2.2GW) was agreed in the 4th meeting of NRSCT held on 25.7.2019 .The agreed scope of work is given at **Annexure-III**.

4.2 The above scheme was deliberated in the 5th meeting of NCT held on 21.08.2019, wherein various packages of the scheme along with implementation mode (through RTM/TBCB) were recommended.

4.3 As discussed in para 1.1, it was decided to review the transmission system for evacuation of power from solar potential of 8.1 GW (Ramgarh/Kuchheri (1.9 GW), Bikaner (2.95 GW), Bhadla (1.05GW) & Fatehgarh (2.2GW) in the 5th NRSCT meeting held on 13.09.2019, in view of the high cost of the HVDC system and difficulty in implementation of the VSC based HVDC transmission system by 2021. The scope of work in the transmission system strengthening for solar potential of 8.1 GW (Ramgarh/Kuchheri (1.9 GW), Bikaner (2.95 GW), Bhadla (1.05GW) & Fatehgarh (2.2GW) as agreed in the 5th meeting of NRSCT held on 25.7.2019 is as under:

Modified Scope agreed in 5th NRSCT:

- i) Establishment of 400/220kV, 4x500 MVA pooling station at suitable location near Ramgarh/Kuchheri in Distt Jaisalmer (Ramgarh-II PS) with 2x125 MVA bus reactor.
- ii) Ramgarh-II PS –Fatehgarh-II PS 400 kV D/c Line (Twin HTLS).
- iii) Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c Line (Twin HTLS)
- iv) Establishment of 400/220kV, 6x500MVA pooling station at suitable location near Bikaner (Bikaner-II PS) with 2x125 MVA bus reactor and with suitable bus sectionalisation at 400 and 200 kV level.
- v) Bikaner-II PS – Khetri 400kV 2xD/c line (Twin HTLS line on M/c tower)
- vi) Removal of LILO of one circuit of Bhadla-Bikaner(RVPN) 400kV D/c(Quad) line at Bikaner(PG). Extension of above LILO section from Bikaner(PG) upto Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line)
- vii) 1x80 MVA Switchable line reactor for each circuit at each end of Bikaner-II – Khetri 400kV 2xD/c line
- viii) Establishment of 765/400kV, 2x1500 MVA S/s at suitable location near Sikar (Sikar-II Substation) with 1x125 MVA& 2x330 MVA bus reactor at Sikar (II)
- ix) Sikar-II – Aligarh 765kV D/c line
- x) Bhadla-II PS – Sikar-II 765kV 2xD/c line
- xi) Sikar-II – Neemrana 400kV D/c line (Twin HTLS)*
- xii) 1x330 MVA Switchable line reactor for each circuit at Sikar end of Bhadla-II – Sikar-II 765kV 2xD/c line
- xiii) 1x240 MVA Switchable line reactor for each circuit at Bhadla-II end of Bhadla-II – Sikar-II 765kV 2xD/c line
- xiv) 1x330MVA Switchable line reactor for each circuit at each end of Sikar-II –Aligarh 765kV D/c line
- xv) Augmentation with 765/400kV, 2x1500MVA transformer (5th & 6th) at Fatehgarh-II PS
- xvi) Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2nd)
- xvii) 1x240 MVA Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla-II 765kV D/c line
- xviii) Augmentation with 400/220kV, 4x500MVA transformer(6th to 9th) at Fatehgarh-II PS with suitable bus sectionalisation at 400 kV & 220 kV
- xix) Augmentation with 765/400kV, 1x1500MVA transformer (4th) at Bhadla-II PS.
- xx) Augmentation with 400/220kV, 3x500MVA transformer (6th to 8th) at Bhadla-II PS with suitable bus sectionalisation at 400 kV & 220 kV.
- xxi) Khetri - Bhiwadi 400kV D/c line (Twin HTLS*)#
- xxii) Power reversal on +500kV, 2500MW Balia – Bhiwadi HVDC line upto 2000MW from Bhiwadi to Balia in high solar generation scenario.
- xxiii) 220kV line bays for interconnection of solar projects at Bikaner-II PS (10 nos.), Ramgarh-II PS (7 nos), Fatehgarh-II PS (7 nos) &Bhadla-II PS (4 nos)
- xxiv) Establishment of 765/400 kV, 3X1500 MVA GIS substation at Narela with 765 kV (2x330 MVA) bus reactor and 400kV (1x125 MVA) bus reactor.
- xxv) Khetri – Narela 765 kV D/c line
- xxvi) 1x330 MVA Switchable line reactor for each circuit at Narela end of Khetri – Narela 765kV D/c line
- xxvii) LILO of 765 kV Meerut- Bhiwani S/c line at Narela

I/7249/2019

xxviii) Removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/ Gopalpur S/s. Extension of above LILO section from Maharani Bagh/Gopalpur upto Narela S/s so as to form Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad) lines.

xxix) STATCOM:

