New Transmission Schemes in WESTERN REGION

Following transmission systems have been approved for implementation in 1st WRSCT meeting held on 05.09.2018, 2nd NCT meeting held on 04.12.2018 and 3rd ECT meeting held on 21.12.2018:

1. **Additional 1x500 MVA 400/220 kV (9th) ICT, for injection from any additional RE project (beyond 4000MW) at Bhuj PS:**
   - Additional 1x500MVA 400/220kV (9th) ICT, for injection from any additional RE project (other than 4000MW injection under SECI bids upto Tranche IV) in existing Bhuj PS with associated 400 kV GIS bay and 220kV AIS bay*.
   - 3 nos. of 220kV line bays(hybrid/MTS) for termination of dedicated lines of RE developers with Stage-II connectivity

   *Implementation of the addl. (9th) ICT at Bhuj PS may be taken up corresponding to injection from any additional RE project (beyond 4000 MW) at Bhuj P.S.*

2. **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**
   - Establishment of 2x1500MVA, 765/400kV Lakadia PS with 765kV (1x330MVAR) & 400kV (125 MVAR) bus reactor
   - LILO of Bhachau – EPGL 400kV D/c (triple) line at Lakadia PS
   - Conversion of existing 2x63MVAR line reactors at Bhachau end of Bhachau – EPGL 400kV D/c line to switchable line reactors
   - Bhuj PS – Lakadia PS 765kV D/c line
   - 2 nos of 765kV bays at Bhuj PS for Bhuj PS – Lakadia PS 765kV D/c line

3. **Western Region Strengthening Scheme-21 (WRSS-21) Part B - Transmission System strengthening for relieving over loadings observed in Gujarat Intra-state system due to RE injections in Bhuj PS**
   - Lakadia – Vadodara 765kV D/c line
   - 330MVAR switchable line reactors at both ends of Lakadia – Vadodara 765kV D/c line
   - 2 nos of 765kV bays at both Vadodara and Lakadia S/Ss for Lakadia – Vadodara 765kV D/c line

4. **Transmission system associated with RE generations at Bhuj –II, Dwarka & Lakadia**
   - Lakadia PS – Banaskantha PS 765kV D/c line
   - 765kV Bays at Lakadia and Banaskantha for Lakadia PS – Banaskantha PS 765kV D/c line
   - 240MVAR switchable Line reactor at Lakadia PS end of Lakadia PS – Banaskantha PS 765kV D/c line
5. Transmission System for providing connectivity to RE projects at Bhuj II (2000 MW) in Gujarat
   - Establishment of 2x1500MVA (765/400kV), 4x500MVA(400/220kV) Bhuj-II PS (GIS) with 765kV (1x330MVAR) and 400kV (125 MVAR) bus reactor along with 7 nos. 220kV line bays
   - Reconfiguration of Bhuj PS – Lakadia PS 765kV D/c line so as to establish Bhuj-II –Lakadia 765 kV D/C line as well as Bhuj-Bhuj-II 765kV D/C line

6. Jam Khabhaliya Pooling Station for providing connectivity to RE projects (1500 MW) in Dwarka (Gujarat):
   - Establishment of 4x500MVA, 400/220kV Jam Khabhaliya PS (GIS) along with 7 nos. 220kV line bays
   - 1 no 400kV bay for M/s Vaayu and 1 no of 220kV bay for M/s Air power
   - 6 nos of 220kV bay for future developers
   - 1x125MVAr, 420kV Bus reactor at Jam Khabhaliya PS along with reactor bay

7. Interconnection of Jam Khabhaliya Pooling Station for providing connectivity to RE projects (1500 MW) in Dwarka (Gujarat):
   - Extension of Essar–Lakadia/Bhachau 400kV D/c (triple) line upto Jam Khabhaliya PS
   - 2 nos. of 400kV line bays at Jam Khabhaliya PS for termination of of Jam Khabhaliya PS-Lakadia 400kV D/c (triple) line
   - 63MVAr switchable Line Reactor at both ends of Lakadia - Jam Khabhaliya 400kV D/c line

8. 400 kV line bay at Solapur PS for St-II connectivity to M/s Toramba Renewable Energy Pvt. Ltd.
   - 1 nos. of 400kV bay at Solapur (PG) for St-II connectivity to M/s Toramba

9. Installation of 400/220 kV ICT along with associated bays at M/s CGPL Switchyard - M/s CGPL Switchyard
   - 1x500 MVA, 400/220 ICT at CGPL Mundra switchyard.

RE POTENTIAL BASED TRANSMISSION SCHEMES

ECT agreed that the following schemes are for broad level planning and integration of potential RE generations assessed in potential RE zones of WR. ECT further agreed that as no developer has applied for Stage-II connectivity/LTA so far, SECI would be requested to apply for Stage-II Connectivity/LTA beforehand in order to utilize the above scheme. Subsequently, these schemes will be taken up for implementation.
10. Transmission System for providing connectivity to RE projects in Gujarat [Lakadia(2000MW)]
   - Establishment of 4x500MVA, 400/220kV ICTs at Lakadia (GIS) PS along with 7 nos. 220kV line bays

