

I/24323/2022



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

सेवा में/To

As per list of Addresses

विषय : ट्रांसमिशन पर राष्ट्रीय समिति (एनसीटी) की दसवीं बैठक-के सम्बन्ध में।

Subject: 10th Meeting of National Committee on Transmission (NCT) – regarding.

महोदया (Madam) / महोदय (Sir),

The 10th meeting of "National Committee on Transmission" (NCT) is scheduled to be held on 7th November, 2022 (Monday), at 11.00 AM. Details are given below.

Venue: Chintan, 2nd Floor, CEA, Sewa Bhawan, R.K. Puram, New DelhiDate : 07th November, 2022 (Monday); Time: 1100 Hrs.

The agenda for the meeting is enclosed herewith. Kindly make it convenient to attend the meeting.

भवदीय/Yours faithfully,

(ईशान शरण/Ishan Sharan)

मुख्य अभियंता /Chief Engineer

प्रतिलिपि / Copy to:

संयुक्त सचिव (पारेषण), विद्युत मंत्रालय, नई दिल्ली /
Joint Secretary (Trans), Ministry of Power, New Delhi

I/24323/2022

List of Addresses:

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.	Sh. Dilip Nigam, Scientist 'G', MNRE, Block no. 14, CGO Complex, Lodhi Road, New Delhi – 110003	6.	Chief Operating Officer, CTUIL, Saudamini, Plot No. 2, Sector-29, Gurgaon – 122 001.
7.	Sh. Rajnath Ram, Adviser (Energy), NITI Aayog, Parliament Street, New Delhi – 110 001.	8.	CMD, POSOCO, B-9, Qutub, Institutional Area, Katwaria Sarai, New Delhi – 110010
9.	Dr. Radheshyam Saha, Ex. Chief Engineer, Central Electricity Authority		

Agenda for the 10th meeting of National Committee on Transmission

1 Confirmation of the minutes of the 9th meeting of National Committee on Transmission.

1.1 The minutes of the 9th meeting of NCT held on 28.09.2022 has been issued vide File No.CEA-PS-12-13/3/2019-PSPA-II Division on 01.11.2022. The same may please be confirmed.

2 Status of the transmission schemes noted/approved/recommended to MoP in the 9th meeting of NCT:

2.1 The status of the transmission schemes noted/approved/recommended to MoP in the 9th meeting of NCT is tabulated below:

Sl. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Survey Agency	MoP approval	BPC	Remarks
	9th NCT					
1.	Augmentation of ISTS for interconnection of HVPNL transmission schemes	Approved for implementation through RTM route	Not applicable	Not required		Allocated to CTUIL
2.	Scheme to relieve high loading of WR-NR Inter Regional Corridor (400 kV Bhinmal-Zerda line)	Approved for implementation through RTM route	Not applicable	Not required		Allocated to CTUIL
3.	Eastern Region Expansion Scheme-XXIX (ERES-XXIX)	Approved for implementation through RTM route	Not applicable	Not required		Allocated to CTUIL
4.	Augmentation of transformation capacity at Kallam PS by 2x500MVA, 400/220kV ICTs (3rd & 4th) along with 220kV bays for RE interconnection	Approved for implementation through RTM route	Not applicable	Not required		Allocated to CTUIL
5.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1: Bikaner Complex)-Part-A	Recommended to MoP for implementation through TBCB	CTUIL	To be approved		
6.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1: Bikaner Complex) Part-B	Recommended to MoP for implementation through TBCB	PFCCCL	To be approved		
7.	Transmission system for evacuation of power from Rajasthan REZ	Recommended to MoP for implementation	PFCCCL	To be approved		

Sl. No	Name of the Transmission Scheme	Noted/ Recommended/ Approved	Survey Agency	MoP approval	BPC	Remarks
	Ph-IV (Part-1) (Bikaner Complex)- Part-C	through TBCB				
8.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex)- Part-D	Recommended to MoP for implementation through TBCB	PFCCCL	To be approved		
9.	Transmission system for evacuation of power from Rajasthan REZ Ph-IV (Part-1) (Bikaner Complex)-Part-E	Approved for implementation through RTM route	Not applicable	Not required		Allocated to CTUIL
10.	Transmission system for evacuation of power from REZ in Rajasthan (20GW) under Phase-III Part I	Recommended to MoP for implementation through TBCB	RECPDCL	To be approved		
11.	North Eastern Region Expansion Scheme- XVI (NERES-XVI)	Approved for implementation through TBCB	CTUIL	Not required	RECPDCL	

* As per the MoP order dated 28.10.2021, ISTS schemes costing between Rs. 100 Crore to Rs. 500 Crore are to be approved by NCT while ISTS schemes costing more than Rs. 500 Crore to be recommended by NCT to MoP for approval.

3 Modifications in Schemes discussed in earlier meetings of NCT:

3.1 Transmission System for Evacuation of Power from RE Projects in Rajgarh (1000 MW) SEZ in Madhya Pradesh - Phase-II

3.1.1 Transmission system for evacuation of Power from RE Projects in Rajgarh (2500 MW) SEZ in Madhya Pradesh was agreed in the 4th meeting of NCT held on 20.01.2021 & 28.01.2021 for implementation in two phases as two different Transmission packages: Phase-I (1500MW) & Phase-II (1000MW).

3.1.2 Ministry of Power, vide Gazette notification dated 24.01.2020 had appointed REC as the Bid Process Coordinator (BPC) for selection of Bidder as Transmission Service Provider (TSP) to establish the subject transmission scheme through Tariff Based Competitive Bidding (TBCB) process. Subsequently, MoP vide gazette notification dated 19.07.2021 had modified the scope of the subject transmission scheme after examining the recommendations of the 4th NCT meeting and renotified the scope to be taken up under Phase-I i.e. "Transmission system for evacuation of power from RE projects in Rajgarh (1500 MW) SEZ in Madhya Pradesh under Phase-I."

3.1.3 Phase-I of the scheme is under implementation by M/s GR Infraprojects Ltd. with SCOD of 30.11.2023.

3.1.4 SECI vide letter dated 23.06.2022 has requested to initiate the development of Pooling Stations simultaneously at various locations specified in the letter, irrespective of the receipt of connectivity applications. **This inter-alia includes implementation of scope of works under Rajgarh Phase-II (1000MW).** The scope of works under Phase-II of the Rajgarh scheme as agreed in the 4th NCT meeting is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity/km.
1.	Augmentation of 400/220 kV, 2x500 MVA ICT (4 th & 5 th) at Pachora PS	400/220 kV, 500 MVA ICT – 2 400 kV ICT bays – 2 220 kV ICT bays – 2 400 kV line bays – 2 220 kV line bays – 4 (to be taken up as per Connectivity/LTA applications received)
2.	Pachora – Shujalpur 400kV D/c line (Quad/HTLS) (with minimum capacity of 2100 MVA/ckt at nominal voltage)	Length – 80 km
3.	2 no. of 400 kV line bays at Shujalpur for Pachora – Shujalpur 400 kV D/c line (with minimum capacity of 2100 MVA/ckt at nominal voltage)	400kV line bays – 2

Note:

(i) Powergrid to provide space for 2 no. of 400 kV line bays at Shujalpur for termination of Rajgarh SEZ PP – Shujalpur 400 kV D/c line.

(ii) Phase-II scheme to be taken up only after grant of Connectivity/LTA applications beyond 1500 MW at Pachora P.S.

(ii) The schedule of implementation of Phase-II of the scheme would be matching with schedule of RE developers or 18 months from the date of transfer of SPV whichever is later.

3.1.5 Phase-II of the scheme, as agreed by 4th NCT, was to be taken up only after grant of Connectivity/LTA applications beyond 1500 MW at Pachora PS. However, based on request of SECI to expedite the Phase-II of the scheme irrespective of connectivity applications, the matter was deliberated in the 9th meeting of NCT held on 28.09.2022. It was decided that the scheme would be reviewed in the next NCT meeting based on visibility of RE generation.

3.1.6 Further, keeping in view the provision for total no. of 220 kV bays (present as well as future) approved at Rajgarh PS (Phase I & Phase II) the scope of

works for Rajgarh Phase-II (10000 MW) scheme as agreed in the 4th meeting of NCT has been updated. The scope of works after incorporation of additions regarding the conductor configuration of Pachora – Shujalpur 400kV D/c line as well as bus sectionalization which required at 220kV level, is as given below (changes marked in bold):

Sl. No.	Scope of the Transmission Scheme	Capacity/km
1.	400/220 kV, 2x500 MVA ICT augmentation (4 th & 5 th) at Pachora PS	400/220 kV, 500 MVA ICT – 2 400 kV ICT bays – 2 220 kV ICT bays – 2 400 kV line bays – 2 220 kV line bays – 4 (to be taken up as per Connectivity/LTA applications received) 220kV Bus Sectionalizer – 1 set 220kV TBC bay – 1 no. 220kV BC bay – 1 no.
2.	Pachora – Shujalpur 400kV D/c line (Quad ACSR/AAAC/AL59 Moose equivalent)	Length – 80 km
3.	2 no. of 400 kV line bays at Shujalpur for Pachora – Shujalpur 400kV D/c line (what about bays at Pachora)	400kV line bays – 2

Note:

- (i) Powergrid to provide space for 2 no. of 400 kV line bays at Shujalpur for termination of Rajgarh SEZ PP – Shujalpur 400 kV D/c line.
- (ii) Phase-II scheme to be taken up only after grant of Connectivity/LTA applications beyond 1500 MW at Pachora P.S.
- (ii) The schedule of implementation of Phase-II of the scheme would be matching with schedule of RE developers or 18 months from the date of transfer of SPV whichever is later.

Madhya Pradesh – Solar Energy Zones (5GW) incl. Rajgarh SEZ

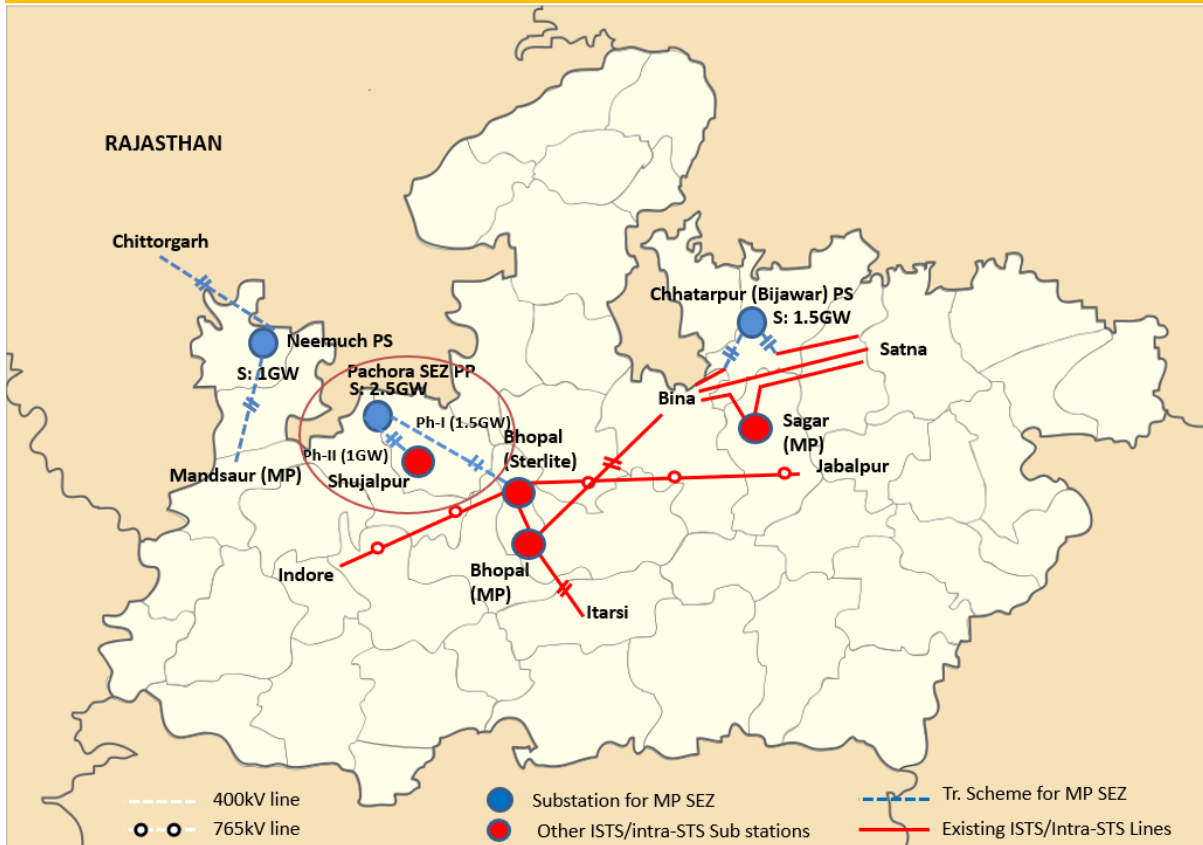


Figure 3-1 Madhya Pradesh - Solar Energy Zone

3.1.7 Members may deliberate.

3.2 **Future space provision in Transmission system for evacuation of power from Chhattarpur SEZ (1500 MW) scheme**

3.2.1 Transmission system for evacuation of power from Chhattarpur SEZ (1500 MW) is currently under bidding with M/s PFCCCL as the Bid Process Coordinator.

3.2.2 In the 9th meeting of NCT, CTU has proposed the revision in the space provisions at Chhattarpur PS to be developed under the aforesaid scheme, in view of the direction of MoP, for more space provisions in new ISTS substations (for evacuation of power from potential RE Zones / for meeting drawl requirements of STUs, etc)

3.2.3 The revised scope of the scheme after revision in the future space provisions vis-à-vis the originally approved scope of works is tabulated below:

Transmission system for evacuation of power from Chhattarpur SEZ (1500 MW)

Sl. No.	Scope of the Transmission Scheme (Original)	Scope of the Transmission Scheme (Revised)
1.	<p>(i) Establishment of 3x500MVA, 400/220 kV Pooling Station at Chhatarpur</p> <p>(ii) 1x125 MVAR, 420 kV bus reactor at Chhatarpur PS</p> <p>(iii) 5 nos. 220kV line bays for solar park interconnection</p> <p><i>*out of Satna – Bina 2xD/c lines, one circuit of 2nd D/c line has been LILOed at Sagar (MPPTCL) substation. The proposed LILO is to be made on the other (1st) D/c line between Satna & Bina</i></p> <p>Future provisions: Space to accommodate:</p> <ul style="list-style-type: none"> • 400/220 kV, 500 MVA ICT along with associated bays -1 • 4 nos. of 220kV line bays • Sectionaliser arrangement 	<p>Establishment of 3x500MVA, 400/220 kV Pooling Station at Chhatarpur</p> <p>1x125 MVAR, 420 kV bus reactor at Chhatarpur PS</p> <p>5 nos. 220kV line bays for solar park interconnection</p> <p><i>*out of Satna – Bina 2xD/c lines, one circuit of 2nd D/c line has been LILOed at Sagar (MPPTCL) substation. The proposed LILO is to be made on the other (1st) D/c line between Satna & Bina</i></p> <p>Future provisions: Space to accommodate:</p> <ul style="list-style-type: none"> • 400/220 kV, 500 MVA ICT along with associated bays -5 • 400 kV line bays: 6 nos. • 3x125MVAr Bus Reactor with bay • 13 nos. of 220kV line bays • Sectionaliser arrangement at 220kV (2 Sets) & 400kV (1 Set) levels
2.	LILO of Satna – Bina 400kV (1 st) D/c line at Chhatarpur PS	LILO of Satna – Bina 400kV (1 st) D/c line at Chhatarpur PS

Note: As per the MoP Gazette, scheme implementation is to be taken only after grant of LTA. In this respect, it may be noted that Generation Projects are yet to be identified at Chhatarpur PS.

3.2.4 In the 9th meeting of NCT, the following observations were made in regard of proposal of CTU to increase the future space provision:

- Chhatarpur scheme (1500 MW) would facilitate evacuation of power from two solar parks, namely, 550 MW at Barethi by M/s NTPC and 950 MW at Bijawar by M/s RUMS. The location of the pooling station at Chhatarpur is nearby Bijawar as Bijawar is located between NTPC Bareithy park and the LILO point towards the LILO point.
- In the recent development, it has emerged that it is not possible for NTPC to construct dedicated transmission line upto the planned Chhatarpur PS on account of the transmission line passing through Panna Tiger Reserve. Accordingly, two separate pooling stations are now being planned for pooling of RE power of RUMS and NTPC. Hence, additional future provisions at Chhatarpur PS may not be required.

3.2.5 In view of above observations, CTUIL was directed by 9th NCT to re-examine the requirement of future provisions and it was decided to redeliberate the same in the next meeting.

Members may deliberate.

3.3 Implementation modalities of Transmission scheme for evacuation of 4.5 GW RE injection at Khavda PS under Phase II- Part D

3.3.1 MoP vide Gazette notification dated 23/09/2020 has notified the “Transmission scheme for evacuation of 4.5 GW RE injection at Khavda P.S. under Phase-II – Part D” to be implemented under TBCB route which forms a part of the planned Transmission system for evacuation of 4.5 GW RE injection from Khavda complex (Part A to Part D). Scope of the scheme is detailed below:

Sl. No.	Scope of the Transmission Scheme	Scheduled COD (months) in months form Effective Date
1	LILO of Pirana (PG) – Pirana (T) 400kV D/c line at Ahmedabad S/s with twin HTLS alongwith reconductoring of Pirana (PG) – Pirana (T) line with twin HTLS conductor	24
2	Bay upgradation work at Pirana (PG) & Pirana (T)# 400kV line bays (Bay Upgradation) – 4nos [@]	

The current rating of existing bays is 2000 A.

@ 04nos. 400kV line bays upgradation includes 02.nos. bays upgradation at Pirana (PG) and 02 nos. bays upgradation at Pirana (T). Upgradation at Pirana(T) shall also include upgradation of 400kV Bus coupler bay and 400kV Transfer bus coupler bay alongwith upgradation of bus bar.

Note:

- (i) Transmission system for evacuation of 3 GW RE injection at Khavda is being taken up under Phase-I. Phase-II RE scheme for evacuation of 4.5 GW RE injection at Khavda needs to be taken up for evacuation requirement beyond 3 GW from Khavda RE park.
- (ii) Implementation of all the transmission packages proposed for evacuation of 4.5 GW RE injection at Khavda RE park under Phase-II (Part A to Part D) needs to be taken up in similar timeframe.
- (iii) The switching scheme of existing 400kV Pirana (T) S/S is Double Main Transfer Scheme (DMT) and existing current rating of Bus Coupler bay and Transfer Bus Coupler bay is 2000A. With upgradation of Line bays to 3150A (to suit the reconductoring with Twin HTLS conductor), existing 400kV Bus Coupler bay and Transfer Bus Coupler bay (with associated Bus Bar) shall also be upgraded to 3150A by the TSP.

3.3.2 BPC has floated RfP for selection of Transmission Service Provider for the execution of subject scheme through TBCB route.

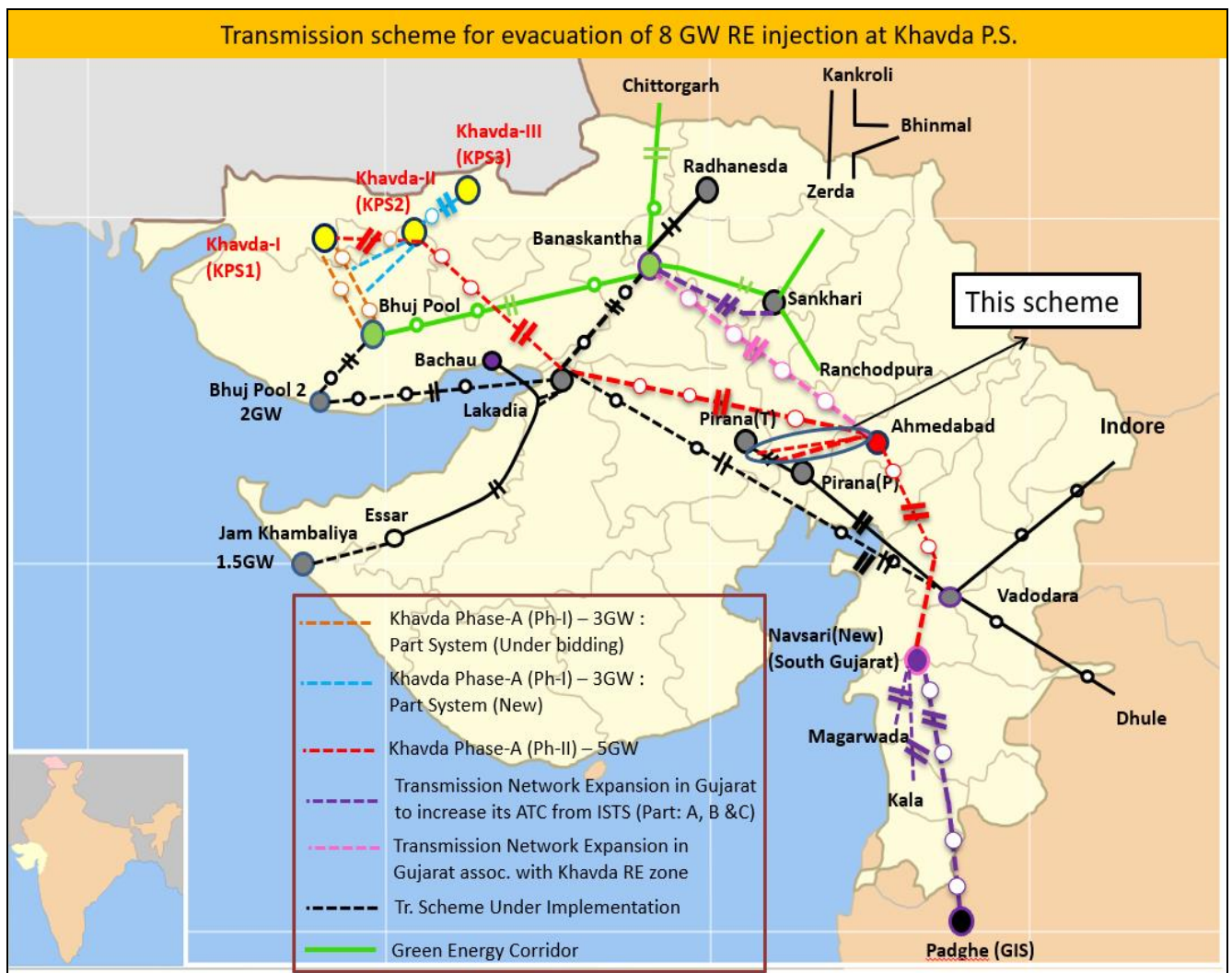
3.3.3 Subsequently, Torrent Power Grid Limited vide e-mail dated 30.09.2022 has highlighted the following commercial & operational issues in respect of implementation of the subject scheme:

- i. “Whether the proposed reconductoring and bay work will have any implication on Tariff of TPGL? If yes, we request you to kindly share the methodology for adjustment (Removal/ replacement of bays at Pirana-PG and Pirana–T and Reconductoring)*
- ii. As existing assets are licensed assets, whether the modification of same requires approval of Hon’ble CERC or not. If yes, we request you to kindly share proposed steps for same?*
- iii. We also request you to kindly clarify the operational aspects in respect of O&M responsibility after execution of the project due to peculiar situation i.e.
 - a. Joint Ownership of line between Torrent Pirana to PGCIL Pirana: Towers will be owned by TPGL whereas reconductoring portion will be owned by the successful bidder. Request to you to guide for responsibility of carrying out line maintenance and tower maintenance.*
 - b. Joint Ownership: O&M of Bays at Pirana (T) within TPL substation and owned & installed by bidder. Request you to please confirm that the bidder will pay the O&M charges to TPGL as per CERC Regulations as TPGL is paying O&M Charges to PGCIL at PGCIL substation end though same is owned by TPGL.**
- iv. Further, we request you to share with us the role and responsibility of declaring Availability so as to avoid possible issues and defining the responsibility for e.g. in case of conductors snapped or Tower collapsed.”*

3.3.4 Reconductoring of the Pirana(PG)-Pirana(T) 400kV D/c line by a new transmission Licensee will lead to joint ownership of the line with the Transmission towers/accessories being owned by TPGL and the conductors/bay equipments being owned by the successful bidder.

3.3.5 Considering the technical and commercial issues raised by Torrent Power Grid Limited (TPGL), it is felt that the implementation modalities of the above scheme may reviewed.

3.3.6 Members may please discuss.



3.4 Modification in notified Transmission schemes “Establishment of Khavda Pooling Station-2 (KPS2) in Khavda RE Park” & “Transmission scheme for injection beyond 3 GW RE power at Khavda PS1”.

3.4.1 MoP vide Gazette notification dated 03.12.2021 had notified the scheme, “Establishment of Khavda Pooling Station-2 (KPS2) in Khavda RE Park” to be implemented under TBCB route.

3.4.2 The scope of the notified scheme along with future space provisions as agreed in 9th NCT meeting is as following (shown in Annexure-I):

Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
1.	Establishment of 765/400 kV, 4x1500MVA, KPS2 (GIS) with 2x330 MVAR 765 kV bus reactor and 2x125	1500 MVA, 765/400 kV ICT- 4 nos. (13x500 MVA including one spare unit) 765 kV ICT bays – 4 nos.

Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
	<p>MVAR 400 kV bus reactor.</p> <p><i>Bus sectionalizer at 765kV & 400kV.</i></p> <p><i>On each bus section, there shall be 2x1500MVA 765/400kV ICTs, 1x330MVAR, 765 kV & 1x125MVAR 420kV bus reactor with space for future expansion.</i></p> <p><i>Bus sectionalizer at 765 kV level shall normally be closed and bus sectionalizer at 400 kV level shall normally be open</i></p> <p><u>Future provisions: Space for</u></p> <p>765/400 kV ICTs along with bays: 5 nos.</p> <p>765kV line bay with switchable line reactor: 10 nos.</p> <p>400kV line bay with switchable line reactor: 12 nos.</p> <p>8000MW, ± 800kV HVDC Converter station (LCC)</p> <p>To take care of any drawal needs of area in future:</p> <p>400/220 kV ICT: 2 nos. 220 kV line bays: 4 nos.</p>	<p>400 kV ICT bays – 4 nos. 765 kV line bays – 2 nos. 400 kV line bays – 3 nos. (3 no. of bays considered at present, one each for NTPC, GSECL & GIPCL)</p> <p>1x330 MVAR, 765 kV bus reactor-2 (7x110 MVAR, including one spare unit) 765 kV reactor bay – 2</p> <p>1x125 MVAR 400 kV bus reactor-2 400 kV reactor bay – 2</p> <p>765 kV bus sectionalizer bay – 2 400 kV bus sectionalizer bay – 2</p>
2.	LILO of one ckt. of KPS1- Bhuj PS 765 kV D/c line at KPS2	Line length – 1 km

3.4.3 The transmission element at Sl. No.2 of the above scheme (LILO of one ckt. of KPS1- Bhuj PS 765 kV D/c line at KPS2) was planned to interconnect KPS2 with KPS1 and Bhuj PS through LILO of one circuit of 765kV KPS1- Bhuj D/c line (under implementation). The said LILO line is planned to be interim in nature and is mandated for RE injection of upto 3GW at KPS1. Beyond 3GW injection at KPS1, KPS1-KPS2 765kV D/c line (to be established vide bypassing of LILO of one ckt. of KPS1-Bhuj at KPS2 & utilisation of LILO section and extension upto KPS1) is required.

3.4.4 In respect of the above, MoP vide Gazette notification dated 03.12.2021 had notified the scheme, “Transmission scheme for injection beyond 3 GW RE power at Khavda PS1 (KPS1)” to be implemented under TBCB route. The scope of subject scheme is given below:

Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
1.	Augmentation of Khavda PS1 by 765/400 kV transformation capacity* (max. upto 4x1500 MVA) with 1x330 MVAR 765 kV bus reactor and 1x125 MVAR 420 kV bus reactor on 2nd 765 kV and 400 kV bus section respectively	765/400 kV, 1500 MVA- 4 nos. (13x500 MVA, including one spare unit) (Actual no. of ICTs may be decided based on evacuation requirement) 765 kV ICT bays – 4 nos. 765 kV line bays – 2 nos. 400 kV ICT bays – 4 nos. 400 kV line bays – 3 nos considered at present (Actual no. of bays as per connectivity granted to RE developers) 1x330 MVA, 765 kV bus reactor- 1no. (4x110 MVA, including one spare unit) 765 kV reactor bay – 1no. 125 MVA, 420 kV reactor- 1no. 400 kV Reactor bay- 1no. 765 kV bus sectionalizer- 2 nos. 400 kV bus sectionalizer- 2 nos.
2.	KPS1-Khavda PS GIS (KPS2) 765 kV D/C line (to be established with bypassing of LILO of one ckt. of KPS1-Bhuj at KPS2 and utilisation of LILO section)	Length ~ 20 km

* Actual no. of ICTs may be decided based on evacuation requirement

Note: (i) Implementation to be taken up for evacuation requirement beyond 3 GW at KPS1

3.4.5 As on date, total of 3500 MW & 2755 MW stage-II connectivity has been granted at KPS1 and KPS2 respectively.

3.4.6 Considering that evacuation requirement at KPS-1 has already exceeded 3GW, the interim arrangement of LILO of one circuit of KPS1-Bhuj 765 D/c line at KPS2 as mentioned in the scope of scheme “Establishment of Khavda Pooling Station-2 (KPS2) in Khavda RE Park” is no more required and the KPS1-KPS2 765kV D/c line is now required to be implemented instead [as mentioned in scheme “Transmission scheme for injection beyond 3 GW RE power at Khavda PS1 (KPS1)”].

3.4.7 Further, in view of deletion of the interim scope at Sl. No. 2 under 7.2, the time frame of the Transmission schemes under 7.2 and 7.4 need to be implemented in a matching timeframe of 24 months, so as to ensure availability of evacuation path from KPS2.

3.4.8 In view of above, **the modified scope of scheme** “Establishment of Khavda Pooling Station -2 (KPS2) in Khavda RE park” is given below:

Establishment of Khavda Pooling Station-2 (KPS2) in Khavda RE Park
(modified scheme)

Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
1.	<p>Establishment of 765/400 kV, 4x1500MVA, KPS2 (GIS) with 2x330 MVAR 765 kV bus reactor and 2x125 MVAR 400 kV bus reactor.</p> <p><i>Bus sectionalizer at 765kV & 400kV.</i></p> <p><i>On each bus section, there shall be 2x1500MVA 765/400kV ICTs, 1x330MVAR, 765 kV & 1x125MVAR 420kV bus reactor with space for future expansion.</i></p> <p><i>Bus sectionalizer at 765 kV level shall normally be closed and bus sectionalizer at 400 kV level shall normally be open</i></p> <p><u>Future provisions: Space for</u></p> <p>765/400 kV ICTs along with bays: 5 nos.</p>	<p>1500MVA, 765/400kV ICT- 4 nos. (13x500 MVA including one spare unit)</p> <p>765 kV ICT bays – 4 nos.</p> <p>400 kV ICT bays – 4 nos.</p> <p>765 kV line bays – 2 nos.</p> <p>400 kV line bays – 3 nos. (3 no. of bays considered at present, one each for NTPC, GSECL & GIPCL)</p> <p>1x330 MVAR, 765 kV bus reactor-2 (7x110 MVAR, including one spare unit)</p> <p>765 kV reactor bay – 2</p> <p>1x125 MVAR 400 kV bus reactor-2</p> <p>400 kV reactor bay – 2</p> <p>765 kV bus sectionalizer bay – 2</p> <p>400 kV bus sectionalizer bay – 2</p>

Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
	<p>765kV line bay with switchable line reactor: 10 nos.</p> <p>400kV line bay with switchable line reactor: 12 nos.</p> <p>8000MW, ± 800kV HVDC Converter station (LCC)</p> <p>To take care of any drawal needs of area in future:</p> <p>400/220 kV ICT: 2 nos. 220 kV line bays: 4 nos.</p>	

Note: The above scheme shall be implemented with an implementation of 24 months and matching with the implementation timeframe of “Transmission scheme for injection beyond 3 GW RE power at Khavda PS1”

3.4.9 The **modified scheme** for “Transmission scheme for injection beyond 3 GW RE power at Khavda PS1” is given below:

Transmission scheme for injection beyond 3 GW RE power at Khavda PS1 (KPS1) (modified Scheme)

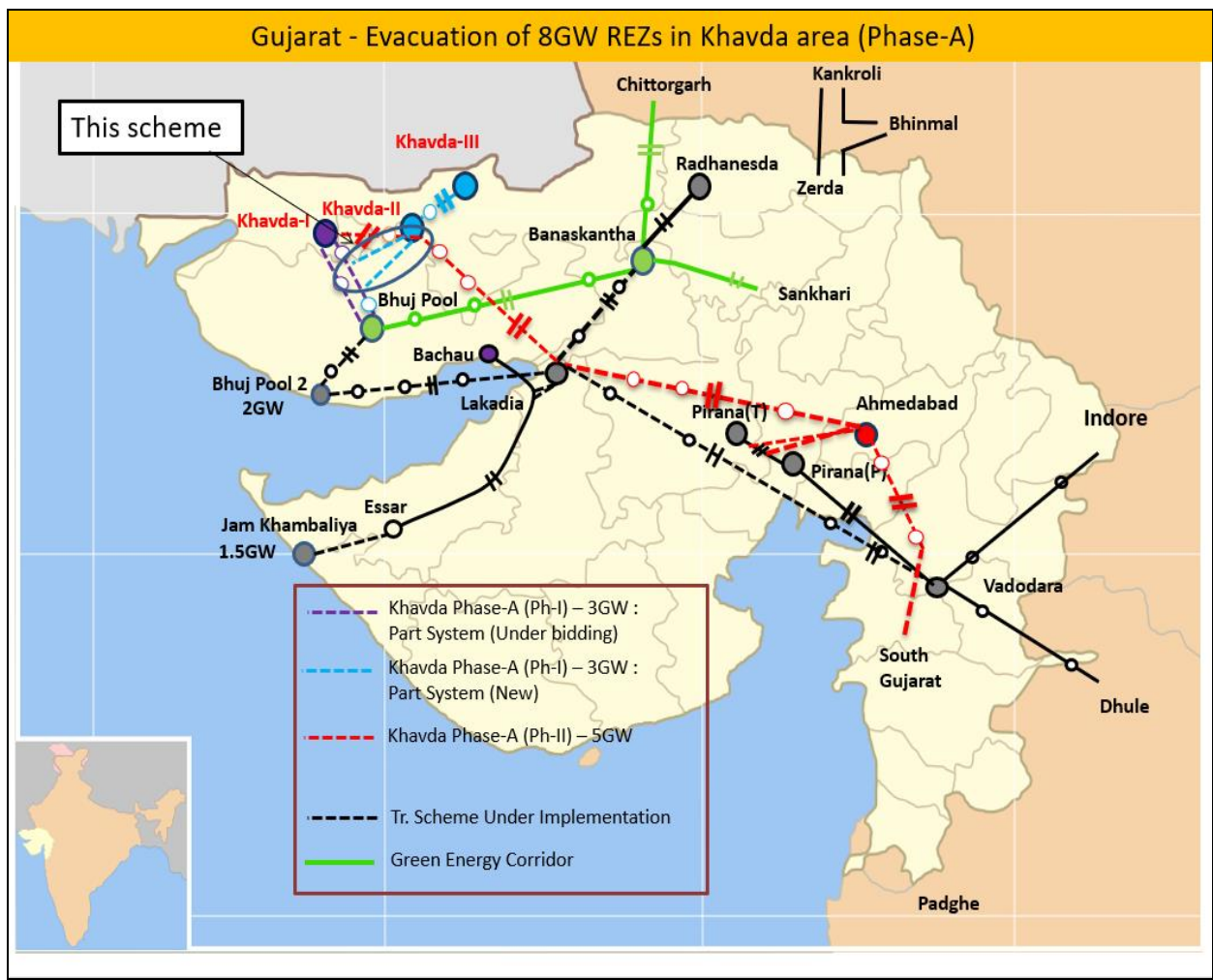
Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
1.	Augmentation of Khavda PS1 by 765/400 kV transformation capacity* (max. upto 4x1500 MVA) with 1x330 MVAR 765 kV bus reactor and 1x125 MVAR 420 kV bus reactor on 2nd 765 kV and 400 kV bus sections respectively	<p>765/400 kV, 1500 MVA- 4 nos. (13x500 MVA, including one spare unit)</p> <p>(Actual no. of ICTs may be decided based on evacuation requirement)</p> <p>765 kV ICT bays – 4 nos. 765 kV line bays – 2 nos. 400 kV ICT bays – 4 nos. 400 kV line bays – 3 nos considered at present (Actual no. of bays as per connectivity granted to RE developers)</p> <p>1x330 MVAR, 765 kV bus reactor- 1no. (4x110 MVAR, including one spare unit)</p> <p>765 kV reactor bay – 1no. 125 MVAR, 420 kV reactor- 1no. 400 kV Reactor bay- 1no. 765 kV bus sectionalizer- 2 nos. 400 kV bus sectionalizer- 2 nos.</p>

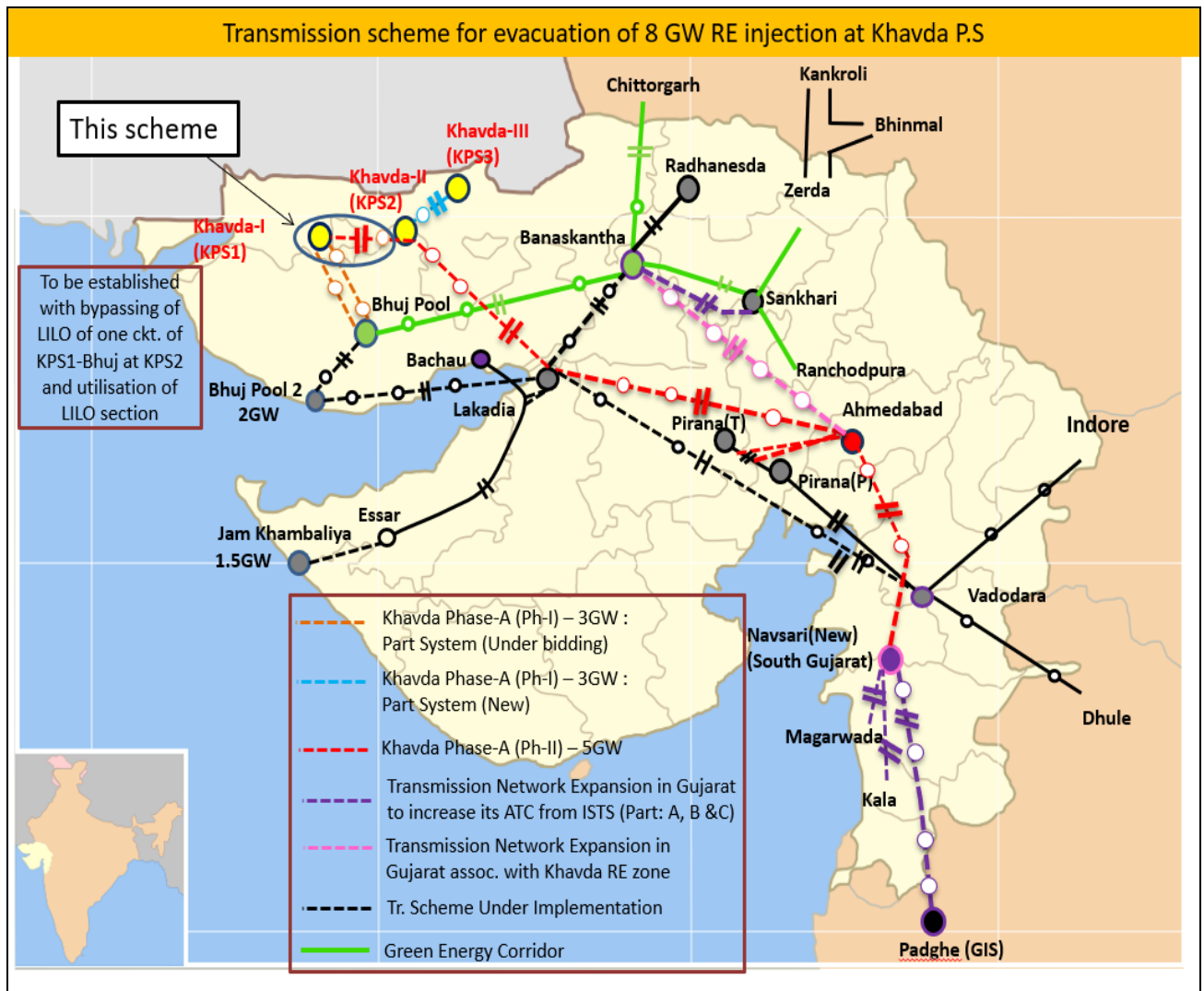
Sl. No.	Scope of the Transmission Scheme	Capacity / line length km
2.	KPS1-Khavda PS GIS (KPS2) 765 kV D/C line	Length ~ 20 km

* KPS1 shall be established in 2 Bus Sections

* Actual no. of ICTs may be decided based on evacuation requirement

The above scheme shall be implemented with an implementation of 24 months and matching with the implementation timeframe of “Establishment of Khavda Pooling Station-2 (KPS2) in Khavda RE Park”.