Fatehgarh – II S/s : STATCOM : ± 600 MVAR, 4x125 MVAR MSC , 2x125 MVAR MSR

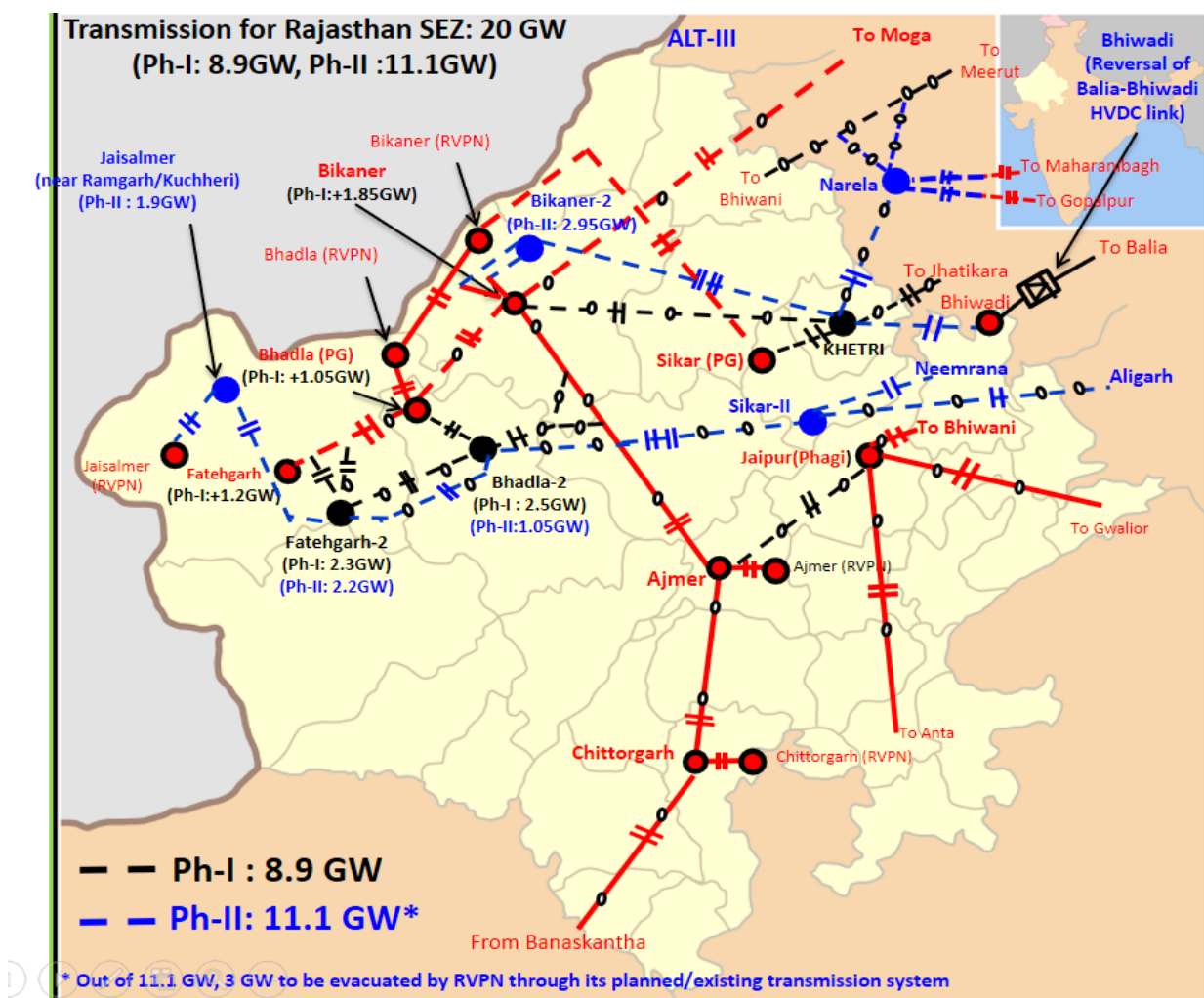
Bhadla – II S/s : STATCOM : ± 600 MVAR, 4x125 MVAR MSC , 2x125 MVAR MSR

Bikaner – II S/s : STATCOM : ± 300 MVAR, 2x125 MVAR MSC , 1x125 MVAR MSR

* with minimum capacity of 2200 MVA on each circuit at nominal voltage

Due to space constraints 400kV bays at Bhiwadi S/s to be implemented as GIS

The proposed transmission system is shown in the Map with blue line



For implementation purpose, the scheme has been split into following transmission packages:

4.3.1 Name of the Scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part A

Sl.	Scope of the	Capacity /km	Estimated
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I/7249/2019

No.	Transmission Scheme		Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 4x500 MVA at Ramgarh – II PS with 420kV (2x125 MVAR) bus reactor <i>Future provisions: Space for 400/220 kV ICTs along with bays: 2 400 kV line bays along with switchable line reactor:2 220 kV line bays:4 420 kV reactors along with bays: 1</i>	400/220 kV, 500 MVA ICT – 4 400 kV ICT bays – 4 220 kV ICT bays – 4 400 kV line bays – 4 220 kV line bays – 7 125 MVAR, 420 kV bus reactor-2 420 kV reactor bay – 2	225
2.	Ramgarh-II PS – Fatehgarh- II PS 400kV D/c line (Twin HTLS*)	Length – 150	255
3.	2 no. of 400 kV line bays at Fatehgarh- II for Ramgarh – II PS–Fatehgarh-II PS 400kV D/c line	400 kV line bays – 2	18
4.	Ramgarh –II PS– Jaisalmer-II (RVPN) 400 kV D/c line (Twin HTLS*)	Length- 60	102
5.	2 no. of 400 kV line bays each at Jaisalmer- II for Ramgarh – II - Jaisalmer-II 400kV D/c line	400 kV line bays – 2	18
		Total	618

* with minimum capacity of 2200 MVA on each circuit at nominal voltage

Note:

- i) Powergrid to provide space for 2 no of 400 kV bays at Fatehgarh-II
- ii) M/s RVPNL to provide space for 2 no of 400 kV bays at Jaisalmer-II
- iii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.1.1 The issue regarding inclusion of line bays under the scope of transmission line developer or under the scope of substation developer was deliberated. Expert members opined that line bay being integral part of line, the same may be included under the scope of transmission line developer. Accordingly, in all the transmission

I/7249/2019

packages the associated line bays at substation has been included in the scope of the transmission line developer.

4.3.1.2 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part A” **may be considered for implementation through TBCB route.**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 1.9 GW in Ramgarh in similar time frame and ensure that entire capacity is bid out to avoid non-utilization of ISTS scheme.
- (c) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021. However, the implementation time-frame of the transmission scheme associated with solar RE projects in Ramgarh potential zone , needs to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

4.3.2 Name of scheme: Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part A1 (765/400kV ICT augmentation at Fatehgarh-II)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Augmentation with 765/400kV, 1x1500MVA transformer (5 th) at Fatehgarh-II PS.	765/400 kV, 1500 MVA ICT – 1 765 kV ICT bays –1 400 kV ICT bays –1	72
		Total	72

4.3.2.1 CEA stated that the proposed scheme involves augmentation of transmission capacity at Fatehgarh II PS by 1x1500 MVA, 765/400 kV for enabling the injection of power of 1.9 GW from Ramgarh SEZ.