11. Transmission system associated with RE generations from potential wind energy zones in Osmanabad area of Maharashtra
   - Establishment of 4x500MVA, 400/220kV at Kallam PS along with 8 nos. 220kV line bays
   - 1x125MVAR bus reactor at Kallam PS
   - LILO of both circuits of Parli (PG) – Pune (GIS) 400kV D/c line at Kallam PS
   - Conversion of 50MVAR fixed Line Reactors on each ckt of Parli (PG) – Pune (GIS) 400kV D/c line at Parli (PG) end into switchable.
   - Provision of new 50MVAR switchable line reactor at Kallam PS end of Kallam – Pune(GIS) 400kV D/c line

12. Transmission system associated with RE generations from potential Solar Energy Zone in Maharashtra (1000 MW under Ph-I)
   - Establishment of 400/220 kV, 2x500 MVA at Solapur PP (near Mohol) along with space for 8 nos. of 220 kV line bays for interconnection of wind & solar projects
   - Solapur pooling point - Solapur (PG) 400 kV D/c line (twin HTLS)
   - 2 nos. of 400kV line bays at Solapur (PG) for Solapur pooling point - Solapur (PG) 400 kV D/c line
   - 1x125 MVAR, 420 kV Bus Reactor at Solapur PP
New Transmission Schemes in SOUTHERN REGION

Following transmission systems have been approved for implementation in 1st SRSCT meeting held on 07.09.2018, 2nd NCT meeting held on 04.12.2018 and 3rd ECT meeting held on 21.12.2018:

1. Tirunelveli and Tuticorin Wind Energy Zone (Tamil Nadu) (500 MW):
   i. Addition of 1x500 MVA, 400/230kV ICTs (4th) at Tuticorin-II GIS sub-station.
   **Operation of Tuticorin Pooling Station – Dharmapuri (Salem) 765kV D/c line (presently operating at 400kV) at its rated voltage. (i. e. 765kV) & 5th ICT (500 MVA) at Tuticorin-II PS would be reviewed for dispersal of more than 2000MW RE generation.

2. Karur / Tiruppur Wind Energy Zone (Tamil Nadu) (2500 MW):
   i. Establishment of 5x500 MVA, 400/230 kV Karur Pooling Station (at a location in between Karur Wind zone and Tiruppur wind zone)
   ii. LILO of both circuits of Pugalur – Pugalur (HVDC) 400 kV D/c line (with Quad Moose ACSR Conductor) at Karur PS
   iii. 9 Nos. of 230kV line bays for interconnection of wind projects
   iv. 2x125 MVAr, 400kV Bus reactors at Karur PS

3. Koppal Wind Energy Zone (Karnataka) (2500 MW)
   i. Establishment of 5x500 MVA, 400/220kV pooling station near Munirabad /suitable location in Koppal distt.
   ii. Pooling station (near Munirabad /suitable location in Koppal distt.) - Munirabad 400 kV D/c Line (with Quad Moose ACSR conductor)
   iii. Pooling station (near Munirabad /suitable location in Koppal distt.) - Narendra (New) 400 kV D/c Line (with Quad Moose ACSR conductor)
   iv. 9 Nos of 220kV line bays for interconnection of wind projects
   v. 2x125 MVAr, 400kV bus reactor at Pooling station (near Munirabad /suitable location in Koppal distt.)
   vi. Adequate space provision for future expansion.

4. Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (AP) (1500 MW):
   i. Establishment of 765/400/220kV 3x1500 MVA, 9x500 MVA Pooling station at suitable location in Kurnool Distt (Kurnool-III)
   ii. Kurnool –III - Kurnool(new) 765 kV D/c Line-
   iii. Kurnool –III - Maheshwaram(PG) 765 kV D/c Line
   iv. 220kV line bays for interconnection of wind projects (15 nos)
   v. 1x330 MVAr (765kV) & 1x125MVAr (400kV) bus reactor at Kurnool-III PS
   vi. 240 MVar Switchable line reactors at both ends of Kurnool PS – Maheshwaram(PG) 765 kV D/c Line
New Transmission Schemes in NORTHERN REGION

Transmission system for Solar Energy Zones in Rajasthan

Following transmission system was technically agreed for evacuation of solar power from Bhadla/Fatehgarh/Bikaner complexes.

**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 Khatri

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)–Khatri S/s 765kV D/c line

vii) Khatri – Jhatikara 765kV D/c line

viii) Khatri – 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 AjmerBhadla-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**
**Part B**

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)

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

Further following future scope/space provision to be kept at new substations/pooling stations was also agreed. This space provision scope is in addition to above Part A & Part-B scope.

1) 765/400/220kV Bhadla-II pooling station
   - 765/400kV, 1x1500MVA transformer
   - 400/220kV, 4x500MVA transformer
   - 4 nos. 765kV line bays with switchable Line reactor
   - 6 nos. 400kV line bays with switchable Line reactor
   - 7 nos. of 220kV line bays

2) 765/400kV Khetri substation
   - 400/220kV, 4x500MVA transformer
   - 4 nos. 765kV line bays with switchable Line reactor
   - 4 nos. 400kV line bays with switchable Line reactor
   - 6 nos. 220kV line bays

3) 765/400/220kV Fatehgarh -II pooling station
   - 400/220kV, 6x500MVA transformer
   - 4 nos. 765kV line bays with switchable Line reactor
   - 6 nos. 400kV line bays with switchable Line reactor
   - 10 nos. 220kV line bays