3.4.10 Members may please discuss.

4. Bidding process/works of transmission schemes at Bidar, Ananthapuram and Kurnool

4.1 The following Transmission scheme were notified by MoP vide Gazette Notification dated 27.01.2020 for implementation through TBCB route:

- (i) Transmission scheme for Solar Energy Zone in Ananthapuram (Ananthapur) (2500 MW) and Kurnool (1000 MW), Andhra Pradesh
- (ii) Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka

Subsequently, bidding had been initiated for the aforesaid schemes but the same were put on hold because of uncertainty in development of RE generation projects due to land issues.

4.2 Further, MoP vide OM dated 04.11.2019 had approved the implementation of Transmission Scheme “Evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (1500 MW) Part A and Part B” by Powergrid under Regulated Tariff Mechanism.

4.3 In the recent development, SECI vide letter dated 23.06.2022 had informed that Delhi, Punjab and Madhya Pradesh have approached SECI for RTC power with Renewable Energy. Since sufficient pooling stations are not available in the identified potential RE generation locations in Southern Region such as Bidar, Ananthpur and Kurnool, SECI had requested CTUIL to initiate the development of Pooling Stations simultaneously at different locations including Ananthpur, Bidar & Kurnool.

4.4 Accordingly, decision needs to be taken regarding resumption of bidding process of the transmission scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka and transmission scheme for Solar Energy Zone in Ananthpuram (Ananthapur) (2500 MW) and Kurnool (1000 MW), Andhra Pradesh. Decision also needs to be taken regarding implementation of Transmission system “Evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (1500 MW) Part A and Part B” which had been allocated to POWERGRID for implementation through RTM route

4.5 The matter was discussed in SRPC forum on 26.08.2022. SR constituents were of the view that issues regarding availability of land for setting up RE generation projects in Bidar & Ananthapuram has not yet been resolved. Further, no connectivity applications have been received by CTUIL from RE generation developers till date. Hence, there is no visibility of materialization of RE generation projects and implementation of associated transmission schemes shall result in unnecessary burden on the DICs.

4.6 Members may deliberate regarding development of transmission system for Bidar, Ananthapuram and Kurnool RE Zones.

4.7 The detailed scope of works for the above mentioned schemes as notified in Gazette dated 27.01.2020 is as given below:

(i) Transmission Scheme for Solar Energy Zone in Bidar (2500 MW), Karnataka

Sl. No.	Scope of the Transmission Scheme
---------	----------------------------------

<p>1.</p>	<p>Establishment of 3x1500MVA (765/400kV), 5x500MVA (400/220kV) station at suitable border location near Bidar with 765kV (1x240 MVAR) and 400kV (1x125 MVAR) Bus Reactor</p> <p><u>A. 765kV</u></p> <ul style="list-style-type: none"> i) ICT: 10x500 MVA, 765/400/33 kV (with 1x500 MVA, 765/400/33 kV Transformer unit as common spare for three banks) ii) ICT bay: 3 nos. iii) Line bay: 2 nos. iv) Bus Reactor: 3x80 MVAR (one bank of 240 MVAR) v) Line Reactor: 6x80 MVAR (two banks of 240 MVAR each) vi) Spare Reactor: 1x80 MVAR (common spare unit for banks of Bus Reactor & Line Reactor) vii) Bus Reactor bay: 1 no. viii) Switchable Line Reactor bay: 2 nos. ix) Space for future line bay: 6 nos. x) Space for future 765/400/33 kV ICT along with associated bay: 1 no. xi) Space for future 765kV Bus Reactor along with associated bay: 1 no. <p><u>B. 400kV</u></p> <ul style="list-style-type: none"> i) ICT: 5x500MVA, 400/220kV ii) ICT bay: 8 nos. (3 nos. for 765/400/33kV and 5 nos. for 400/220/33kV) iii) Bus Reactor: 1x125 MVAR, 420kV iv) Bus Reactor bay: 1 no. v) Space for future line bay: 8 nos. vi) Space for future 765/400/33kV ICT bay: 1 no. vii) Space for future 400/220/33kV ICT along with associated bay: 2 nos. <p><u>C. 220kV</u></p> <ul style="list-style-type: none"> i) ICT bay: 5 nos. (4 nos. on Bus section-A and 1 no. on Bus section-B) ii) Line bay: 8 nos. (6 nos. on Bus section-A and 2 no. on Bus section-B) iii) Bus sectionalizer bay: 2 nos. (one no. for each Main Bus) iv) Bus coupler bay: 2 nos. (one no. for each Bus section) v) Transfer Bus coupler bay: 2 nos. (one no. for each bus section) vi) Space for future 400/220kV ICT bay: 2 nos. (2 nos. on Bus section-B) vii) Space for future line bay: 4 nos. (2 nos. each on Bus section-A & Bus section-B)
<p>2.</p>	<p>Bidar PS – Maheshwaram (PG) 765 kV D/C line</p>
<p>3.</p>	<p>2 nos. of 765 kV Line bays at Maheshwaram (PG) GIS substation for termination of Bidar PS – Maheshwaram (PG) GIS 765 kV D/C line</p>
<p>4.</p>	<p>765kV, 1x240 MVAR Switchable Line Reactor for each circuit at Bidar PS end of Bidar PS- Maheshwaram (PG) GIS 765 kV D/C line [as per A. v), vi) & viii) above]</p>

Note:

1. POWERGRID to provide space for 2 no. of 765 kV line bays at Maheshwaram (PG) substation for termination of Bidar PS – Maheshwaram (PG) 765 kV D/c line

(ii) Transmission scheme for Solar Energy Zone in Ananthpuram (Ananthapur) (2500 MW) and Kurnool (1000 MW), Andhra Pradesh

S. No.	Scope of the Transmission Scheme
1.	Establishment of 400/220 kV, 7x500 MVA pooling station at suitable border location between Ananthpuram & Kurnool Distt with 400kV (2x125 MVAR) bus reactor A. 400 kV <ol style="list-style-type: none">i. ICT: 7x500MVA, 400/220kVii. ICT bay: 7 nos.iii. Line bay: 4 nos.iv. Bus Reactor: 2x125 MVAR, 420kVv. Bus Reactor bay: 2 nos.vi. Line Reactor: 2x80 MVAR, 420kVvii. Switchable line reactor bay: 2 Nosviii. Space for future line bay along with switchable line reactor: 6 nos.ix. Space for future 400/220kV ICT along with associated bay: 1 nos. B. 220 kV <ol style="list-style-type: none">i. ICT bay: 7 nos. (4 nos. on Bus section-A and 3 nos. on Bus section-B)ii. Line bay: 12 nos. (6 nos. on Bus section-A and 6 nos. on Bus section-B)iii. Bus sectionalizer bay: 2 nos. (one no. for each Main Bus)iv. Bus coupler bay: 2 nos. (one no. for each Bus section)v. Transfer Bus coupler bay: 2 nos. (one no. for each Bus section)vi. Space for future 400/220kV ICT bay: 1 nos. (1 no. on Bus section-B)vii. Space for future line bay: 4 nos. (2 nos. on Bus section-A and 2 nos. on Bus section-B)
2.	Ananthpuram PS-Kurnool-III PS 400 kV (High capacity equivalent to quad moose) D/c Line
3.	2 Nos 400 kV line bays at Kurnool-III PS for Ananthpuram PS-Kurnool-III PS 400 kV D/c line
4.	Ananthpuram PS-Cuddapah 400 kV (High capacity equivalent to quad moose) D/c Line
5.	2 Nos 400 kV line bays Cuddapah PS for Ananthpuram PS-Cuddapah 400 kV
6.	80 MVA, 420 KV switchable line reactor for Ananthpuram PS-Cuddapah 400 kV D/c line [As per A.vi) & vii) above]

Note:

1. POWERGRID to provide space for 2 nos. 400kV GIS line bays at Cuddapah PS.
2. Developer of Kurnool-III PS to provide space for 2 nos. 400kV line bays at Kurnool-III PS.

(iii) Evacuation of power from RE Sources in Kurnool Wind Energy Zone (3000 MW) /Solar Energy Zone (1500 MW) Part A and Part B

Part A

Sl. No.	Scope of the Transmission Scheme	Capacity /Km
1.	<p>Establishment of 765/400/220kV 3x1500MVA, 9x500 MVA Pooling station at suitable location in Kurnool Distt (Kurnool-III) with 1x330 MVAr (765kV) & 1x125MVAr (400kV) bus reactor</p> <p>220kV line bays for interconnection of wind projects (15 nos)</p> <p>Space for</p> <p>i) 765/400kV ICTs along with bays:2 nos.</p> <p>ii) 400/220kV ICTs along with bays:4 nos.</p> <p>iii) 765kV line bays: 6 nos.</p> <p>iv) 400kV line bays: 4 nos.</p> <p>v) 230kV line bays: 7 nos</p>	<p>3x1500 MVA, 765/400kV 9x500MVA, 400/220kV 330MVAr BR -1 125MVAr BR -1</p> <p>765kV Line bay-2 765kV ICT bay-3 400kV ICT bay-12 220kV ICT bay-9 400kV reactor bay-1 220kV line bays-15 765kV reactor bay-1 1x500 MVA, 765/400 kV, 1-ph ICT (spare unit) 1x110MVAR, 765 kV, 1 ph. Switchable reactor (spare unit) (for 330 MVAr bus reactor) & 1x80 MVAR, 765 kV , 1 ph. Switchable reactor (spare unit) (for 240 MVAr line reactor)</p>
2	Kurnool-III PS – Kurnool(new) 765kV D/c line	100km
3	765kV lines bays at Kurnool(new) -2nos.	765kV line bays-2
Note: PGCIL to provide space for 2nos. of 765kV bays at Kurnool (new)		

Part-B

Sl. No.	Scope of the Transmission Scheme	Capacity / Km
1.	Kurnool- III PS – Maheshwaram (PG) 765kV D/c Line	250km
2.	765kV lines bays at Kurnool-III (2 nos) and Maheshwaram (PG) (2 nos)	765kV line bays-4
3.	240 MVAr Switchable line reactors at both ends of Kurnool –III PS – Maheshwaram (PG) 765 kV D/c Line along with bays	240 MVAr Switchable line reactor -4
<p>Note: (i) PGCIL to provide space for 2 nos. of 765kV bays at Maheshwaram(PG) S/s</p> <p>(ii) PGCIL to provide space at Maheshwaram (PG) for 765kV Switchable line reactors at Maheshwaram end of kurnool-III PS-Maheshwaram(PG) 765kV D/c line.</p>		

5 New Transmission Schemes submitted by CTUIL:

5.1 Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II (Phase- A) in Karnataka

Sl. No.	Items	Details									
1.	Name of Scheme	Transmission Scheme for integration of Renewable Energy Zone in Koppal-II (Phase-A) and Gadag-II (Phase-A) in Karnataka									
2.	Scope of the scheme	<table border="1"> <thead> <tr> <th>Sl.</th> <th>Scope of the Transmission Scheme</th> <th>Capacity /km</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II (Phase A) Pooling Station with provision of two (2) sections of 4500 MVA each at 400kV level and provision of four (4) sections of 2500 MVA each at 220kV level</td> <td> <ul style="list-style-type: none"> • 765/400kV, 1500 MVA, ICTs – 2 nos. (7x500 MVA incl. 1 spare unit) • 765kV ICT bays – 2 nos. • 400kV ICT bays – 2 nos. • 400/220kV, 500 MVA, ICTs – 2 nos. • 400kV ICT bays – 2 nos. • 220kV ICT bays – 2 nos. </td> </tr> <tr> <td></td> <td>Future Space</td> <td></td> </tr> </tbody> </table>	Sl.	Scope of the Transmission Scheme	Capacity /km	1.	Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II (Phase A) Pooling Station with provision of two (2) sections of 4500 MVA each at 400kV level and provision of four (4) sections of 2500 MVA each at 220kV level	<ul style="list-style-type: none"> • 765/400kV, 1500 MVA, ICTs – 2 nos. (7x500 MVA incl. 1 spare unit) • 765kV ICT bays – 2 nos. • 400kV ICT bays – 2 nos. • 400/220kV, 500 MVA, ICTs – 2 nos. • 400kV ICT bays – 2 nos. • 220kV ICT bays – 2 nos. 		Future Space	
Sl.	Scope of the Transmission Scheme	Capacity /km									
1.	Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II (Phase A) Pooling Station with provision of two (2) sections of 4500 MVA each at 400kV level and provision of four (4) sections of 2500 MVA each at 220kV level	<ul style="list-style-type: none"> • 765/400kV, 1500 MVA, ICTs – 2 nos. (7x500 MVA incl. 1 spare unit) • 765kV ICT bays – 2 nos. • 400kV ICT bays – 2 nos. • 400/220kV, 500 MVA, ICTs – 2 nos. • 400kV ICT bays – 2 nos. • 220kV ICT bays – 2 nos. 									
	Future Space										

		<p>Provisions: (Including space for Phase-B)</p> <ul style="list-style-type: none"> • 765/400kV, 1500 MVA, ICTs – 6 nos. • 765kV ICT bays – 6 nos. • 400kV ICT bays – 6 nos. • 400/220kV, 500 MVA, ICTs – 10 nos. • 400kV ICT bays – 10 nos. • 220kV ICT bays – 10 nos. • 765kV line bays – 8 nos. (with provision for SLR) • 400kV line bays – 14 nos. (with provision for SLR) • 220kV line bays – 12 nos. • 220kV Sectionalization bay: 3 sets • 220 kV Bus Coupler (BC) Bay – 3 nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3 nos. • 400kV Sectionalization bay: 1 sets 	<ul style="list-style-type: none"> • 765kV line bays – 2 nos.(at Koppal-II for termination of Koppal-II-Narendra new 765kV D/c line) • 220kV line bays – 4 nos. • 220 kV Bus Coupler (BC) Bay – 1 no. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 no.
	2.	Koppal-II PS – Narendra New 765kV D/c line with 240 MVar SLR at Koppal-II PS end (~150 km)	<p style="text-align: center;">~150 km</p> <ul style="list-style-type: none"> • 765kV line bays – 2 nos. (GIS) (at Narendra New) • 765 kV, 240 MVar SLR at Koppal-II PS – 2 nos. (7x80 MVar inc. 1 switchable spare unit)
	3.	2x330 MVar (765kV) & 2x125MVar (400kV) bus reactors at Koppal-II PS	<ul style="list-style-type: none"> • 765 kV, 330 MVar Bus Reactor – 2 nos. (7x110 MVar inc. 1 switchable spare unit) • 765 kV Bus Reactor bays – 2 nos. • 420kV, 125 MVar Bus Reactors – 2

		<ul style="list-style-type: none"> nos. • 420kV, 125 MVAR Bus Reactor bays – 2 nos.
4.	<p>Establishment of 400/220kV, 2x500 MVA Gadag-II (Phase A) Pooling Station</p> <p>Future Space Provisions:</p> <ul style="list-style-type: none"> • 400/220kV, 500 MVA, ICTs – 10 nos. • 400kV ICT bays – 10 nos. • 220kV ICT bays – 10 nos. • 400kV line bays – 6 nos. • (with provision for SLR) • 220kV line bays – 10 nos. • 220kV Sectionalisation bay: 3 sets • 220 kV Bus Coupler (BC) Bay – 3 nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3 nos. 	<ul style="list-style-type: none"> • 400/220 kV, 500 MVA ICTs – 2 nos. • 400 kV ICT bays – 2 nos. • 220 kV ICT bays – 2 nos. • 400 kV line bays – 2 nos. (at Gadag-II for termination of Gadag-II – Koppal-II line) • 220kV line bays – 4 nos. • 220 kV Bus Coupler (BC) Bay – 1 no. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 no.
5.	Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line (~100 km)	<p>~100 km</p> <p>400kV line bays - 2 (at Koppal-II)</p>
6.	2x125MVAR 420kV bus reactors at Gadag-II PS	<ul style="list-style-type: none"> • 420kV, 125 MVAR bus reactors – 2 nos. • 420kV, 125 MVAR bus reactor bays – 2 nos.
3.	Depiction of the scheme on Transmission Grid Map	Annexure-I(a)
4.	Upstream/downstream system associated with	Not applicable

	the scheme																																																											
5.	Objective / Justification	<p>Govt. of India has set a target of 500 GW generation capacity from non-fossil fuel resources by 2030. In this direction, MNRE has identified addition of 181.5 GW RE Potential in the States of Andhra Pradesh, Telangana, Karnataka, Rajasthan, Madhya Pradesh and Tamil Nadu (Offshore). Out of the identified 181.5 GW Potential, 86 GW RE Potential is identified in the State of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu (Offshore) in Southern Region. The transmission system for integration of 181.5 GW RE Potential is under advanced stage of identification by CEA in coordination with CTU.</p> <p>Out of the identified (86 GW) RE Potential in Southern Region, 17 GW has been identified in the State of Karnataka. MNRE have indicated that out of the 17 GW REZ potential in Karnataka, transmission system for evacuation capacity of about 10.5 GW may be identified considering the Energy Storage System. The details of district wise potential is as below:</p> <table border="1" data-bbox="639 936 1382 1312"> <thead> <tr> <th rowspan="2">District</th> <th colspan="2">Potential (GW)</th> <th rowspan="2">Total (GW)</th> <th rowspan="2">Dispatch (90% S + 55% W)</th> <th rowspan="2">BESS</th> <th rowspan="2">Evacuation capacity to be planned (GW)</th> </tr> <tr> <th>Wind</th> <th>Solar</th> </tr> </thead> <tbody> <tr> <td>Koppal</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Gadag</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Davangere / Chitradurga</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Bijapur</td> <td>2</td> <td></td> <td>2</td> <td>1.1</td> <td></td> <td>2</td> </tr> <tr> <td>Bellary</td> <td></td> <td>1.5</td> <td>1.5</td> <td>1.35</td> <td></td> <td>1.5</td> </tr> <tr> <td>Tumkur</td> <td></td> <td>1.5</td> <td>1.5</td> <td>1.35</td> <td></td> <td>1.5</td> </tr> <tr> <td>Total</td> <td>8</td> <td>9</td> <td>17</td> <td>12.5</td> <td>3</td> <td>11</td> </tr> </tbody> </table> <p>A comprehensive transmission system has been identified for immediate integration and evacuation of the above potential.</p> <p>Further, based on the communication received from SECI regarding prioritization of development of transmission system for integration of additional RE potential in Koppal and Gadag area of Karnataka and receipt of Stage-II Connectivity applications of about 900 MW at Koppal-II / Gadag-II area (Koppal-II – 400 MW & Gadag-II – 500 MW), as an advance action, transmission system for integration and immediate evacuation of additional RE potential of 1 GW each at Koppal-II and Gadag-II is being proposed for implementation.</p> <p>The Gadag-II REZ is being integrated with Koppal-II PS through Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line and Gadag-II REZ evacuation and</p>	District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)	Wind	Solar	Koppal	2	2	4	2.9	1	2	Gadag	2	2	4	2.9	1	2	Davangere / Chitradurga	2	2	4	2.9	1	2	Bijapur	2		2	1.1		2	Bellary		1.5	1.5	1.35		1.5	Tumkur		1.5	1.5	1.35		1.5	Total	8	9	17	12.5	3	11
District	Potential (GW)			Total (GW)	Dispatch (90% S + 55% W)					BESS	Evacuation capacity to be planned (GW)																																																	
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Koppal	2	2	4	2.9	1	2																																																						
Gadag	2	2	4	2.9	1	2																																																						
Davangere / Chitradurga	2	2	4	2.9	1	2																																																						
Bijapur	2		2	1.1		2																																																						
Bellary		1.5	1.5	1.35		1.5																																																						
Tumkur		1.5	1.5	1.35		1.5																																																						
Total	8	9	17	12.5	3	11																																																						

		<p>integration is dependent on Koppal-II PS. Accordingly, the scheme “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A)” and “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) Gadag-II” are required to be implemented simultaneously as a single scheme.</p> <p>The present phased scheme shall facilitate immediate integration and evacuation of 1 GW potential each at Koppal-II and Gadag-II.</p> <p>The scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru (Minutes of Joint Study meeting attached at Annexure-II).</p> <p>The scheme was also agreed in the 9th CMETS(SR) held on 29.07.2022 (Minutes of meeting attached at Annexure-III).</p>
6.	Estimated Cost	Rs. 2564 Crore
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	<p>A. ATC (considering Levelized Tariff @15% of estimated cost): 384.6 Crore</p> <p>B. Present ATC: Rs. 42,259.4 Crore[#]</p> <p>C. A/B (%): 0.91%</p>
8.	Need of phasing, if any	The implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects. The present scheme was already phased.
9.	Implementation timeframe	<p>18 months from date of allocation to implementing agency / SPV Transfer (as the case may be).</p> <p>Tentative time-frame: Aug'24 (Considering 6 months for necessary approvals & subsequent award of the project)</p>
10.	Inclusion of any wild life/protected area along the transmission line route	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	<p>The scheme was discussed in the 43rd SRPC meeting held on 23.09.2022 (Minutes of meeting attached at Annexure-IV).</p> <p>SRPC vide letter dated 04.10.2022 has recommended the scheme (Copy of SRPC views attached at Annexure-V).</p>
12.	System Study for evolution of the proposal	Minutes of the Joint Study meeting of Southern Region Constituents held on 30 th June – 2 nd July, 2022 at SRPC, Bengaluru are attached at Annexure-II with details of study considerations, load flow and short circuit results for various alternatives studied during the meeting.

Total YTC allowed for Jun'22, as per Notification of Transmission Charges payable by DICs for Billing Month of August, 2022 dated 25.07.2022 posted on NLDC website.

Note:

Space for Battery Energy Storage System (BESS) in Koppal-II PS and Gadag-II PS:

During the system studies carried out for integration and immediate evacuation of additional RE potential of 2 GW each at Koppal and Gadag, 1 GW (for 5 hours) BESS each at Koppal-II and Gadag-II was considered. The land requirement for establishment of BESS shall be under the under scope of BESS implementing agency.

Further, power from other RE Zones in Karnataka viz. Davangere, Bijapur and Bellary area (part of 181.5 GW RE capacity addition by 2030) would be pooled at Koppal-II PS for further evacuation.

Members may deliberate.

5.2 Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B)

S. No.	Items	Details												
1.	Name of Scheme	Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II(Phase-B)												
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3.	Depiction of the scheme on Transmission Grid Map	Annexure-I(b)																																												
4.	Upstream/downstream system associated with the scheme	Not applicable																																												
5.	Objective / Justification	<p>Govt. of India has set a target of 500 GW generation capacity from non-fossil fuel resources by 2030. In this direction, MNRE has identified addition of 181.5 GW RE Potential in the States of Andhra Pradesh, Telangana, Karnataka, Rajasthan, Madhya Pradesh and Tamil Nadu (Offshore). Out of the identified 181.5 GW Potential, 86 GW RE Potential is identified in the State of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu (Offshore) in Southern Region. The transmission system for integration of 181.5 GW RE Potential is under advanced stage of identification by CEA in coordination with CTU.</p> <p>Out of the identified (86 GW) RE Potential in Southern Region, 17 GW has been identified in the State of Karnataka. MNRE have indicated that out of the 17 GW REZ potential in Karnataka, transmission system for evacuation capacity of about 10.5 GW may be identified considering the Energy Storage System. The details of district wise potential is as below:</p> <table border="1"> <thead> <tr> <th rowspan="2">District</th> <th colspan="2">Potential (GW)</th> <th rowspan="2">Total (GW)</th> <th rowspan="2">Dispatch (90% S + 55% W)</th> <th rowspan="2">BESS</th> <th rowspan="2">Evacuation capacity to be planned (GW)</th> </tr> <tr> <th>Wind</th> <th>Solar</th> </tr> </thead> <tbody> <tr> <td>Koppal</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Gadag</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Davangere / Chitradurga</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Bijapur</td> <td>2</td> <td></td> <td>2</td> <td>1.1</td> <td></td> <td>2</td> </tr> <tr> <td>Bellary</td> <td></td> <td>1.5</td> <td>1.5</td> <td>1.35</td> <td></td> <td>1.5</td> </tr> </tbody> </table>	District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)	Wind	Solar	Koppal	2	2	4	2.9	1	2	Gadag	2	2	4	2.9	1	2	Davangere / Chitradurga	2	2	4	2.9	1	2	Bijapur	2		2	1.1		2	Bellary		1.5	1.5	1.35		1.5
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Bellary		1.5	1.5	1.35		1.5																																								

Tumkur		1.5	1.5	1.35		1.5
Total	8	9	17	12.5	3	11

A comprehensive transmission system has been identified for immediate integration and evacuation of the above potential.

Based on the communication received from SECI regarding prioritization of development of transmission system for integration of additional RE potential in Koppal and Gadag area of Karnataka and receipt of Stage-II Connectivity applications of about 900 MW at Koppal-II / Gadag-II area (Koppal-II – 400 MW & Gadag-II – 500 MW), as an advance action, transmission system for integration and immediate evacuation of RE potential of 1 GW each at Koppal-II and Gadag-II was proposed under “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II in Karnataka”.

Further, integration of balance additional 1 GW RE potential at Koppal-II is being proposed under the present scheme “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II(Phase-B) Koppal-II (Phase-B)”. Accordingly, the Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs.

The scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru (Minutes of Joint Study meeting attached at **Annexure-II**).

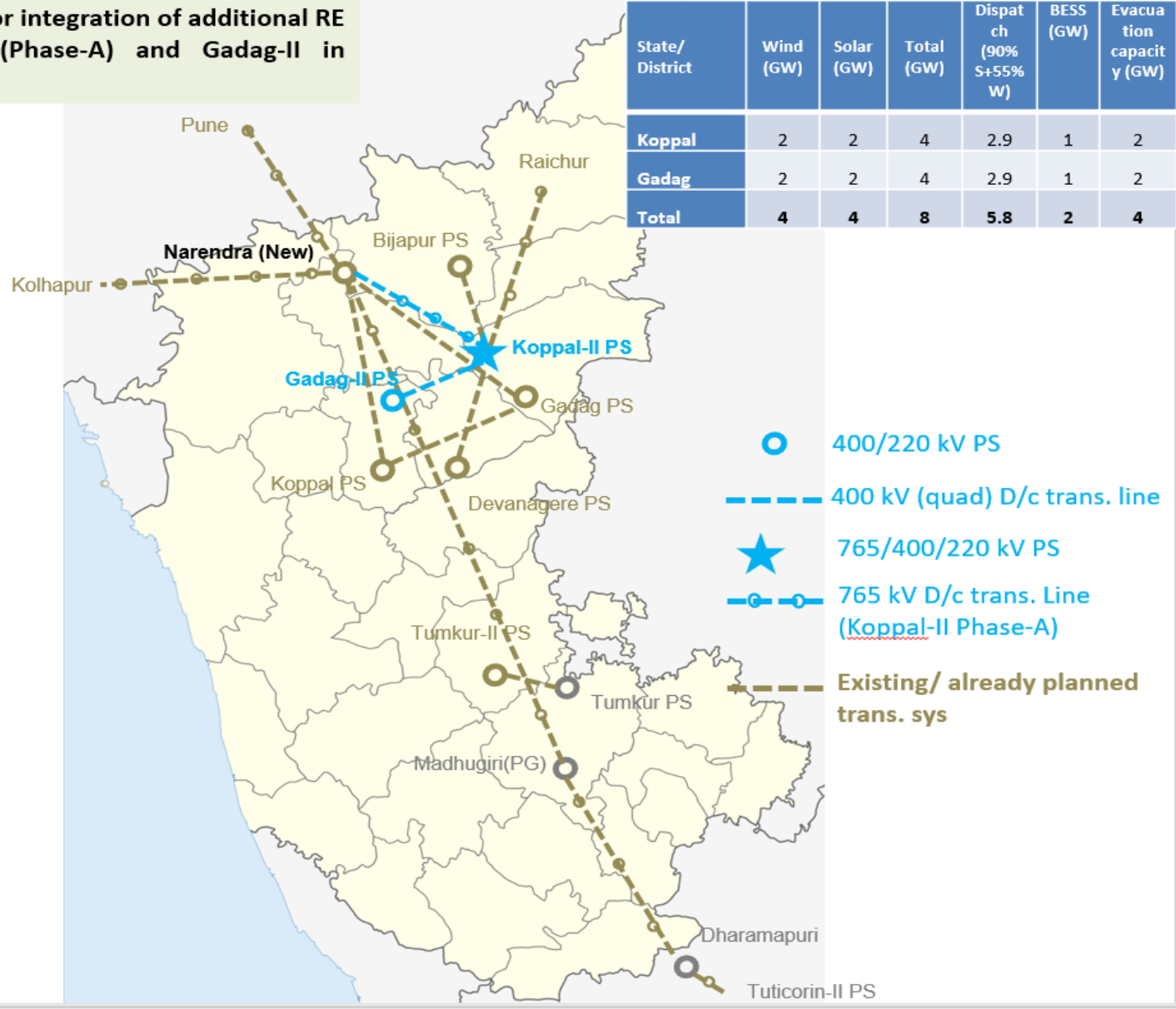
The scheme was also agreed in the 9th CMETS(SR) held on 29.07.2022 (Minutes of meeting attached at **Annexure-III**).

6.	Estimated Cost	Rs. 1881 Crore
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	A. ATC (considering Levelized Tariff @15% of estimated cost): 282.15 Crore B. Present ATC: Rs. 42,259.4 Crore# C. A/B (%): 0.667%
8.	Need of phasing, if any	The implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects. The present scheme was already phased.
9.	Implementation timeframe	18 months from date of allocation to implementing agency / SPV Transfer (as the case may be). Tentative time-frame: Aug'24 (Considering 6 months for necessary approvals & subsequent award of the project)
10.	Inclusion of any wild life/protected area along the transmission line	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.

	route	
11.	Deliberations with RPC along with their comments	The scheme was discussed in the 43 rd SRPC meeting held on 23.09.2022 (Minutes of meeting attached at Annexure-IV). SRPC vide letter dated 04.10.2022 has recommended the scheme (Copy of SRPC views attached at Annexure-V).
12.	System Study for evolution of the proposal	Minutes of the Joint Study meeting of Southern Region Constituents held on 30 th June – 2 nd July, 2022 at SRPC, Bengaluru are attached at Annexure-II with details of study considerations, load flow and short circuit results for various alternatives studied during the meeting.

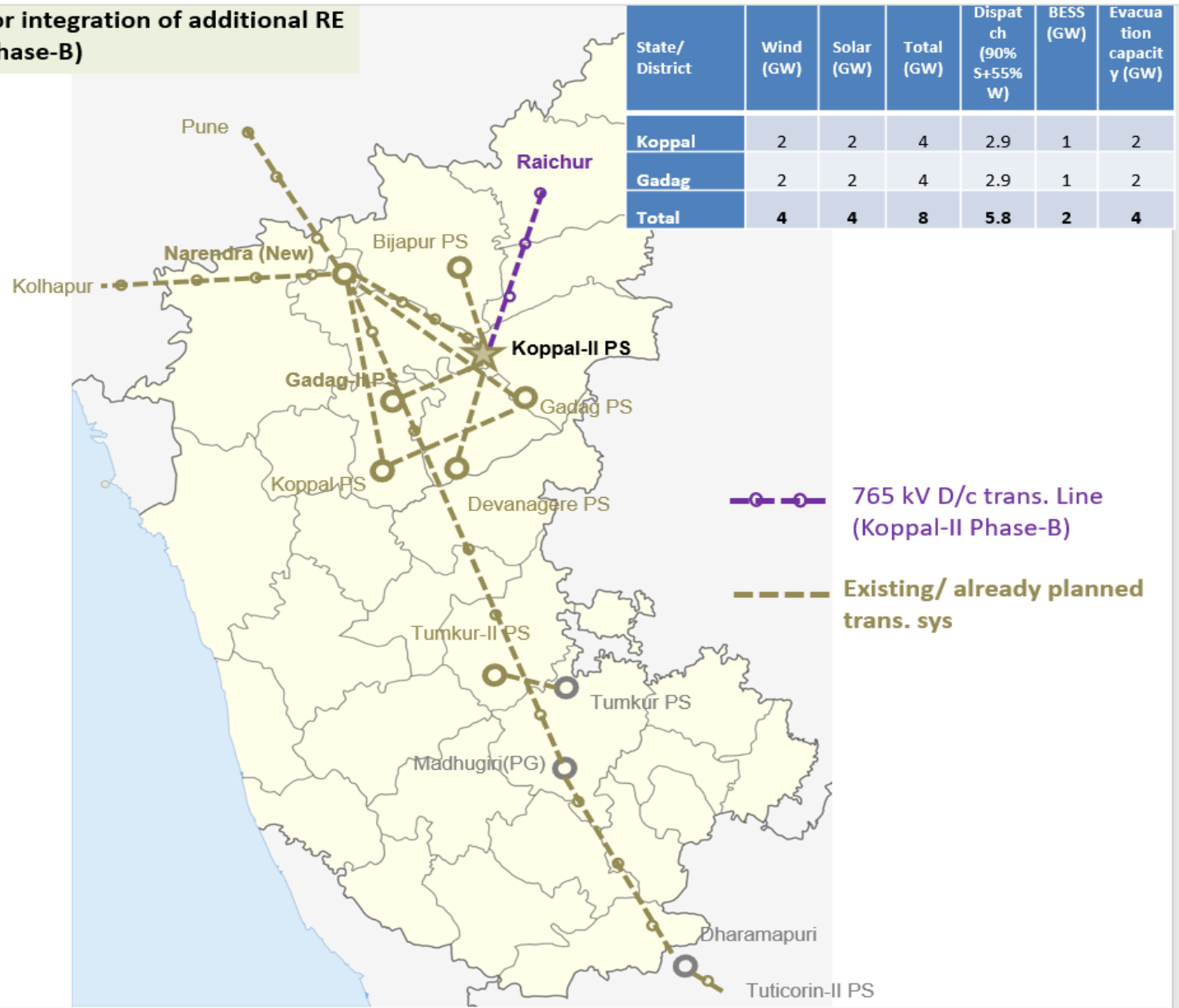
Total YTC allowed for Jun'22, as per Notification of Transmission Charges payable by DICs for Billing Month of August, 2022 dated 25.07.2022 posted on NLDC website

Transmission Scheme for integration of additional RE potential in Koppal-II(Phase-A) and Gadag-II in Karnataka

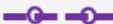



State/ District	Wind (GW)	Solar (GW)	Total (GW)	Dispat ch (90% S+55% W)	BESS (GW)	Evacua tion capacit y (GW)
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Total	4	4	8	5.8	2	4

Transmission Scheme for integration of additional RE potential in Koppal-II(Phase-B)



State/ District	Wind (GW)	Solar (GW)	Total (GW)	Dispat ch (90% S+55% W)	BESS (GW)	Evacua tion capacit y (GW)
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Total	4	4	8	5.8	2	4

 765 kV D/c trans. Line (Koppal-II Phase-B)
 Existing/ already planned trans. sys

6 Evaluation of functioning of National Grid.

POSOCO may make the requisite presentation apprising NCT of the performance of national Grid.

7 Comprehensive presentation by CTU apprising NCT of measures taken for ensuring development of an efficient, co-ordinated and economical ISTS for smooth flow of electricity.

CTU may present

8 Five-year rolling plan for ISTS capacity addition.

- As per the amended ToR of the NCT, CTU shall prepare a five-year rolling plan for ISTS capacity addition every year. The Annual Plan shall be put up to the NCT six months in advance.
- CTU may present
- Members may deliberate

9 Any other issues, with permission of chair

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड
(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)
(भारत सरकार का उद्यम)

CENTRAL TRANSMISSION UTILITY OF INDIA LTD.

(A wholly owned subsidiary of Power Grid Corporation of India Limited)

(A Government of India Enterprise)

Ref.: C/CTU/S/03/NCT

18.10.2022

Shri Ishan Sharan
Chief Engineer & Member Secretary (NCT)
Central Electricity Authority
Sewa Bhawan, R.K.Puram,
New Delhi-110 066.

Sub: New ISTS for deliberation in the forthcoming NCT meeting – reg.

Dear Sir,

This is in continuation to our letter dated 14.10.2022 wherein it was requested to convene NCT meeting at the earliest for deliberations on the scheme "Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka" and recommendation to MoP.

In this regard, the para mentioned in the above referred letter "*Further, SRPC vide letter dated 04.10.2022 has recommended the above scheme*" may be read as "**Further, SRPC vide letter dated 04.10.2022 has forwarded the views on the above scheme**".

Further, in the SI.No. 11 (Deliberations with RPC along with their comments) of the Enclosure-I i.e. "*SRPC vide letter dated 04.10.2022 has recommended the scheme (Copy of SRPC views attached at Annexure-V)*" may be read as "**SRPC vide letter dated 04.10.2022 has forwarded the views on the scheme (Copy of SRPC views attached at Annexure-V)**".

Thanking you,

Yours faithfully,


(Jasbir Singh) 18/10/22
Chief General Manager

Copy to:

1. Chief Engineer (PSP&A-I) Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi-110 066.	2. Member Secretary Southern Regional Power Committee 29, Race Course Cross Road, Bangalore – 560 009
3. Executive Director Southern Regional Load Dispatch Centre 29, Race Course Cross Road, Bangalore – 560009	4. Director (SO) POSOCO 9 th Floor, IFCI Towers, 61, Nehru Place, New Delhi – 110019

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड
(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)
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14.10.2022

Shri Ishan Sharan

Chief Engineer & Member Secretary (NCT)
Central Electricity Authority
Sewa Bhawan, R.K.Puram,
New Delhi-110 066.

Sub: New ISTS for deliberation in the forthcoming NCT meeting – reg.

Dear Sir,

This is with reference to proposed ISTS Network Expansion scheme "Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka". The scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru. The scheme was also agreed in the 9th CMETS(SR) held on 29.07.2022. The estimated cost of the scheme is Rs. 4445 Crores.

The details of the same are summarised below:

Sl.	Name of Scheme	State(s)	Tentative Cost (Rs. Crore)
1.	Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II in Karnataka	Karnataka	2564
2.	Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B)	Karnataka	1881
		Total	4445

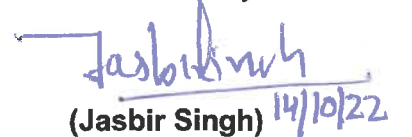
Details of the above scheme in the prescribed format are given at **Enclosure-I**.

Further, SRPC vide letter dated 04.10.2022 has recommended the above scheme.

In line with MoP office order no. 15/3/2018-Trans-Pt(5) dated 28.10.2021 regarding reconstitution of NCT, it is requested to convene NCT meeting at the earliest for deliberations on the above schemes & recommendation to MoP.

Thanking you,

Yours faithfully,


(Jasbir Singh) 14/10/22

Chief General Manager

Copy to:

1. Chief Engineer (PSP&A-I) Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi-110 066.	2. Member Secretary Southern Regional Power Committee 29, Race Course Cross Road Bangalore – 560 009
3. Executive Director Southern Regional Load Dispatch Centre 29, Race Course Cross Road, Bangalore – 560009	4. Director (SO) POSOCO 9 th Floor, IFCI Towers, 61, Nehru Place, New Delhi – 110019

Enclosure-I

1. ISTS Network Expansion scheme “Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka”

(i) Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II in Karnataka

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	<ul style="list-style-type: none"> • 220kV Sectionalization bay: 3 sets • 220 kV Bus Coupler (BC) Bay – 3 nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3 nos. • 400kV Sectionalization bay: 1 sets 	
2.	Koppal-II PS – Narendra New 765kV D/c line with 240 MVar SLR at Koppal-II PS end (~150 km)	<p>~150 km</p> <ul style="list-style-type: none"> • 765kV line bays – 2 nos. (GIS) (at Narendra New) • 765 kV, 240 MVar SLR at Koppal-II PS – 2 nos. (7x80 MVar inc. 1 switchable spare unit)
3.	2x330 MVar (765kV) & 2x125MVar (400kV) bus reactors at Koppal-II PS	<ul style="list-style-type: none"> • 765 kV, 330 MVar Bus Reactor – 2 nos. (7x110 MVar inc. 1 switchable spare unit) • 765 kV Bus Reactor bays – 2 nos. • 420kV, 125 MVar Bus Reactors – 2 nos. • 420kV, 125 MVar Bus Reactor bays – 2 nos.
4.	<p>Establishment of 400/220kV, 2x500 MVA Gadag-II Pooling Station</p> <p>Future Space Provisions:</p> <ul style="list-style-type: none"> • 400/220kV, 500 MVA, ICTs – 10 nos. • 400kV ICT bays – 10 nos. • 220kV ICT bays – 10 nos. • 400kV line bays – 6 nos. (with provision for SLR) • 220kV line bays – 10 nos. • 220kV Sectionalisation bay: 3 sets • 220 kV Bus Coupler (BC) Bay – 3 nos. 	<ul style="list-style-type: none"> • 400/220kV, 500 MVA, ICTs – 2 nos. • 400kV ICT bays – 2 nos. • 220kV ICT bays – 2 nos. • 400kV line bays – 2 nos. (at Gadag-II for termination of Gadag-II – Koppal-II line)) • 220kV line bays – 4 nos. • 220 kV Bus Coupler (BC) Bay – 1 no. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 no.