4.3.2.2 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part A1 (765/400kV ICT augmentation at Fatehgarh II)” **may be considered for implementation through RTM route** as it involves upgradation of substation /addition of transformation capacity in under implementation substation.
- (b) The completion schedule for scheme would be same as the completion schedule of the scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part A”.

I/7249/2019

4.3.3 Name of the Scheme: Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part B

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2 nd)	Length-200	937
2.	2 no. of 765 kV line bays each at Fatehgarh-II and Bhadla-II for Fatehgarh-II PS – Bhadla- II PS 765kV D/c line (2 nd)	765 kV line bays – 4	80
3.	1x240 MVar Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla- II 765kV D/c line (2 nd)	240 MVar, 765 kV reactor- 4 (2 reactors each at Fatehgarh-II and Bhadla-II) Switching equipment for 765 kV reactor - 4 (2 Switching equipments each at Fatehgarh-II and Bhadla-II) <i>(1x80 MVar spare reactor each at Fatehgarh-II and Bhadla-II to be used as spare for Fatehgarh-II – Bhadla-II 765kV D/c line (2nd))</i>	99
		Total	1116

Note:

- i. Powergrid to provide space for 2 no of 765 kV bays each at Fatehgarh II and Bhadla II substation and space for 2 no of switchable line reactors each at Fatehgarh II and Bhadla II substation
- ii. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.3.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part B” **may be considered for implementation through TBCB route.**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 2.2 GW in Fatehgarh and 1.05 GW in Bhadla in similar time frame and ensure that entire capacity is bid out to avoid non-utilization of ISTS scheme.
- (d) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021. However, the implementation time-frame of the transmission scheme associated with solar RE projects in

I/7249/2019

Fatehgarh and Bhadla potential zones, need to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

4.3.4 Name of scheme: Transmission system strengthening Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase II –Part B1 (765/400/220 ICT augmentation at Fatehgarh-II and Bhadla-II)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Augmentation with 765/400kV, 1x1500MVA transformer (6 th) at Fatehgarh-II PS.	765/400 kV, 1500 MVA ICT – 1 765 kV ICT bays –1 400 kV ICT bays –1	72
2.	Augmentation with 400/220kV, 4x500MVA Transformer (6 th to 9 th) at Fatehgarh-II PS with suitable Bus sectionalisation at 400 and 220 kV level.	400/220 kV, 500 MVA ICT – 4 400 kV ICT bays –4 220 kV ICT bays –4 220 kV line bays-7	167
3.	Augmentation with 400/220kV, 3x500MVA Transformer (6 th to 8 th) at Bhadla-II PS with suitable Bus sectionalisation at 400 and 220 kV level.	400/220 kV, 500 MVA ICT – 3 400 kV ICT bays –3 220 kV ICT bays –3 220 line bays-5	121
4.	Augmentation with 765/400 kV ,1x1500 MVA transformer (4 th) at Bhadla-II PS.	765/400, 1500 MVA ICT- 1 765 ICT bays-1 400 kV ICT bays-1	72
5.	STATCOM at Fatehgarh-II S/s	± 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR	250
6.	STATCOM at Bhadla–II S/s	± 600 MVAR, 4x125 MVAR MSC, 2x125 MVAR MSR	250
		Total	932

4.3.4.1 The proposed scheme involves augmentation of transmission capacity at Fatehgarh II PS by 1x1500 MVA, 765/400 kV and 4x500MVA, 400/220kV for enabling the injection of power from Fatehgarh SEZ under Phase II. The scheme also involves augmentation of transmission capacity at Bhadla II PS by 1x1500 MVA, 765/400 kV and 3x500MVA, 400/220kV for enabling injection of power from Bhadla SEZ under Phase II and the provision of STATCOM of capacity ± 600 MVAR, 4x125

MVAr MSC, 2x125 MVAr MSR at both Fatehgarh-II and Bhadla-II S/s for voltage stability.

4.3.4.2 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part B1 (765/400/220 ICT augmentation at Fatehgarh II and Bhadla-II)” **may be considered for implementation through RTM route as it involves upgradation of substation /addition of transformation capacity in under implementation substation.**
- (b) The completion schedule for scheme would be same as the completion schedule of the scheme “Transmission system strengthening for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part B”
- (c) SECI to invite bids for setting up of Solar RE projects for the entire potential of 2.2 GW in Fatehgarh and 1.05 GW in Bhadla in similar time frame and ensure that entire capacity is bid out to avoid non-utilization of ISTS scheme.

4.3.5 Name of the Scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase-II- Part C

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 765/400 kV, 2x1500 MVA at Sikar – II with 400kV (1x125 MVAr) and 765 kV (2x330 MVAr) bus reactor <i>Future provisions: Space for- 765/400kV ICT along with bays -2 765 kV line bays along with switchable line reactors – 10 400 kV line bays along with switchable line reactor –6 400/220kV ICT along with bays -4 220kV bays -8 400kV bus reactor -2</i>	765/400 kV, 1500 MVA ICT – 2 765/400 kV, 500 MVA spare single phase ICT-1 765 kV ICT bays – 2 400 kV ICT bays – 2 765 kV line bays –2 400 kV line bays- 2 125 MVAr, 420 kV bus reactor-1 420 kV reactor bay – 1 330 MVAr, 765 kV bus reactor- 2 765 kV reactor bay- 2 110 MVAr, 765 kV, 1 ph Reactor (spare unit) -1	322
2.	Bhadla-II PS – Sikar-II 765kV D/c line	Length- 310 km	1452
3.	2 no. of 765 kV line bays at Bhadla- II for Bhadla-II PS	765 kV line bays –2	40