		220 kV Transfer Bus Coupler (TBC) Bay – 3 nos.																																																											
	5.	Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line (~100 km)	~100 km 400kV line bays - 2 (at Koppal-II)																																																										
	6.	2x125MVAr 420kV bus reactors at Gadag-II PS	• 420kV, 125 MVAr bus reactors – 2 nos. 420kV, 125 MVAr bus reactor bays – 2 nos.																																																										
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		<p>A comprehensive transmission system has been identified for immediate integration and evacuation of the above potential.</p> <p>Further, based on the communication received from SECI regarding prioritization of development of transmission system for integration of additional RE potential in Koppal and Gadag area of Karnataka and receipt of Stage-II Connectivity applications of about 900 MW at Koppal-II / Gadag-II area (Koppal-II – 400 MW & Gadag-II – 500 MW), as an advance action, transmission system for integration and immediate evacuation of additional RE potential of 1 GW each at Koppal-II and Gadag-II is being proposed for implementation.</p> <p>The Gadag-II REZ is being integrated with Koppal-II PS through Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line and Gadag-II REZ evacuation and integration is dependent on Koppal-II PS. Accordingly, the scheme “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A)” and “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) Gadag-II” are required to be implemented simultaneously as a single scheme.</p> <p>The present phased scheme shall facilitate immediate integration and evacuation of 1 GW potential each at Koppal-II and Gadag-II.</p> <p>The scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru (Minutes of Joint Study meeting attached at Annexure-II).</p> <p>The scheme was also agreed in the 9th CMETS(SR) held on 29.07.2022 (Minutes of meeting attached at Annexure-III).</p>
6.	Estimated Cost	Rs. 2564 Crore
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	<p>A. ATC (considering Levelized Tariff @15% of estimated cost): 384.6 Crore</p> <p>B. Present ATC: Rs. 42,259.4 Crore[#]</p> <p>C. A/B (%): 0.91%</p>
8.	Need of phasing, if any	The implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects. The present scheme was already phased.
9.	Implementation timeframe	<p>18 months from date of allocation to implementing agency / SPV Transfer (as the case may be).</p> <p>Tentative time-frame: Aug'24 (Considering 6 months for necessary approvals & subsequent award of the project)</p>

10.	Inclusion of any wild life/protected area along the transmission line route	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.
11.	Deliberations with RPC along with their comments	The scheme was discussed in the 43 rd SRPC meeting held on 23.09.2022 (Minutes of meeting attached at Annexure-IV). SRPC vide letter dated 04.10.2022 has recommended the scheme (Copy of SRPC views attached at Annexure-V).
12.	System Study for evolution of the proposal	Minutes of the Joint Study meeting of Southern Region Constituents held on 30 th June – 2 nd July, 2022 at SRPC, Bengaluru are attached at Annexure-II with details of study considerations, load flow and short circuit results for various alternatives studied during the meeting.

Total YTC allowed for Jun'22, as per Notification of Transmission Charges payable by DICs for Billing Month of August, 2022 dated 25.07.2022 posted on NLDC website.

Note:

Space for Battery Energy Storage System (BESS) in Koppal-II PS and Gadag-II PS:

During the system studies carried out for integration and immediate evacuation of additional RE potential of 2 GW each at Koppal and Gadag, 1 GW (for 4 hours) BESS each at Koppal-II and Gadag-II was considered. The land requirement for establishment of BESS shall be under the under scope of BESS implementing agency.

(ii) Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B)

S. No.	Items	Details									
1.	Name of Scheme	Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II(Phase-B)									
2.	Scope of the scheme	<table border="1"> <thead> <tr> <th>Sl.</th> <th>Scope of the Transmission Scheme</th> <th>Capacity /km</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Koppal-II PS – Raichur 765kV D/c line with 330 MVar SLR at Koppal-II PS end (~190 km)</td> <td>~190 km <ul style="list-style-type: none"> • 765kV line bays – 2 nos. (at Koppal-II) • 765kV line bays – 2 nos. (at Raichur) • 765 kV, 330 MVar SLR at Koppal-II PS – 2 nos. (7x110 MVar inc. 1 switchable spare unit) </td> </tr> <tr> <td>2.</td> <td>Augmentation of 2x1500, 765/400kV, ICTs at Koppal-II PS</td> <td> <ul style="list-style-type: none"> • 765/400kV, 1500 MVA, ICTs – 2 nos. • 765kV ICT bays – 2 nos. • 400kV ICT bays – 2 nos. </td> </tr> </tbody> </table>	Sl.	Scope of the Transmission Scheme	Capacity /km	1.	Koppal-II PS – Raichur 765kV D/c line with 330 MVar SLR at Koppal-II PS end (~190 km)	~190 km <ul style="list-style-type: none"> • 765kV line bays – 2 nos. (at Koppal-II) • 765kV line bays – 2 nos. (at Raichur) • 765 kV, 330 MVar SLR at Koppal-II PS – 2 nos. (7x110 MVar inc. 1 switchable spare unit) 	2.	Augmentation of 2x1500, 765/400kV, ICTs at Koppal-II PS	<ul style="list-style-type: none"> • 765/400kV, 1500 MVA, ICTs – 2 nos. • 765kV ICT bays – 2 nos. • 400kV ICT bays – 2 nos.
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		<p>3. Augmentation of 2x500, 400/220kV, ICTs at Koppal-II PS.</p> <ul style="list-style-type: none"> • 400/220kV, 500 MVA, ICTs – 2 nos. • 400kV ICT bays – 2 nos. • 220kV ICT bays – 2 nos. • 220kV line bays – 4 nos. • 220kV Sectionalization bay: 1 set • 220 kV Bus Coupler (BC) Bay – 1 no. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 no. 																																												
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5.	Objective / Justification	<p>Govt. of India has set a target of 500 GW generation capacity from non-fossil fuel resources by 2030. In this direction, MNRE has identified addition of 181.5 GW RE Potential in the States of Andhra Pradesh, Telangana, Karnataka, Rajasthan, Madhya Pradesh and Tamil Nadu (Offshore). Out of the identified 181.5 GW Potential, 86 GW RE Potential is identified in the State of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu (Offshore) in Southern Region. The transmission system for integration of 181.5 GW RE Potential is under advanced stage of identification by CEA in coordination with CTU.</p> <p>Out of the identified (86 GW) RE Potential in Southern Region, 17 GW has been identified in the State of Karnataka. MNRE have indicated that out of the 17 GW REZ potential in Karnataka, transmission system for evacuation capacity of about 10.5 GW may be identified considering the Energy Storage System. The details of district wise potential is as below:</p> <table border="1"> <thead> <tr> <th rowspan="2">District</th> <th colspan="2">Potential (GW)</th> <th rowspan="2">Total (GW)</th> <th rowspan="2">Dispatch (90% S + 55% W)</th> <th rowspan="2">BESS</th> <th rowspan="2">Evacuation capacity to be planned (GW)</th> </tr> <tr> <th>Wind</th> <th>Solar</th> </tr> </thead> <tbody> <tr> <td>Koppal</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Gadag</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Davangere / Chitradurga</td> <td>2</td> <td>2</td> <td>4</td> <td>2.9</td> <td>1</td> <td>2</td> </tr> <tr> <td>Bijapur</td> <td>2</td> <td></td> <td>2</td> <td>1.1</td> <td></td> <td>2</td> </tr> <tr> <td>Bellary</td> <td></td> <td>1.5</td> <td>1.5</td> <td>1.35</td> <td></td> <td>1.5</td> </tr> </tbody> </table>	District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)	Wind	Solar	Koppal	2	2	4	2.9	1	2	Gadag	2	2	4	2.9	1	2	Davangere / Chitradurga	2	2	4	2.9	1	2	Bijapur	2		2	1.1		2	Bellary		1.5	1.5	1.35		1.5
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A comprehensive transmission system has been identified for immediate integration and evacuation of the above potential.

Based on the communication received from SECI regarding prioritization of development of transmission system for integration of additional RE potential in Koppal and Gadag area of Karnataka and receipt of Stage-II Connectivity applications of about 900 MW at Koppal-II / Gadag-II area (Koppal-II – 400 MW & Gadag-II – 500 MW), as an advance action, transmission system for integration and immediate evacuation of RE potential of 1 GW each at Koppal-II and Gadag-II was proposed under “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II in Karnataka”.

Further, integration of balance additional 1 GW RE potential at Koppal-II is being proposed under the present scheme “Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II(Phase-B) Koppal-II (Phase-B)”. Accordingly, the Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs.

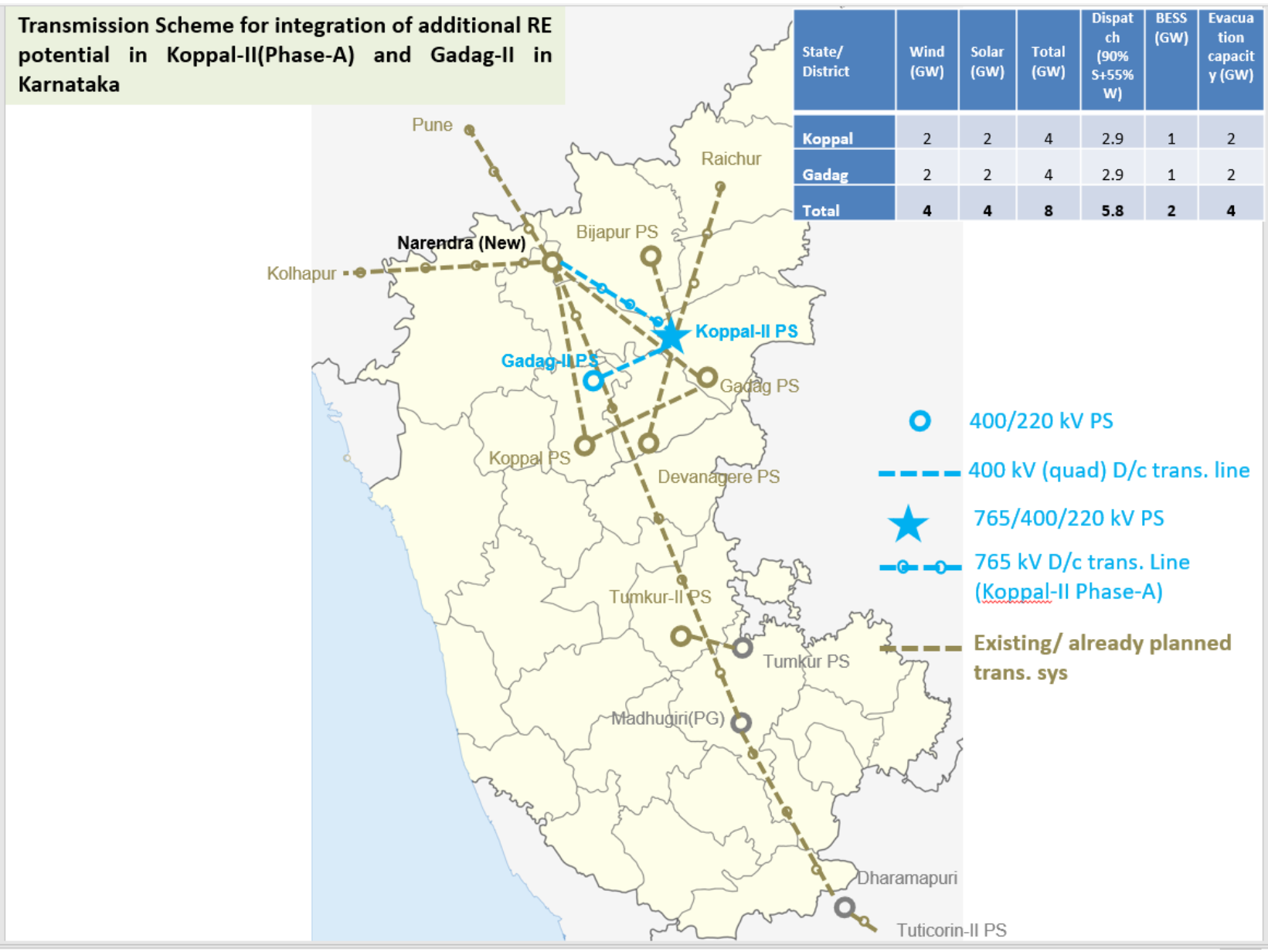
The scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru (Minutes of Joint Study meeting attached at **Annexure-II**).

The scheme was also agreed in the 9th CMETS(SR) held on 29.07.2022 (Minutes of meeting attached at **Annexure-III**).

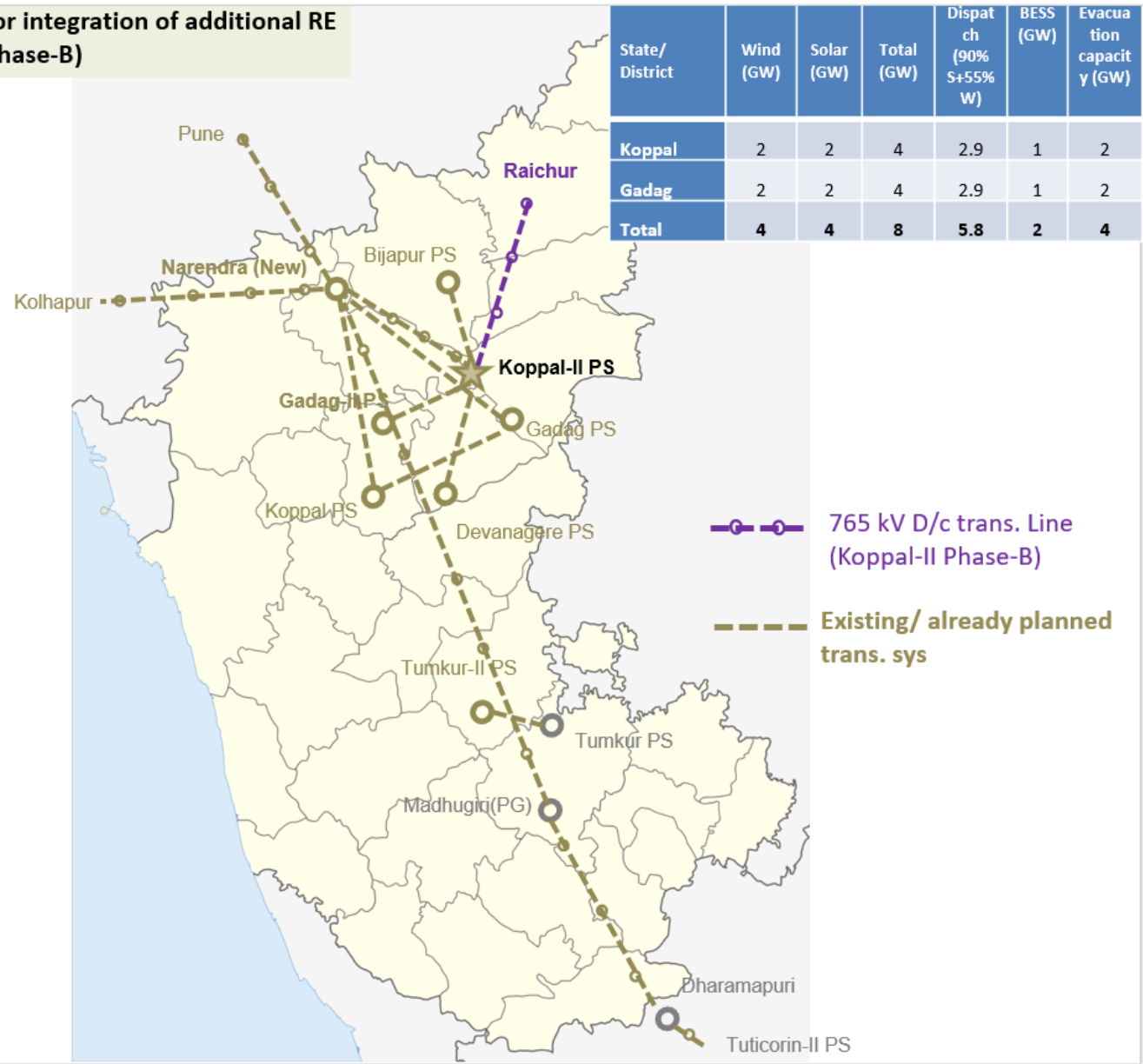
6.	Estimated Cost	Rs. 1881 Crore
7.	Impact on the total Annual Transmission charges in % along with the existing ATC	A. ATC (considering Levelized Tariff @15% of estimated cost): 282.15 Crore B. Present ATC: Rs. 42,259.4 Crore [#] C. A/B (%): 0.667%
8.	Need of phasing, if any	The implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects. The present scheme was already phased.
9.	Implementation timeframe	18 months from date of allocation to implementing agency / SPV Transfer (as the case may be). Tentative time-frame: Aug'24 (Considering 6 months for necessary approvals & subsequent award of the project)
10.	Inclusion of any wild life/protected area along	No major National Park, Wildlife Sanctuary or other protected areas observed. However, for details of forest/protected areas, survey is required to be done.

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Transmission Scheme for integration of additional RE potential in Koppal-II(Phase-B)



State/ District	Wind (GW)	Solar (GW)	Total (GW)	Dispat ch (90% S+55% W)	BESS (GW)	Evacua tion capacit y (GW)
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Total	4	4	8	5.8	2	4

सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड

(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)

(भारत सरकार का उदयम)

CENTRAL TRANSMISSION UTILITY OF INDIA LTD.

(A wholly owned subsidiary of Power Grid Corporation of India Limited)

(A Government of India Enterprise)

Ref: CTU/S/00/Joint Studies-SR**Date:** 21.07.2022**As per distribution list****Subject: Minutes of the Joint Study meeting of Southern Region Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru.**

Dear Sir/Ma'am,

As per the decision in the 7th Consultation Meeting for Evolving Transmission Schemes in SR, held on 31.05.2022 and 42nd SRPC meeting held on 04.06.2022, physical Joint Study meeting of Southern Region Constituents was held on 30th June – 2nd July, 2022 at SRPC, Bengaluru to discuss various ISTS transmission proposals.

In this regard, please find attached minutes of the meeting.

Thanking you,

Yours faithfully,

**(Anil Kr. Meena)**
Sr. DGM**Encl:** As above

Distribution List:

1. Chief Engineer (PSP&A – I) Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi – 110 066.	2. Member Secretary Southern Regional Power Committee 29, Race Course Cross Road Bangalore – 560 009.
3. Director (Transmission) Transmission Corp. of Andhra Pradesh Ltd. (APTRANSCO) Vidyut Soudha, Gunadala, Eluru Rd, Vijayawada, Andhra Pradesh – 520 004	4. Director Transmission) Transmission Corp. of Telangana Ltd. Vidyut Soudha Hyderabad – 500 082 Fax: 040-23321751
5. Director (Transmission) Karnataka State Power Transmission Corp. Ltd., Cauvery Bhawan Bangalore – 560 009 Fax: 080-22228367	6. Director (Trans. & System Op.), Kerala State Electricity Board Ltd. Vidyuthi Bhawanam, Pattom, P.B. No. 1028 Thiruvananthapuram – 695 004. Fax: 0471-2444738
7. Director (Transmission Projects) Tamil Nadu Transmission Corporation Ltd (TANTRANSCO) 6 th Floor, Eastern Wing, 800 Anna Salai, Chennai – 600 002 Fax: 044-28516362	8. Superintending Engineer –I First Floor, Electricity Department Gingy Salai, Puducherry – 605 001.
9. Executive Director Southern Regional Load Dispatch Centre POSOCO 29, Race Course Cross Road, Bangalore – 560 009	

**Minutes of the Joint Study meeting of Southern Region Constituents
held on 30th June – 2nd July, 2022 at SRPC, Bengaluru**

1. During the 7th Consultation Meeting for Evolving Transmission Schemes in SR, held on 31.05.2022 through virtual mode, it was decided that physical Joint Study would be conducted in June/July, 2022 with participation from Southern Region stake holders, CEA, SRPC, CTU, POSOCO etc. for Transmission Schemes for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary Area of Karnataka and Transmission system for grant of LTA to M/s NPCIL for 2000 MW Kudankulam APP generation expansion project.

Further, during the 42nd SRPC meeting held on 04.06.2022, Southern Region constituents had also requested for physical Joint Study meeting for studying ISTS proposals and Intra State constraints during peak demand.

Accordingly, Joint Studies were conducted from 30th June to 2nd July, 2022 at SRPC, Bengaluru. List of participants are attached at **Annexure-I**.

2. Member Secretary, SRPC, welcomed the participants. He stated that Joint Studies would be conducted as per the circulated agenda and the transmission system evolved in the Joint Studies will be put-up for discussions in the upcoming Consultation Meeting for Evolving Transmission Schemes in SR. It was also opined that a separate Joint Studies may be conducted with CEA for transmission schemes and proposals of Intra-State transmission system. He requested the STU representatives to participate actively so that their concerns in the proposal for ISTS schemes are addressed.
3. ED, SRLDC, acknowledged the importance of ISTS network provided by the system planners with which the Southern Region could meet the highest ever peak demand of about 60,000 MW & also imported about 16,000 MW from NEW grid without any congestion or market split. However, he expressed concerns for the inadequate planning / implementation under Intra-State network of various States which has observed multiple instances of congestion / isolated disturbances and operations without meeting the N-1 contingency criteria during the past peak demand season in Southern Region. If the adequate measure are not taken in time, the States may not be able to meet their future peak demand and may have to face load shedding or unnecessary stress on the transmission system despite having margins in the ISTS network. In this background he expressed that suitable augmentation for strengthening of ISTS & Intra-STS shall be identified during this Joint Study meeting for future requirements.
4. Member Secretary, SRPC, requested Sr. DGM (CTU) to take-up the proposals for discussions.
5. As opening remarks, Sr. DGM (CTU) stated that CTU has been making its consistent effort in planning the ISTS network for fulfillment of the needs of the Southern States. As acknowledged by SRLDC, CTU in association with the Southern Region stake holders had identified & implemented transmission system which has met the requirements towards import of cheaper power from NEW grid and facilitated in

meeting the demand under peak load season. However, as we all know, Southern States are rich in RE resources and Govt. of India is targeting to harness the RE resources to the extent possible for meeting future requirements. This situation may leads to Southern Region in surplus of power during peak RE season and shall export power to NEW grid, however on the contrary it is expected to remain power deficit during the peak demand season and continue to import power from NEW grid. Therefore, under such scenario the Inter-Regional corridors between SR grid and NEW grid shall be optimally utilized for export / import of power as per the requirements of Southern States.

In this background, CTU has proposed Joint Study meeting, as were conducted in the past also, for identification of transmission system for Kudankulam 3 & 4 (2x1000 MW) under LTA and transmission system for integration of additional RE potential in Koppal-II & Gadag-II under Phase-II and Davangere, Bijapur & Bellary under future phases. The system studies may be taken-up on generation basis and area basis along with other scenarios.

6. Transmission system for evacuation of power from Kudankulam 3 & 4 (2x1000 MW) under LTA.

CTU informed that LTA application has been received from M/s NPCIL in the month of May, 2022 for transfer of power from Kudankulam Atomic Power Plant – 3 & 4 (2x1000 MW) to Southern Region beneficiaries on target basis. The details of the application are given below:

Application Id	Name of the Applicant	Date of Application	LTA quantum (MW)	LTA Start date	Drawl Point
1200003911	Nuclear Power Corporation of India Ltd.	10.05.2022	2000	31.05.2025	Target (SR)

It was informed that though LTA has been sought from 31.05.2025, however looking into the past experience wherein it is observed that commissioning of NPCIL generation projects faces substantial delay, the system studies may be carried out under 2026-27 time frame with the availability of identified transmission system under respective STUs. Further, NPCIL has informed that Unit-5&6 have also been planned and has been considered by CEA under the draft NEP for generation under 2026-27 time frame.

It was also informed that as part of Rolling Plan for ISTS for 2026-27, network updation was carried out in system study files in consultation with SR constituents and detailed system studies were carried out for 9 nos. of scenarios in 2026-27 timeframe. The findings of the system studies were brought out as Rolling Plan 2026-27 (Inter State Transmission System) and the same is available at CTU website. Further, exercise for preparation of system study files for 2027-28 are being undertaken by CTU in consultation with the SR constituents.

Kudankulam is the nuclear generation project which shall be considered available under all the scenarios. To observe the worst scenarios, the System studies were conducted for 2026-27 timeframe for maximum export (Scenario 4 - June solar max)

and import scenario (Scenario 7 - February Solar max) of Southern incorporating the STU network changes. As per the prepared LGB, export of 9500 MW is envisaged in Scenario-4 with the consideration of KNPP U-3&4 and Koppal/Gadag REZ potential. Further, with the consideration of above generation, import of 8000 MW is considered in Scenario-7. It was informed that Offshore wind potential of 5342 MW has been identified by MNRE/ SECI in the coast of Tamil Nadu near Tuticorin area for which Stage-1 auction is expected by 2022 & Stage-2 auction is expected between 2024-26. The transmission system for integration of 181.5 GW of REZ (which includes the above Offshore potential of 5 GW) is under identification by CEA in consultation with CTU and a detailed report for the same is expected to be published shortly. Accordingly, looking into the concurrent timeframe of development of KNPP-3&4 and Offshore potential REZ, CTU opined that same may also be considered in the system studies to assess overall network adequacy in the area. Further, any additional transmission system required for evacuation of power from KNPP-5&6 may also be studied during the Joint Study meeting.

TANGEDCO representative informed that they have requested MoP for allocation of entire power from KNPP-3&4 which is under consideration by MoP. Therefore, transmission system may be evolved considering both the likely scenarios wherein entire power is allocated to Tamil Nadu or alternatively it is allocated to the SR States.

The LGB considered for the studies is enclosed at **Annexure-II**

The detailed system studies were conducted for both the scenarios wherein detailed deliberations were held on the LGB and various alternatives were studied. It was observed that with the interconnection of KNPP-3&4 to Tuticorin PS, generation of about 4058 MW (Tuticorin-II GIS PS REZ – 2.5 GW, CEPL- 558 MW, Tuticorin JV- 1000 MW) is being pooled at Tuticorin PS and in addition to KNPP complex (4000 MW). Under such a case, the Tuticorin-Madurai 400 kV (quad) D/c line do not meet 'N-1' contingency criteria. Therefore, Tuticorin JV – Tuticorin PS 400kV (quad) D/c line and Tuticorin PS – Madurai 400kV (quad) D/c line may be bypassed at Tuticorin PS to form Tuticorin JV – Madurai 400kV (quad) D/c line.

Based on the studied alternatives, a comprehensive transmission system was evolved for evacuation of power from Kudankulam Phase-II (4x1000 MW). Details of the transmission system are as below:

Comprehensive Transmission System requirement for evacuation and supply of power from Kudankulam Phase-II (4x1000 MW)

- Kudankulam Ph-II - Tuticorin PS - Viruddanagar (TN) 400kV (quad) D/c line
- Kudankulam Ph-II - Samugarangapuram (TN) 400kV (quad) D/c line
- Bypassing of Tuticorin JV – Tuticorin PS 400kV (quad) D/c line and Tuticorin PS – Madurai 400kV (quad) D/c line at Tuticorin PS to form Tuticorin JV – Madurai 400kV (quad) D/c line.
- Shifting of one circuit of Kudankulam 1&2 – Tirunelveli 400kV (quad) D/c line to Kudankulam 3&4 to form Kudankulam 3&4 – Tirunelveli 400kV (quad) line
- 2x125 MVAR (420kV) bus reactors at Kudankulam Unit - 3&4
- 2x125 MVAR (420kV) bus reactors at Kudankulam Unit - 5&6

- Charging of Tuticorin PS - Salem 765kV D/c line (presently charged at 400kV level) at its rated 765kV voltage level
- Upgradation of Tuticorin PS with 3x1500 MVA 765/400kV ICTs
- Upgradation of Salem with 3x1500 MVA 765/400kV ICTs

Phasing of the Comprehensive Transmission System with KKNPP 3&4 and KKNPP 5&6

(i) Transmission Scheme for Kudankulam 3 & 4

a. Option-1 : (Power is allocated to SR beneficiaries)

- Kudankulam Ph-II – Tuticorin PS 400kV (quad) D/c line.
- Tuticorin PS – Viruddanagar (TN) 400kV (quad) D/c line.
- Kudankulam Ph-II – Samugarangapuram(TN) 400kV (quad) D/c line **(under the scope of TANTRANSCO)**
- Bypassing of Tuticorin JV – Tuticorin PS 400kV (quad) D/c line and Tuticorin PS – Madurai 400kV (quad) D/c line at Tuticorin PS to form Tuticorin JV – Madurai 400kV (quad) D/c line.
- Shifting of one circuit of Kudankulam 1&2 – Tirunelveli 400kV (quad) D/c line to Kudankulam 3&4 to form Kudankulam 3&4 – Tirunelveli 400kV (quad) line
- 2x125 MVA (420kV) bus reactors at Kudankulam 3&4
- Charging of Tuticorin PS – Salem 765kV D/c line (presently charged at 400kV level) at its rated voltage of 765kV level
- Upgradation of Tuticorin PS with 3x1500 MVA 765/400kV ICTs
- Upgradation of Salem with 3x1500 MVA 765/400kV ICTs

Note: Separate 230kV level connectivity to KKNP Phase-II shall be identified by TANTRANSCO separately for providing start-up power, black start and evacuation of part of its share. TANTRANSCO shall submit detailed evacuation plan.

b. Option-2 : (Entire Power is allocated to Tamil Nadu)

- Kudankulam Ph-II – Viruddanagar (TANTRANSCO) 400kV (quad) D/c line **(under the scope of TANTRANSCO)**
- Kudankulam Ph-II – Samugarangapuram (TANTRANSCO) 400kV (quad) D/c line **(under the scope of TANTRANSCO)**
- Shifting of one circuit of Kudankulam 1&2 – Tirunelveli 400kV (quad) D/c line to Kudankulam 3&4 to form Kudankulam 3&4 – Tirunelveli 400kV (quad) line
- 2x125MVA (420kV) bus reactors at Kudankulam 3&4

Note: Separate 230kV level connectivity to KKNP Phase-II shall be identified by TANTRANSCO separately for providing start-up power, black start and evacuation of part of its share. TANTRANSCO shall submit detailed evacuation plan.

(ii) Transmission Scheme for Kudankulam Unit - 5 & 6

The balance transmission system from the Comprehensive Transmission System required for evacuation and supply of power from Kudankulam Phase-II (4x1000 MW) shall be taken-up with the KKNPP-5&6.

SRPC requested that the constituents may express their observations / comments on the proposal for evacuation of power from Kudankulam Ph-II.

SRLDC expressed that the proposal seems to be in order and no issues are expected in evacuation of power from KNPPP-3&4 with the proposed transmission system. However, augmentation in corresponding State network needs to be identified and implemented on time by respective STUs for absorption of allocated power from Kudankulam Units. It was also informed that the transmission system in Tamil Nadu experiences severe loading on 400/230kV ICTs and intra-state transmission lines every year during the peak demand season. Similar constraints are expected in the intra state transmission system of APTRANSCO for drawl of power. Karnataka transmission system is also facing the similar issues of constraints under the state transmission system. CTU informed that the issue of requirement of strengthening of the Intra-State transmission system has been highlighted in several meetings and the same has also been brought out by SRPC and SRLDC. Further, on account of inadequacy of margins in drawl capacity of AP/Tamil Nadu, CTU may be in a difficult position to grant additional LTA/MTOA for drawl of power. Towards this, TANTRANSCO stated that they shall take-up the requisite ICT augmentations and identify & take-up the implementation of required Intra-State system strengthening on priority.

SRLDC further stated that with the commissioning of 4 more units at Kudankulam NPP complex total generating capacity will be 6000 MW. The total start-up power requirement would be around 360 MW (6% of capacity) in case of any grid disturbance. However, there are limited self-starting hydro resources available in south Tamil Nadu, which would not fulfil this requirement. Hence it is suggested to plan for a Combined Cycle Gas plant for providing Start-Up Power. Accordingly, it was suggested that separate 230kV level connectivity to KNPP Phase-II may be identified by TANTRANSCO separately for providing start-up power, black start and evacuation of part of its share. TANTRANSCO shall submit detailed evacuation plan.

SRLDC further requested that sufficient reactive compensation may be identified for the subject transmission scheme. Further availability of the same may be ensured prior to commissioning of the generation project & transmission lines. CTU informed that provision of the suitable reactive compensation has been kept under the transmission system. Further reactive compensation on the transmission lines shall be suitably identified based on the line length and be implemented with the transmission system. TANGEDCO representative informed that the identified transmission system is agreeable to them and may be taken-up based on the allocation of share of power from KNPP-3&4 by MoP. Towards an enquiry raised by TANGEDCO regarding charging of Tuticorin PS - Salem 765kV D/c line (presently charged at 400kV level) at its rated 765kV voltage level, CTU clarified that though upgradation of only Tuticorin PS - Salem 765kV D/c line shall be required for evacuation of power from KNPP-3&4. However, based on the materialization of potential REZ in Southern Region, the

upgradation of entire 765 kV corridor from Tuticorin – Salem – Madhugiri – Narendra may be required for facilitating export of surplus power from Southern Region. The same has already been agreed as “Common Transmission System Strengthening in Southern Region for export of power from Solar & Wind Energy Zone in Southern Region”. However, the implementation shall be taken-up as per the requirements. TANGEDCO requested that session on assessment of ATC/TTC for States may be carried out by RLDC / CTU in consultation with States. After deliberations, it was agreed that it shall be conducted by RLDC separately.

APTRANSCO informed that the proposal is agreeable. Further, upgradation of 765 kV corridor from Tuticorin – Salem – Madhugiri – Narendra may be taken-up only upon materialization of RE generation projects in Southern Region.

KPTCL agreed with the proposed transmission scheme and requested that as an additional scenario, off-peak scenario with generation at Bellary/RTPS etc. may also be carried-out. Accordingly, system studies were also conducted on Scenario 6 (June night off-peak) wherein it was observed that the line loadings were found generally in order.

KSEB also agreed for the transmission system and informed that they may be looking for allocation of 10% power from KNPP-3&4. With the proposed transmission system, the allocation of Kerala may be adequately transferred from Tirunelveli. The study results are enclosed at **Exhibit – 1 & 2** as per below details.

SI.No.	Scenario	Case	Exhibit No.
1.	Scenario-4 (Export case)	Base Case (With KNPP 3 & 4 units)	Exhibit-1
2.		Base case + Outage of KNPP 3&4– Tuticorin PS 400kV (quad) D/c line	Exhibit-1a
3.		Base case + Outage of KNPP 3&4 – Samugarangapuram 400kV (quad) D/c line	Exhibit-1b
4.		Base case + Outage of Tuticorin PS – Virudhunagar 400kV (quad) D/c line	Exhibit-1c
5.		Base case + N-1 of Tuticorin PS – Dharmapuri 765kV D/c line	Exhibit-1d
6.		Base Case + KNPP 5 & 6 units	Exhibit-1e
7.	Scenario-7 (Import case)	Base Case (With KNPP 3 & 4 units)	Exhibit-2
8.		Base case + Outage of KNPP 3&4 – Tuticorin PS 400kV (quad) D/c line	Exhibit-2a
9.		Base case + Outage of KNPP 3&4 – Samugarangapuram 400kV (quad) D/c line	Exhibit-2b
10.		Base case + Outage of Tuticorin PS – Virudhunagar 400kV (quad) D/c line	Exhibit-2c
11.		Base case + N-1 of Tuticorin PS – Dharmapuri 765kV D/c line	Exhibit-2d
12.		Base Case + KNPP 5 & 6 units	Exhibit-2e

7. Transmission Scheme for Renewable Energy Zone (Phase-II) in Koppal-II in Karnataka and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary.

CTU informed that as part of transmission system planning for 18.5 GW in Southern Region, CTU has planned the Koppal PS and Gadag PS in the state of Karnataka with 5x500 MVA, 400/220 kV ICTs. The Transmission System associated with Koppal PS and Gadag PS are under advance stage of implementation. CTU has allocated all 9 nos. of 220 kV line bays for 2664.6 MW capacity at Koppal PS and all 8 nos. of 220kV line bays for 2110MW capacity at Gadag PS to various RE developers in Karnataka for termination of their dedicated transmission line. Accordingly, Koppal PS and Gadag PS have been closed for further grant of Connectivity through allocation of new bay(s). However, margins available in the allocated bay(s) shall be utilized for Connectivity through enhancement in Connectivity quantum or sharing of dedicated transmission line.

Further, Govt. of India has set a target of 500 GW capacity addition from non-fossil fuel based generation capacity by 2030. In this direction, MNRE has identified the 181.5 GW of RE Potential in the states of Andhra Pradesh, Telangana, Karnataka, Rajasthan, Madhya Pradesh and Tamil Nadu (Offshore). Out of the identified 181.5 GW Potential, 86 GW RE Potential is identified in the State of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu (Offshore) in Southern Region. The transmission system for integration of the RE Potential is under advanced stage of identification by CEA in coordination with CTU.

Out of this 86 GW RE Potential in Southern Region, 17 GW has been identified in the State of Karnataka. MNRE have indicated that out of the 17 GW REZ potential in Karnataka, transmission system for evacuation capacity of 10.5 GW may be identified considering the Energy Storage System. The details of district wise RE potential and evacuation capacity to be planned considering Wind & Solar dispatch are given below:

District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)
	Wind	Solar				
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Davangere / Chitradurga	2	2	4	2.9	1	2
Bijapur	2		2	1.1		2
Bellary		1.5	1.5	1.35		1.5
Tumkur		1.5	1.5	1.35		1.5
Total	8	9	17	12.5	3	11

Additional transmission system is required for integration and immediate evacuation of additional RE potential of 2 GW at Koppal and Gadag each as well as integration of RE potential at Gadag, Davangere, Bijapur and Bellary through 400kV transmission lines with Koppal-II PS 765/400/220kV.

Further, it was informed that SECI vide email dated 08.05.2022 has communicated that they have floated tenders for selection of RE developer and the developers would

opt for setting up of RE projects in Koppal and Gadag area of Karnataka. Accordingly, SECI has requested to prioritize the development of associated transmission system for integration of additional potential at Koppal and Gadag.

Also, CTU is continuously receiving Connectivity applications and representations from RE developers for further augmentation of capacity at under implementation Koppal PS and Gadag PS so that they may further integrate the proposed RE generation projects in the area. CTU has already received connectivity application of 600 MW at Koppal/Gadag-II area. CTU is obligated to grant connectivity/LTA to such applicants as per the roles assigned to CTU under the Electricity Act, 2003 / CERC Regulations / Detailed Procedure in a time-bound manner. In view of the above, as advanced action, transmission system for integration and immediate evacuation of additional RE potential of 2 GW at Koppal and Gadag each as well as integration of RE potential at Gadag, Davangere, Bijapur and Bellary through 400kV transmission lines with Koppal-II PS 765/400/220kV has been identified. The 765/400/220kV Koppal-II PS is being envisaged for final capacity of 9.5 GW considering the integration of above pooling stations.

System studies were conducted for 2026-27 timeframe for maximum export (Scenario 4 - June solar max) and import scenario (Scenario 7 - February Solar max) of Southern incorporating the STU network changes. As per the LGB, export of 7500 MW is envisaged in Scenario-4 with the consideration of KNPP U-3&4 and Koppal/Gadag REZ potential. Further, with the consideration of above generation, import of 8000 MW is considered in Scenario-7. The study results enclosed at **Exhibit 3 & 4** as per below details.

SI.No.	Scenario	Case	Exhibit No.
1.	Scenario-4 (Export case)	Base Case (With Koppal-II & Gadag-II generation)	Exhibit-3
2.		Base case + N-1 of Koppal-II PS – Narendra New 765kV D/c line	Exhibit-3a
3.		Base case + N-1 of Koppal-II PS – Raichur 765kV D/c line	Exhibit-3b
4.		Base case + N-1 of Narendra New – Pune 765kV D/c line	Exhibit-3c
5.		Base case + N-1 of Narendra New-Kolhapur 765kV D/c line(charged at 400kV)	Exhibit-3d
6.		Base case + N-1 of Kolhapur(PG) – Kolhapur(MSETCL) 400kV D/c line	Exhibit-3e
7.	Scenario-7 (Import case)	Base Case (With Koppal-II & Gadag-II generation)	Exhibit-4
8.		Base case + N-1 of Koppal-II PS – Narendra New 765kV D/c line	Exhibit-4a
9.		Base case + N-1 of Koppal-II PS – Raichur 765kV D/c line	Exhibit-4b
10.		Base case + N-1 of Narendra New – Pune 765kV D/c line	Exhibit-4c
11.		Base case + N-1 of Narendra New-Kolhapur 765kV D/c line(charged at 400kV)	Exhibit-4d
12.		Base case + N-1 of Kolhapur(PG) – Kolhapur(MSETCL) 400kV D/c line	Exhibit-4e

Further from the system studies, it is observed that the fault levels at the Narendra New may cross the designed equipment ratings. Under such circumstances, suitable action shall be taken including bypass of Koppal-II PS – Narendra New 765kV D/c line and Narendra New – Kolhapur 765kV line (charged at 400kV) at Narendra New to form Koppal-II PS – Kolhapur 765kV D/c line. The details of envisaged transmission system for integration and evacuation of RE potential from Koppal-II and Gadag-II and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary are as given below:

District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)
	Wind	Solar				
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Total	4	4	8	5.8	2	4

(i) Transmission Scheme for Renewable Energy Zone (Phase-II) in Koppal-II in Karnataka and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary.

a. Phase-A

- Establishment of 765/400kV 2x1500 MVA, 400/200kV 2x500 MVA Koppal-II Pooling Station with provision of two (2) sections of 4500 MVA each at 765/400kV level and provision of four (4) sections of 2500 MVA each at 400/220kV level
- Koppal-II PS – Narendra New 765kV D/c line with 240 MVA SLR at Koppal-II PS end (~150 km)
- 2x330 MVA (765kV) & 2x125MVA (400kV) bus reactors at Koppal-II PS
- Provision for 25 acres of land for establishment of BESS at Koppal-II PS

b. Phase-B

- Koppal-II PS – Raichur 765kV D/c line with 330 MVA SLR at Koppal-II PS end (~190 km)
- Augmentation of 2x1500, 765/400kV, ICTs at Koppal-II PS.
- Augmentation of 2x500, 400/220kV, ICTs at Koppal-II PS.

Future Provisions

- Space provision for 8 nos. of 400/220kV, 500 MVA ICTs at Koppal-II PS
- Space for 4 nos. of 765/400kV, 1500 MVA ICTs at Koppal-II PS

(ii) Transmission Scheme for Renewable Energy Zone (Phase-II) in Gadag-II in Karnataka

- Establishment of 400/220kV, 2x500 MVA Gadag-II Pooling Station
- Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line (~100 km)
- 2x125MVA 420kV bus reactors at Gadag-II PS
- Provision for 25 acres of land for establishment of BESS at Gadag-II PS

Future Provisions

- Space provision for 10 nos. of 400/220kV, 500 MVA ICTs at Gadag-II PS

The SR constituents were requested for their observations / comments on the identified transmission system for Koppal-II & Gadag-II.

SRLDC requested that options may be explored for utilization of HVDC links like Raigarh-Pugalur HVDC and Talcher-Kolar HVDC in reverse mode for export of surplus power during peak RE scenario. Towards this, CTU clarified that based on the feedback received from POSOCO, adequate ICT augmentation has been planned and is being implemented at Raigarh & Kotra section in WR to facilitate operation of Raigarh-Pugalur HVDC link in reverse mode. With this augmentation, power flow of the order of 3000 MW may be exported through Raigarh-Pugalur HVDC to NEW grid. SRLDC opined that options may also be explored for further enhancing the capacity of reverse power flow to 6000 MW on Raigarh-Pugalur HVDC. In this regard, CTU clarified that Raigarh-Pugalur HVDC has been designed for reverse power flow upto 3000 MW. However, the matter for enhancement of the same to 6000 MW shall be suitably taken-up with POWERGRID to explore the feasibility of the same. With respect to Talcher-Kolar HVDC operation in reverse mode, it was clarified that the same is not possible due to non-implementation of Talcher-II back-up transmission system at Talcher and low voltage issues at Kolar. Further in case of blocked mode / reverse mode of operation of Talcher – Kolar HVDC, loading on Talcher - Meramundli line increases which trigger the SPS at Talcher-II generation of NTPC and shall lead to tripping of generation units which ultimately leads to depriving of Southern Region constituents of cheapest available power. SRLDC opined that transmission planning to utilize the HVDC Talcher - Kolar Export Capability may be explored.

Further, SRLDC opined that instead of bypassing of Koppal-II PS – Narendra New 765kV D/c line and Narendra New – Kolhapur 765kV line (charged at 400kV) at Narendra New to form Koppal-II PS – Kolhapur 765kV D/c line, bypassing of Koppal-II PS – Narendra New 765kV D/c line & Narendra New – Pune 765kV line at Narendra New to form Koppal-II PS – Pune 765kV D/c line may be explored. Towards this, CTU informed that in such case, less power flow is observed on the line as the length of Koppal-II PS – Pune 765kV D/c line shall be more than 400km.

TANGEDCO representative stated that initially potential of 18.5 GW was assessed by SECI/MNRE in the states of Andhra Pradesh, Karnataka and Tamil Nadu and a comprehensive transmission system was evolved for integration and evacuation of power from these REZs in Southern Region. Subsequently, petition for grant of regulatory approval was filed by CTU before Hon'ble Central Commission through Petition no. 200/MP/2019 wherein based on the submissions of Southern Region constituents, the requirement of transmission system for prioritized potential was scaled down from 18.5 GW to 8 GW based on the progress of generation projects in Southern Region. Hon'ble Commission vide its order dated 26.11.2021 has observed that basic ingredients of planning, namely availability of land, applications for LTA, comprehensive all India study and respecting the view-points of stakeholders, especially those who finally bear the cost of the transmission system through

transmission charges should be considered while identification of the transmission system.

He further stated that the transmission system should be identified based on the actual “developable” potential considering the availability of land in consultation with the regional constituents. The transmission system should not be evolved merely on the basis of envisaged potential without identification of likely generation developers and identified beneficiaries. SECI/MNRE should come-up with a detailed report capturing all such details viz., location-wise potential assessed, actual developable potential, land availability, generation developers and identified beneficiaries. He further stated that in absence of identified generation developers / beneficiaries, SECI should apply for connectivity / LTA on behalf of such generation developers / beneficiaries. SECI may be requested to come up with location specific bids including BESS at Pooling Station for optimal utilization of envisaged potential at these areas. Further, optimal transmission system may be evolved for integration of potential REZ with the grid so that the constituents are not burdened. In this background he appreciated the proposal of CTU wherein BESS has been considered for optimal requirement of transmission system under ISTS. Further SECI may be requested to come out with a plan / modality of implementation of BESS.

Towards this, CTU clarified that based on the feedback received from constituents, optimal transmission system has been identified for integration of Koppal and Gadag REZ (Ph-II) utilizing the margins available in the existing / under-implementation transmission network. Further, the implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects at Koppal & Gadag area.

TANGEDCO representative informed that they are in agreement with the proposal. However, the implementation of transmission system may be taken up in phased manner subject to materialization of RE projects.

After detailed deliberations, the proposal was agreed by SRPC, SRLDC, TANGEDCO, TANTRANSCO, TSTRANSCO, APTRANSCO, KSEB and KPTCL. However, the implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects. It was also agreed that the Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs.

8. ICT constraints in Southern Region Transmission system.

With the consideration of the transmission system planned by respective STUs for year 2025-26 time frame following ICT constraints have been observed through the Joint Studies. It was also pointed out that STUs shall give in writing their implementation plan for the transmission system identified for respective state for meeting the future load requirements. The studies have been carried out considering following State wise peak load for 2025-26 timeframe as informed by the respective STUs.

State	Load as per 19 th EPS (MW)	Load as per STU (MW)
Andhra Pradesh	15698	15698
Telangana	17738	17738
Karnataka	17554	17554
Kerala	6305	5200
Tamil Nadu	25750	21000
Pondicherry	680	680

The maximum import considered for the Southern Region in the studies for 2025-26 timeframe is about 19000 MW. The list of ICTs which are not meeting N-1 criteria and whose loading is beyond 70% are tabulated and enclosed at **Exhibit – 5**. State wise deliberations are as below:

Andhra Pradesh :

Sl.	Substation	Owner	Existing / UC ICTs (MVA)	Loading on ICTs	% loading
1.	Maradam	APTRANSCO	2x315 + 2x500	2x224 + 2x351	71
2.	Cuddapah	POWERGRID	2x315 + 1x500	2x284 + 1x451	90

APTRANSCO informed that presently 2x315 + 1x500 MVA ICTs are available at Maradam 400/220kV substation and 1x500 MVA 4th ICT is under implementation. With the commissioning of 4th ICT, the loadings will be reduced. Further, the loading on the ICTs is around 71 % and there is no N-1 violation observed in the study.

With regard to ICT loadings at Cuddapah, APTRANSCO informed that the loading on ICTs are being observed with the consideration of 8 GW RE potential at Kurnool-III & Anantapur PS. SRLDC informed that presently no N-1 violation is observed in Cuddapah ICTs. CTU informed that ICT augmentation at Cuddapah may be taken up in the CMETS meeting of SR as and when the requirement arises.

After detailed deliberations following was concluded/agreed

- i. APTRANSCO may study in detail regarding the requirement of additional ICT at Maradam.
- ii. CTU may take the ICT augmentation at Cuddapah in the CMETS meeting of SR based on the requirements.

Telangana :

Sl.	Substation	Owner	Existing / UC ICTs (MVA)	Loading on ICTs (MVA)	% loading
1.	Ramagundam STPP	NTPC	2x250 + 2x315, 400/220kV & 1x200, 400/132kV	2x148 + 2x187, 400/220kV & 1x167, 400/132kV	59 & 84
2.	Kothagudem 400/220kV	TSTRANSCO	315 (PST)	253	80

3.	Maheshwaram (PG) 765/400kV	POWERGRID	2x1500	2x1517	101
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TSTRANSCO informed that presently 2x250 + 2x315, 400/220kV ICTs and 1x200 MVA, 400/132kV ICT are available at Ramagundam STPP. The 1x200 MVA, 400/132kV ICT is getting overloaded. The loads are being shifted / rearranged from Ramagundam and loading on the ICT may be relieved.

With regard to the ICT loading at Kothagudam, TSTRANSCO informed that 1x315 MVA ICT available at Kothagudam is Phase shifting transformer and power flow on the ICT may be controlled in either direction as per the requirement. SRPC opined that adequacy of the 220kV downstream network may be ensured by TSTRANSCO when the power flow through the PST is maximum. TSTRANSCO informed that there are no constraints in the 220kV network, however, detailed study may be carried out.

With regard to the ICT loading at Maheshwaram(PG) 765/400kV, CTU informed that informed that presently 2x1500 MVA ICTs are available at Maheshwaram(PG) 765/400kV S/s and augmentation with 1x1500 MVA 3rd ICT may be proposed. TSTRANSCO informed that for controlling the short circuit at Maheshwaram (TSTRANSCO) S/s, bus splitting arrangements and series line reactors are being proposed and with the proposed arrangements, the ICT loading may be reduced. CTU informed that the ICT augmentation proposal may studied along the proposal for controlling the short circuit at Maheshwaram (TSTRANSCO).

After detailed deliberations following was concluded/agreed

- i. TSTRANSCO may shift/rearrange the loads at Ramagundam to relieve the loading on the ICT at Ramgundam STPP
- ii. TSTRANSCO may study the adequacy of 220kV downstream network at Kothagudam.
- iii. The requirement of 3rd 1500 MVA ICT at Maheshwaram 765/400kV S/s may be studied may studied along the proposal for controlling the short circuit at Maheshwaram (TSTRANSCO) in a separate Joint Study meeting in participation with CTU, CEA & TSTRANSCO.

Karnataka:

With considering the planned future transmission system under STU, loadings at most of the substations is addressed, however same may also be reviewed as part of Annual Rolling Plans exercise.

STUs shall give in writing their implementation plan for the transmission system identified for respective state for meeting the future load requirements.

Kerala:

Sl.	Substation	Owner	Existing / UC ICTs (MVA)	Loading on ICTs (MVA)	% loading
1.	Kottayam 400/220kV	KSEB	2x315	2x222	70

KSEB informed that Kottayam 400/220kV S/s with 2x315 MVA ICTs is under implementation and scheduled for commissioning in Dec'22. KSEB informed that as the loading on the ICTs is about 70% only, ICT augmentation may not be required. SRPC opined that as Kottayam S/s is under construction substation, the ICT augmentation requirement may be studied later after commissioning of the S/s.

SRLDC informed that presently, ICTs at Cochin and North Trichur HVDC are overloaded. CTU informed that 3rd 500 MVA ICT at Cochin is under implementation and is expected by Oct'22. Further, considering the transmission system associated with Wayanad & Kasargode, the ICT loadings at North Trichur HVDC are addressed. The ICT augmentation requirement may be assessed based on the progress of the transmission system.

After detailed deliberations following was concluded/agreed

- i. ICT augmentation requirement at Kottayam may be studied later after commissioning of the Kottayam S/s.
- ii. The ICT augmentation requirement at North Trichur HVDC may be assessed based on the progress of the transmission system planned by STU.

STUs shall give in writing their implementation plan for the transmission system identified for respective state for meeting the future load requirements.

Tamil Nadu

Sl.	Substation	Owner	Existing / UC ICTs (MVA)	Loading on ICTs (MVA)	% loading
1.	Neyveli TS-II 400/230kV	NLC	2x250	2x177	71
2.	Salem	TANTRANSCO	3x500, 400/230kV & 3x200, 400/110kV	3x180, 400/230kV & 3x141, 400/110kV	36 & 71
3.	Edayarpalayam	TANTRANSCO	2x500, 400/230kV & 3x200, 400/110kV	2x257, 400/230kV & 3x206, 400/110kV	51 & 104
4.	Arni	TANTRANSCO	2x500, 400/230kV & 3x200, 400/110kV	2x49, 400/230kV & 3x176, 400/110kV	10 & 88
5.	Cuddalore	TANTRANSCO	2x500, 400/230kV & 2x200, 400/110kV	2x179, 400/230kV & 2x183, 400/110kV	36 & 92
6.	Alagarkoil	TANTRANSCO	2x500, 400/230kV & 2x200, 400/110kV	2x82, 400/230kV & 2x143, 400/110kV	16 & 72
7.	Kamuthi	TANTRANSCO	2x500, 400/230kV & 2x200, 400/110kV	2x255, 400/230kV & 2x95, 400/110kV	81 & 48

CTU informed that the issue of overloading of Neyveli TS-II ICTs were deliberated in several meetings and no solution has been found so far by NLC Ltd. or the TANTRANSCO.

TANTRANSCO informed that they had requested to replace the 2x250 MVA ICTs with 2x500 MVA or to shift one NLC unit connected at 400kV to 230kV level so that ICT loadings may be relieved. However, NLC had informed that space is not available for replacement of ICTs and shifting of unit is also not possible.

TANTRANSCO informed that with the implementation of Cuddalore 400/230kV S/s and shifting of loads, the ICTs may be relieved. Forum requested TANTRANSCO to expedite the implementation of Cuddalore 400/230kV S/s. It was also decided that, NLC and TANTRANSCO may explore possibility of replacing of existing 2x250 MVA ICTs at NLC TS-II with 2x500 MVA ICTs. During the meeting it was suggested to have a joint visit at Neyveli TS-II with participation from CTU, SRPC, SRLDC, POWERGRID, TANTRANSCO and CEA for exploring the space provisions and other alternatives to address the overloading of ICTs.

With regard to ICT loadings at Salem, TANTRANSCO informed that they are planning to replace the 400/230kV, 3x315 MVA ICTs with 400/230kV, 3x500 MVA ICTs. CTU informed that the overloading was observed in the 400/110kV, 3x200 MVA ICTs and replacing of 3x315 MVA ICTs with 3x500 MVA ICTs shall marginally relieve the loading on 200 MVA ICTs and suitable ICT augmentation or shifting of loads may be done. TANTRANSCO informed that they shall study in detail and revert back on the matter.

With regard to ICT loadings at Edayarpalayam, Arni, Cuddalore, Alagarkoil and Kamuthi, TANTRANSCO informed that they shall study in detail and revert back on the matter.

After detailed deliberations following was concluded/agreed

- i. TANTRANSCO may study in detail regarding the requirement of additional ICTs at Salem, Edayarpalayam, Arni, Cuddalore, Alagarkoil and Kamuthi.
- ii. NLC and TANTRANSCO may explore possibility of replacing of existing 2x250 MVA ICTs at NLC TS-II with 2x500 MVA ICTs.
- iii. TANTRANSCO suggested joint visit with participation from CTU, SRPC, SRLDC, POWERGRID, TANTRANSCO and CEA for exploring the space provisions and other alternatives.

STUs shall give in writing their implementation plan for the transmission system identified for respective state for meeting the future load requirements.

9. Utilization of Hyderabad – Kurnool 765kV D/c line as per SRPC recommendations.

It was informed that Hyderabad – Kurnool 765kV D/c line under the “Additional inter-Regional AC link for import into Southern Region i.e. Warora-Warangal and Chilakaluripeta - Hyderabad - Kurnool 765 kV link” transmission scheme is being implemented through TBCB route and is expected to be commissioned by July, 2022. In the 42nd SRPC meeting held on 04.06.2022, SRPC had recommended to carry out joint studies for utilization of Hyderabad – Kurnool 765kV D/c line.

Accordingly, detailed studies were carried out on the present time operational study file of SRLDC (the results are enclosed at **Exhibit-6**), wherein following was observed with consideration of the transmission line:

- Each circuit gets loading of about 230 MW from Kurnool to Hyderabad under the peak demand scenario in SR as well under off-peak demand in SR.
- Overall reduction of about 20 MW losses in SR transmission system
- With consideration of the line, import through Wardha – Nizamabad reduced by about 50-60 MW.
- The 400kV RTPS – Veltor S/c line is highly loaded under certain scenarios and with commissioning of Hyderabad – Kurnool 765kV D/c line, loading is reducing by approx. 30 – 50 MW.
- Voltage rise of about 15kV is observed on both ends.

From the above analysis, the forum observed that the independent commissioning of the transmission line without the other elements i.e. Warora-Warangal-C'peta/Hyderabad 765kV corridor may not be useful for SR grid.

TSTRANSCO informed that the loading on Hyderabad – Kurnool 765kV D/c line is very minimal and in addition Kurnool-III – Maheshwaram 765kV D/c line was also planned as a part of evacuation of 4.5 GW potential REZ from Kurnool area which shall also be lightly loaded. TSTRANSCO suggested that instead of constructing new lines i.e. Kurnool-III – Kurnool New 765kV D/c line and Kurnool-III – Maheshwaram 765kV D/c line, the Hyderabad – Kurnool 765kV D/c line may be LILOOed at Kurnool-III for optimal utilization of the system. CTU informed that same shall be reviewed.

10. Additional observations indicated by SRLDC during the meeting.

a) RTPS – Veltor 400kV S/c line over loading:

SRLDC informed that during Peak wind season in Southern Region, the RTPS – Veltor 400kV S/c line flow is as high as 700 MW. Suitable re-arrangement/ transmission augmentation needs to be planned. TSTRANSCO informed that on account of high loading on the Raichur - Veltor 400kV S/c line, TTC of Telangana is restricted and suitable augmentation may be explored. CTU informed that, Raichur - Veltor 400kV S/c line is an ISTS line owned by POWERGRID designed at 45-75 deg and options may be explored for reconductoring of conductor / replacement of corridor based on the inputs from POWERGRID.

b) Chittoor – Thiruvallam 230kV S/c line over loading:

SRLDC informed Chittoor – Thiruvallam 230kV S/c line is severely overloaded and it is frequently tripping due to SPS operation. Hence suitable re-arrangement for LILO at 400/220kV Thiruvallam may be proposed, which would result in the strengthening of the N-1 violated 230kV Thiruvallam - Thiruvallam(TN) D/c line. It was decided that TANGEDCO and APTRANSCO may plan suitable strengthening for the same.

As closing remarks for the Joint Study meeting, CGM(CTU) thanked all the participants from SRPC, SRLDC & STUs for their active participation and contribution to make a success to the Joint Studies meeting and concluding the ISTS proposals for deliberations and approval from appropriate forums. He also expressed that CTU has

always been in favor of physical Joint Study meetings which facilitate proper coordination & planning and CTU shall continue these study meetings in future as well.

CGM (CTU) also informed that as per the Electricity Rules, 2021, CTU has to draw up plan for Inter-State Transmission System (ISTS) for next five years on rolling basis every year, identifying specific transmission projects which are required to be taken up along with their implementation time lines. In this direction, CTU in coordination with the STUs, had published the first Rolling Plan report on 31.03.2022 for 2026-27 timeframe. Further, CTU is in process of preparation of interim report for ISTS Rolling Plan for 2027-28 which shall be published by September, 2022. We are witnessing the active involvement & participation of SR STUs towards providing timely inputs for preparation of the ISTS Rolling Plan. We also expect such cooperation, involvement & active participation from the STUs in future exercise also.

SE (SRPC) expressed that physical Joint Study meetings has facilitated detailed deliberations, better coordination and agreement on the proposals with addressing the issues and concerns of the STUs which was facing a little constraint during virtual meetings. He also opined that such joint study meetings may be carried out more frequently in future for better cooperation and participation from all the stake holders.

Meeting ended with vote of thanks.

* * * * *

Annexure-I

**List of participants of the Joint Study meeting of Southern Region
Constituents held on 30th June – 2nd July, 2022 at SRPC, Bengaluru**

Sl.No.	Name	Designation
	SRPC	
1.	Shri Asit Singh	MS
2.	Shri N R L K Prasad	SE
3.	Ms Betsy Sebastain	AEE
	CTUIL	
4.	Shri Jasbir Singh	CGM
5.	Shri Anil Kumar Meena	Sr. DGM
6.	Shri Ankush Patel	Manager
7.	Shri Venkatesh Gorli	Manager
	SRLDC	
8.	Shri S P Kumar	ED
9.	Shri L Sharath Chand	Manager
10.	Shri Janardhan	Manager
11.	Shri Madan Kumar	Asst. Manager
	APTRANSCO	
12.	Shri C H Sreenivasa Rao	EE
13.	Shri G Ramamohan Rao	AEE
	TSTRANSCO	
14.	Shri J Ajay Kumar	DE
15.	Shri P Srinivasu	ADE
16.	Shri P Sandeep Reddy	AE
	KPTCL	
17.	Ms Manjula M Y	EE
18.	Ms Gayatri Kulkarni	EE
19.	Ms Divya Prabha H	AEE

20.	Ms Shalini N	AE
21.	Ms Anjali	AE
	TANGEDCO	
22.	Dr. R Kathiravan	EE
23.	Shri G Ramesh Kumar	EE
24.	Shri D Narendran	AE
25.	Ms L Porchelvi	AEE
26.	Shri R Srinivasan	AEE
	KSEB	
27.	Shri Anu S Ramesh	AE
28.	Shri Praveen N R	AE
29.	Ms Amrita Sasi	AEE

Installed Capacity

Region	Thermal Central	Thermal State	Thermal Private	Thermal	Hydro	Nuclear	Solar	Rooftop	Wind	Other RE	Diesel	Gas	Total	EPS Peak Demand	App. Peak Demand	
NR	11440	41299	0	52739	26169	4420	70085	4500	6401	1360	0	3583	169256	97182	91294	
WR	19000	35950	36850	91800	8168	3240	34616	4500	31321	0	0	10139	183784	94825	89080	
SR	12870	37511	4640	55021	17699	5820	41550	4500	36153	2358	983	3366	167450	83652	78584	
ER	24440	12775	4150	41365	14686	0	1103	400	0	0	0	0	57554	35674	33513	
NER	750	0	0	750	4375	0	100	100	0	0	0	1854	7179	6710	6303	
	68500	127534	45640	241674	71097	13480	147454	14000	73875	3718	983	18941	585222	298774	298774	
	241674				239047							318043				

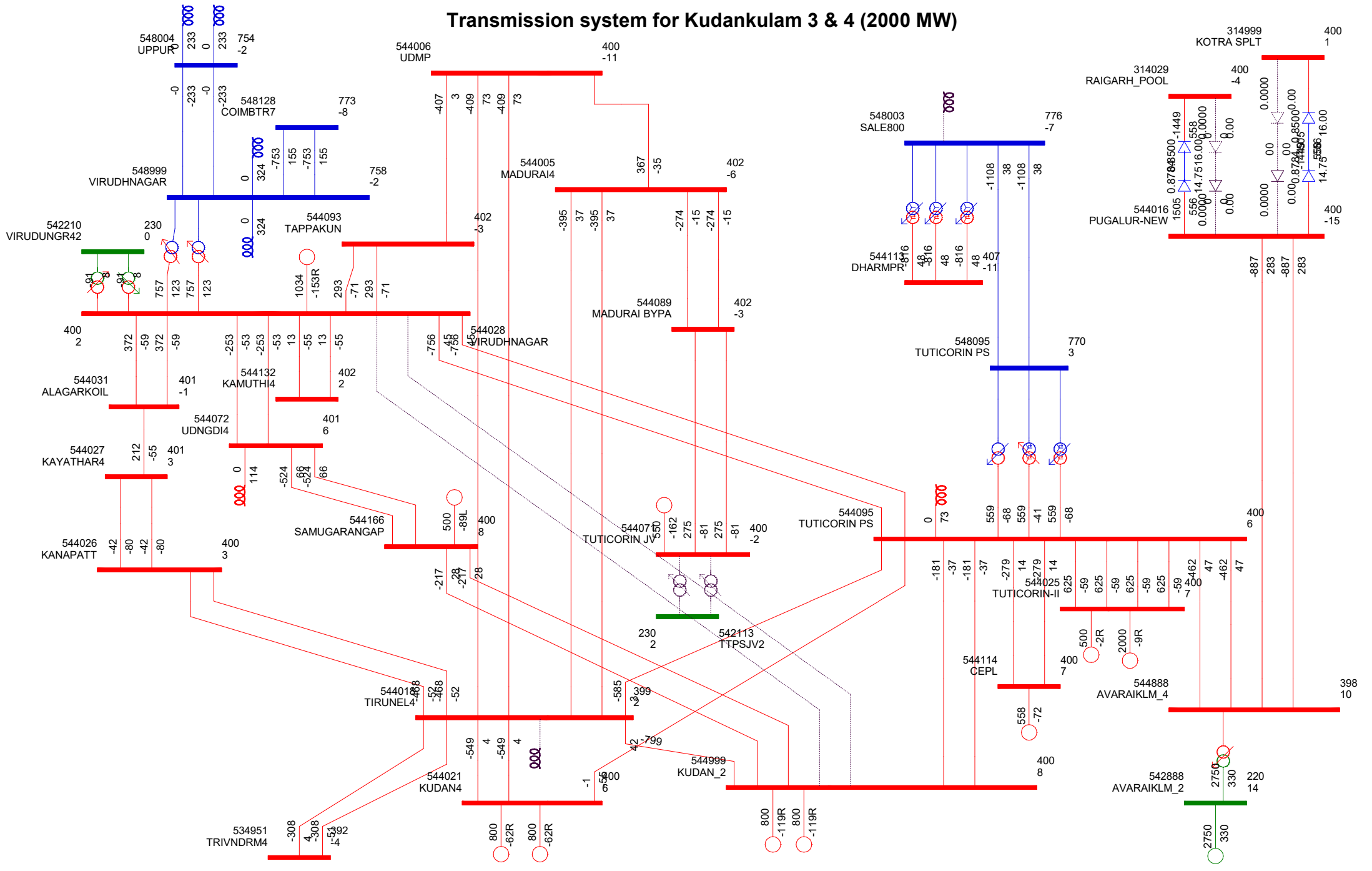
Scenario 4 : Solar Max
Jun 2026

Availability factor	Thermal Central	Thermal State	Thermal Private	Reqd Thermal	Hydro	Nuclear	Solar	Solar rooftop	Wind	Other Renewable	Diesel	Gas		National DF	Regional DF		
NR	25%	7%	0%	23%	70%	80%	90%	60%	50%	0%	0%	0%		88%	83%		
WR	40%	4%	36%	25%	40%	80%	85%	60%	55%	0%	0%	0%		89%	84%		
SR	24%	6%	31%	11%	40%	80%	85%	60%	55%	0%	0%	0%		80%	75%		
ER	10%	9%	34%	-1%	70%	80%	85%	60%	0%	0%	0%	0%		84%	79%		
NER	55%	0%	0%	0%	70%	80%	85%	60%	0%	0%	0%	0%		64%	60%		
														91%	271884		
Availability	Central	Thermal State	Thermal Private	Reqd Thermal	Hydro	Nuclear	Solar	Solar rooftop	Wind	RE RPO	Diesel	Gas	Total availability	Demand Factor	Surplus/Deficit	Net Availability	Net Demand
NR	2888	2941	0	12370	18318	3536	63077	2700	3201	51690	0	0	96660	85914	10746	93960	83214
WR	7568	1527	13206	23377	3267	2592	29424	2700	17227	55604	0	0	77510	84840	-7331	74810	82140
SR	3064	2220	1452	6175	7080	4656	35318	2700	19884	48914	0	0	76373	66825	9548	73673	64125
ER	2530	1178	1408	-380	10280	0	938	240	0	18693	0	0	16574	30018	-13444	16334	29778
NER	413	0	0	0	3063	0	85	60	0	2650	0	0	3620	4288	-668	3560	4228
Total	16462	7866	16066	41541	42008	10784	128840	8400	40311	177552	0	0	270736	271884	-1149	262336	263484
	40393				177551							255262					

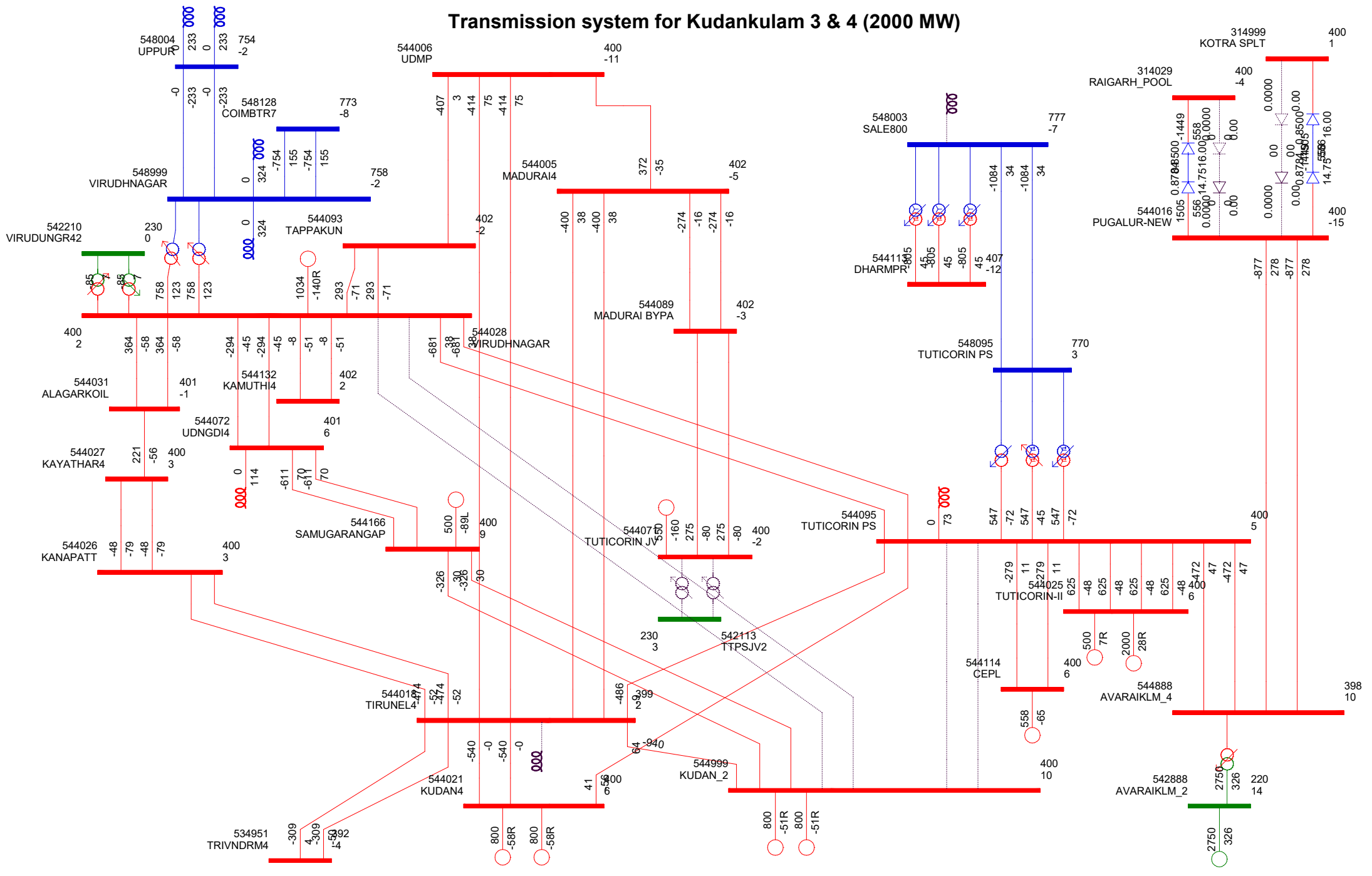
Scenario 7 : Solar max
Feb 2027

Availability factor	Thermal Central	Thermal State	Thermal Private	Reqd Thermal	Hydro	Nuclear	Solar	Solar rooftop	Wind	Other Renewable	Diesel	Gas		National DF	Regional DF		
NR	32%	32%	0%	27%	30%	80%	90%	60%	10%	0%	0%	0%		70%	66%		
WR	44%	23%	53%	48%	20%	80%	90%	60%	10%	0%	0%	0%		99%	93%		
SR	33%	46%	34%	56%	20%	80%	90%	60%	0%	0%	0%	0%		94%	89%		
ER	46%	26%	55%	12%	30%	80%	90%	60%	0%	0%	0%	0%		69%	65%		
NER	55%	0%	0%	0%	30%	80%	90%	60%	0%	0%	0%	0%		55%	52%		
														90%	268897		
Availability	Central	Thermal State	Thermal Private	Reqd Thermal	Hydro	Nuclear	Solar	Solar rooftop	Wind	RE RPO	Diesel	Gas	Total availability	Demand Factor	Surplus/Deficit	Net Availability	Net Demand
NR	3614	13220	0	14483	7851	3536	63077	2700	640	42179	0	0	94637	68048	26589	91937	65348
WR	8448	8327	19542	43962	1634	2592	31154	2700	3132	45373	0	0	77529	93560	-16031	74829	90860
SR	4274	17130	1590	30877	3540	4656	37395	2700	0	39914	0	0	71285	78986	-7701	68585	76286
ER	11154	3339	2283	5168	4406	0	993	240	0	15253	0	0	22413	24601	-2187	22173	24361
NER	413	0	0	0	1313	0	90	60	0	2163	0	0	1875	3702	-1827	1815	3642
Total	27901	42016	23414	94489	18742	10784	132709	8400	3772	144881	0	0	267739	268897	-1158	259339	260497
	93332				144881							253455					

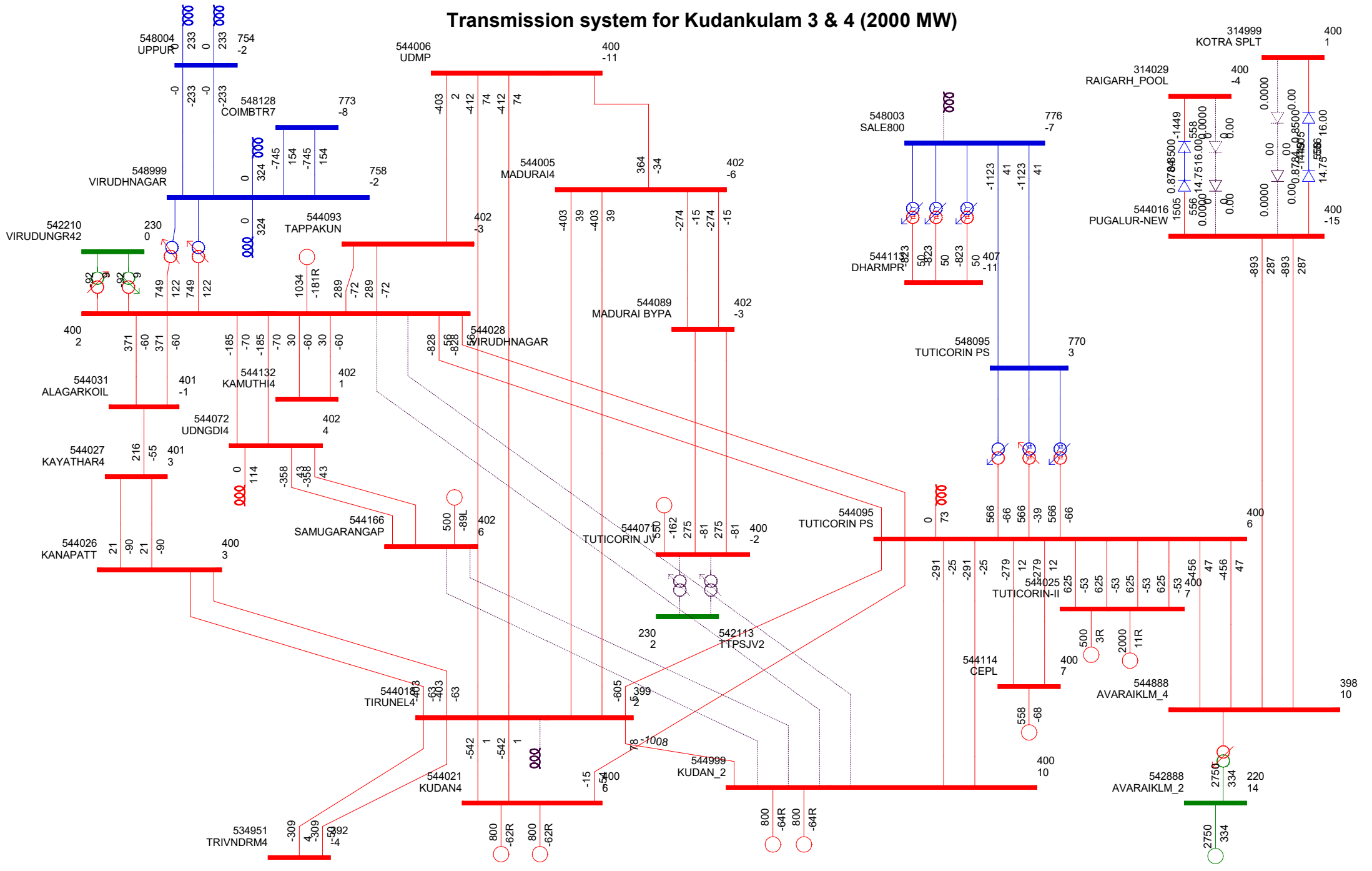
Transmission system for Kudankulam 3 & 4 (2000 MW)



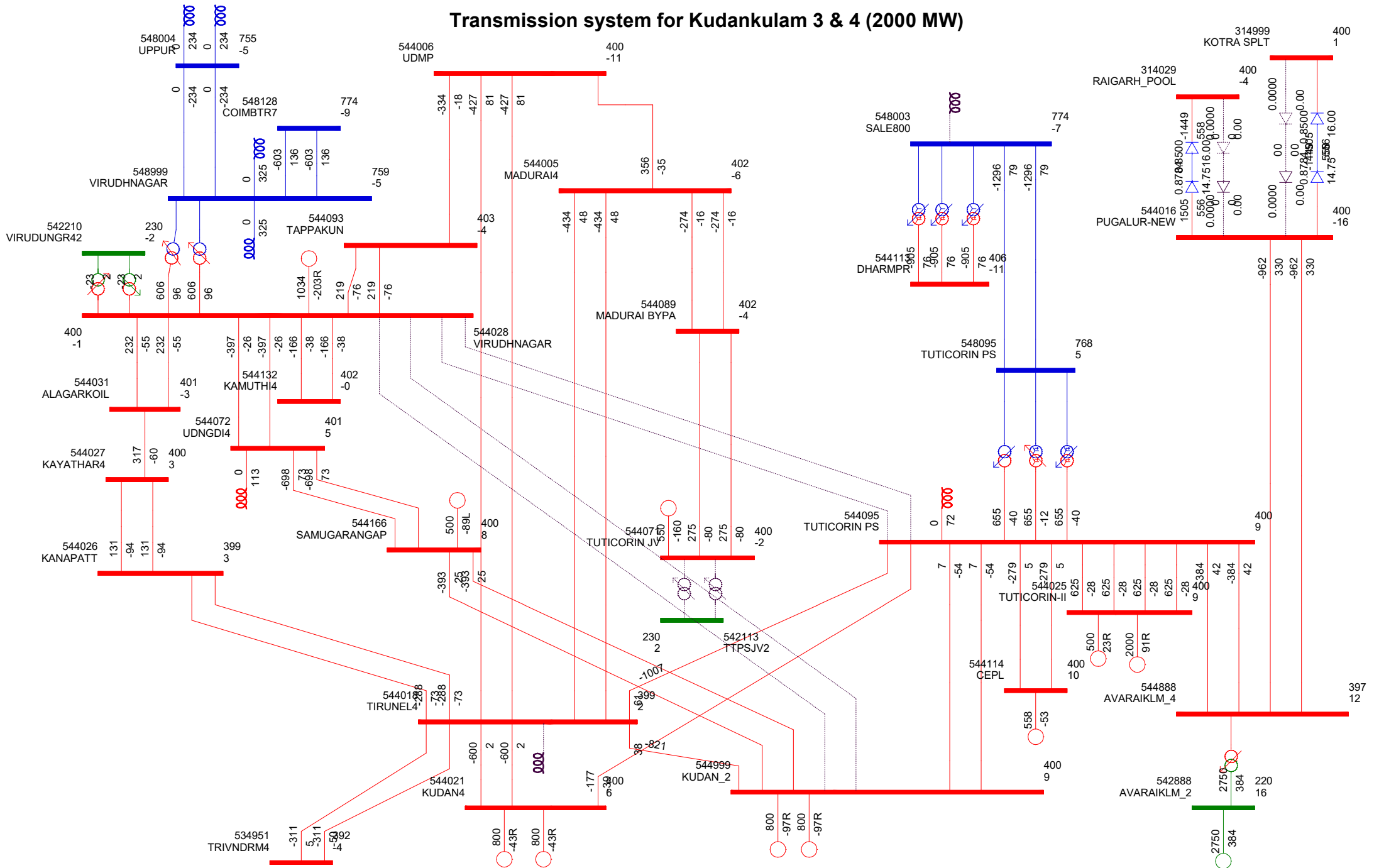
Transmission system for Kudankulam 3 & 4 (2000 MW)