I/7249/2019

	– Sikar-II 765kV D/c line		
4.	1x330 MVAr switchable line reactor for each circuit at Sikar-II end of Bhadla-II PS – Sikar-II 765kV D/c line	330MVAr, 765 kV reactor- 2 Switching equipment for 765 kV reactor - 2	62
5.	1x240MVAr switchable line reactor for each circuit at Bhadla-II end of Bhadla-II PS – Sikar-II 765kV D/c line	240MVAr, 765 kV reactor- 2 Switching equipment for 765 kV reactor - 2	50
6.	Sikar-II – Neemrana 400kV D/c line (Twin HTLS*)	Length-140	238
7.	2 no. of 400 kV line bays at Neemrana for Sikar-II – Neemrana 400kV D/c line (Twin HTLS*)	400 kV line bays- 2	18
		Total	2182

**with minimum capacity of 2200 MVA on each circuit at nominal voltage*

Note:

- i. Powergrid to provide space for 2 no of 765 kV bays at Bhadla II and space for 2 no of switchable line reactors at Bhadla II substation
- ii. Powergrid to provide space for 2 no of 400 kV bays each at Neemrana
- iii. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.5.1 CEA stated that the scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part C” has been planned to enable the evacuation of RE power from Ramgarh, Fatehgarh and Bhadla SEZs under phase II.

4.3.5.2 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part C” **may be considered for implementation through TBCB route**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 1.9 GW in Ramgarh, 2.2 GW in Fatehgarh and 1.05 GW in Bhadla in similar time frame and ensure that entire capacity is awarded.
- (e) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021. However, the implementation time-frame of the transmission scheme associated with solar RE projects in

I/7249/2019

Ramgarh, Fatehgarh and Bhadla potential zones, need to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

4.3.6 Name of the Scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Part D

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Sikar-II – Aligarh 765kV D/c line	Length – 330 km	1545
2.	2 no. of 765 kV line bays each at Sikar-II and Aligarh for Sikar-II – Aligarh 765kV D/c line	765 kV line bays – 4	80
3.	1x330 MVAR switchable line reactor for each circuit at each end of Sikar-II – Aligarh 765kV D/c line	330MVAR, 765 kV reactor- 4 (2 reactors each at Sikar-II and Aligarh) Switching equipment for 765 kV reactor - 4 (2 Switching equipment each at Sikar-II and Aligarh) 110 MVAR, 765 kV, 1 ph Reactor (spare unit) -1	116
		Total	1741

Note:

- i. Powergrid to provide space for 2 no of 765 kV bays and space for 2 no of line reactors at Aligarh substation
- ii. Developer of Sikar-II S/s to provide space for 2 no of 765 kV bays and space for 2 no of line reactors at Sikar-II substation
- iii. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.6.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II –Part D**” **may be considered for implementation through TBCB route**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 1.9 GW in Ramgarh, 2.2 GW in Fatehgarh and 1.05 GW in Bhadla in similar time frame and ensure that entire capacity is awarded.
- (c) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021. However, the implementation

I/7249/2019

time-frame of the transmission scheme associated with solar RE projects in Ramgarh, Fatehgarh and Bhadla potential zones, need to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

4.3.7 Name of the scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Part E

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Bhadla-II PS – Sikar-II 765kV D/c line(2 nd)	Length- 310 km	1452
2.	2 no. of 765 kV line bays each at Bhadla- II and Sikar-II for Bhadla-II PS – Sikar-II 765kV D/c line	765 kV line bays – 4	80
3.	1x330 MVAR switchable line reactor for each circuit at Sikar-II end of Bhadla-II PS – Sikar-II 765kV D/c line	330 MVAR, 765 kV reactor- 2 Switching equipment for 765 kV reactor - 2	62
4.	1x240MVAR switchable line reactor for each circuit at Bhadla-II end of Bhadla-II PS – Sikar-II 765kV D/c line	240 MVAR, 765 kV reactor- 2 Switching equipment for 765 kV reactor - 2	50
		Total	1644

Note:

- i. Powergrid to provide space for 2 no of 765 kV bays and space for 2 no of line reactors at Bhadla II substation
- ii. The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.7.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II –Part E**” **may be considered for implementation through TBCB route**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 1.9 GW in Ramgarh, 2.2 GW in Fatehgarh and 1.05 GW in Bhadla in similar time frame and ensure that entire capacity is awarded.
- (c) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021. However, the implementation time-frame of the transmission scheme associated with solar RE projects in

I/7249/2019

Ramgarh, Fatehgarh and Bhadla potential zones, need to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

4.3.8 Name of the scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Part F

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 400/220 kV, 6x500 MVA Pooling Station at Bikaner –II PS with suitable bus sectionalisation at 400 kV and 220 kV level and with 420kV (2x125 MVAR)bus reactor <i>Future provisions: Space for 400/220 kV ICTs along with bays:4 400 kV line bays:6 220 kV line bays:6 420 kV reactors along with bays: 2</i>	400/220 kV, 500 MVA ICT – 6 400 kV ICT bays – 6 220 kV ICT bays – 6 400 kV line bays – 4 220 kV line bays – 10 125 MVAR, 420 kV bus reactor-2 400 kV bus reactor bay – 2 400 kV 80MVAR line reactor – 4 nos Switching equipment for 400 kV switchable line reactor –4	339
2.	Bikaner-II PS – Khetri 400 kV 2xD/c line (Twin HTLS* on M/c Tower)	Length –2x270	1199
3.	1x80MVAR switchable Line reactor on each circuit at Khetri end of Bikaner-II – Khetri 400 kV 2xD/c Line	400 kV 80MVAR reactor – 4nos. Switching equipment for 400 kV switchable line reactor –4	39
4.	4 no. of 400 kV line bays at Khetri for Bikaner –II PS – Khetri 400kV 2xD/c line	400 kV line bays – 4	72
5.	Khetri- Bhiwadi 400 kV D/c line (Twin HTLS)*	Length- 120	205
6.	2 no. of 400 kV line bays at Khetri for Khetri - Bhiwadi 400kV D/c line	400 kV line bays – 2	18
7.	2 no of 400 kV(GIS) line bays at Bhiwadi for Khetri- Bhiwadi 400 kV D/c line	400 kV line bays – 2	26

I/7249/2019

8.	STATCOM at Bikaner-II S/s	± 300 MVA _r , 2x125 MVA _r MSC, 1x125 MVA _r MSR	200
		Total	2,098

**with minimum capacity of 2200 MVA on each circuit at nominal voltage*

Note:

- i) Powergrid to provide space for 2 no of 400 kV bays at Bhiwadi substation.
- ii) Developer of Khetri substation to provide space for 6 no of 400 kV bays at Khetri for Bikaner-II –Khetri 400 kV 2x D/c line along with space for switchable line reactors & Khetri- Bhiwadi 400 kV D/c line (Twin HTLS)
- iii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.8.1 CEA stated that the Bikaner II Pooling Station has been proposed with 400/220 kV, 6x500 MVA transformation capacity along with 10 no. of 220 kV line bays for evacuation of power from the entire 2.95 GW of RE potential in Bikaner SEZ under Phase II.

4.3.8.2 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II –Part F**” **may be considered for implementation through TBCB route.**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 2.95 GW in Bikaner in similar time frame and ensure that entire capacity is bid out to avoid non-utilization of ISTS scheme.
- (c) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021. However, the implementation time-frame of the transmission scheme associated with RE projects in Bikaner Solar Potential zone, needs to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

4.3.9 Name of the scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Part F1

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Removal of LILO of one circuit of Bhadla-Bikaner (RVPN) 400kV D/c(Quad) line at Bikaner(PG). Extension of above LILO section from Bikaner(PG) up to Bikaner-II PS to form	Length - 25	65

I/7249/2019

	Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line		
2.	2 nos. of 400 kV line bays at Bikaner-II PS for Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line formed after removal of LILO of one circuit of Bhadla-Bikaner(RVPN) 400kVD/c(Quad)	400 kV line bays – 2	18
		Total	83

Note:

- i) *Developer of Bikaner-II to provide space for 2 no of 400 kV bays for termination of Bikaner-II PS- Bikaner (PG) 400 kV D/c (Quad)*
- ii) *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey*

4.3.9.1 CEA stated that the proposed scheme is to establish interconnection between Bikaner (PG) and Bikaner II for enabling the evacuation of power from Bikaner SEZ under Phase II.

4.3.9.2 NCT agreed with the proposal and recommended the following:

- a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II-Part F1**” **may be considered for implementation through RTM route.**
- b) The completion schedule for scheme would be same as the completion schedule of the scheme “Transmission system strengthening Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part F”.

4.3.10 Name of the scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Part G

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Establishment of 765/400 kV, 3X1500 MVA GIS substation at Narela with 765 kV (2x330 MVA) bus reactor and 400 kV (1x125 MVA) bus reactor <i>Future provisions: Space for 765/400kV ICTs along with</i>	765/400 kV, 1500 MVA ICT – 3 765/400 kV, 500 MVA spare ICT (1-phase) – 1 765 kV ICT bays –3 400 kV ICT bays –3 765 kV line bays- 4 (GIS) 330MVA, 765 kV bus reactor- 2 765 kV bus reactor bay – 2 110 MVA, 765 kV, 1-Ph Bus	618

I/7249/2019

	<i>bays: 1 765 kV line bays along with switchable line reactor: 6 400 kV line bays: 6+4 765kV reactor along with bays:2 400/220 kV ICTs along with bays:8 220 kV line bays: 12 400 kV bus reactor along with bays:2</i>	Reactor (spare unit) -1 125 MVAR, 420 kV bus reactor - 1 420 kV bus reactor bay – 1 330 MVAR, 765 kV line reactor- 2 Switching equipment for 765 kV reactor - 2 <i>(1x110 MVAR spare reactor at Khetri to be used as spare for Khetri – Narela 765 kV D/c line)</i>	
2.	Khetri – Narela 765 kV D/c line 1x330MVAR Switchable line reactor for each circuit at Narela end of Khetri – Narela 765kV D/c line	Length -180	843
3.	2 nos. of 765 kV line bays at Khetri for Khetri – Narela 765 kV D/c line	765 kV line bays –2 (AIS)	40
4.	LILO of 765 kV Meerut-Bhiwani S/c line at Narela	Length – 25	117
		Total	1618

Note:

- i) *Developer of Khetri substation to provide space for 2 no of 765 kV bays at Khetri substation along with the space for 2 no of line reactors.*
- ii) *The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey*

4.3.10.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II –Part G**” **may be considered for implementation through TBCB route.**
- (b) SECI to invite bids for setting up of Solar RE projects for the entire potential of 2.95 GW in Bikaner in similar time frame and ensure that entire capacity is bid out to avoid non-utilization of ISTS scheme.
- (c) The implementation time-frame of the transmission schemes associated with Ph-II of 66.5 GW RE integration is December’ 2021.However, the implementation time-frame of the transmission scheme associated with RE projects in Bikaner Solar Potential zone, needs to be firmed up by CTU in consultation with CEA, MNRE and SECI before taking up the implementation.

I/7249/2019

4.3.11 Name of the scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Part G1 (Maharani Bagh/Gopalpur- Narela 765/400 kV substation 400 kV interconnection)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh /Gopalpur S/s. Extension of above LILO section from Maharani Bagh/ Gopalpur upto Narela S/s so as to form Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad)lines.	Length – 14 (2x7)	36
2.	2 no of line bays at Narela each for Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad) lines formed after removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/Gopalpur S/s and Extension of above LILO section from Maharani Bagh/Gopalpur uptoNarela S/s.	400 kV line bays – 4	36
		Total	72

Note:

- (i) Developer of Narela substation to provide space for 4 no of 400 kV bays for Narela – Maharani Bagh/Gopalpur 400kV 2xD/c(Quad)
- (ii) The line lengths mentioned above are approximate as the exact length shall be obtained after the detailed survey

4.3.11.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II –Part G1**” may be considered for implementation through RTM route.
- (b) The completion schedule for scheme would be same as the completion schedule of the scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part G”.