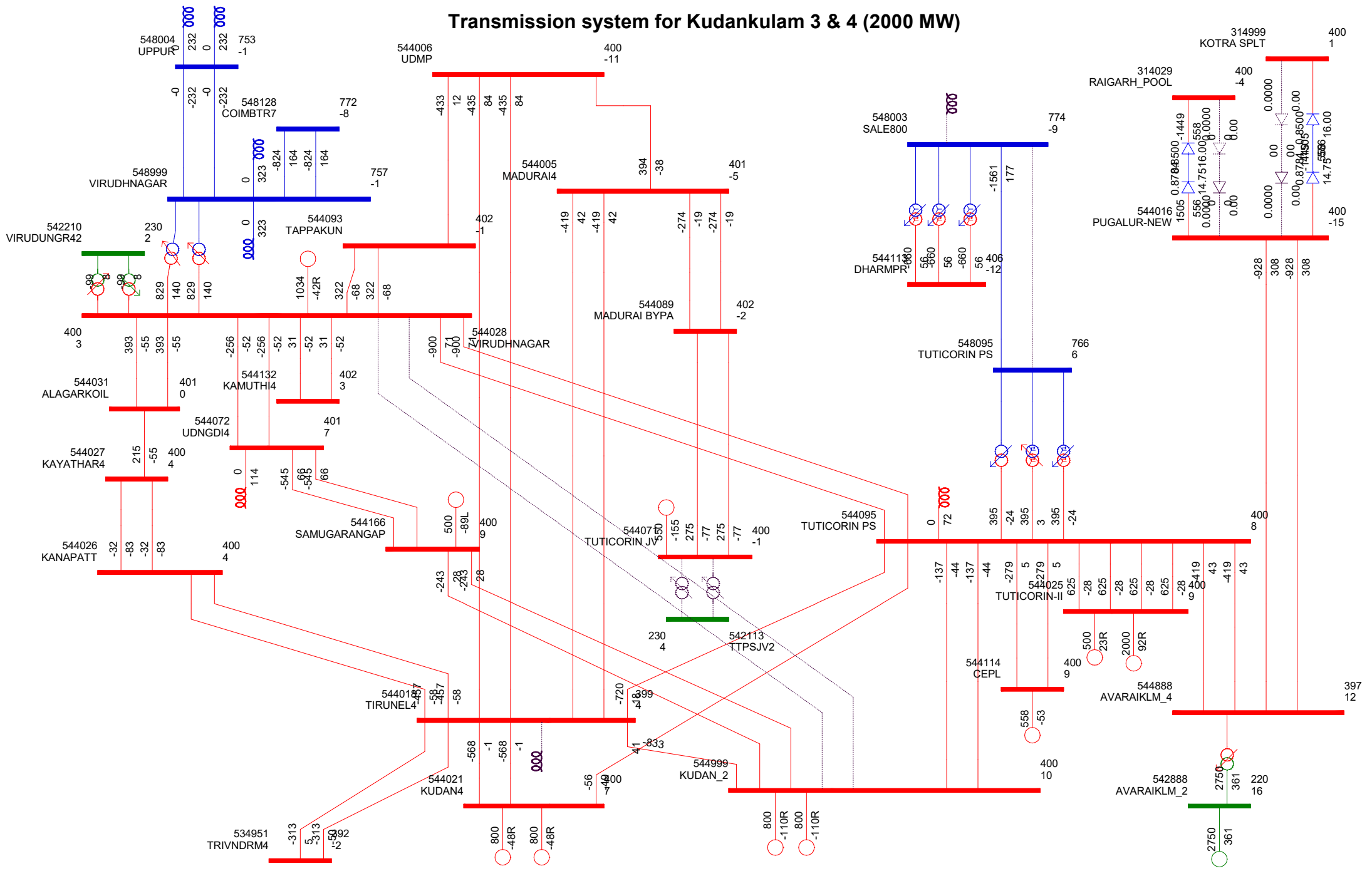
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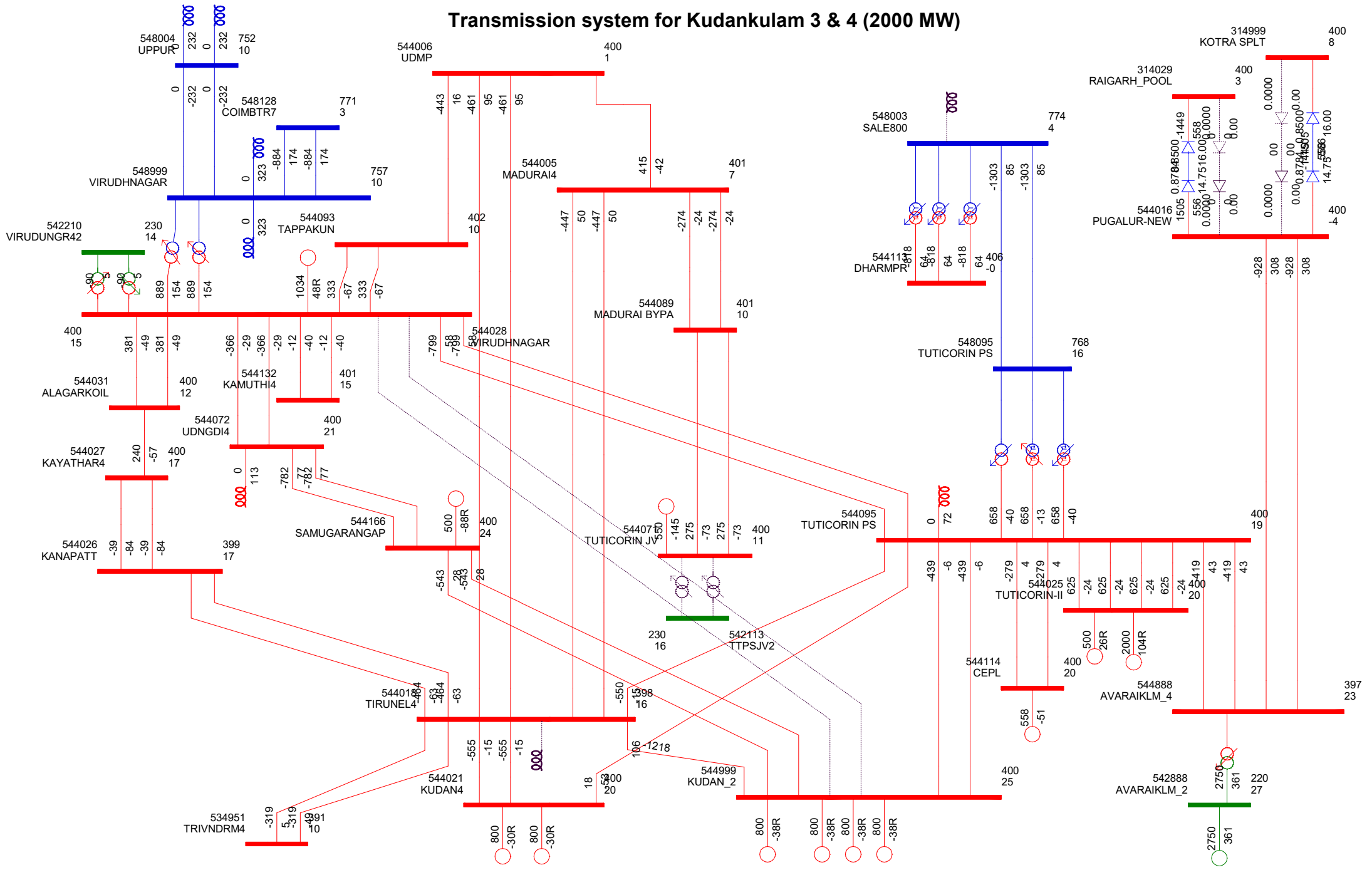
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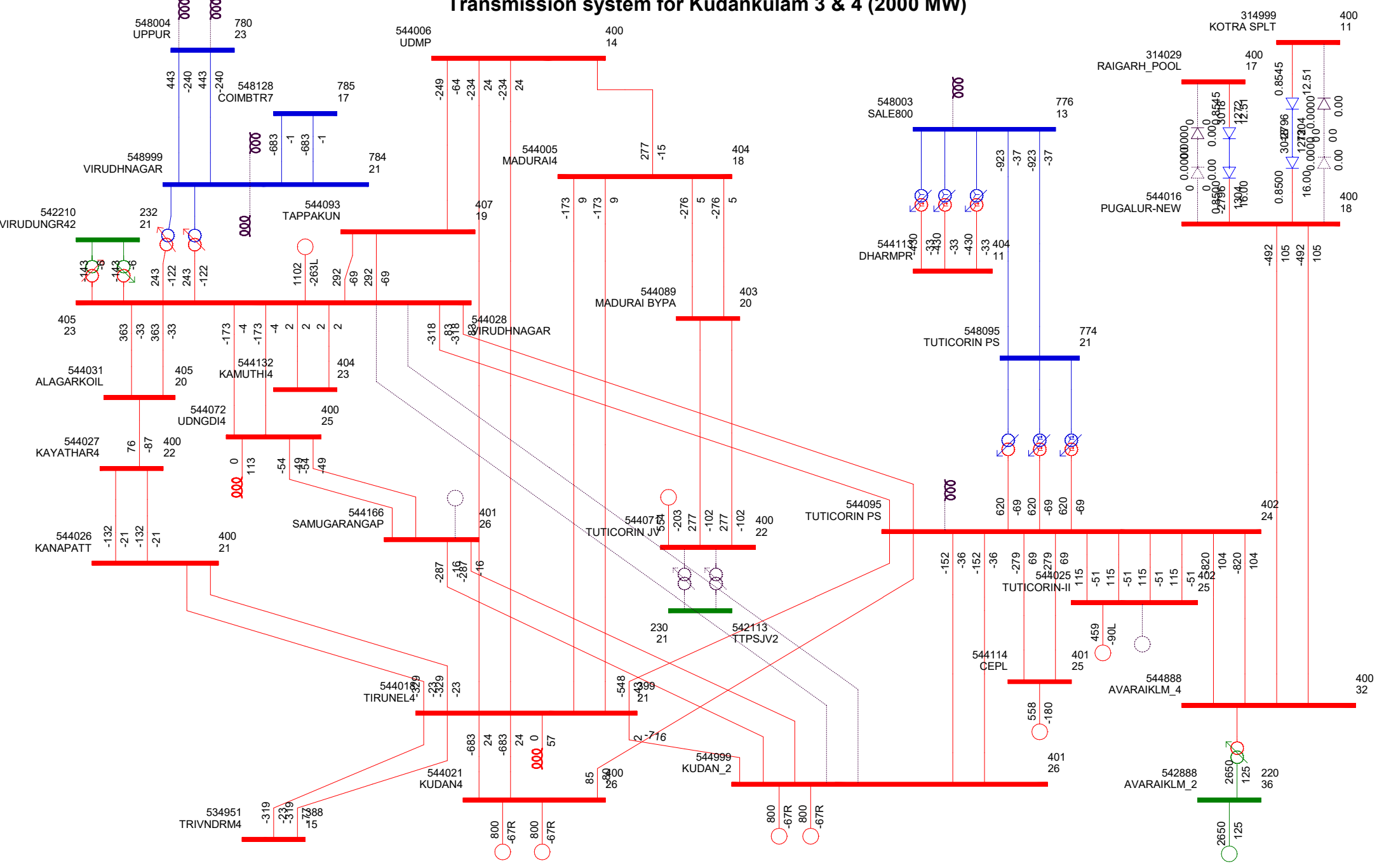
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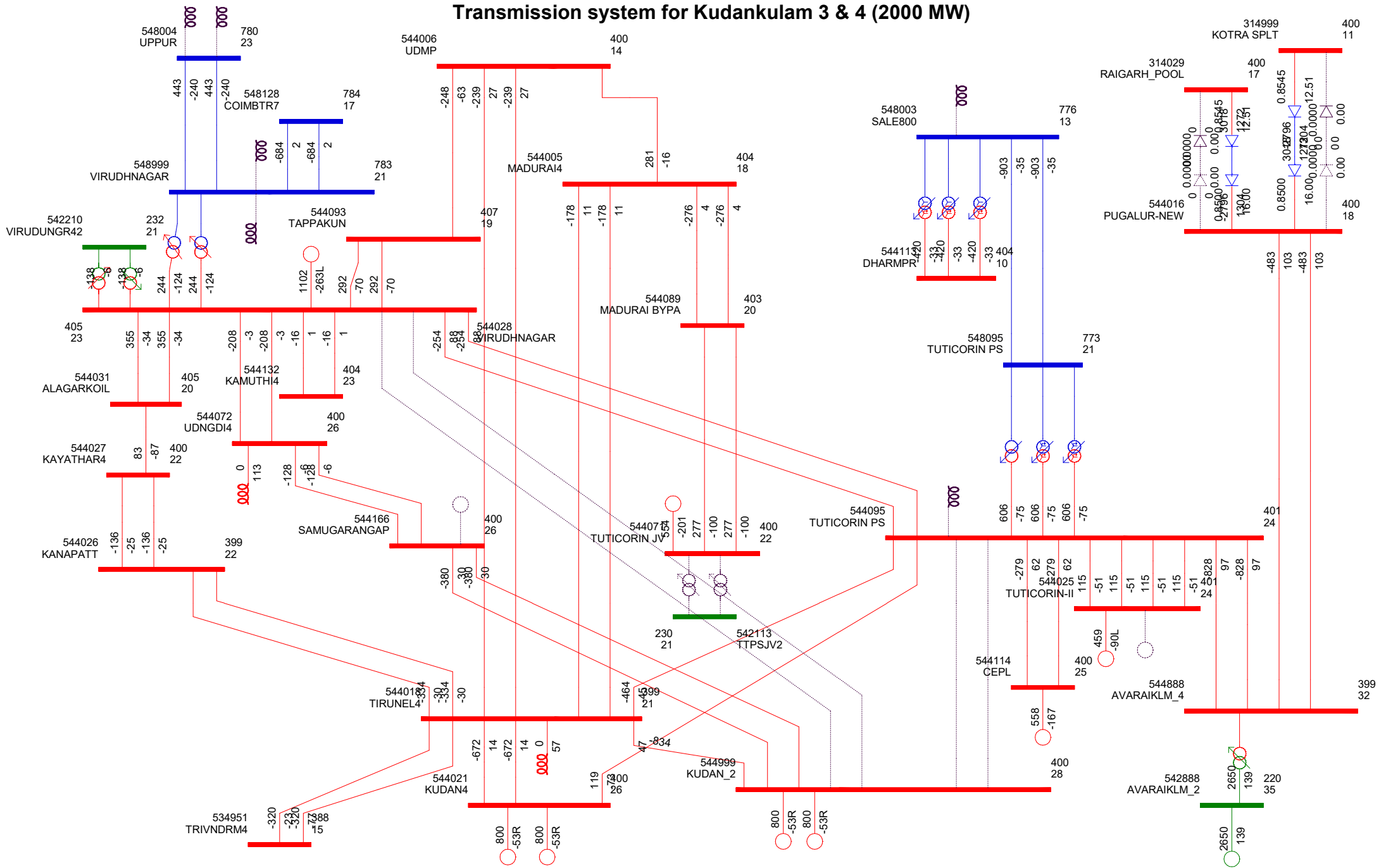
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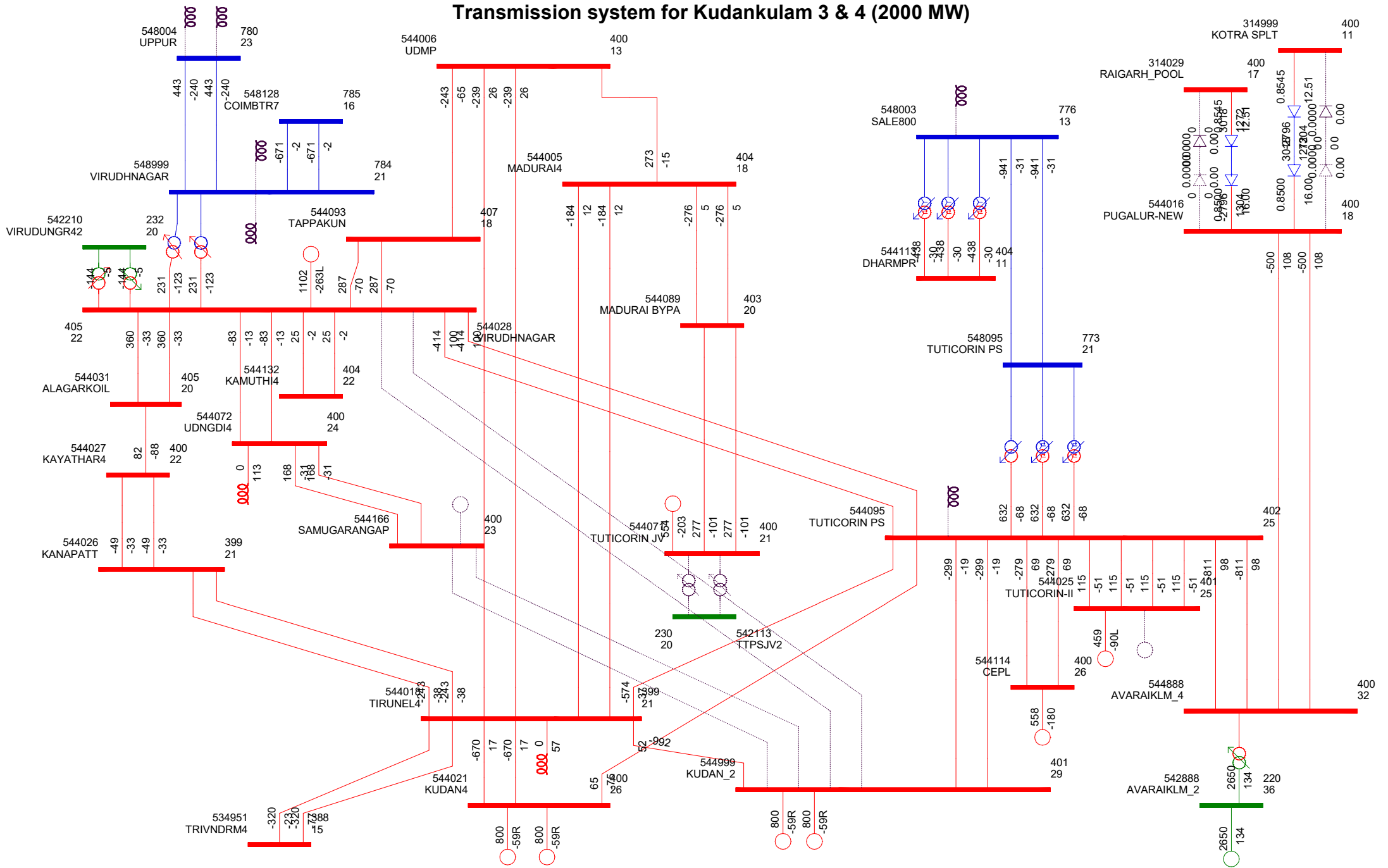
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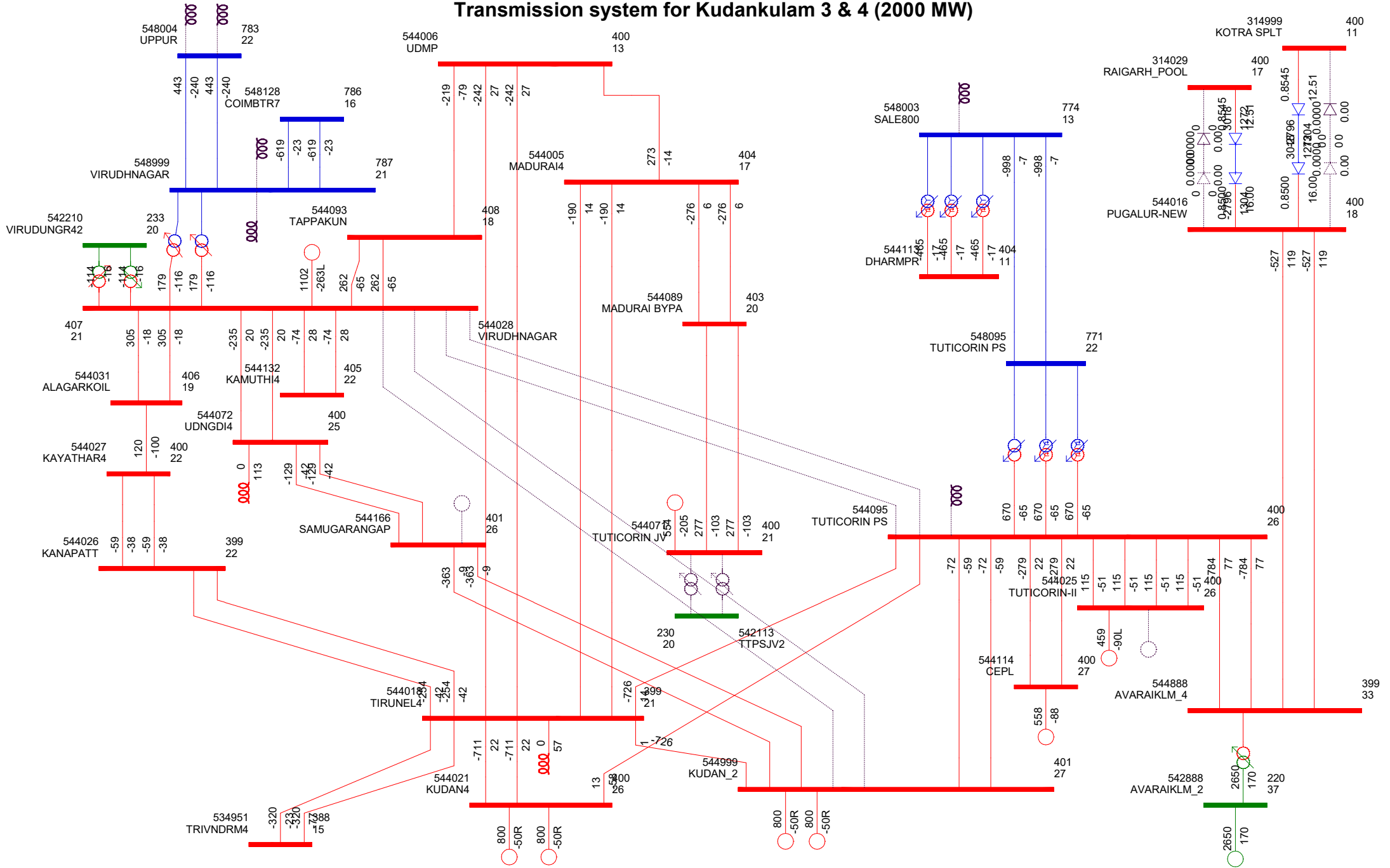
Transmission system for Kudankulam 3 & 4 (2000 MW)



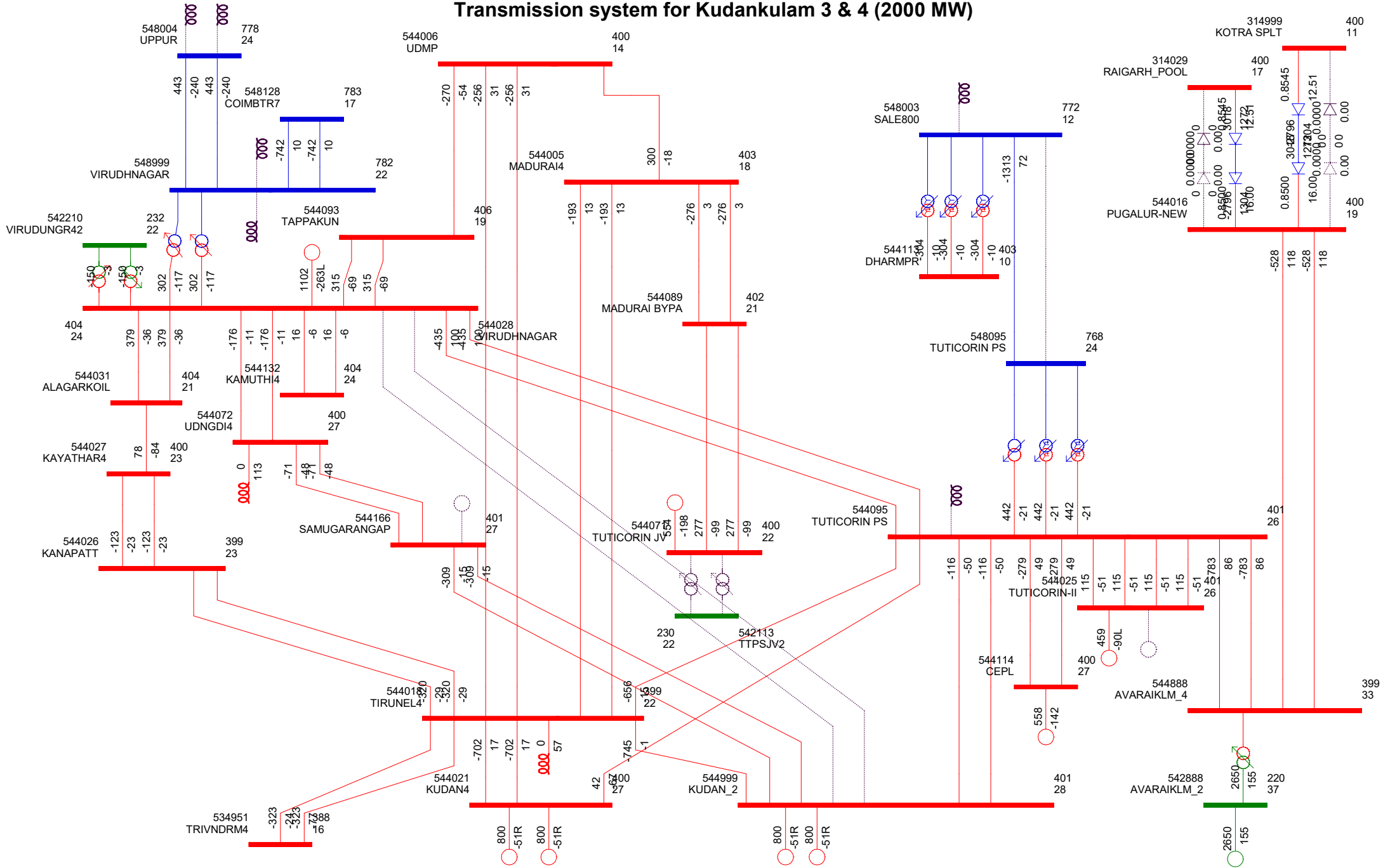
Transmission system for Kudankulam 3 & 4 (2000 MW)



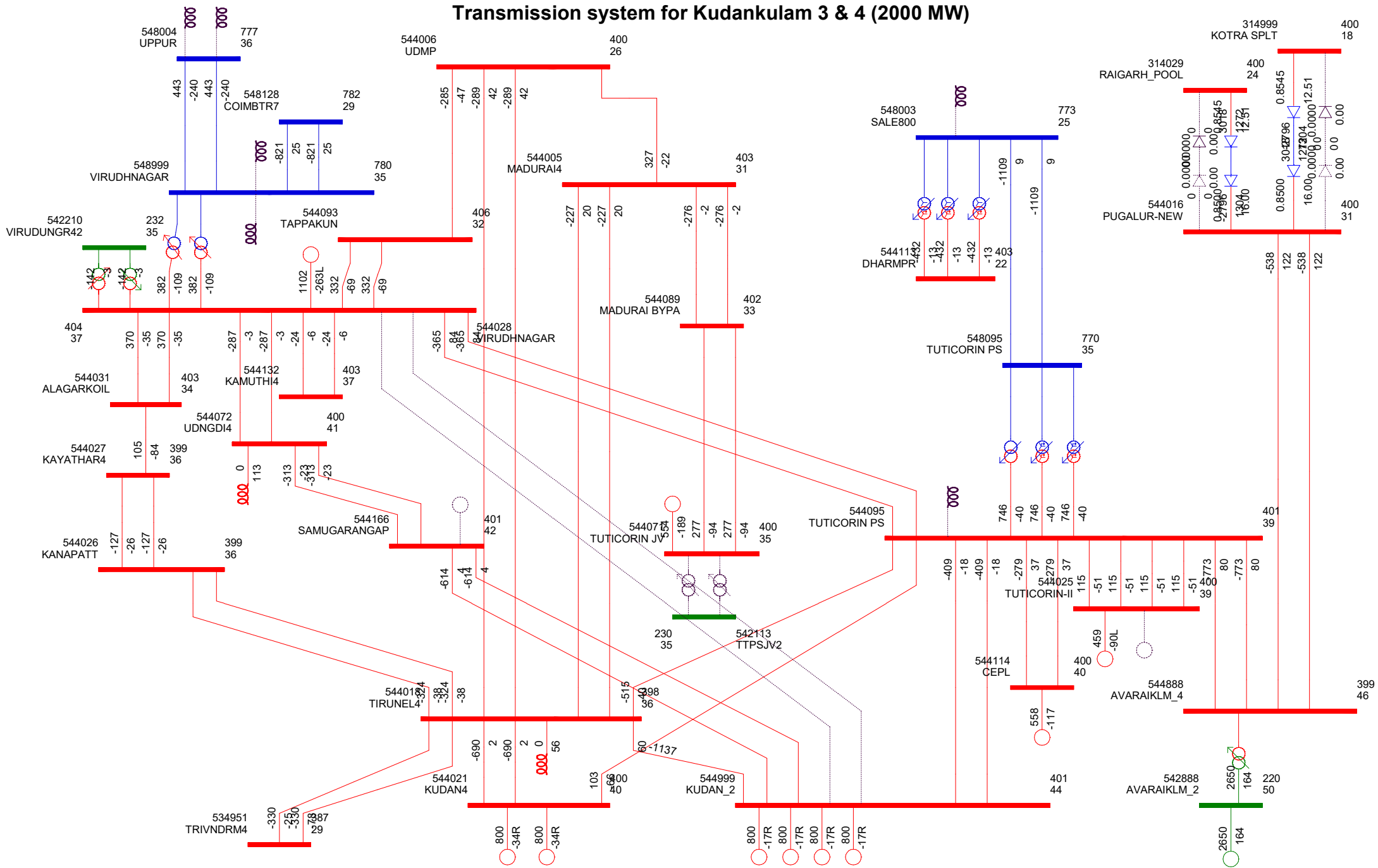
Transmission system for Kudankulam 3 & 4 (2000 MW)



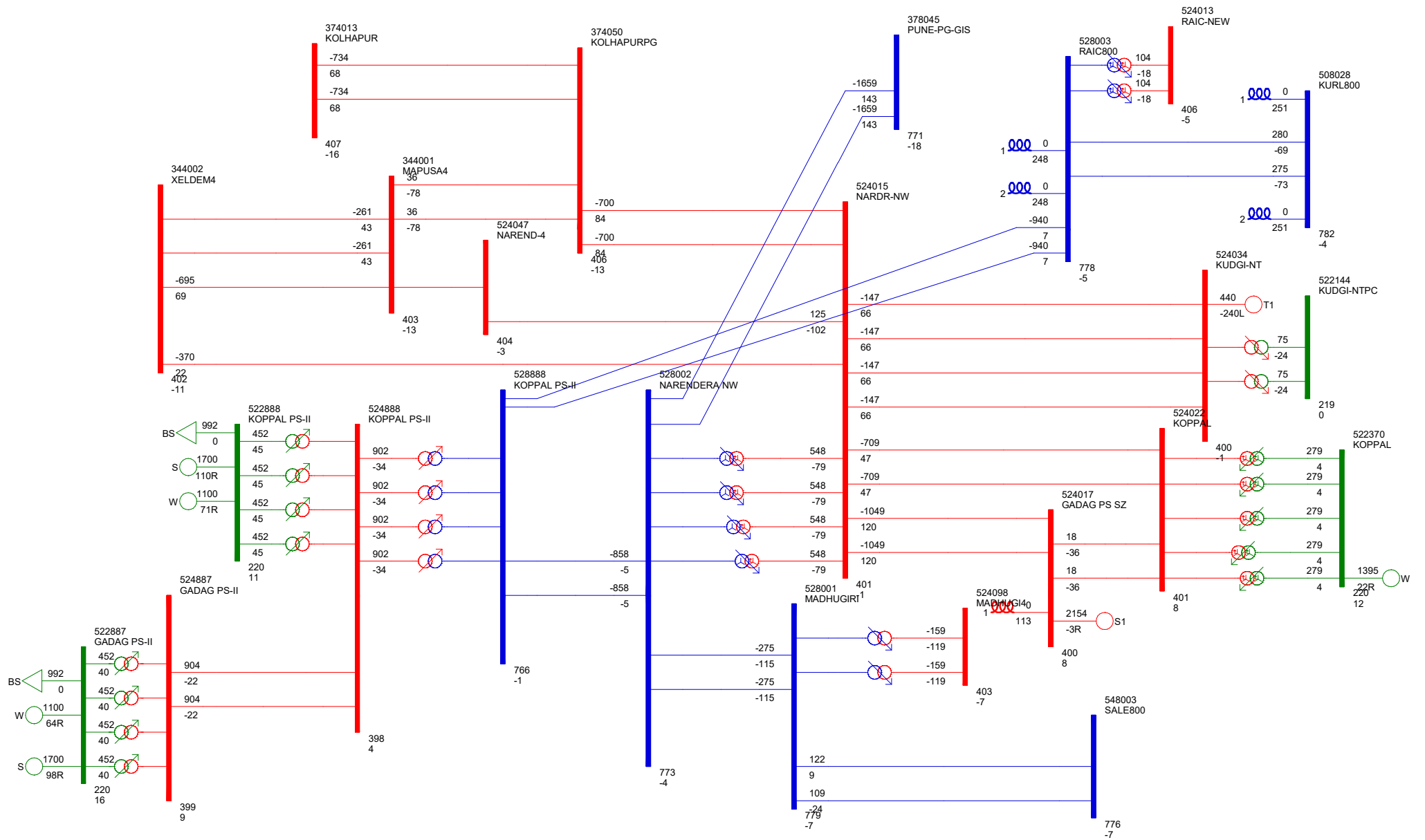
Transmission system for Kudankulam 3 & 4 (2000 MW)



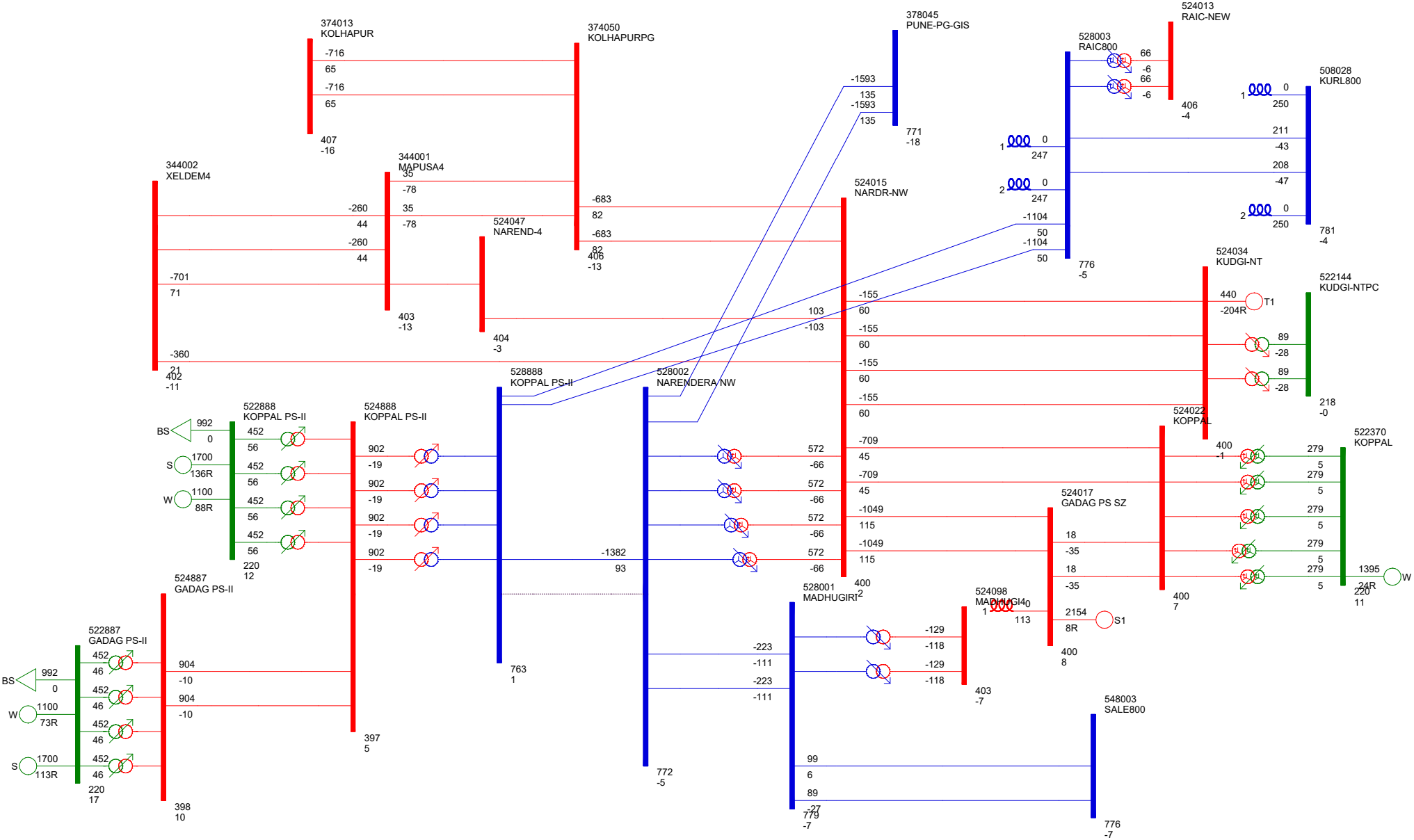
Transmission system for Kudankulam 3 & 4 (2000 MW)



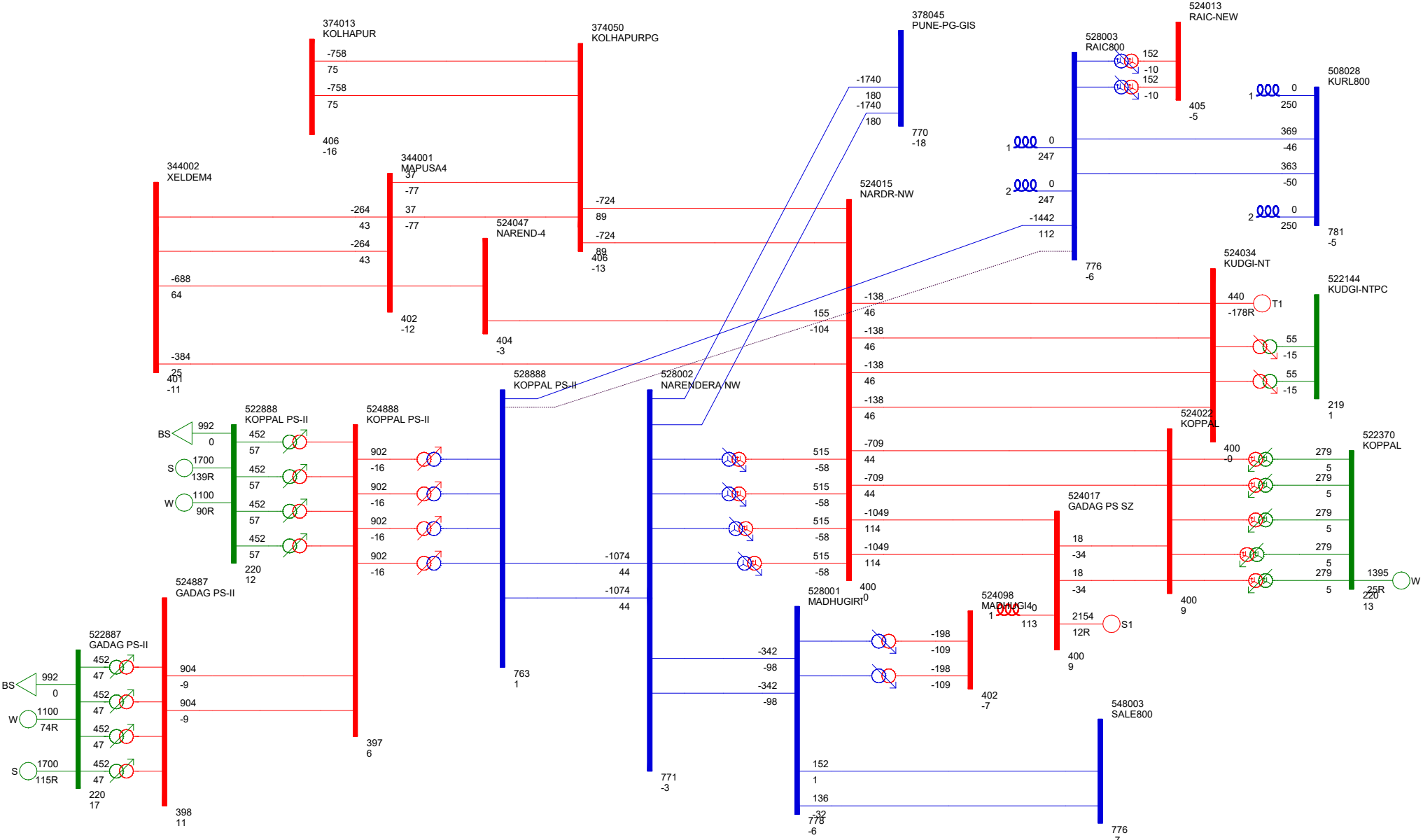
System Studies for integration of potentail REZ at Koppal-II/Gadag-II