I/7249/2019

4.3.12 Name of the scheme: Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under Phase-II- Power reversal in Balia-Bhiwadi HVDC line

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Power reversal on ± 500 KV, 2500 Balia- Bhiwadi HVDC line upto 2000 MW from Bhiwadi to Balia	2000 MW	15
		Total	15

4.3.12.1 NCT agreed with the proposal and recommended the following:

- Transmission scheme “Transmission system strengthening scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under **Phase II – Power reversal in Balia-Bhiwadi HVDC line**” may be considered for implementation through RTM route.
- The completion schedule for scheme would be same as the completion schedule of the scheme “Transmission system strengthening Scheme for evacuation of power from solar energy zones in Rajasthan (8.1 GW) under phase II –Part F”.

5.0 New Inter-State Transmission Schemes in Eastern Region :

5.1 Transmission system for power evacuation from Arun-3 (900MW) HEP, Nepal of M/s SAPDC

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Indian portion of Dhalkebar (Nepal) – Muzaffarpur (POWERGRID) 400kV D/c (Quad) line	Length- 95 km	246
2.	2 no. of 400 KV line bays at Muzaffarnagar (POWERGRID) for Muzaffarpur (POWERGRID) 400 kV D/c (Quad) line	400 kV line bays- 2	18
		Total	264

5.1.1 NCT agreed with the proposal and recommended the following:

6th meeting of National Committee on Transmission held on 30.09.2019 – Minutes

I/7249/2019

- (a) Transmission scheme “Transmission system for power evacuation from Arun-3 (900MW) HEP, Nepal of M/s SAPDC” **may be considered to be implemented through RTM route.**
- (b) The implementation time-frame of the transmission scheme should match with the time frame of the Nepalese portion of the line from Dhalkebar (Nepal) upto Indian Border.

5.2 Augmentation of transformation capacity at Muzaffarpur (POWERGRID) S/s

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1.	Augmentation with 400/220 kV , 1x500 MVA transformer at Muzaffarpur S/s	400/220 kV, 1x500 MVA ICT-1 400 kV ICT bays-1 220 kV ICT bays (GIS)-1 220 kV cable between ICT & GIS bay	34

5.2.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Augmentation of transformation capacity at Muzaffarpur (POWERGRID) S/s” **may be considered to be implemented through RTM route.**
- (b) The implementation time-frame of the transmission scheme is December’ 2019.

5.3 Additional 400kV connectivity at 400/220/132kV Saharsa (new) 400/220/132kV S/s

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1	LILO of Kishanganj (POWERGRID) – Darbhanga (DMTCL) 400kV D/c (Quad) line at Saharsa S/s	Length- 20 km	52
2	4 no. of 400kV line bays at Saharsa (New) S/s of POWERGRID for termination of above LILO line	400 kV line bays- 4	36
		Total	88

5.3.1 NCT agreed with the proposal and recommended the following:

I/7249/2019

- (a) Transmission scheme “Additional 400kV connectivity at 400/220/132kV Saharsa (new) 400/220/132kV S/s” **may be considered to be implemented through RTM route.**

5.4 Bypassing of 400kV lines to limit fault current level at Farakka (NTPC)

Sl. No.	Scope of the Transmission Scheme	Capacity /km	Estimated Cost (in Rs Cr)
1	Bypassing of Farakka – Kahalgaon (ckt-3 & ckt-4) and Farakka – Durgapur 400kV D/c lines of POWERGRID so as to form Kahalgaon – Durgapur 400kV D/c line under ISTS		10

5.4.1 NCT agreed with the proposal and recommended the following:

- (a) Transmission scheme “Bypassing of 400kV lines to limit fault current level at Farakka (NTPC)” **may be considered to be implemented through RTM route.**

Meeting ended with thanks to the chair.

I/7249/2019

Annexure-I**List of Participants of the 6th meeting of National Committee on Transmission (NCT) held on 30.09.2019 at CEA, New Delhi**

S.No.	Name (S/Shri)	Designation	Mb. No.	Email
	CEA			
1	P.S Mhaske	Chairman		
2	Somit Das Gupta	Member (E&C)		
3	Goutam Roy	Chief Engineer	8376817933	Goutamroy.715@gmail.com
4	Pardeep Jindal	Chief Engineer	9818768460	pjindal@nic.in
5	Awdhesh Kr. Yadav	Director (PSPA-I)	9868664087	awd.cea@gmail.com
6	Manjari Chaturvedi	Director (PSPA-I)	9810502209	manjari.cea@gmail.com
7	Ishan Sharan	Director (PSPA-II)	9868021344	i.sharan@nic.in
	TECH. EXPERT			
8	Prabhakar Singh	Tech. Expert	9873174448	Prabhakar.s@rediffmail.com
9	P.K. Pahwa	Tech. Expert	9818243524	Pkpahwa2000@yahoo.com
	MoP			
10	D.K Shrivastava	Director	9560763305	dhirajshrivastava@nic.in
	CTU			
11	Subir Sen	COO (CTU)	9650293185	subir@powergridindia.com
12	Mukesh Khanna	CGM (CTU-Plg)	9910378098	mkhanna@powergridindia.com
	PFCCL			
13	Ina Gupta	Manager	9212225125	inasethi@pfcindia.com
	RECTPCL			
14	Ankit Kumar	Dy. Manager	9891128569	ankitkumar.1@gmail.com

I/7249/2019

Annexure IIStatus of Transmission Projects through TBCB as on 30.09.2019 (RECTPCL)