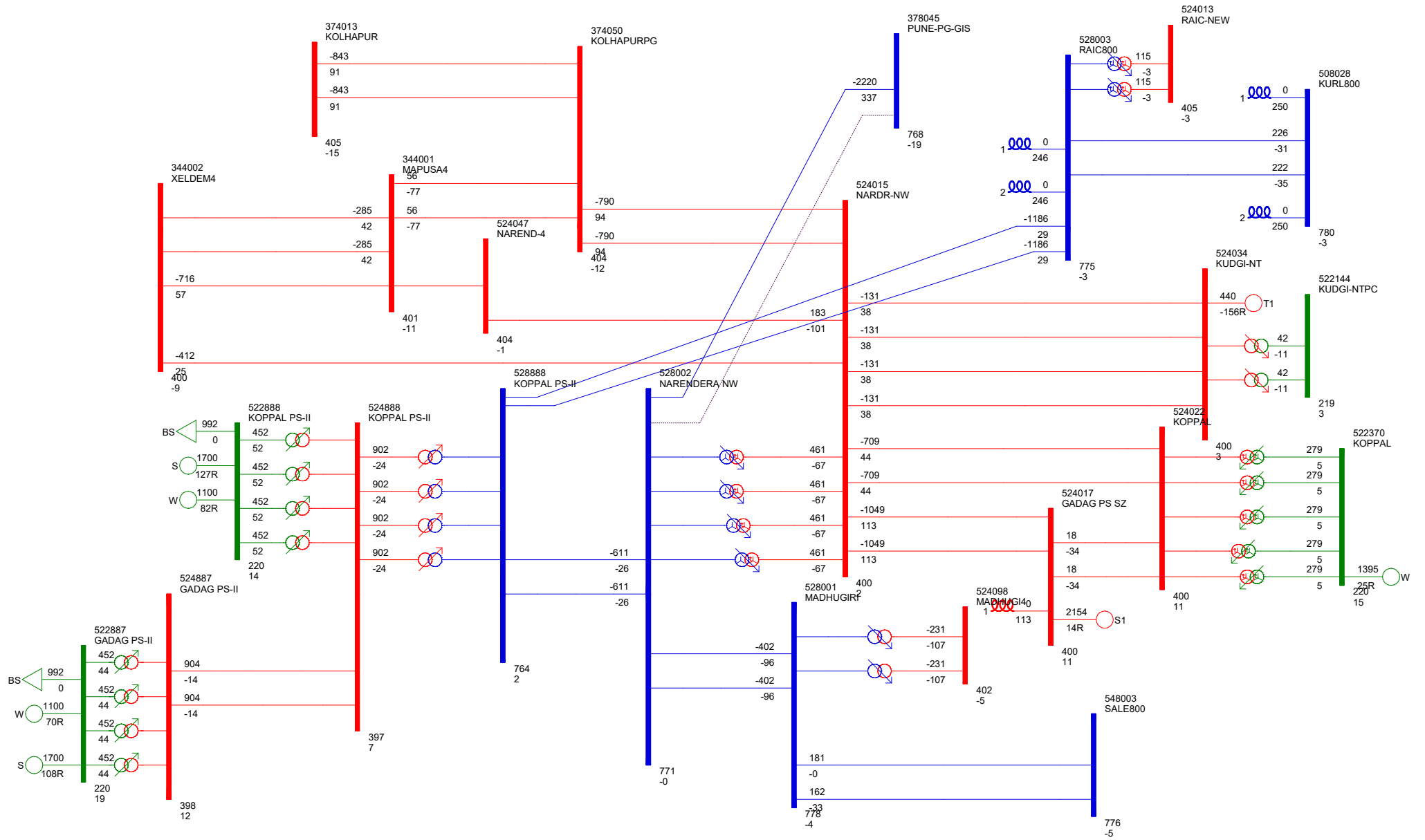
System Studies for integration of potentail REZ at Koppal-II/Gadag-II



System Studies for integration of potentail REZ at Koppal-II/Gadag-II



System Studies for integration of potentail REZ at Koppal-II/Gadag-II



System Studies for integration of potentail REZ at Koppal-II/Gadag-II

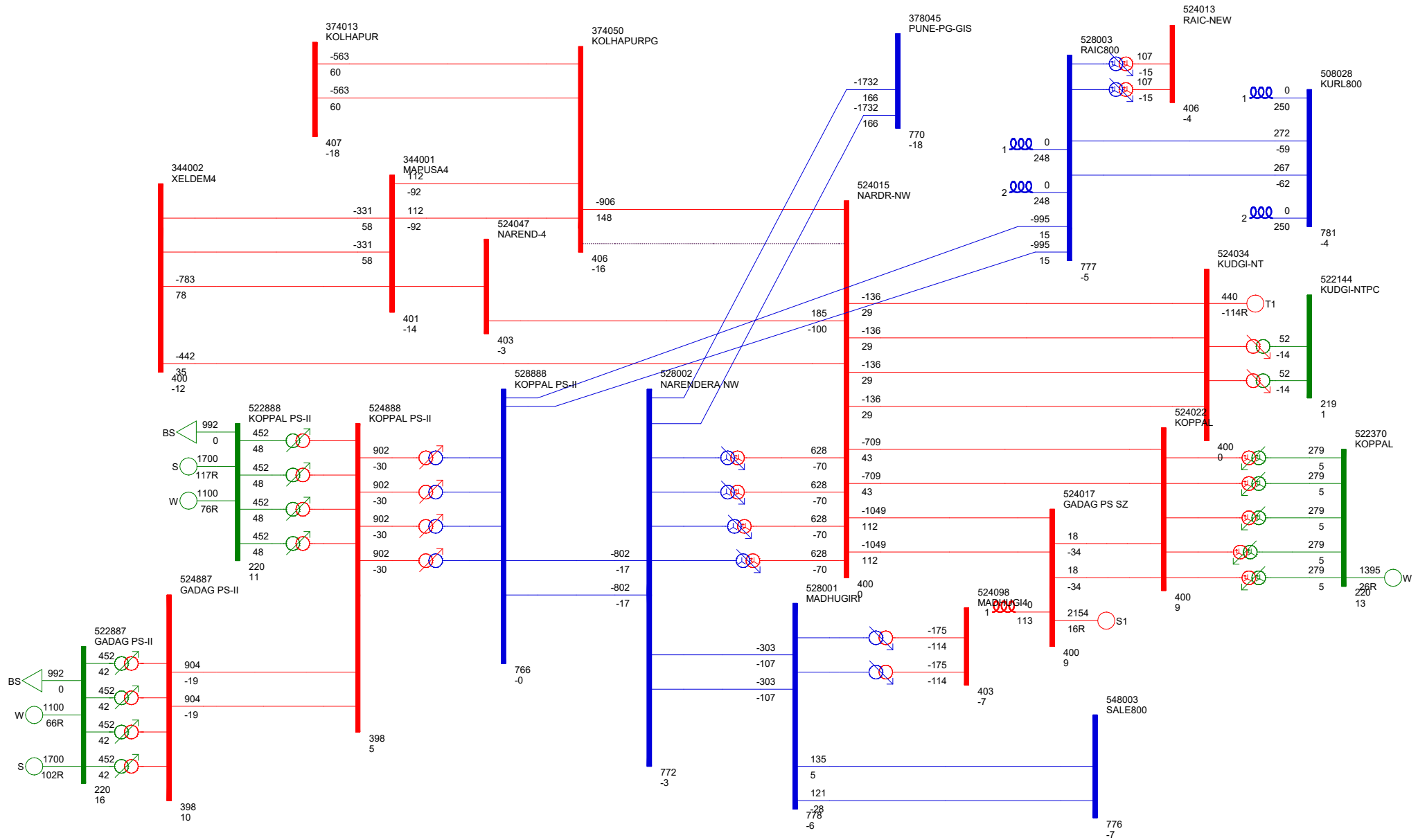
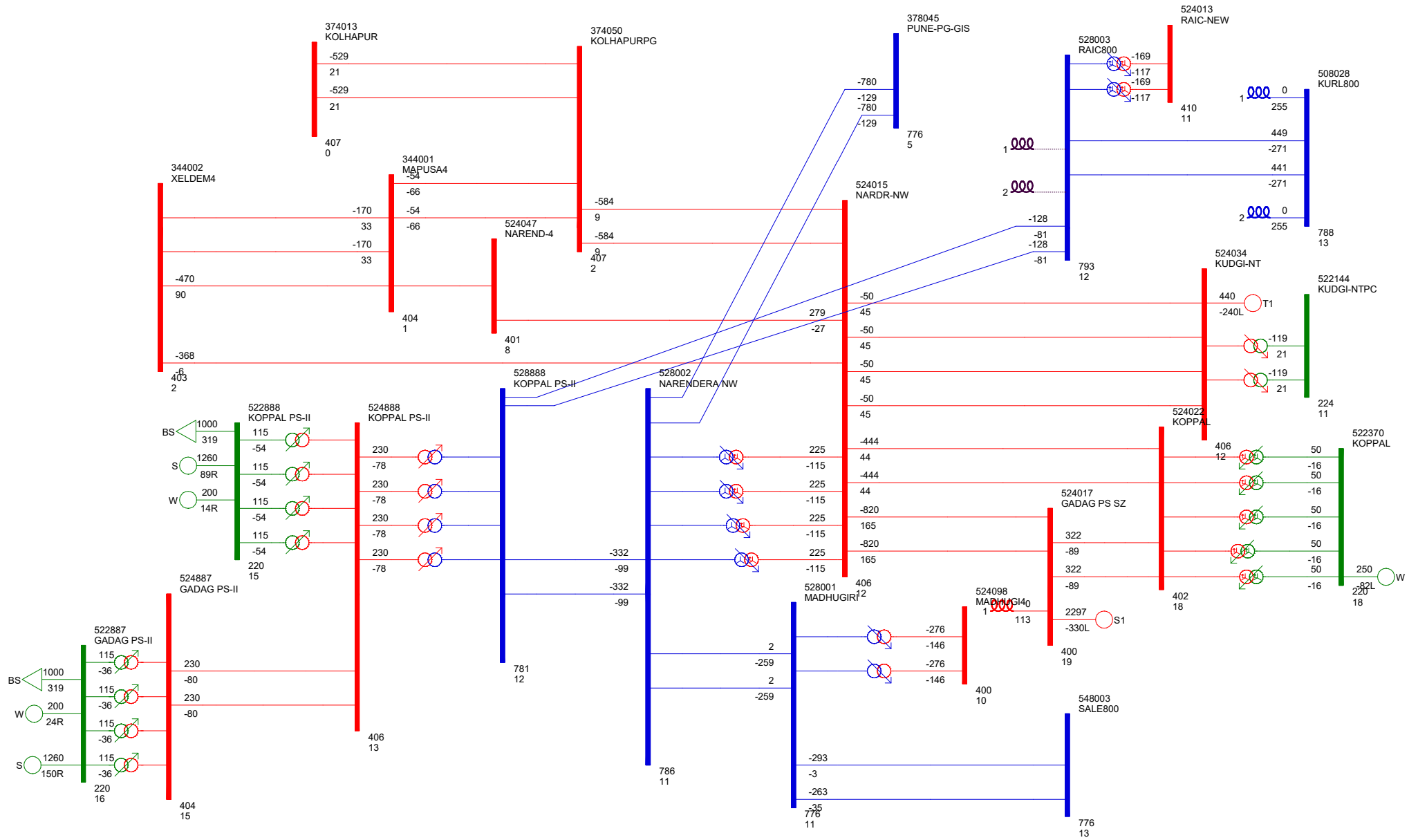
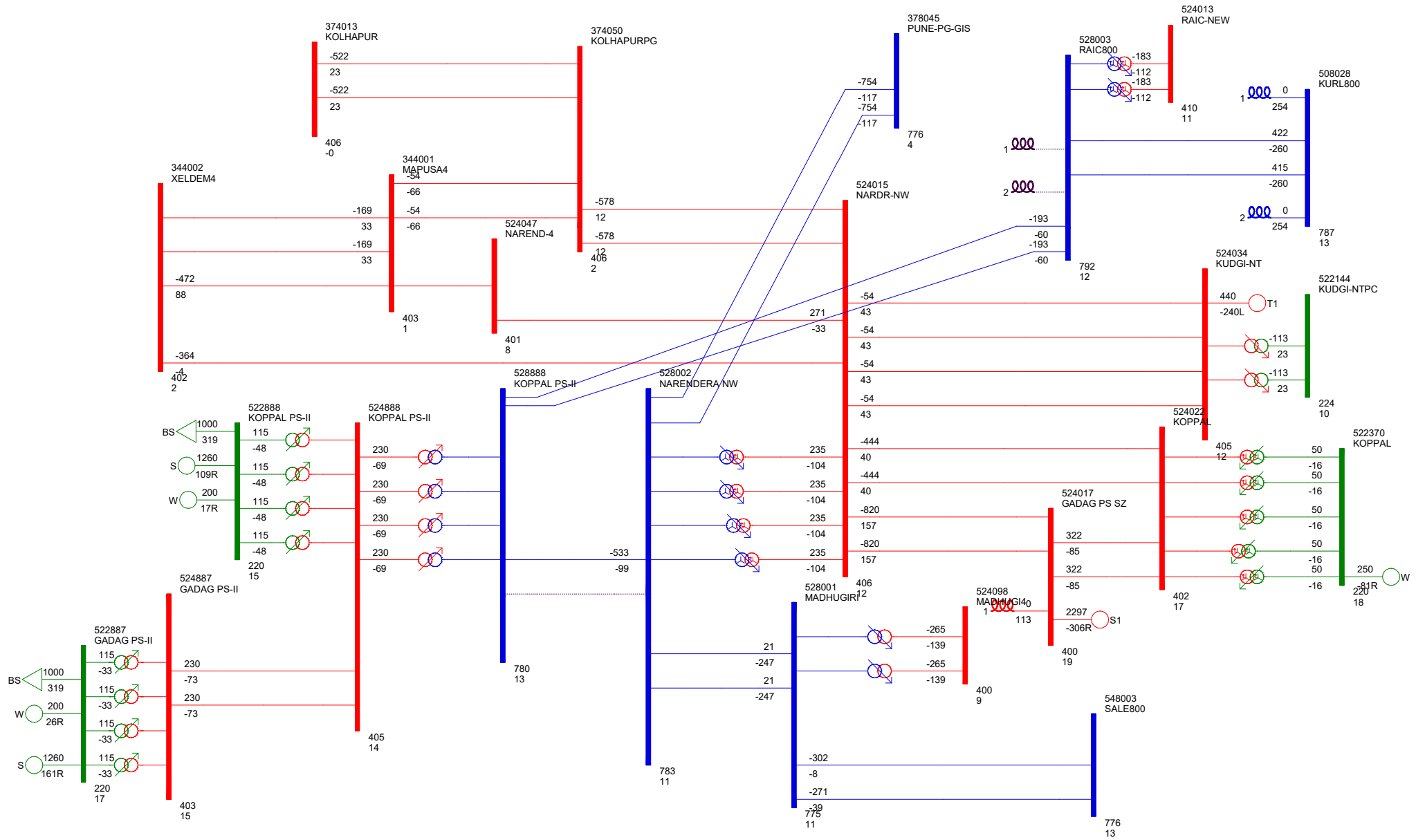


Exhibit-4 : Base Case (With Koppal-II & Gadag-II generation)

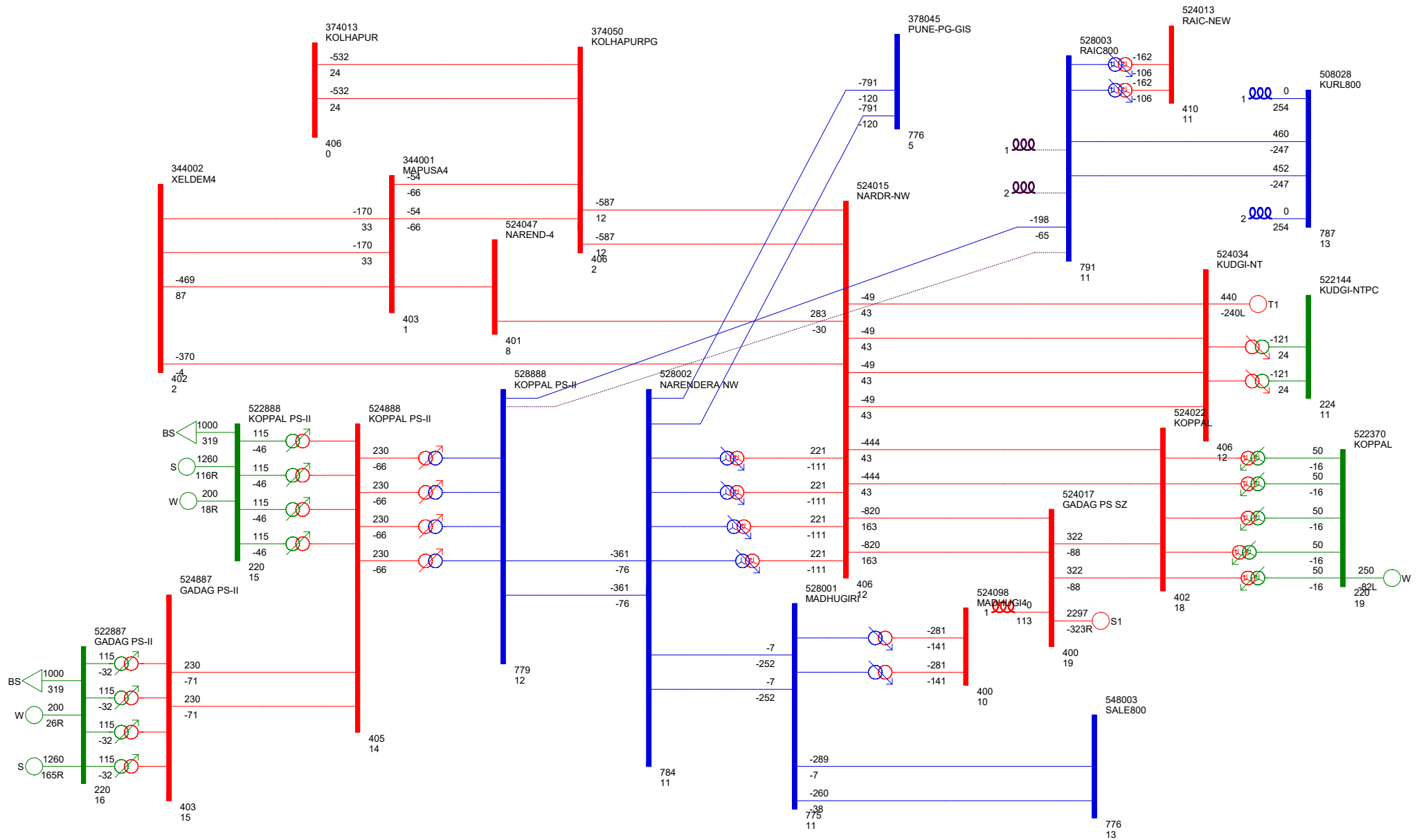
System Studies for integration of potentail REZ at Koppal-II/Gadag-II



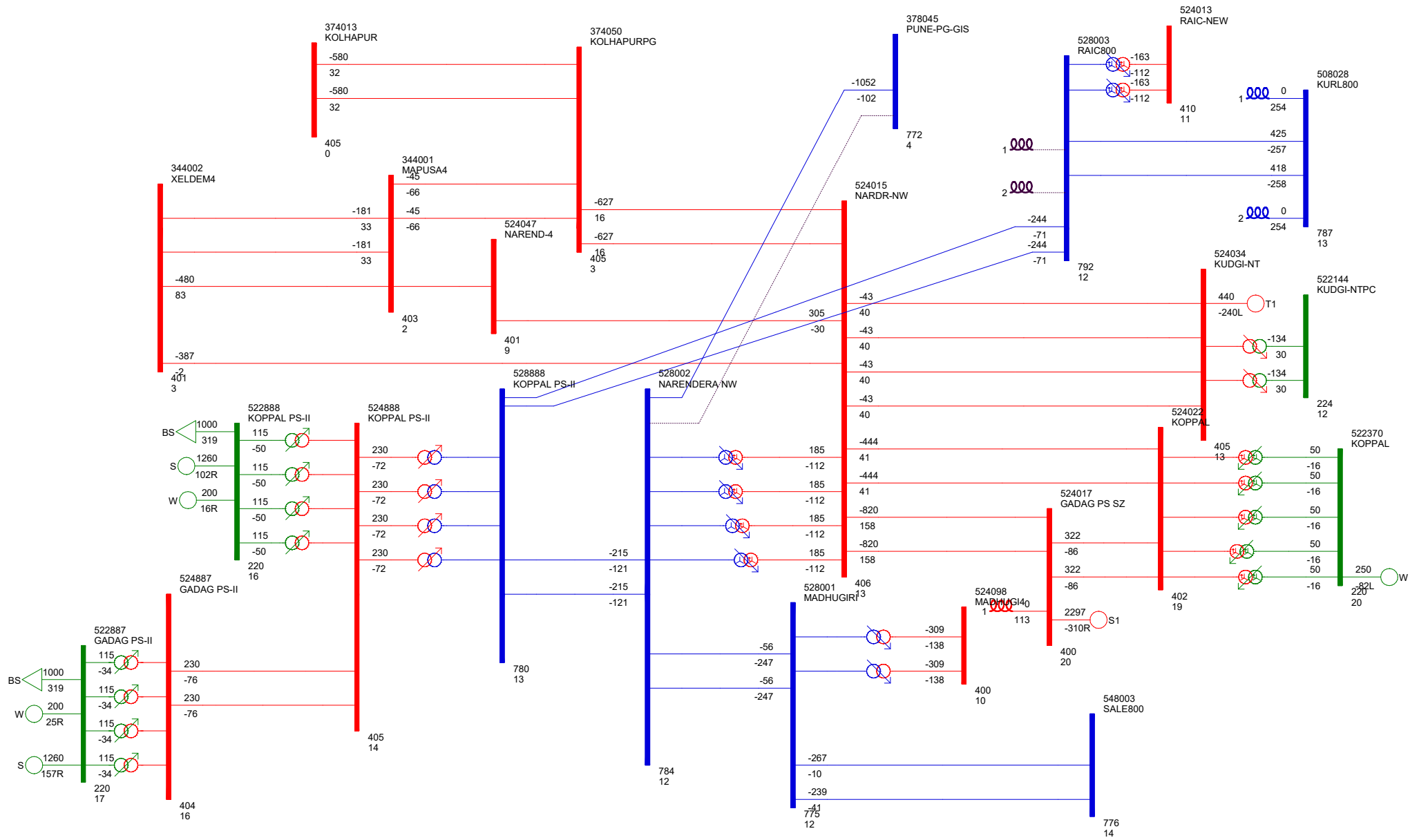
System Studies for integration of potentail REZ at Koppal-II/Gadag-II



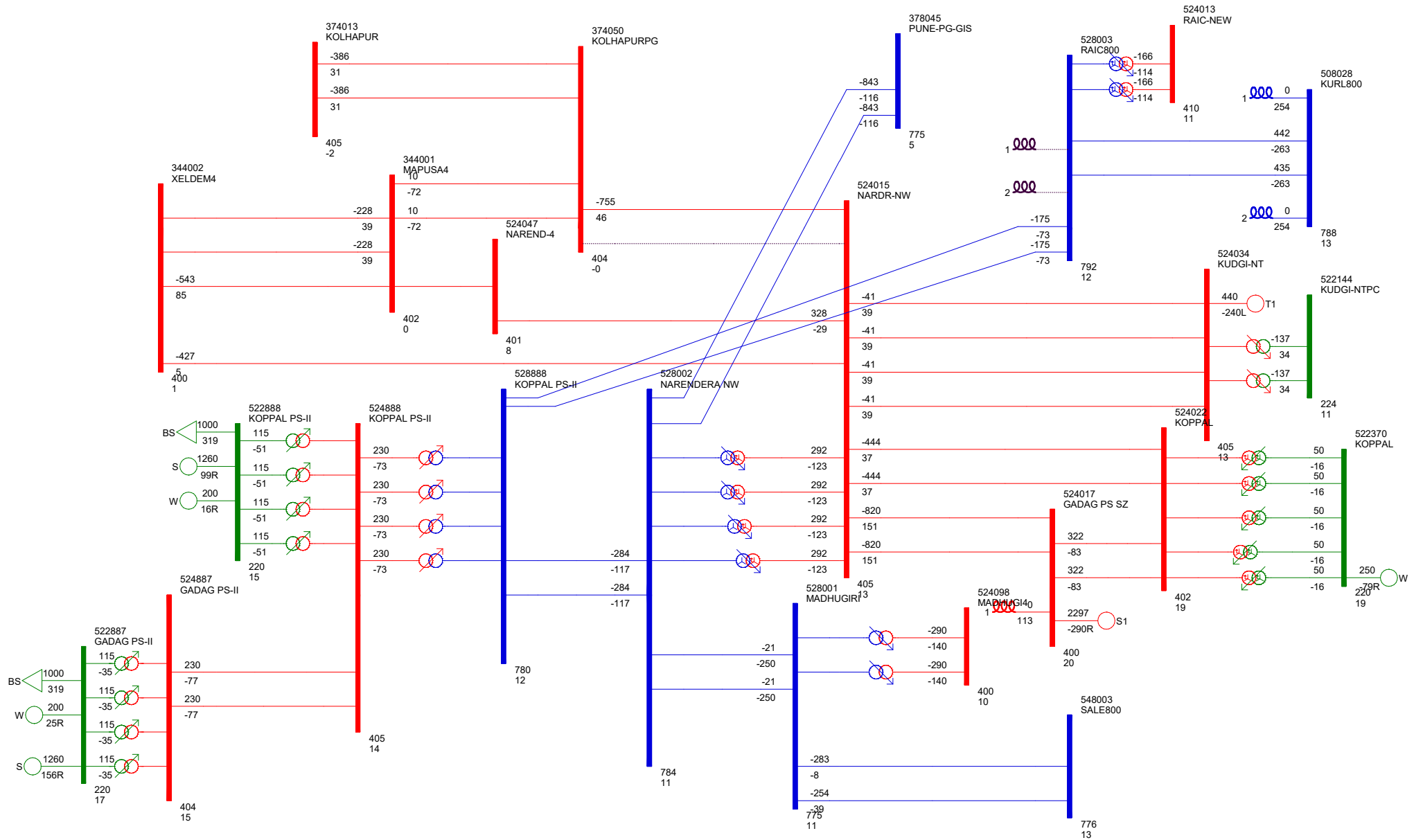
System Studies for integration of potentail REZ at Koppal-II/Gadag-II



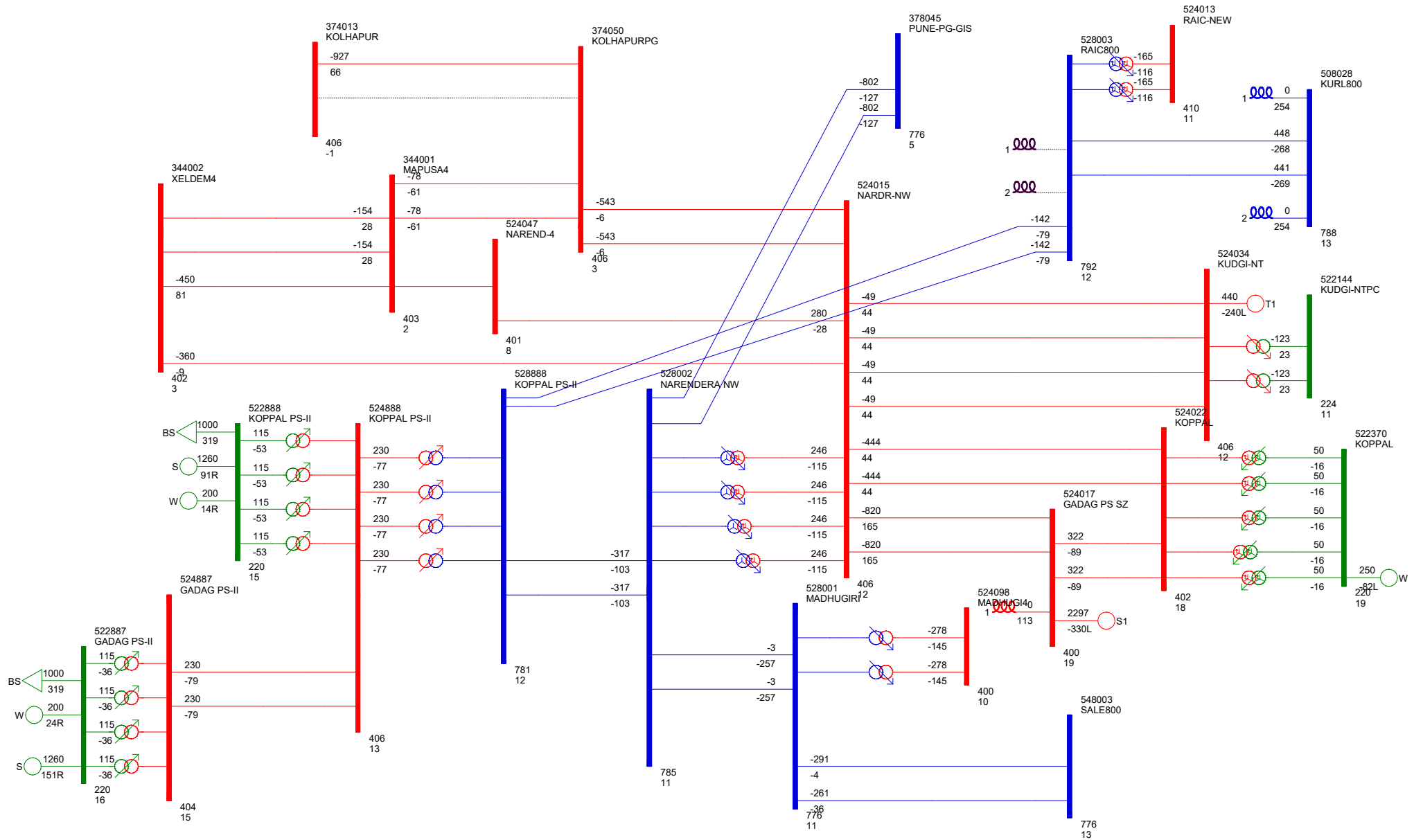
System Studies for integration of potentail REZ at Koppal-II/Gadag-II



System Studies for integration of potentail REZ at Koppal-II/Gadag-II



System Studies for integration of potentail REZ at Koppal-II/Gadag-II



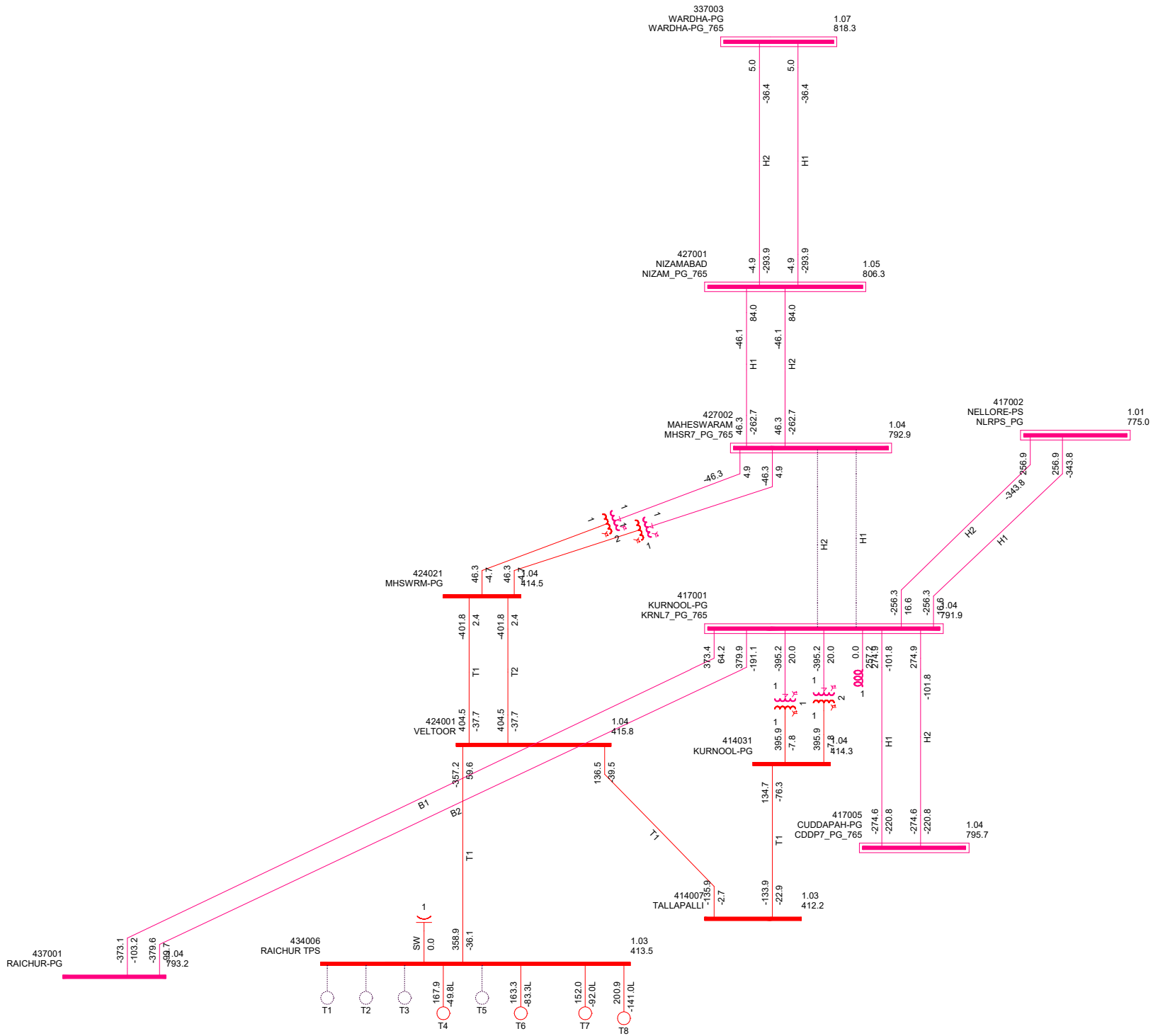
List of ICTs whose loading is beyond 70% and not meeting N-1 criteria

PTI INTERACTIVE POWER SYSTEM SIMULATOR--PSS(R)E THU, JUL 14 2022 11:36

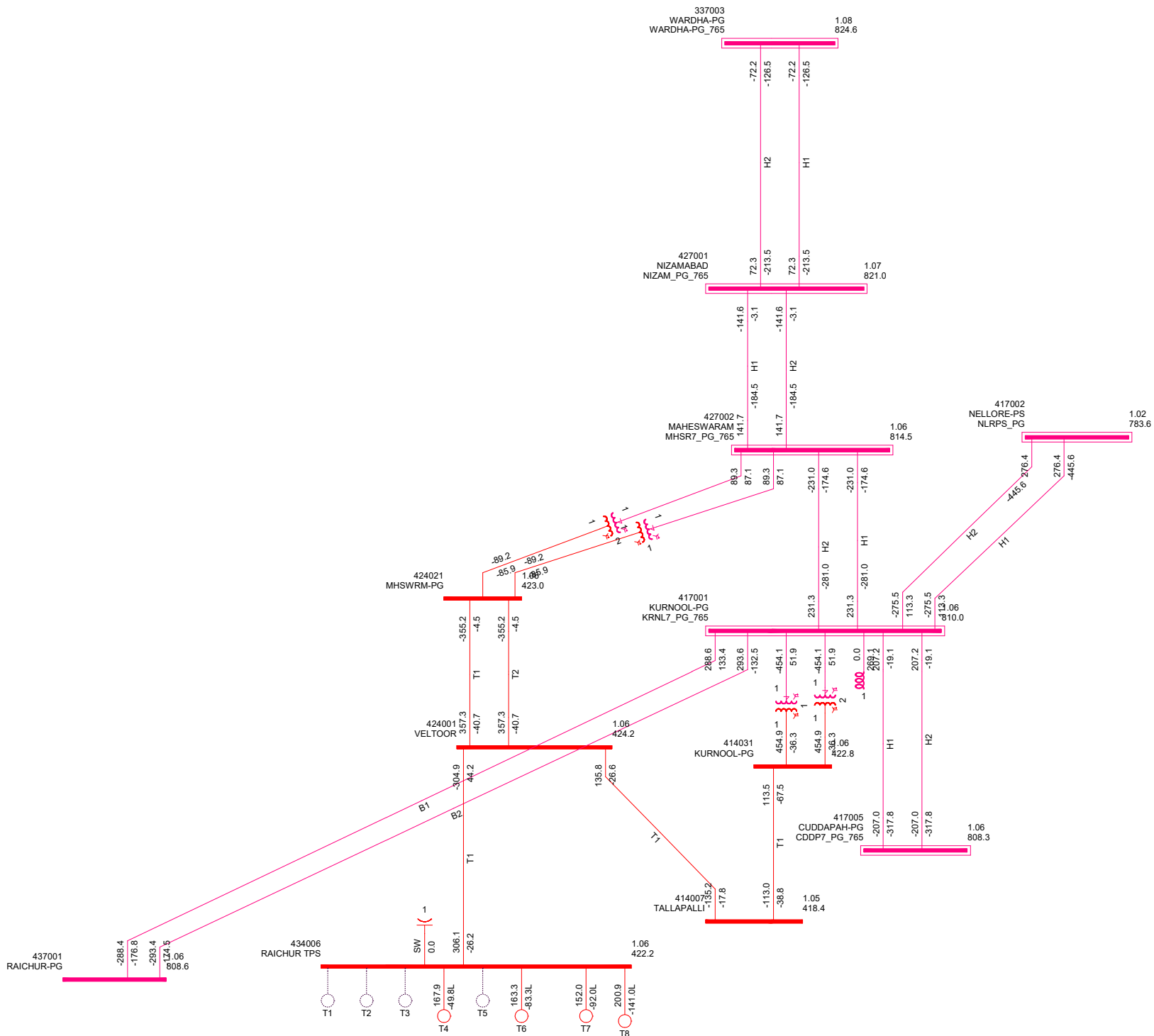
OUTPUT FOR AREA 5 [SOUTH]
 SUBSYSTEM LOADING CHECK (INCLUDED: TRANSFORMERS) (EXCLUDED: LINES; BREAKERS AND SWITCHES)
 MVA LOADINGS ABOVE 70.0 % OF RATING SET 1:

X----- FROM BUS -----X X----- TO BUS -----X											
BUS#-SCT	X-- NAME	--X BASKV	AREA	BUS#-SCT	X-- NAME	--X BASKV	AREA	CKT	LOADING	RATE1	PERCENT
502039	MARADAM1	220.00	5	504039	MARADAM	400.00*	5	E1	223.6	315.0	71.0
502039	MARADAM1	220.00	5	504039	MARADAM	400.00*	5	E2	223.6	315.0	71.0
502039	MARADAM1	220.00	5	504039	MARADAM	400.00*	5	P3	350.9	500.0	70.2
502039	MARADAM1	220.00	5	504039	MARADAM	400.00*	5	P4	350.9	500.0	70.2
502216	CHINAKAMPALL	220.00	5	504007	CUDP	400.00*	5	1	283.8	315.0	90.1
502216	CHINAKAMPALL	220.00	5	504007	CUDP	400.00*	5	2	283.8	315.0	90.1
502216	CHINAKAMPALL	220.00	5	504007	CUDP	400.00*	5	3	450.7	500.0	90.1
511001	RSTP	132.00*	5	514001	RAMGUNDM STP	400.00	5	1	167.5	200.0	83.8
512198	KTPS-V	220.00*	5	514049	KOTH-VI	400.00	5	1	253.3	315.0	80.4
514101	MAHESWRM	400.00	5	518051	MAHESHWARAM	765.00*	5	1	1516.7	1500.0	101.1
514101	MAHESWRM	400.00	5	518051	MAHESHWARAM	765.00*	5	2	1516.7	1500.0	101.1
532259	KOTTAYAM2	220.00	5	534048	KOTTAYAM4	400.00*	5	1	221.5	315.0	70.3
532259	KOTTAYAM2	220.00	5	534048	KOTTAYAM4	400.00*	5	2	221.5	315.0	70.3
540506	SALEM41	110.00	5	544003	SALE	400.00*	5	1	141.8	200.0	70.9
540506	SALEM41	110.00	5	544003	SALE	400.00*	5	2	141.8	200.0	70.9
540506	SALEM41	110.00	5	544003	SALE	400.00*	5	3	141.8	200.0	70.9
540571	ARNI21	110.00	5	544034	ARNI-TNEB	400.00*	5	1	176.0	200.0	88.0
540571	ARNI21	110.00	5	544034	ARNI-TNEB	400.00*	5	2	176.0	200.0	88.0
540571	ARNI21	110.00	5	544034	ARNI-TNEB	400.00*	5	3	176.0	200.0	88.0
540712	CUDALU21	110.00*	5	544029	CUDDALORE TN	400.00	5	1	183.4	200.0	91.7
540712	CUDALU21	110.00*	5	544029	CUDDALORE TN	400.00	5	2	183.4	200.0	91.7
540757	ALAKAR21	110.00	5	544031	ALAGARKOIL	400.00*	5	1	143.2	200.0	71.6
540757	ALAKAR21	110.00	5	544031	ALAGARKOIL	400.00*	5	2	143.2	200.0	71.6
541506	EDAYARPYM41	110.00	5	544122	EDARPLYM	400.00*	5	1	208.7	200.0	104.3
541506	EDAYARPYM41	110.00	5	544122	EDARPLYM	400.00*	5	2	208.7	200.0	104.3
541506	EDAYARPYM41	110.00	5	544122	EDARPLYM	400.00*	5	3	208.7	200.0	104.3
542012	NLCTS22	230.00	5	544001	NYVL TS 2	400.00*	5	1	177.3	250.0	70.9
542012	NLCTS22	230.00	5	544001	NYVL TS 2	400.00*	5	2	177.3	250.0	70.9
542130	KAMUDHI42	230.00	5	544132	KAMUTHI4	400.00*	5	1	255.2	315.0	81.0
542130	KAMUDHI42	230.00	5	544132	KAMUTHI4	400.00*	5	2	255.2	315.0	81.0

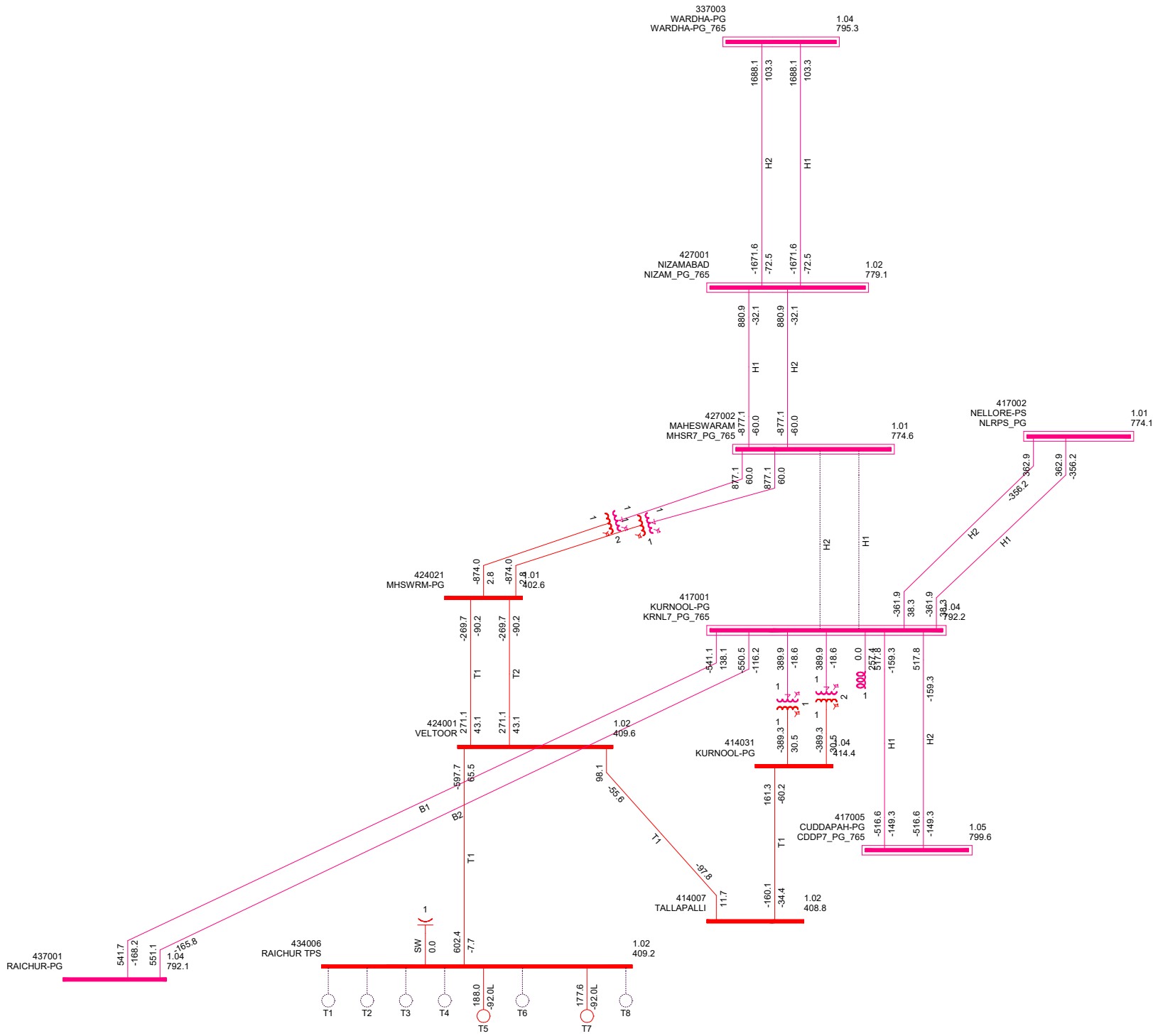
BASECASE :- Export Scenario, 765kV Kurnool - Maheswaram Outage



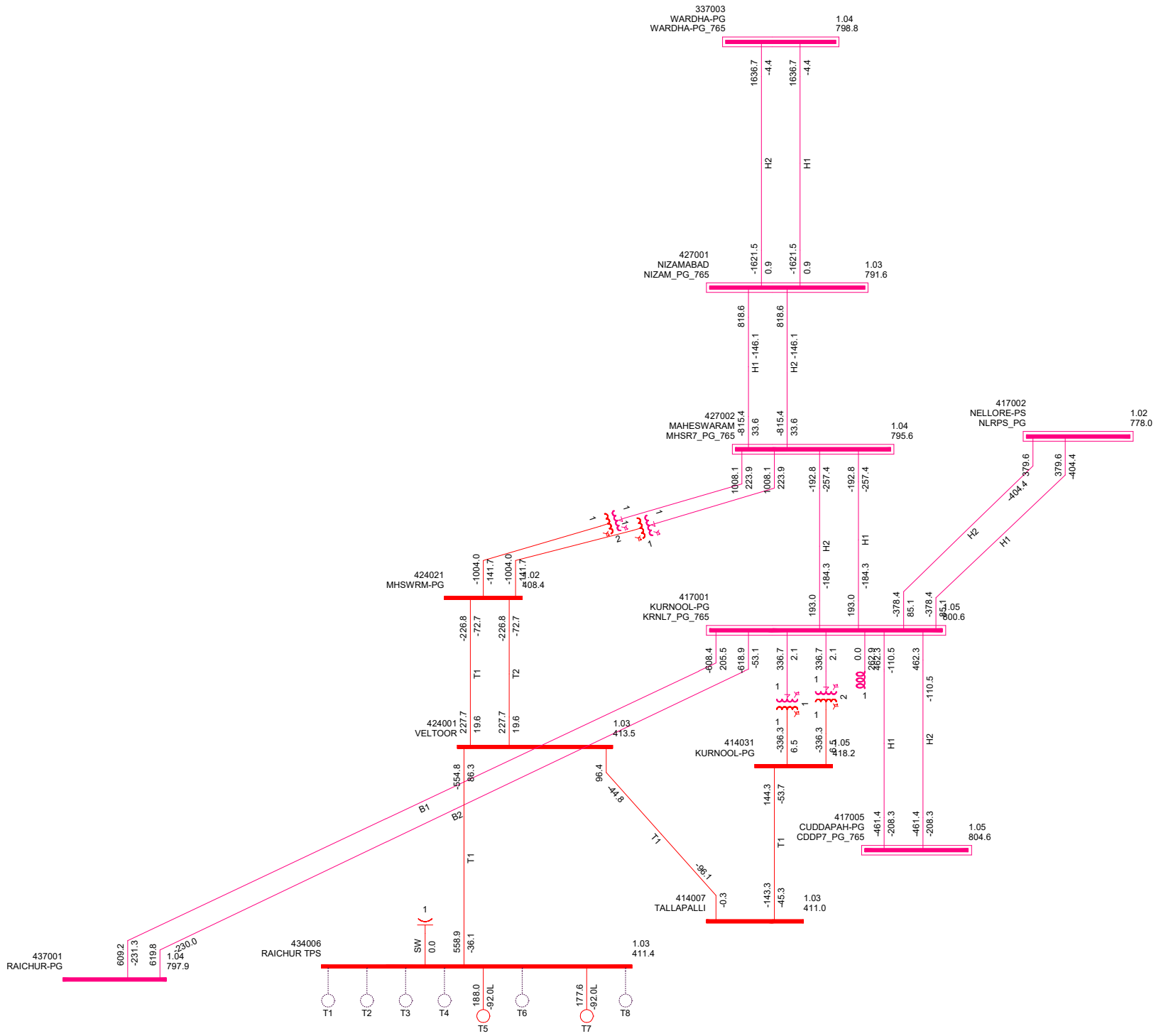
CASE 1 :- Export Scenario, 765kV Kurnool - Maheswaram in-service



Case 2:- Import Scenario, 765kV Kurnool - Maheswaram Outage



Case 3 :- Import Scenario, 765kV Kurnool - Maheswaram in-service



सेंट्रल ट्रांसमिशन यूटिलिटी ऑफ इंडिया लिमिटेड

(पावर ग्रिड कॉर्पोरेशन ऑफ इंडिया लिमिटेड के स्वामित्व में)

(भारत सरकार का उदयम)

CENTRAL TRANSMISSION UTILITY OF INDIA LTD.

(A wholly owned subsidiary of Power Grid Corporation of India Limited)

(A Government of India Enterprise)

Ref: CTU/S/00/9th CMETS-SR

Date: 16.08.2022

As per distribution list

Subject: Minutes of 9th Consultation Meeting for Evolving Transmission Schemes in Southern Region-reg.

Dear Sir/Ma'am,

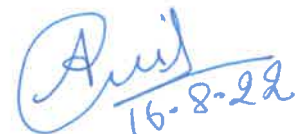
दक्षिणी क्षेत्र में पारेषण योजनाओं को विकसित करने हेतु दिनांक 29.07.2022 को वर्चुअल मोड से संपन्न हुई 9वीं परामर्श बैठक का संलग्न कार्यवृत्त प्राप्त करें। परामर्श बैठक का कार्यवृत्त वेबसाइट पर भी उपलब्ध है। (www.ctuil.in>> [ISTS Planning and Coordination](#) >> [Consultation Meeting for ISTS](#)>> [Southern Region](#))

Please find attached minutes of the 9th Consultation Meeting for Evolving Transmission Scheme in Southern Region held on 29.07.2022 through virtual mode.

The minutes are also available at our website (www.ctuil.in>> [ISTS Planning and Coordination](#) >> [Consultation Meeting for ISTS](#)>> [Southern Region](#)).

Thanking you,

Yours faithfully,



(Anil Kr. Meena)

Sr. DGM

Distribution List:

1. Chief Engineer (PSP&A – I) Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi – 110 066.	2. Chief Engineer (Transmission/GEC) Ministry of New and Renewable Energy, Block 14, CGO Complex, Lodhi Road, New Delhi – 110003
3. Director (Transmission) Transmission Corp. of Andhra Pradesh Ltd. (APTRANSCO) Vidyut Soudha, Gunadala, Eluru Rd, Vijayawada, Andhra Pradesh – 520004	4. Member Secretary Southern Regional Power Committee 29, Race Course Cross Road Bangalore – 560 009.
5. Director Transmission) Transmission Corp. of Telangana Ltd. Vidyut Soudha Hyderabad – 500 082 Fax: 040-23321751	6. Director (Transmission) Karnataka State Power Transmission Corp. Ltd., Cauvery Bhawan Bangalore – 560 009 Fax: 080-22228367
7. Director (Trans. & System Op.), Kerala State Electricity Board Ltd. Vidyuthi Bhawanam, Pattom, P.B. No. 1028 Thiruvananthapuram – 695 004. Fax: 0471-2444738	8. Director (Transmission Projects) Tamil Nadu Transmission Corporation Ltd (TANTRANSCO) 6th Floor, Eastern Wing, 800 Anna Salai, Chennai – 600 002 Fax: 044-28516362
9. Superintending Engineer –I First Floor, Electricity Department Gingy Salai, Puducherry – 605 001.	10. Director (SO) POSOCO 9 th Floor, IFCI Towers, 61, Nehru Place, New Delhi – 110019
11. Executive Director Southern Regional Load Dispatch Centre POSOCO 29, Race Course Cross Road, Bangalore – 560009	12. Director (Power System) Solar Energy Corporation of India Ltd. D-3, 1 st Floor, A wing, Religare Building, District Centre, Saket, New Delhi – 110017

Connectivity/ LTA/ MTOA Applicants

<p>1. Shri Sandeep Sarwate ACE Nuclear Power Coporation of India Ltd. 11N 29, VS Bhawan Anu Shakti Nagar Mumbai-94, Maharsashtra Email: ssarwate@npcil.co.in hrahim@npcil.co.in</p>	<p>2. Shri Kunal L Kaistha General Manager Green Infra Wind Energy Ltd. 5th Floor, Tower-C, building no. 8, DLF, Cyber park Gurugram-122002, Haryana Email: kunal.kaistha@sembcorp.com pawan.sharma@sembcorp.com</p>
<p>3. Shri Anish Pasrija GM-Business development Greenko AP01 IREP Pvt. Ltd. 15th floor, Hindustan Times House 18-20 KG Marg, New Delhi Email: anish.p@greenkogroup.com manojkumar.t@greenkogroup.com</p>	<p>4. Shri Pavan Kumar Gupta Authorized Signatory Ken Renewables India Pvt Ltd 14th Floor, Tower-B, Vatika Towers, DLF Golf Course Road, Sunciy Sector 54 Gurugram, Haryana Email: pavan.gupta@enel.com namit.jain@enel.com</p>
<p>5. Shri Anujesh Shahi Chief Marketing and Strategy TATA Power Trading Company Ltd. Shatabdi Bhawan, B-12 & 13, Sector-4, Noida, Uttar Pradesh Email: anujesh.shahi@tatapower.com ravidabbiru@tatapower.com</p>	

Minutes of 9th Consultation Meeting for Evolving Transmission Schemes in SR, held on 29.07.2022

CGM (CTU) welcomed the participants to 9th Consultation Meeting for Evolving Transmission System in Southern Region. It was mentioned that CTU is putting all efforts for coordinated planning of ISTS network. Accordingly, a joint study meeting of Southern Regional constituents was held from 30th June to 02nd July, 2022 at SRPC, Bengaluru. Subsequently, agenda of the meeting was taken up for discussion. List of participants attached at **Annexure-I**

A. Confirmation of Minutes of the 8th Consultation Meeting for Evolving Transmission Schemes in Southern Region

CTU informed that minutes of the 8th Consultation Meeting for Evolving Transmission Schemes in Southern Region held on 28.06.2022 were circulated vide letter dated 12.07.2022. As no comments/observations were received, minutes were confirmed as circulated.

B. ISTS Network Expansion schemes in Southern Region

1. Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary Area of Karnataka

CTU stated that during the 7th Consultation Meeting for Evolving Transmission Schemes in SR, held on 31.05.2022, it was informed that the Koppal PS and Gadag PS with 5x500 MVA, 400/220 kV ICTs were identified in the state of Karnataka as part of transmission system planning for 18.5 GW in Southern Region and are under advance stage of implementation. Further, CTU has allocated all 9 nos. of 220 kV line bays at Koppal PS and all 8 nos. of 220kV line bays at Gadag PS for grant / agreed for grant of Stage-II Connectivity for 2753.6 MW and 1995 MW respectively, to various RE developers for termination of their dedicated transmission line(s). Accordingly, Koppal PS and Gadag PS have been closed for further grant of Connectivity through allocation of new bay. However, limited margins are available in the allocated bay(s) at Gadag PS which shall be utilized for grant of St-II Connectivity through enhancement in Connectivity quantum or sharing of dedicated transmission line(s).

Further, Govt. of India has set a target of 500 GW generation capacity from non-fossil fuel resources by 2030. In this direction, MNRE has identified addition of 181.5 GW RE Potential in the States of Andhra Pradesh, Telangana, Karnataka, Rajasthan, Madhya Pradesh and Tamil Nadu (Offshore). Out of the identified 181.5 GW Potential, 86 GW RE Potential is identified in the State of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu (Offshore) in Southern Region. The transmission system for integration of 181.5 GW RE Potential is under advanced stage of identification by CEA in coordination with CTU.

Out of the identified (86 GW) RE Potential in Southern Region, 17 GW has been identified in the State of Karnataka. MNRE have indicated that out of the 17 GW REZ potential in Karnataka, transmission system for evacuation capacity of 10.5 GW may be identified considering

the Energy Storage System. The district wise details of RE potential and evacuation capacity to be planned considering Wind & Solar dispatch are given below:

Table 1

District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)
	Wind	Solar				
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Davangere / Chitradurga	2	2	4	2.9	1	2
Bijapur	2		2	1.1		2
Bellary		1.5	1.5	1.35		1.5
Tumkur		1.5	1.5	1.35		1.5
Total	8	9	17	12.5	3	11

Further, it was informed that SECI vide email dated 08.05.2022 has communicated that they have floated tenders for selection of RE developer and the developers would opt for setting up of RE projects in Koppal and Gadag area of Karnataka. Accordingly, SECI has requested to prioritize the development of associated transmission system for integration of additional potential at Koppal and Gadag. CTU is receiving Connectivity applications and representations from RE developers for further augmentation of capacity at under implementation Koppal PS and Gadag PS so that they may further integrate their proposed RE generation projects in the area. CTU has already received connectivity application of 600 MW at Koppal/Gadag-II area. CTU is obligated to grant connectivity/LTA to such applicants as per the roles assigned to CTU under the Electricity Act, 2003 / CERC Regulations / Detailed Procedure in a time-bound manner. In view of the above, as an advance action, transmission system for integration and immediate evacuation of additional RE potential of 2 GW each at Koppal and Gadag as well as integration of RE potential at Gadag, Davangere, Bijapur and Bellary through 400kV transmission lines with Koppal-II PS 765/400/220kV needs to be identified.

The details RE potential at Koppal-II and Gadag-II for which transmission system is being envisaged for integration and evacuation are as given below:

Table 2

District	Potential (GW)		Total (GW)	Dispatch (90% S + 55% W)	BESS	Evacuation capacity to be planned (GW)
	Wind	Solar				
Koppal	2	2	4	2.9	1	2
Gadag	2	2	4	2.9	1	2
Total	4	4	8	5.8	2	4

Accordingly, during the 7th Consultation Meeting, it was decided that physical Joint Study would be conducted in June/July 2022, with participation from Southern Region stake holders, CEA, SRPC, CTU, POSOCO etc., to identify and finalize Transmission Schemes for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary Area of Karnataka and Transmission system for grant of LTA for 2000 MW to M/s NPCIL for proposed generation expansion at Kudankulam APP. The Joint Studies were conducted during 30th June to 2nd July, 2022 at SRPC, Bengaluru.

During the Joint Study meeting, following was deliberated:

- Transmission system should be identified based on the actual “developable” potential considering the availability of land in consultation with the regional constituents. The transmission system should not be evolved merely on the basis of envisaged potential without identification of likely generation developers and identified beneficiaries.
- SECI/MNRE should come-up with a detailed report capturing all such details viz., location-wise potential assessed, actual developable potential, land availability, generation developers and identified beneficiaries. In absence of identified generation developers / beneficiaries, SECI should apply for connectivity / LTA on behalf of such generation developers / beneficiaries.
- SECI may be requested to come up with location specific bids including BESS at Pooling Station for optimal utilization of envisaged potential at these areas. Further, optimal transmission system may be evolved for integration of potential REZ with the grid so that the constituents are not burdened. Further, SECI may be requested to come out with a plan / modality of implementation of BESS.

After detailed deliberations, following transmission system was agreed during the joint study meeting for integration and evacuation of RE potential from Koppal-II and Gadag-II and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary:

(i) Transmission Scheme for Renewable Energy Zone (Phase-II) in Koppal-II in Karnataka and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary.

a. Phase-A

- Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II Pooling Station with provision of two (2) sections of 4500 MVA each at 765/400kV level and provision of four (4) sections of 2500 MVA each at 400/220kV level
- Koppal-II PS – Narendra New 765kV D/c line with 240 MVar SLR at Koppal-II PS end (~150 km)
- 2x330 MVar 765kV bus reactors at Koppal-II PS
- 2x125MVar 420kV bus reactors at Koppal-II PS
- Provision for 25 acres of land for establishment of BESS at Koppal-II PS

b. Phase-B

- Koppal-II PS – Raichur 765kV D/c line with 330 MVar SLR at Koppal-II PS end (~190 km)

- Augmentation of 2x1500, 765/400kV, ICTs at Koppal-II PS.
- Augmentation of 2x500, 400/220kV, ICTs at Koppal-II PS.

Future Provisions

- Space provision for 8 nos. of 400/220kV, 500 MVA ICTs at Koppal-II PS
- Space for 4 nos. of 765/400kV, 1500 MVA ICTs at Koppal-II PS

(ii) Transmission Scheme for Renewable Energy Zone (Phase-II) in Gadag-II in Karnataka

- Establishment of 400/220kV, 2x500 MVA Gadag-II Pooling Station
- Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line (~100 km)
- 2x125MVAr 420kV bus reactors at Gadag-II PS
- Provision for 25 acres of land for establishment of BESS at Gadag-II PS

Future Provisions

- Space provision for 10 nos. of 400/220kV, 500 MVA ICTs at Gadag-II PS

The above transmission scheme mentioned at (i) and (ii) also includes future provision for line bays at 765 kV, 400 kV and 220 kV for interconnection of ISTS/ Intra State Transmission System and termination of dedicated Connectivity transmission lines for RE integration, bus sectionalizer, TBC & BC etc., however complete details of same have not been mentioned here.

It was also decided that the implementation of transmission system shall be taken up in phased manner subject to materialization of RE projects. It was also agreed that the Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs.

SECI was requested to provide their views on the observations raised by the forum during the Joint Study meeting.

In this regard, SECI informed that as a part of Govt. of India target of 500 GW generation capacity from non-fossil fuel resources by 2030, 181.5 GW RE potential has been identified after detailed discussions with all the concerned States. The identified potential along with land availability have been confirmed by all the concerned States and only after due deliberations, MNRE/SECI have finalized the report on 181.5 GW RE potential.

SECI also informed that the development of transmission system may be taken up at various locations simultaneously so that the RE developers may be facilitated for integration as per their convenience for land acquisition for establishment of RE generation project. Earlier

Koppal & Gadag PS were not receiving Connectivity/LTA applications, now both the PS are full from the Connectivity applications. Further, SECI informed that several Wind, Solar and Hybrid location based tenders are in pipeline and shall be issued shortly. RE developers may show interest only at the locations where transmission planning is initiated or proper transmission infrastructure is available. Without the pooling stations and associated transmission system, the RE developers cannot be granted connectivity. Accordingly, the initiation for development of transmission system may be taken up simultaneously so that RE developers may seek connectivity at multiple locations and implementation of the transmission system may be carried out in phased manner.

CTU informed that during the Joint Study meeting, the SR constituents expressed that out of the 18.5 GW RE potential in SR, potential has not been materialized so far at Kurnool and Anantapur area. Further, Connectivity/LTA for 420 MW, out of identified potential of 2.5 GW, has been granted at Karur. Forum has opined that SECI may come up with location specific bids in order to optimize the transmission system. Further, for optimal utilization of the transmission system, the future REZs may be developed along with BESS.

SECI informed that out of the 181.5 GW identified potential, the transmission system was to be planned for about 121 GW considering the BESS and same was also part of the 181.5 GW planning report. Further the SECI had included the provision of BESS along with the generation in few bids which shall be issued shortly. With regard to location specific bids, SECI informed that they are inviting location specific bids, however, the locations are multiple and RE developers may seek connectivity at multiple locations.

TANGEDCO representative informed that Tamil Nadu was consulted for assessment of 181.5 GW potential study and requested to share the report with the constituents so that respective states may carryout detailed analysis. The CTU proposal for Koppal-II PS & Gadag-II PS was agreeable for them technically based on the identified potential, however, SECI is requested to come up with location specific bids or SECI may apply for connectivity / LTA in the absence of such generation developers / beneficiaries as has been facilitated by CERC in the connectivity regulations. Further, the transmission system may be taken up for implementation in phased manner only after identification of the generation developers. With regard to BESS, TANTRANSCO requested SECI to clarify the implementation modality of BESS and detailed report including detailed guidelines in this regard may be furnished. It was also requested that a special meeting may be convened to discuss the implementation modalities of BESS and implementation of the projected RE capacity for better understanding of the constituents.

KPTCL enquired about the provision of 25 acres land for BESS kept in the scheme. Inclusion of 25 acres land provision in the transmission scheme shall increase the transmission charges and STUs will be burdened. CTU informed that only the provision for land has been kept, however, the installation of BESS will be carried out by the bidder at his own cost and will not be included in the transmission project cost. The TSP may charge the bidder for the utilization of the land for BESS.

KPTCL further informed that the implementation of the system may be taken up only after grant of LTA. Towards this, CTU informed that with the introduction of CERC Connectivity and GNA Regulations, 2022, the implementation of the system cannot be linked with LTA.

However, as decided in the Joint Study meeting, the implementation of transmission system shall be taken up in phased manner subject to materialization of RE generation projects.

TSTRANSCO also opined that BESS may not be made as part of ISTS and beneficiaries may not be burdened on this account.

APTRANSCO opined that the implementation of transmission system shall be taken up in phased manner subject to materialization of RE generation projects.

Puducherry informed that they are of same opinion as of TANTRANSCO.

SRPC opined that SECI may give detailed presentation with regard to 181.5 GW planning report either in the CMETS meeting or SRPC meeting, for better understanding and co-operation of the SR constituents. SECI informed that the 181.5 GW potential report indicating the potential, BESS and transmission requirement was already included in the agenda of the 7th CMETS(SR) meeting. SRPC informed that PPT has been shared, however, basis / report on which the potential has been assessed was not included in the PPT and requested to share the details. It was decided that once the 181.5 GW transmission planning report is made available, the report may be included in the CMETS agenda and detailed presentation may be arranged.

After detailed deliberations, following transmission system was agreed by all SR constituents:

(i) Transmission Scheme for Renewable Energy Zone (Phase-II) in Koppal-II in Karnataka and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary.

a. Phase-A

- Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II Pooling Station with provision of two (2) sections of 4500 MVA each at 765/400kV level and provision of four (4) sections of 2500 MVA each at 400/220kV level
- Koppal-II PS – Narendra New 765kV D/c line with 240 MVAR SLR at Koppal-II PS end (~150 km)
- 2x330 MVAR (765kV) & 2x125MVAR (400kV) bus reactors at Koppal-II PS
- Provision for 25 acres of land for establishment of BESS at Koppal-II PS

b. Phase-B

- Koppal-II PS – Raichur 765kV D/c line with 330 MVAR SLR at Koppal-II PS end (~190 km)
- Augmentation of 2x1500, 765/400kV, ICTs at Koppal-II PS.
- Augmentation of 2x500, 400/220kV, ICTs at Koppal-II PS.

Future Provisions

- Space provision for 8 nos. of 400/220kV, 500 MVA ICTs at Koppal-II PS
- Space for 4 nos. of 765/400kV, 1500 MVA ICTs at Koppal-II PS

(ii) Transmission Scheme for Renewable Energy Zone (Phase-II) in Gadag-II in Karnataka

- Establishment of 400/220kV, 2x500 MVA Gadag-II Pooling Station
- Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line (~100 km)
- 2x125MVAr 420kV bus reactors at Gadag-II PS
- Provision for 25 acres of land for establishment of BESS at Gadag-II PS

Future Provisions

- Space provision for 10 nos. of 400/220kV, 500 MVA ICTs at Gadag-II PS

It was also decided that the implementation of transmission system shall be taken up in phased manner subject to materialization of RE generation projects. It was also agreed that the Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs.

2. Proposal for Augmentation of Transformation Capacity in Tamil Nadu:

CTU informed that based on the feedback from SRLDC regarding improving the reliability and meet the N-1 contingency criteria, proposal for augmentation of transformation capacity at Udumalpet ISTS S/s in Tamil Nadu was deliberated during the 8th Consultation Meeting for Evolving Transmission Scheme in SR, held on 28.06.2022. In the meeting, following was agreed after detailed deliberations.

- As TANTRANSCO is looking into the possibility of readjustment of load / network & study other possible alternatives and sought more time to look into the matter. Therefore, it was decided that proposal for Augmentation of transformation capacity at Udumalpet S/s shall be discussed in 9th CMETS(SR).

CTU informed that no inputs have been received yet from TANTRANSCO regarding proposal on augmentation of transformation capacity at Udumalpet S/s. TNSLDC informed that N-1 violation duration for Udumalpet ICTs is 1% only and augmentation of transformation capacity at Udumalpet S/s is not required for the time being and same shall be discussed later as per the requirement.

SRLDC informed that considering load growth of about 5-7% per year, the loadings on the ICTs may further increase in near future and N-1 violation duration may also increase further. Further, the augmentation of ICT takes adequate time, augmentation of transformation capacity is very much required and should be taken up for implementation on the priority basis.

TANTRANSCO informed that after making LILO of existing Myvadi – Kurkathi 230 kV S/c line at Rasipalayam, the loading on the Udumalpet ICTs is expected to be reduced and presently the augmentation of transformation capacity at Udumalpet S/s is not required and same may be studied and taken up later based on the requirement.

After detailed deliberations, it was decided that the augmentation of transformation capacity at Udumalpet S/s may be studied in the joint study meeting being proposed by CEA for STU proposals and augmentation may be proposed based on the requirement.

C. Connectivity related proposals in Southern Region

Proposal for grant of connectivity to the applications received from renewable energy sources in June' 2022

CTU informed that 02 nos. of Stage-I connectivity applications and 01 no. Enhancement in Stage-II Connectivity application have been received in the month of June' 2022 in conformity with CERC Regulations. Details of applications along with the proposal are given below in table 3 & 4 respectively.

Table 3

Sl.	Stage-I Connectivity Application No.	Applicant Name	Location	Date of Application	Connectivity Sought (MW)	Nature of Applicant	Proposed Connectivity location	Connectivity Start date (sought by applicant)	Proposed Tr. System for Connectivity
1.	1200003970	Green Infra Renewables Energy Ltd.	Raichur, karnataka	09.06.2022	100	Generator (Wind)	Gadag PS, Karnataka	31.12.2024	Generation Pooling Station of Green infra Renewables Energy Ltd at Raichur – Gadag -II PS 220 kV S/c line
2.	0150200007	Ken Renewables India Pvt Ltd	Anantapur, Andhra Pradesh	30.06.2022	350	Generator (Solar)	Pavagada PS, Karnataka	30.06.2025	Generation Pooling Station of Ken Renewables India Pvt Ltd at Anantapur – Pavagada PS 220 kV S/c line

1. M/s Green Infra Renewables Energy Ltd. has sought stage-I connectivity for 100 MW (application no.1200003970) at Gadag PS with start date of connectivity as 31.12.2024 for its Wind based generator at Raichur, Karnataka.

CTU informed that Gadag PS was considered for implementation with 8 nos. of 220 kV lines bays and all 220 kV line bays have already been allocated to various RE developers for Connectivity of their generation projects. Presently, about 5500 MW Stage-I and 1995 MW of Stage-II Connectivity have already been granted to various RE developers at Gadag PS. However, for grant of Stage-II Connectivity, margin is available in 03 nos. of 220 kV dedicated Connectivity transmission infrastructure line.

After deliberation, it was agreed to grant Stage-I Connectivity for 100 MW (application no. 1200003970) to M/s Green Infra Renewables Energy Ltd. at Gadag-II PS with following Connectivity transmission system. However, at time of receipt of Stage-II Connectivity application from M/s Green Infra Renewables Energy Ltd. for above mentioned RE project, grant of Stage-II Connectivity shall be offered at Gadag PS, in order of priority as per CERC Regulation/ Procedure, if margin shall be available at time of receipt of application.

Transmission System for Stage-I Connectivity application no 1200003970:

i. Dedicated Connectivity Transmission System :

- Generation Pooling Station of Green infra Renewables Energy Ltd. – Gadag-II PS 220 kV S/c line.

ii. Common Transmission System :

Transmission Scheme for Renewable Energy Zone (Phase-II) in Gadag-II in Karnataka

- Establishment of 400/220kV, 2x500 MVA Gadag-II PS
- Gadag-II PS – Koppal-II PS 400kV (Quad Moose) D/c line
- 2x125MVA 420kV bus reactors at Gadag-II PS

Transmission Scheme for Renewable Energy Zone (Phase-II) in Koppal-II in Karnataka and Common Transmission Scheme for integration of additional RE potential in Gadag, Davangere, Bijapur and Bellary.

Phase-A

- Establishment of 765/400kV 2x1500 MVA, 400/200kV 2x500 MVA Koppal-II Pooling Station with provision of two (2) sections of 4500 MVA each at 765/400kV level and provision of four (4) sections of 2500 MVA each at 400/220kV level
- Koppal-II PS – Narendra New 765kV D/c line with 240 MVA SLR at Koppal-II PS end (~150 km)
- 2x330 MVA (765kV) & 2x125MVA (400kV) bus reactors at Koppal-II PS
- Provision for 25 acres of land for establishment of BESS at Koppal-II PS

2. M/s Ken Renewables India Pvt. Ltd. has sought stage-I connectivity for 350 MW (application no. 0150200007) at Pavagada PS with start date of connectivity as 30.06.2025 for its Solar based generator at Anantapur, Andhra Pradesh.

Regarding, Pavagada PS it was informed that Stage-II Connectivity for 3050 MW has already been granted and further margins are not available to grant additional Stage-II Connectivity. Therefore, Pavagada PS is being closed grant of additional Stage-II Connectivity through allocation of new 220kV line bays. Further, as part of 500 GW RE capacity by 2030, Tumkur-II PS is being planned for evacuation of 1500 MW potential RE capacity. As Connectivity has been sought only Stage-I and grant of Stage-I Connectivity does not include allocation of bay or create right for bay, therefore it was proposed to grant stage-I connectivity PS for 350 MW (application no. 0150200007) to M/s Ken Renewables India Pvt. Ltd. at Pavagada PS. However, at time of receipt of Stage-II Connectivity application from the applicant for above mentioned project, grant of Stage-II Connectivity shall be considered at Pavagada PS only if Stage-II Connectivity granted at Pavagada PS is revoked for any applicant due to any reason and sufficient margins are available, else grant of Stage-II Connectivity shall be considered at Tumkur-II PS, which is under planning.

After deliberation, above mentioned proposal for grant of Stage-I Connectivity for 350 MW (application no. 0150200007) at Pavagada PS to M/s Ken Renewables India Pvt. Ltd was agreed. Transmission system for grant of Stage-I Connectivity is given below.

Transmission System for Stage-I Connectivity application no 0150200007:

- Generation Pooling Station of Ken Renewables India Pvt Ltd at Anantapur–Pavagada PS 220 kV S/c line.

3. M/s Greenko AP01 IREP Pvt Ltd. has sought enhancement in stage-II connectivity for 565 MW for its Hybrid based power generation project in Kurnool, Andhra Pradesh on the basis of clause 9.2.2. of RE Revised Procedure (land and finance route). Details of application and proposed transmission system for Connectivity are given below.

Table 4

Sl.	Stage-II Connectivity Enhancement App. No.	Applicant Name	Connectivity App. No. & Quantum • St-I & St-II (Granted)	Location	Date of Application	Enhancement in Stage-II Connectivity Sought (MW)	Nature of Applicant	Proposed Connectivity location	Connectivity Start date (sought by applicant)	Proposed Tr. System for Connectivity
1.	1200003962	Greenko AP01 IREP Pvt Ltd.	St-I 1200002537 (1465 MW) St-II 1200002672 (900 MW)	Kurnool, AP	07.06.2022	500+65	Generator (Hybrid)	Kurnool PS, AP	15.12.2023	Generation Pooling Station of M/s Greenko AP01 IREP Pvt. Ltd. - Kurnool New 400 kV 2 nd S/c strung on D/c towers.

It was informed that M/s Greenko has already been granted Stage-I and stage-II connectivity for 1465 MW (application no. 1200002537) and 900 MW (application no. 1200002672) respectively at Kurnool New S/s through dedicated transmission system i.e. generation Pooling Station of Greenko AP01 IREP Pvt Ltd at Kurnool – Kurnool New PS 400kV S/c line strung on D/c tower, for its proposed IREP generation project in Kurnool, Andhra Pradesh.

With grant of Enhancement in stage-II Connectivity for 565 MW, total Stage-II Connectivity granted to M/s Greenko AP01 IREP Pvt. Ltd. will be 1465 MW. As 1465 MW is huge quantum, therefore for reliability and security of the grid it was proposed to grant Enhancement in Stage-II Connectivity for 565 MW through 2nd 400kV S/c strung on D/c tower. Further, space for new 400kV line bay is available at Kurnool New S/s for grant of Enhancement in Stage-II connectivity for 565 MW through 2nd 400kV S/c strung on D/c tower.

Regarding implementation of 400 kV line bay at Kurnool New S/s for termination of above mentioned dedicated Transmission Connectivity line i.e. 2nd 400kV S/c strung on D/c tower, M/s Greenko AP01 IREP Pvt. Ltd. requested to consider implementation of same as part of ISTS. After deliberation same was agreed and M/s Greenko AP01 IREP Pvt. Ltd. was requested to submit the following details through formal letter.

- Breakup details of RE projects corresponding to enhancement in Stage-II Connectivity quantum (565 MW)
- Details of generator unit size of PSP
- Request for implementation of 400 kV line bay Kurnool New under ISTS.

After detailed deliberation, it was agreed to grant enhancement in Stage-II Connectivity for 565 MW (application no. 1200003962) to M/s Greenko AP01 IREP Pvt. Ltd. with start date of Connectivity as 15.12.2023 (Tentative). Transmission system for grant of Stage-II Connectivity is given below.

Transmission System for Stage-II Connectivity application no 1200003962:

- Generation Pooling Station of M/s Greenko AP01 IREP Pvt. Ltd. - Kurnool New 400 kV 2nd S/c line strung on D/c towers (1st S/c line strung on D/c tower is already being implemented by M/s Greenko for Stage-II Connectivity granted for application no. 1200002672) along with line bay at generation end - under the scope of applicant.
- One No. 400 kV line bay at Kurnool New S/s for termination of above mentioned dedicated Connectivity transmission line - under the scope ISTS.

Firm date of Start Date of Connectivity shall be informed only after allocation of work to respective implementing agency for implementation of 400 kV line bay under ISTS for above mentioned dedicated Connectivity line at Kurnool New.

Subsequently, vide letter dated 01.08.2022 M/s Greenko AP01 IREP Pvt. Ltd. requested to implement 400 kV line bay at Kurnool New for termination of above mentioned dedicated transmission system as part of ISTS. It was also submitted that enhancement in Stage-II Connectivity (565 MW) has been sought against implementation of additional 2x240 MW +120MW PSP turbine capacity.

It was also informed that Stage-II Connectivity grantee shall furnish progress of the monitoring parameters on quarterly basis online in the format given at FORMAT-RCON-II-M by the last day of each quarter. Failure to update progress of the monitoring parameters shall be considered as adverse progress and, in such case, CTU shall approach the Commission for appropriate directions. Further, the applicant shall also abide by the provisions mentioned at **Annexure-II**.

D. LTA related proposals in Southern Region

1. Proposals for grant of LTA to the applications received in May' 2022 with injection in Southern Region and Drawl in Southern Region

CTU informed that LTA application of M/s NPCIL for 2000 MW injection at Kudankulam 3&4, Tamil Nadu and drawl in SR (Target) was discussed in the 8th Consultation Meeting for Evolving Transmission Schemes in SR, held on 28.06.2022. Details of application are given below.

Table 5

Sl.	LTA Application No.	Applicant Name	Nature of Applicant	Location	LTA Quantum (MW)	Injection point	Drawl point	Start date of LTA (as per application)	End date of LTA (as per application)
1.	1200003911	Nuclear Power Corporation of India Ltd.	Generator (Nuclear)	Kudankulam, Tamil Nadu	2000 MW (without PPA / PSA) without NoC)	Kudankulam, Tamil Nadu	SR (Target): 2000 MW	31.05.2025	31.05.2050

In the meeting, it was decided that detailed analysis for requirement of LTA transmission system shall be carried out during the Joint Study meeting of Southern Regional constituents which is scheduled to be held from 30.06.2022 – 02.07.2022 at SRPC, Bengaluru. After identification of the LTA transmission system, the application shall be discussed in next Consultation Meeting for Evolving Transmission Scheme in SR. Accordingly, Joint Studies were conducted from 30th June to 2nd July, 2022 at SRPC, Bengaluru.

During the Joint Study meeting, it was emerged that in addition to units 3 & 4 (2x1000 MW), units 5 & 6 (2x1000 MW) of Kudankulam NPP are also under planning phase. TANGEDCO representative informed that they have requested MoP for allocation of entire power from KNPP-3 & 4 (2x1000 MW) to Tamil Nadu and same is under consideration by MoP. Therefore, transmission system may be evolved considering both the likely scenarios wherein entire power is allocated to Tamil Nadu or alternatively it is allocated to the SR States.