Sl. no.	Transmission Scheme	Status
1	Western Region Strengthening Scheme – 21 (WRSS-21) Part-A - Transmission System Strengthening for relieving over loadings observed in Gujarat Intra-State System due to RE Injections in Bhuj PS	<ul style="list-style-type: none"> • RFQ issued on 12.01.2019, 8 bidders shortlisted to participate in RFP • RfP issued on 13.03.2019, 5 bidders participated in RFP stage • Adani Transmission Limited emerged as L1 bidder with levelised tariff of Rs. 951.29 Million • LOI issued on 31.07.2019. • Regulatory Approval pending from CERC. SPV can be transferred to selected bidder only after regulatory approval.
2	Transmission System associated with RE generations at Bhuj-II, Dwarka & Lakadia	<ul style="list-style-type: none"> • RFQ issued on 12.01.2019, 8 bidders shortlisted to participate in RFP • RfP issued on 13.03.2019 • RFP bids opened on 21.08.2019, 5 bidders participated in RFP stage. • As no LTTCs finalized till date, Initial Offer opening deferred till LTTCs are finalized and TSA is signed • Regulatory Approval pending from CERC • SPV can be transferred to selected bidder only after regulatory approval and identification & signing of TSA by LTTCs
3	Jam khambaliya Pooling Station and Interconnection of Jam khambaliya Pooling Station for providing connectivity to RE Projects (1500 MW) in Dwarka (Gujarat) and Installation of 400/220 kV ICT along with associated bays at M/s CGPL Switchyard	<ul style="list-style-type: none"> • RFQ issued on 12.01.2019, 8 bidders shortlisted to participate in RFP • RfP issued on 13.03.2019. • RFP bids opened on 23.09.2019, 6 bidders participated in RFP stage • As no LTTCs finalized till date, financial to be opened bids only when LTTC is finalised. • Regulatory Approval pending from CERC • SPV can be transferred to selected bidder only after regulatory approval and identification & signing of TSA by LTTCs
4	Construction of Ajmer (PG)-Phagi 765 kV D/C line along with associated bays for Rajasthan SEZ	<ul style="list-style-type: none"> • RFQ issued on 12.01.2019, 8 bidders shortlisted to participate in RFP • RfP issued on 13.03.2019, 6 bidders participated. • PGCIL emerged as L1 bidder with levelised tariff of Rs. 613.31 Million • LOI issued on 29.08.2019. • SPV to be transferred upon receipt of approval from Ministry of Power
5	Transmission system associated with LTA application from Rajasthan SEZ (Part -C)	<ul style="list-style-type: none"> • RFQ issued on 12.01.2019, 8 bidders shortlisted to participate in RFP • RfP issued on 13.03.2019, 3 bidders participated in RFP stage. • PGCIL emerged as L1 bidder with levelised tariff of Rs.

I/7249/2019

	1220.42 Million. <ul style="list-style-type: none"> • LOI issued on 31.07.2019. • SPV transferred to PGCIL on 29.08.2019
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Status of Transmission Projects through TBCB as on 30.09.2019 (PFCCL)

S.No	Name of Transmission Project	Present Status
	Western Region Strengthening Scheme- (WRSS-XIX) and North Eastern Region Strengthening Scheme- (NERSS-IX)	(07) Seven bidders were shortlisted at RfQ Stage on October 26, 2018 to participate in the next stage of bidding i.e RfP. RfP documents issued on 13.11.2018. Two (2) bidders submitted RfP bids on 27.05.2019. RfP (Price Bid) opened on 20.06.2019; <ul style="list-style-type: none"> • E-reverse bidding held on 21.06.2019; • BEC in its meeting held on 10.07.2019 for evaluation of financial Bids opined that the Levelised Transmission Charges discovered through the bid process are 45.2% higher than the Levelised Tariff worked out as per CERC norms; • Further, BEC advised BPC to consult the matter with Cost Committee (to review the cost estimates if required) and CEA in order to assess the reasonability of the discovered price for further necessary action. • The cost committee has made a site visit to Mumbai area on 09.09.2019 for ROW assessment and will submit its report to BEC shortly. • Out of 24 nos. LTTCs in WR & NER region, 3 LTTCs i.e TSECL in NER region and DNH & D&D are yet to sign the TSA. CEA is in touch with these LTTCs.
	WRSS-21 (Part-B) Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS	RfQ notification published on 17.01.2019; <ul style="list-style-type: none"> • RfQ opened on 18.02.2019; • Eight (8) bidders shortlisted at RfQ stage; RfP documents issued on 18.03.2019; Three (3) bidders submitted RfP bids on 25.06.2019; RfP (financial) bid opened on 15.07.2019 followed by e-reverse auction held on 16.07.2019; Based upon e-RA, M/s Sterlite Grid 18 Limited emerged as the Successful Bidder; <ul style="list-style-type: none"> • LoI issued to the Successful Bidder on 31.07.2019; • Necessary approval from MoP for transfer of SPV has been received on 12.09.2019. • Regulatory approval from CERC is awaited; • Transfer of SPV expected by 30.09.2019.
	Transmission System for providing connectivity to RE projects at Bhuj-II (2000MW) in Gujarat	RfQ notification published on 17.01.2019; RfQ opened on 18.02.2019; <ul style="list-style-type: none"> • Nine (9) bidders shortlisted at RfQ stage; RfP documents issued on 18.03.2019; Three (3) bidders submitted RfP bids on 02.07.2019; RfP (financial) bid opened on 16.07.2019 followed by e-reverse auction held on 17.07.2019;

I/7249/2019

S.No	Name of Transmission Project	Present Status
		<ul style="list-style-type: none"> • Based upon e-RA, M/s Power Grid Corporation of India Limited emerged as the Successful Bidder; • LoI issued to the Successful Bidder i.e. M/s Power Grid Corporation of India Limited on 31.07.2019; • TSA has been signed by all the LTTCs; • Necessary approval from MoP for transfer of SPV has been received on 12.09.2019. • Regulatory approval from CERC is awaited; • Transfer of SPV expected by 30.09.2019.
	Transmission system associated with applications from Rajasthan Part-B LTA from SEZ.	<ul style="list-style-type: none"> • RfQ notification published on 17.01.2019; • RfQ opened on 19.02.2019; • Nine (9) bidders shortlisted at RfQ stage; • RfP documents issued on 03.06.2019; • Four (4) bidders submitted RfP bids on 29.08.2019; • RfP (financial) bid opened on 04.09.2019 followed by e-reverse auction held on 05.09.2019; • Based upon e-RA, M/s Power Grid Corporation of India Limited emerged as the Successful Bidder; • LoI issued to the Successful Bidder on 11.09.2019; • TSA has been signed by all the LTTCs; • Regulatory approval is received, however, other necessary approval for transfer of SPV is being in progress. • Transfer of SPV is expected by 30.09.2019.
	Transmission system associated with applications from Rajasthan Part-D LTA from SEZ.	<ul style="list-style-type: none"> • RfQ notification published on 17.01.2019; • RfQ opened on 19.02.2019; • Nine (9) bidders shortlisted at RfQ stage; • RfP documents issued on 18.03.2019; • Six (6) bidders submitted RfP bids on 25.06.2019; • RfP (financial) bid opened on 17.07.2019 followed by e-reverse auction held on 18.07.2019; • Based upon e-RA, M/s Adani Transmission Limited emerged as the Successful Bidder; • LoI issued to the Successful Bidder on 31.07.2019; • TSA has been signed by all the LTTCs; • Necessary approval from MoP for transfer of SPV has been received on 12.09.2019. • SPV was transferred on 19.09.2019.

I/7249/2019

Annexure III

Transmission system for evacuation of power from Solar potential of 8.1 GW -Ramgarh/Kuchheri (1.9 GW), Bikaner (2.95 GW), Bhadla (1.05GW) & Fatehgarh (2.2GW) as agreed in the 4th meeting of NRSC held on 25.7.2019.

A. EHVAC Portion

- i) Establishment of 400/220kV, 4x500 MVA pooling station at suitable location near Ramgarh/Kuchheri in Distt Jaisalmer (Ramgarh-II PS)
- ii) Establishment of 400/220kV, 6x500MVA pooling station at suitable location near Bikaner (Bikaner-II PS) with suitable bus sectionalisation at 400 and 220 kV level.
- iii) Establishment of 765/400kV, 3x1500MVA substation at suitable location in Narela (near delhi)
- iv) Augmentation with 765/400kV, 2x1500MVA transformer (5th & 6th) at Fatehgarh-II PS.
- v) Augmentation with 400/220kV, 4x500MVA transformer at Fatehgarh-II PS with suitable bus sectionalisation at 400 and 220 kV level
- vi) Augmentation with 400/220kV, 3x500MVA transformer at Bhadla-II PS with suitable bus sectionalisation at 400 and 220 kV level.
- vii) Augmentation with 765/400kV, 1x1500MVA (3rd) transformer at Bikaner(PG)
- viii) Ramgarh-II PS –Fatehgarh-II PS 400 kV D/c Line (Twin HTLS^s)
- ix) Ramgarh-II PS – Jaisalmer-II (RVPN) 400 kV D/c Line (Twin HTLS^s)
- x) Fatehgarh-II PS – Bhadla-II PS 765kV D/c line (2nd)
- xi) Bikaner-II PS – Khetri 400kV 2xD/c line (*Twin HTLS^s line on M/c tower*)
- xii) Khetri - Bhiwadi 400kV D/c line (Twin HTLS^s)**
- xiii) Removal of LILO of one circuit of Bhadla-Bikaner(RVPN) 400kV D/c(Quad) line at Bikaner(PG). Extension of above LILO section from Bikaner(PG) upto Bikaner-II PS to form Bikaner-II PS – Bikaner (PG) 400kV D/c(Quad) line
- xiv) Khetri - Narela 765kV D/c line
- xv) LILO of 765kV Meerut – Bhiwani S/c line at Narela S/s
- xvi) Removal of LILO of Bawana – Mandola 400kV D/c(Quad) line at Maharani Bagh/Gopalpur S/s. Extension of above LILO section from Maharani Bagh/Gopalpur upto Narela S/s so as to form Maharani Bagh – Narela 400kV D/c(Quad) and Maharani Bagh -Gopalpur-Narela 400kV D/c(Quad) lines.
- xvii) LILO of both circuits of Bawana – Mandola 400kV D/c(Quad) line at Narela S/s
- xviii) Power reversal on ± 500 kV, 2500MW Balia – Bhiwadi HVDC line upto 2000MW from Bhiwadi to Balia
- xix) 220kV line bays for interconnection of solar projects at Bikaner-II PS (10 nos.), Ramgarh-II PS (7 nos), Fatehgarh-II PS (8 nos) & Bhadla-II PS (4 nos)
- xx) 1x125 MVA_r (420kV), 2x240 MVA_r (765kV) Bus Reactor at Narela Substation
- xxi) 2x125 MVA_r (420kV) Bus Reactor each at Bikaner-II & Ramgarh-II PS
- xxii) 1x240 MVA_r Switchable line reactor for each circuit at each end of Fatehgarh-II – Bhadla-II 765kV D/c line (2nd)
- xxiii) 1x80 MVA_r Switchable line reactor for each circuit at each end of Bikaner-II – Khetri 400kV 2xD/c line

I/7249/2019

xxiv) 1x240 MVA Switchable line reactor for each circuit at each end of Khetri – Narela
765kV D/c line

*** Due to space constraints 400kV bays at Bhiwadi S/s to be implemented as GIS
\$ with minimum capacity of 2200 MVA on each circuit at nominal voltage*

B. HVDC Portion

- 1) VSC based HVDC system between Bhadla-II PS and suitable location near Modipuram
 - i) ± 400 kV, 5000 MW HVDC terminal at Pooling point near Bhadla-II PS
 - ii) ± 400 kV, 5000 MW HVDC terminal at Pooling point in suitable location near Modipuram
 - iii) ± 400 kV HVDC line (Quad) between Bhadla-II PS and suitable location near Modipuram (on M/c tower)

AC interconnection at Pooling point in suitable location near Modipuram

- 2) 5x1500MVA transformer at suitable location (near modipuram)