Based on the studied alternatives, following comprehensive transmission system was approved for evacuation of power from Phase-II of Kudankulam NPP (units 3, 4, 5 & 6 - 4x1000 MW) :

Comprehensive Transmission System requirement for evacuation and supply of power from Kudankulam Phase-II (4x1000 MW)

- Kudankulam Ph-II - Tuticorin PS - Viruddanagar (TN) 400kV (quad) D/c line
- Kudankulam Ph-II - Samugarangapuram (TN) 400kV (quad) D/c line
- Bypassing of Tuticorin JV – Tuticorin PS 400kV (quad) D/c line and Tuticorin PS – Madurai 400kV (quad) D/c line at Tuticorin PS to form Tuticorin JV – Madurai 400kV (quad) D/c line.
- Shifting of one circuit of Kudankulam 1&2 – Tirunelveli 400kV (quad) D/c line to Kudankulam 3&4 to form Kudankulam 3&4 – Tirunelveli 400kV (quad) line
- 2x125 MVA (420kV) bus reactors at Kudankulam Unit - 3&4
- 2x125 MVA (420kV) bus reactors at Kudankulam Unit - 5&6
- Charging of Tuticorin PS - Salem 765kV D/c line (presently charged at 400kV level) at its rated 765kV voltage level
- Upgradation of Tuticorin PS with 3x1500 MVA 765/400kV ICTs
- Upgradation of Salem with 3x1500 MVA 765/400kV ICTs

Phasing of the Comprehensive Transmission System with KKNPP 3&4 and KKNPP 5&6

(i) Transmission Scheme for Kudankulam 3 & 4 :

a. Option-1 : (Power is allocated to SR beneficiaries)

- Kudankulam Ph-II – Tuticorin PS 400kV (quad) D/c line.
- Tuticorin PS – Viruddanagar (TN) 400kV (quad) D/c line.
- Kudankulam Ph-II – Samugarangapuram(TN) 400kV (quad) D/c line **(under the scope of TANTRANSCO)**
- Bypassing of Tuticorin JV – Tuticorin PS 400kV (quad) D/c line and Tuticorin PS – Madurai 400kV (quad) D/c line at Tuticorin PS to form Tuticorin JV – Madurai 400kV (quad) D/c line.
- Shifting of one circuit of Kudankulam 1&2 – Tirunelveli 400kV (quad) D/c line to Kudankulam 3&4 to form Kudankulam 3&4 – Tirunelveli 400kV (quad) line
- 2x125 MVA (420kV) bus reactors at Kudankulam 3&4
- Charging of Tuticorin PS – Salem 765kV D/c line (presently charged at 400kV level) at its rated voltage of 765kV level
- Upgradation of Tuticorin PS with 3x1500 MVA 765/400kV ICTs
- Upgradation of Salem with 3x1500 MVA 765/400kV ICTs

Note: Separate 230kV level connectivity to KKNP Phase-II shall be identified by TANTRANSCO separately for providing start-up power, black start and evacuation of part of its share. TANTRANSCO shall submit detailed evacuation plan.

b. Option-2 : (Entire Power is allocated to Tamil Nadu)

- Kudankulam Ph-II – Viruddanagar (TANTRANSCO) 400kV (quad) D/c line (under the scope of TANTRANSCO)
- Kudankulam Ph-II – Samugarangapuram (TANTRANSCO) 400kV (quad) D/c line (under the scope of TANTRANSCO)
- Shifting of one circuit of Kudankulam 1&2 – Tirunelveli 400kV (quad) D/c line to Kudankulam 3&4 to form Kudankulam 3&4 – Tirunelveli 400kV (quad) line
- 2x125MVA (420kV) bus reactors at Kudankulam 3&4

Note: Separate 230kV level connectivity to KKNP Phase-II shall be identified by TANTRANSCO separately for providing start-up power, black start and evacuation of part of its share. TANTRANSCO shall submit detailed evacuation plan.

In present meeting, CTU informed that NPCIL vide email dated 27.07.2022 had raised certain observations with regard to comprehensive transmission system:

- From the Phasing of the Comprehensive Transmission System with KKNPP 3&4 and KKNPP 5&6, NPCIL understands that the proposed transmission system mentioned in Option-1 and Option-2 is for KKNPP 3&4 and KKNPP 5&6 together and not specifically for KKNPP 3&4. The same needs to be clarified/confirmed.
- Power evacuation from KKNPP 3&4 and KKNPP 5&6 at 230kV level is not envisaged.
- NPCIL is putting up separate 400kV switchyards for KKNPP 3&4 and KKNPP 5&6. Thus, planning of the comprehensive transmission System with KKNPP 3&4 and KKNPP 5&6 needs to be done considering separate 400kV buses for KKNPP 3&4 and KKNPP 5&6. The switchyard of KKNPP 3&4 which is under construction will have 4 nos. of 400kV line feeders for KKNPP 3&4 (including one interconnection between KKNPP 1&2 and KKNPP 3&4 stipulated through the letter dated 12/22/2021 for grant of connectivity from CTUIL to meet commissioning power requirements - which is being taken up by NPCIL for survey/construction). For KKNPP 5&6, NPCIL is envisaging 6 nos. of 400kV line feeders (including one for interconnection between KKNPP 3&4 and KKNPP 5&6). Thus, transmission/evacuation planning needs to be done accordingly.

CTU clarified that comprehensive transmission system was planned during the Joint Study meeting for evacuation of power from Phase-II of Kudankulam NPP (Units 3, 4, 5 & 6 - 4x1000 MW) which comprises of 5 circuits for evacuation of 4000 MW. Further, it was informed that separate 230kV level connectivity for providing start-up power, black start was recommended by SRPC & SRLDC during the Joint Study meeting which may also be utilized for evacuation of part of Tamil Nadu's share as per requirement. Further, with regard to NPCIL's statement that they had designed the switchyard for KKNP-3&4 as per the grant of Connectivity & will have provision for 4 nos. of 400kV line feeders, CTU informed that mere connectivity was granted to KKNP-3 & 4 through bus extension of KKNP-1&2 or through UG cable/overhead line. Transmission system for evacuation of power from KNPP-3 & 4 was not indicated in the connectivity intimation. Further, for a new generation project there should be adequate space for sufficient 400kV line bays required for termination of evacuation lines of the generation project.

NPCIL informed that the proposed separate 230kV level connectivity is only for start-up power and black start facility and evacuation through 230kV is not envisaged. CTU informed separate 230kV is required for start-up power and black start facility, however, for evacuation of part of Tamil Nadu's share through 230kV level, NPCIL may take up the matter with TANTRANSCO. NPCIL opined that the response from MoP is still awaited and once the same is finalized, transmission system may be finalized based on whether the entire allocation is to TANTRANSCO or to other beneficiaries as well. Towards an enquiry raised by NPCIL pertaining to requirement of 230 kV transmission system, CTU clarified that home states have been facilitated for drawl of their share of power through their own transmission system as per the extant CERC Regulations as well as GNA Regulations. Further, SRPC stated that as per GOI Policy notified on 19.07.2022 "in case the State, where the CPSE generating Station is located, needs to draw the free power / their share from the generating station, they can plan and build the Intra State transmission lines of required capacity at their own cost. This will relieve them from using the ISTS network for drawal of their share and thus, will not have the burden of paying the ISTS charges".

TANGEDCO stated that based on the observations received from CTU/SRLDC, TANTRANSCO has implemented 230 kV transmission system on their cost for start-up and black start in case of KNPP-1&2. The transmission system is being utilized for drawl of part of share of Tamil Nadu from KNPP-1 & 2. In the instant case also, TANTRANSCO wishes to plan and implement suitable 230 kV transmission

system from KNPP-3&4 at its own cost for start-up and black start and utilize the same for evacuation of part of its share. Accordingly, there should not be any reservations from NPCIL for 230kV level connectivity from KNPP-3&4.

NPCIL stated that in case of KNPP-1&2, 230 kV transmission network was integrated with the generation through 2 nos. of 400/230 kV ICTs within the switchyard of NPCIL, however no such ICTs are planned in case of KNPP-3&4. SRPC stated that in any case, 230 kV level connectivity is to be required to be planned for providing start-up facilities and providing auxiliary power. Towards this, NPCIL stated that the auxiliary power has been planned to be provided through existing 230 kV transmission system of TANTRANSCO as well as planned 400 kV evacuation transmission system (in exigency conditions). However, interconnection of 400kV & 230 kV through ICT has not been envisaged. Further, the generation switchyard is in advance stage of implementation and any deviation from planned design of the switchyard may lead to delay in commissioning of the project. SRPC opined that in such a case, detailed deliberations are required to be taken-up with NPCIL & TANTRANSCO.

NPCIL stated that separate switchyard is planned for KNPP-5&6 as the same is located at about 1-2 kms from KNPP-3&4. Towards this, CTU stated that such an arrangement shall lead to planning sub-optimal transmission system and accordingly same cannot be accepted. Moreover, NPCIL designed suboptimal switchyard of KNPP-1&2 switchyard bus restricted to 2000A, and the same mistake cannot be repeated. Comprehensive transmission system has been planned for KNPP-3&4 and KNPP-5&6 with common switchyard. Further, in case of different location of both the phases, suitable arrangement may be worked-out through bus extension (through cable or overhead lines) as is being done in case of connectivity to KNPP-3&4. If required, NPCIL should re-design their generation switchyard so that transmission system may be utilized in an optimal manner.

CTU stated that LTA applications are to be processed in a time bound manner as per the timelines defined in CERC Regulations. Accordingly, a comprehensive transmission system has been evolved keeping in view the allocation of entire power to Tamil Nadu or to other beneficiaries.

After detailed deliberations, it was agreed that joint study shall be carried out with participation of SRPC, SRLDC, CEA, NPCIL, TANTRANSCO and CTU to finalize transmission system of grant of LTA to M/s NPCIL for expansion of generation project at Kudankulam. Further, NPCIL shall submit all generation pooling related documents in advance. After joint study, matter will be taken up in next Consultation Meeting for Evolving Transmission Scheme in SR.

2. Proposals for grant of LTA to the applications received in June' 2022 with injection in Southern Region and Drawl in Other Region

CTU informed that 01 no. LTA application has been received in month of June' 2022, with injection in SR and drawl in NR and WR. Details of the application along with the proposal are given below.

Table 6

Sl.	LTA Application No.	Applicant Name	Nature of Applicant	Location	LTA Quantum (MW)	Injection point	Drawl point	Start date of LTA (as per application)	End date of LTA (as per application)
1.	0450200009	Greenko AP01 IREP Pvt Ltd.	Generator (Hybrid PSP)	Kurnool, Tamil Nadu	565 MW (with PPA / PSA) without NoC)	Kurnool PS, Andhra Pradesh	WR (Target): 285 MW NR (Target): 280 MW	15.12.2023	15.12.2048

M/s Greenko AP01 IREP Pvt. Ltd. has sought grant of LTA for 565 MW (from 15.12.2023 to 15.12.2048) with injection at Kurnool PS, Andhra Pradesh and drawl of power in WR:285 MW and NR:280 MW as Target region.

M/s Greenko AP01 IREP Pvt. Ltd. has already been granted Stage-II Connectivity for 900 MW (application no. 1200002672) and enhancement in Stage-II Connectivity for 565 MW (application no. 1200003962) has been agreed for grant (refer item no. D.3 of the minutes) for its proposed RE project at Kurnool New S/s, Andhra Pradesh. Further, M/s Greenko AP01 IREP Pvt. Ltd. has already been granted LTA for 900 MW (application no. 1200003664) at Kurnool New S/s. With consideration of above proposal for grant for LTA, total grant of LTA to M/s Greenko shall be 1465 MW.

Regarding availability of transmission system for export of power from Kurnool New, Andhra Pradesh to beneficiaries in NR and WR (on target basis), the transmission scheme “*ISTS Network Expansion scheme between Western Region & Southern Region for export of surplus power during high RE scenario in Southern Region*”, which includes Narendra New – Pune 765kV D/c line is under bidding stage and same is expected with tentative commissioning schedule of June, 2024. The details system studies have been carried wherein it is observed that loadings are generally in order.

After deliberation it was agreed to grant LTA to M/s Greenko AP01 IREP Pvt. Ltd. for application no. 0450200009 for export of power to NR (as target region – 280 MW) and WR (as target region – 285 MW) with start date of LTA as 01.07.2024 (Tentative) with following transmission system.

Common Transmission System for LTA for export of power to NR (as target region – 280 MW) and WR (as target region – 285 MW) with start date of LTA as 01.07.2024 (tentative) -under ISTS :

- **ISTS Network Expansion scheme in Western Region & Southern Region for export of surplus power during high RE scenario in Southern Region:**

Table 7

Sl.	Scope of the Transmission Scheme	Capacity /km
1.	Narendra New (GIS) – Pune (GIS) 765kV D/c line with 1x330MVAR switchable line reactor on each ckt at both ends	340 km <ul style="list-style-type: none"> • 765 kV line bays -2 (GIS) (at Narendra New) • 765 kV line bays -2 (GIS) (at Pune) • 765 kV, 330 MVAR SLR – 2 nos (7 X 110 MVAR incl. 1 switchable spare unit) at Pune (GIS) • 765 kV, 330 MVAR SLR – 2 nos (6 X 110 MVAR) at Narendra (New) (GIS)
2.	Upgradation of Narendra (New) (GIS) to its rated voltage of 765 kV level along with 4x1500 MVA transformer and 2x330 MVAR Bus Reactor.	<ul style="list-style-type: none"> • 765/400 kV, 1500 MVA- 4 no. (13 X 500 MVA incl. 1 spare unit) • 765 kV ICT bays- 4 nos. (GIS) • 400 kV ICT bays- 4 nos. (GIS) • 765 kV, 330 MVAR BR – 2 nos. (7 X 110 MVAR incl. 1 switchable spare unit to be used for both bus/line reactors) • 765 kV Bus Reactor bays – 2 nos. (GIS)

**Narendra (New)(GIS) - Kolhapur 765kV D/c line to be kept charged at 400kV level*

*^Out of required 04 nos. of 400kV ICT bays (GIS) for 765/400kV ICTs, 02 nos. of 400 kV ICT bays (GIS) for 765/400kV ICTs are under implementation through TBCB route under the scheme “**Evacuation of Power from RE Sources in Koppal Wind Energy Zone (Karnataka) (2500 MW)**”*

Firm date of start of LTA shall be informed after successful transfer of SPV to successful bidder. Further, M/s Greenko shall be liable to pay transmission charges, as per CERC Regulation, from firm date of grant of LTA.

E. Proposal for grant of MTOA to M/s TATA Power Trading Company Ltd.

CTU informed that 1 no. MTOA application (no. 0551100004) has been received from TATA Power Trading Company Ltd for 51.6 MW with injection from Jindal India Thermal Power Limited (JITPL) (2X600MW) generation project in Odisha (ER) and drawl at South Western Railway, Karnataka (SR). Details of the MTOA application are as given below:

Table 8

Application No.	Applicant	Quantum (MW)	Date of Application	Start date of MTOA	End date of MTOA	Injection	Drawl
0551100004	TATA Power Trading Company Ltd	51.6	29-06-2022	01.12.2022	30.11.2025	JITPL, Odisha (ER)	South West Railway, Karnataka (SR)

M/s JITPL is connected with ISTS network at 765/400kV Angul PS of POWERGRID through JITPL – Angul PS 400kV D/c line. At present, LTA of 323 MW for transfer of power from JITPL generation plant (2x600MW) in Odisha to KSEB (SR: 95 MW) & BSPHCL (ER: 228 MW) is operational. In addition to the LTA, MTOA of total 311.08 has also been granted from generation project of M/s JITPL with 106.88 MW drawl in Northern Region and 204.2 MW drawl in Western Region.

Now, M/s TPTCL vide above application has requested for grant of 51.6 MW MTOA from generation project of M/s JITPL in Odisha to South West Railway in Karnataka. The drawl of power under the said MTOA by South West Railway would be through KPTCL STU network. No objection certificate issued by Karnataka SLDC, copy of PPA signed between JITPL & TPTCL and copy of PSA signed between TPTCL & South Western Railway have been submitted along with the application.

CTU representative informed that present ATC of Southern Region for import of power from NEW grid is 18,900 MW and sufficient margins are available for allocation under LTA/MTOA. System studies have been carried out for Dec'2022 time frame considering existing transmission system & under implementation transmission system scheduled for commissioning within next 6 months. From the system studies, it is observed that power flows are generally in order for transfer of 51.6 MW power from JITPL, Odisha to South Western Railway, Karnataka.

After deliberations, it was agreed that MTOA of 51.6 MW may be granted to M/s TATA Power Trading Company Ltd with the margins available in existing / under implementation transmission system.

List of participants of 9th Consultation Meeting for Evolving Transmission Schemes in SR held on 29.07.2022

CEA

1. Shri J Ganeshwara Rao DD

SRPC

1. Shri N R L K Prasad SE
2. Shri Betsy Sebastian AEE

POSOCO

1. Shri SP Kumar ED, SRLDC
2. Shri L Sharat Chand Manager, SRLDC
3. Shri T Srinivas Sr. GM, SRLDC

STU

1. Shri M Sudarsan SE/SS, TANGEDCO
2. Mrs. K. Bindu SE/SS-1, APTRANSCO
3. Shri Ch.Srinivasa Rao SE (PS), APTRANSCO
4. Shri Vishwanath Naik CE (Plg. & Co-ordination), KPTCL
5. Shri D Chetan SE, KPTCL
6. Shri P. Ramachandran Director Tr. Project, TANTRANSCO
7. Shri P Srinivasu ADE (SS-II), TSTRANSCO
8. Shri Sheshagiri DE (SS-II), TSTRANSCO
9. Shri B Ramaiyah CE, TSTRANSCO
10. Shri D. Shanmugavadivel EE, Electricity Department, Govt. of Pudducherry

SECI

1. Shri R K Agarwal Consultant

CTUIL

1. Shri Jasbir Singh CGM
2. Shri Rajesh Verma Sr. DGM
3. Shri Anil Kr Meena Sr. DGM

- | | | |
|----|----------------------|---------------|
| 4. | Shri Ajay Dahiya | Chief Manager |
| 5. | Shri Amandeep Kala | Chief Manager |
| 6. | Shri Ankush Patel | Manager |
| 7. | Shri Venkatesh Gorli | Manager |
| 8. | Smt. Himanshi | Manager |
| 9. | Shri Umesh Dhanuk | Engineer |

Connectivity Applicants

- | | | |
|----|-------------------------|---------------------------------|
| 1. | Shri Sandeep Sarwate | ACR, NPCIL |
| 2. | Shri Namit Jain | Ken Renewables India Pvt. Ltd. |
| 3. | Shri Ravi Kiran Patnaik | TATA Power Trading Company Ltd. |
| 4. | Shri Anish Pasrija | Greenko AP01 IREP Pvt. Ltd. |
| 5. | Shri Pavan Sharma | Green Infra Wind Energy Ltd. |

* * * * *

Annexure-II

The following provisions shall be applied with respect to grant of connectivity to RE projects to the ISTS Grid:

- The grant of Stage-I Connectivity shall not create any vested right in favor of the grantee on ISTS infrastructure including bays. Stage-I Connectivity grantee shall be required to update the quarterly progress of development of their generation project and associated transmission infrastructure/dedicated line as per format RCON-I-M by 30th day of June and 31st day of December of each year. Further, Stage-I Connectivity grantees who fail to apply for Stage-II Connectivity within 24 months from grant of Stage-I Connectivity shall cease to be Stage-I grantee and their Application fees shall be forfeited.
- If the capacity of the Stage-I Connectivity location is allocated to other Stage-II grantees, the balance Stage-I grantees shall be allocated Stage-II Connectivity to an alternate location.
- For optimization of ROW, it is proposed that transmission towers of various dedicated lines, up to 2-3 km periphery from the entry of the pooling station may be of Multi-circuit type. The generation developers/applicants associated with the various pooling stations may coordinate amongst themselves for implementation of such span/stretches of the dedicated connectivity lines with M/C towers.
- The grant of Stage-I / Stage-II Connectivity shall not entitle an applicant to interchange any power with the grid unless it obtains LTA/MTOA/STOA for power transfer requirements. As grant of LTA may require transmission system strengthening, the applicants are advised to apply for LTA immediately, to enable timely transfer of power to the beneficiaries. Also as per the prevailing Transmission Planning Criteria of CEA, "N-1" contingency criteria may not be applied to the immediate connectivity of wind/solar farms with the ISTS/Intra State grid.
- Stage-II Connectivity Grantee shall sign the Transmission Agreement for Connectivity and submit the Connectivity Bank Guarantee (Conn-BG1 and Conn-BG2) to CTU within 30 days of issue of intimation. No extension of time shall be granted and in case of failure to sign the Agreement and / or to furnish the requisite bank guarantee, Stage-II Connectivity shall be cancelled under intimation to the grantee without any prior notice.
- Two or more Applicants may apply for Stage-II Connectivity at a common bay along with an agreement duly signed between such Applicants for sharing the Dedicated Transmission Line. The Stage-II Connectivity shall be granted to such Applicants subject to availability of capacity in the Dedicated Transmission Line. In such cases, Conn-BG1 and Conn-BG2, as applicable as per Clause 10.8 of the Revised RE Procedure, shall be submitted by each such Applicant.
- The Stage-II Connectivity grantee shall furnish progress of the monitoring parameters on quarterly basis in the format given at FORMAT-RCON-II-M by the last day of each quarter. Failure to update progress of the monitoring parameters shall be considered as adverse progress and, in such case, CTU shall approach the Commission for appropriate directions. Further, the Stage-II Connectivity grantees shall be required to complete the dedicated transmission line(s) and pooling sub-station(s) as defined under para 11.2(A) of the Revised Detailed

Procedure for RE. If the grantee fails to complete the dedicated transmission line within the stipulated period, the Conn-BG1 & Conn-BG2 of the grantee shall be encashed and Stage-II connectivity shall be revoked.

- Applicants after grant of Stage-II Connectivity to the grid shall have to furnish additional details to CTU for signing of “Connection Agreement” as per format given at FORMAT-CON-4. The finalized template of generation data for Solar and Wind based generation projects has been appended as additional sections at Para F (Details of Connection – Solar PV Station) and Para G (Details of Connection – Wind Generating Station) in the existing FORMAT-CON-4. The modified FORMAT CON-4 is available on our website (www.powergridindia.com >> CTU Open Access). The Applicants are advised to furnish such details as early as possible for enabling them have lead time for any type of access.
- The CTU will process the above information and will intimate the Connection details as per format given at FORMAT-CON-5. Pursuant to such Connection details, the applicant shall have to sign “Connection Agreement” with CTU prior to the physical interconnection as per format given at FORMAT-CON-6. In case the connectivity is granted to the ISTS of an inter-State transmission licensee other than the CTU, a tripartite agreement shall be signed between the applicant, the Central Transmission Utility and such inter-State transmission licensee, in line with the provisions of the Regulations.
- Applicants are required to submit the test reports supported vide undertaking as well as compliance certificate from manufacturer for all applicable provisions under the CEA (Technical Standards for Connectivity to the Grid) Regulations, 2007 (as amended thereof) (including the provisions of LVRT/HVRT, active power injection control, dynamically varying reactive power support, limits for Harmonic & DC current injection, Flicker limits etc.) from labs accredited by Govt./NABL/other recognized agencies. In case any discrepancies / incompleteness are found in the documents / test reports submitted to CTU, the connection offer (CON-5) / connection agreement (CON-6) shall not be processed further.
- Not limited to above, applicant shall comply all respective provision of revised procedure for “Grant of Connectivity to Projects based on Renewable sources to Inter – State Transmission System” and CERC Regulation (Grant of Connectivity, Long-term Access and Medium term Open Access in ISTS and related matters), 2009 and amendment thereof.
- CEA vide order dated 09.11.2020, has mandated all power generating stations of 0.5 MW or above capacity to register themselves on CEA e-portal and get a Unique Registration Number (URN). The same is required as per Regulation 11 of Technical Standards for Connectivity with the Grid Regulations, 2007 prior to physical inter-connection of the Generating station with ISTS Grid.

* * * * *

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति 29, रेसकोर्स क्रॉस रोड बेंगलूर- 560 009	 सत्यमेव जयते	Government of India Central Electricity Authority Southern Regional Power Committee 29, Race Course Cross Road Bengaluru-560 009	
Email:mssrpc-ka@nic.in		Phone: 080-22287205	
सं/No.	SRPC/43(SRPC)/2022/	दिनांक/ Date	04.10.2022

सेवा में /To:

(वितरण सूची के अनुसार / *As per the distribution list*)

विषय : एस आर पी सी की 43 वी (23.09.2022) / टी सी सी की 41वी (20.09.2022) बैठकों की कार्यवृत्त के संबंध में

Subject: Minutes of the 43rd Meeting SRPC (23.09.2022)/ 41st Meeting of TCC (20.09.2022)-reg.


महोदय /महोदया
Sir/Madam,

वीडियो कॉन्फ्रेंसिंग (वीसी) के माध्यम से 23 सितंबर 2022 को सम्पन्न एसआरपीसी की 43वीं बैठक और 20 सितंबर 2022 को सम्पन्न टीसीसी एसआरपीसी की 41वीं बैठक के कार्यवृत्त संलग्न हैं। कार्यवृत्त को एसआरपीसी की वेबसाइट पर अपलोड कर दिया गया है। अनुलग्नक कृपया एसआरपीसी की वेबसाइट से डाउनलोड किए जा सकते हैं।

Please find enclosed the Minutes of the 43rd Meeting of SRPC held on 23rd September 2022 and 41st Meeting of TCC held on 20th September 2022 through Video Conferencing (VC). The same has been uploaded on SRPC website.

धन्यवाद / Thanking you,

भवदीय/Yours faithfully,


(असित सिंह /Asit Singh)

सदस्य सचिव/Member Secretary

	Decision: Chairperson, SRPC to take up with MoP for resolving ROW issues and to expedite the commissioning.	MoP.	
10	25. Notification of Flexibility in generation scheme by MoP Decision: Chairperson, SRPC to take up with Secretary, Ministry of Power on behalf of State utilities for modifications in the scheme	Chairperson, SRPC vide letter dated 18.07.2022 has taken up with MoP.	Copy of the letter at Annexure-3m

TCC/SRPC noted the action taken on the decisions of SRPC in the previous meeting.

4. Membership to SRPC

4.1 Nomination of Private Transmission Licensee in SRPC

- a) Central electricity Authority (CEA) vide letter dated 09.06.2022 (**Annexure-4a**) has nominated **M/s Kudgi Transmission Ltd. (KTL) as Member of SRPC for the year 2022-23.**
- b) Accordingly, SRPC Secretariat vide letter dated 10th June 2022 (**Annexure-4b**) has sought nomination from KTL to represent SRPC/ Sub-Committees of SRPC during the year 2022-23.
- c) KTL vide mail dated (**Annexure-4c**) has stated that they are not interested in being Member of SRPC for the year 2022-23.
- d) In view of the above it is proposed that there would be no Private Transmission Licensee Member of SRPC for the year 2022-23 and CEA would be informed accordingly.

4.2 TCC Deliberation:

- a) MS, SRPC mentioned that Central electricity Authority (CEA) has nominated M/s Kudgi Transmission Ltd. (KTL) as Member of SRPC for the year 2022-23. KTL vide letter dated 05.09.2022 (**Annexure-4d**) has informed that they are not willing to be Member of SRPC for the year 2022-23. As such, there would not be Private Transmission Licensee representation in SRPC for the year 2022-23. CEA would be informed the non-acceptance of membership by KTL.
- b) TCC recommended MS, SRPC to convey the KTL communication in respect of Membership of SRPC to CEA.

SRPC noted the above.

5. Inter-state transmission system planned by CTU

- 5.1 One of the functions of SRPC is to provide views on the inter-state transmission system planned by CTU within 45 days of receipt of the proposal by the concerned RPC. The views

of RPC will be considered by National Committee on Transmission for sending their recommendation to Ministry of Power for approval of new inter-state transmission system.

- 5.2 MoP vide letter dated 10th January 2022 informed that it has been decided that views of RPCs regarding any new ISTS expansion must be recorded in the Minutes of NCT meeting and in case RPC does not agree with the new ISTS, then justification for recommending the same for implementation should also be recorded in the MoM, so that appropriate decision can be taken by Ministry of Power while approving the ISTS project.
- 5.3 CTUIL vide letter dated 29th August 2022 (**Annexure-5a**) has submitted proposed ISTS Network Expansion scheme “*Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka*”. Brief details of the scheme is as below:

(i) Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-A) and Gadag-II in Karnataka

a) Scope of the scheme:

<i>SN</i>	<i>Scope of the Transmission Scheme</i>	<i>Capacity /km</i>
1.	<p>Establishment of 765/400kV 2x1500 MVA, 400/220kV 2x500 MVA Koppal-II Pooling Station with provision of two (2) sections of 4500 MVA each at 765/400kV level and provision of four (4) sections of 2500 MVA each at 400/220kV level</p> <p>Future Space Provisions: (Including space for Phase-B)</p> <ul style="list-style-type: none"> • 765/400 kV, 1500 MVA, ICTs – 6 nos. • 765 kV ICT bays – 6 nos. • 400 kV ICT bays – 6 nos. • 400/220 kV, 500 MVA, ICTs – 10 nos. • 400 kV ICT bays – 10 nos. • 220 kV ICT bays – 10 nos. • 765 kV line bays – 8 nos. (with provision for SLR) • 400 kV line bays – 14 nos. (with provision for SLR) • 220 kV line bays – 12 nos. • 220 kV Sectionalization bay: 3 sets • 220 kV Bus Coupler (BC) Bay – 3 nos. • 220 kV Transfer Bus Coupler (TBC) Bay – 3 nos. 	<ul style="list-style-type: none"> • 765/400 kV, 1500 MVA, ICTs – 2 nos. (7x500 MVA incl. 1 spare unit) • 765 kV ICT bays – 2 nos. • 400 kV ICT bays – 2 nos. • 400/220 kV, 500 MVA, ICTs – 2 nos. • 400 kV ICT bays – 2 nos. • 220 kV ICT bays – 2 nos. • 765 kV line bays – 2 nos. (at Koppal-II for termination of Koppal-II-Narendra new 765 kV D/c line) • 220 kV line bays – 4 nos. • 220 kV Bus Coupler (BC) Bay – 1 no. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 no.

<i>SN</i>	<i>Scope of the Transmission Scheme</i>	<i>Capacity /km</i>
	<ul style="list-style-type: none"> 400 kV Sectionalization bay: 1 sets 	
2.	Koppal-II PS – Narendra New 765 kV D/c line with 240 MVAR SLR at Koppal-II PS end (~150 km)	~150 km <ul style="list-style-type: none"> 765 kV line bays – 2 nos. (GIS) (at Narendra New) 765 kV, 240 MVAR SLR at Koppal-II PS – 2 nos. (7x80 MVAR inc. 1 switchable spare unit)
3.	2 x 330 MVAR (765kV) & 2 x 125 MVAR (400 kV) bus reactors at Koppal-II PS	<ul style="list-style-type: none"> 765 kV, 330 MVAR Bus Reactor – 2 nos. (7 x 110 MVAR inc. 1 switchable spare unit to be used for both bus/line reactors) 765 kV Bus Reactor bays – 2 nos. 420 kV, 125 MVAR Bus Reactors – 2 nos. 420 kV, 125 MVAR Bus Reactor bays – 2 nos.
4.	Establishment of 400/220 kV, 2 x 500 MVA Gadag-II Pooling Station Future Space Provisions: <ul style="list-style-type: none"> 400/220 kV, 500 MVA, ICTs – 10 nos. 400 kV ICT bays – 10 nos. 220 kV ICT bays – 10 nos. 400 kV line bays – 6 nos. (with provision for SLR) 220 kV line bays – 10 nos. 220 kV Sectionalisation bay: 3 sets 220 kV Bus Coupler (BC) Bay – 3 nos. 220 kV Transfer Bus Coupler (TBC) Bay – 3 nos. 	<ul style="list-style-type: none"> 400/220 kV, 500 MVA, ICTs – 2 nos. 400 kV ICT bays – 2 nos. 220 kV ICT bays – 2 nos. 400 kV line bays – 2 nos. (at Gadag-II for termination of Gadag-II – Koppal-II line)) 220 kV line bays – 4 nos. 220 kV Bus Coupler (BC) Bay – 1 no. 220 kV Transfer Bus Coupler (TBC) Bay – 1 no.
5.	Gadag-II PS – Koppal-II PS 400 kV (Quad Moose) D/c line (~100 km)	~100 km 400 kV line bays - 2 (at Koppal-II)
6.	2 x 125 MVAR 420 kV bus reactors at Gadag-II PS	<ul style="list-style-type: none"> 420 kV, 125 MVAR bus reactors – 2 nos. 420 kV, 125 MVAR bus reactor bays – 2 nos.

b) Estimated Cost: Rs. 2564 Crore

c) Implementation timeframe: Tentative time-frame: **August 2024** (Considering 6 months for necessary approvals & subsequent award of the project)

(ii) Transmission Scheme for integration of Renewable Energy Zone (Phase-II) in Koppal-II (Phase-B)

a) Scope of the scheme:

<i>SN</i>	<i>Scope of the Transmission Scheme</i>	<i>Capacity /km</i>
1.	Koppal-II PS – Raichur 765 kV D/c line with 330 MVA SLR at Koppal-II PS end (~190 km)	~190 km <ul style="list-style-type: none"> • 765 kV line bays – 2 nos. (at Koppal-II) • 765 kV line bays – 2 nos. (at Raichur) • 765 kV, 330 MVA SLR at Koppal-II PS – 2 nos. (6x110 MVA units)
2.	Augmentation of 2 x 1500, 765/400kV, ICTs at Koppal-II PS	<ul style="list-style-type: none"> • 765/400 kV, 1500 MVA, ICTs – 2 nos. • 765 kV ICT bays – 2 nos. • 400 kV ICT bays – 2 nos.
3.	Augmentation of 2 x 500, 400/220 kV, ICTs at Koppal-II PS.	<ul style="list-style-type: none"> • 400/220 kV, 500 MVA, ICTs – 2 nos. • 400 kV ICT bays – 2 nos. • 220 kV ICT bays – 2 nos. • 220 kV line bays – 4 nos. • 220 kV Sectionalization bay: 1 set • 220 kV Bus Coupler (BC) Bay – 1 no. • 220 kV Transfer Bus Coupler (TBC) Bay – 1 no.

b) Estimated Cost: Rs. 1881 Crore

c) Implementation timeframe: Tentative time-frame: **August 2024** (Considering 6 months for necessary approvals & subsequent award of the project)

5.4 The scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June - 2nd July, 2022 at SRPC, Bengaluru. The scheme was also agreed in the 9th Consultation Meeting for Evolving Transmission Scheme in SR held on 29.07.2022. The estimated cost of the scheme is Rs. 4445 Crores.

5.5 It was stated that the transmission scheme would facilitate integration and immediate evacuation of additional RE potential of 2 GW each at Koppal and Gadag as well as integration of RE potential at Gadag, Davangere, Bijapur and Bellary through 400kV transmission lines with Koppal-II PS 765/400/220kV. The transmission scheme shall also act as an enabler towards achieving the Govt. of India target of establishing 500 GW capacity from non-fossil based energy sources by 2030. Presently, Stage-II Connectivity applications of about 400 MW at Koppal-II and 500 MW at Gadag-II has been agreed for grant.

5.6 In consideration of above, CTU requested SRPC to forward their views in respect of the ISTS Network Expansion scheme "*Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka*" so that the transmission scheme may be taken up promptly for consideration in the NCT meeting along with the views of SRPC.

5.7 TCC Deliberation:

- a) Transmission scheme for integration of Renewable Energy Zone in Koppal-II and Gadag-II in Karnataka was deliberated in the meeting. The scheme details were appraised to the forum by MS, SRPC. He informed the forum that as per the potential assessed by SECI for a RE potential of 17 GW in the state of Karnataka, CTUIL has planned transmission

system for 11 GW considering RE diversity factor and BESS. The present part scheme involves establishment of 765/400 kV 2 x 1500 MVA, 400/220 kV 2 x 500 MVA Koppal-II PS and 400/220 kV, 2 x 500 MVA Gadag-II PS. The transmission lines and ICTs associated with the Pooling station have been planned in a phased manner to ensure optimisation of the transmission system planned.

- b) MS, SRPC updated the forum that no margin for connectivity is available at the existing Koppal-I and Gadag-I substations (as per CTUIL, all the 9 no. of bays at Koppal-I and all the 8 no. of bays at Gadag-I have been agreed for grant of Stage-II Connectivity of 2665 MW and 2110 MW respectively). He further apprised that connectivity applications are being received for the proposed Koppal-II and Gadag-II, accordingly this transmission has been planned by CTUIL. The planned transmission system was thoroughly studied and finalized in the Joint study meeting held at SRPC held during 30th June – 2nd July, 2022 and was discussed & agreed in the 9th CMETS-SR meeting held on 29.07.2022.
- c) CTUIL informed the forum that all efforts have been made to bring out a comprehensive and optimal transmission scheme during planning of this transmission system. CTUIL has received Stage-I Connectivity applications of 700 MW and Stage-II Connectivity applications of 400 MW at Koppal-II. At Gadag-II, CTUIL has received Stage-I Connectivity applications of 1100 MW and Stage-II Connectivity applications of 500 MW. CTUIL assured the forum that most of the Connectivity applications have been through SECI bidding route and CTUIL is continuously monitoring development of the RE generators through quarterly JCC meetings. In case any lapse is observed on part of any RE Developer, CTUIL is taking necessary action as mandated by CERC regulations. CTUIL expressed their faith that all RE generation projects in the area will materialize and added that many RE Developers have shown interest in developing the RE potential in this area including through KREDL, and requested for comments and observations of SR Constituents on the proposal.
- d) Director (Grid & Tr. Mgmt), APTRANSCO expressed concern that it shall be ensured that any transmission scheme planned for RE projects is fully utilized by ensuring that the concerned RE Developers develop their RE generation projects well in time. He opined that no transmission system planned shall remain stranded with a tariff burden on end consumers.
- e) TANGEDCO stated that the scheme was agreed in 9th CMETS-SR meeting with the observation that SECI shall share RE potential assessment report and location specific bids floated by SECI. SECI was also requested to share the modality of implementation of BESS. However, no update in this regard was communicated by SECI. They further added that it was also decided in 9th CMETS that before planning any transmission system, SECI, MNRE or MOP shall obtain from SR states information regarding state-wise requirement of RE capacity as per RPO obligation, intra-state embedded RE capacity envisaged for the coming 5 years, RE generation from different modes to avoid development of stranded transmission system. This way, beneficiaries and state Discoms shall be given adequate opportunity to assess the requirement of the planned system. They also opined that a huge transmission system should not be planned without appropriately assessing the “developable” potential considering the availability of land in consultation with the

regional constituents. The transmission system should not be evolved merely on the basis of envisaged potential without identification of likely generation developers and identified beneficiaries.

- f) CTUIL responded that the concerns of SR constituents raised during Joint study meeting as well as CMETS-SR-9 meetings were forwarded to SECI. Further informed that SECI is planning to come up with location specific bids for development of RE potential at multiple locations. TANGEDCO opined that planning transmission system without finalizing the location of RE generation may not be proper and optimal. CTUIL responded that Koppal-II and Gadag-II have been planned with a transformation capacity of 1000 MVA in phase-I and only a single 765kV connectivity (D/C) to Narendra has been included for optimally developing the transmission system. In this regard, TANGEDCO opined that CTUIL may examine the necessity of RE pooling station at 765 kV; instead, planning of the same at 400kV which would reduce the investment quantum as well should be seen. To this, CTUIL informed that considering the volume of LTA applications being received at the proposed PS, full utilization of margins at existing Koppal-I and Gadag-I, conservation of ROW requirements, 765kV PS is being planned. CTUIL reiterated that the proposal, along with observations of SR constituents, shall be submitted to NCT and MoP for approval and suitable directions would be given by MoP to SECI to ensure that the planned transmission system does not become stranded. CTUIL also appraised the forum that they have calculated the margins available in the existing transmission system and declared in their website to ensure optimal utilization of existing assets to the extent possible. BESS initial bidding has already happened at Fatehgarh –II, and once finalized, SECI and MNRE may be requested to issue guidelines regarding BESS. CTUIL requested the forum to assess their proposal from a holistic view as the 765 kV Substation has been planned to avoid multiple substations at same location in future.
- g) Director (T, SO, P&S) KSEBL also raised concern regarding non-materialization of SECI RE projects in time as per the stated timelines. They requested CTUIL to keep track of the same. Unnecessary burden to the beneficiaries & system operator should be avoided.
- h) TSTRANSCO observed that for RE projects, efforts should first be made to utilizing the margins available in the existing transmission system and thereby avoid planning of redundant transmission system. It was pointed out that bidding of the RE projects should be in sync with the development of associated transmission network and requested a meeting with SECI to ensure the same. In this connection, they enquired regarding measures planned to relieve transmission constraints of SR during export of power from SR to NEW grid.
- i) CTUIL responded that the existing Koppal-I and Gadag-I substations have been fully utilized and various measures have been taken to relieve congestion during export of power from SR to NEW grid. These include (i) upgradation of Kolhapur PG to Kolhapur line to HTLS conductor to aid in export of more power from SR to NEW grid, (ii) Augmentation of the ICT's at Raigarh bus to export 3000 MW of power from Pugalur to Raigarh with reverse mode operation of Pugalur HVDC is under implementation and 6000 MW possibility of export is being examined. Regarding the RE monitoring and realization of RE generation projects, CTUIL informed that all projects are being monitored

continuously by them, and SECI has also been requested to come up with location specific bids to ensure optimal utilization of transmission system, and put on record that complete allocation of margins at Koppal-I and Gadag-I has been due to prompt action by SECI, and all information regarding spare capacity available in any bay as well as complete information regarding all transmission systems have been made available on CTUIL website for all RE developers as well as all constituents.

- j) KPTCL opined that since CTUIL has planned for phased implementation of the transmission project, commencement of the same may be planned only after grant of LTA. They informed the forum that no land has been allotted by State Government to the RE Developers in this connection and expressed concern that planning of such a huge transmission system merely on the basis of assessed potentials need to be examined. MS, SRPC responded that MoP in their letter dated 15.11.2021 and as noted in 7th Meeting of NCT (03.12.2021) clearly states about de-linking development of transmission system with grant of LTA. He also stated that grant of stage-II connectivity at Koppal-II and Gadag-II has been done after proper evaluation of stage-I connectivity applications which have fulfilled necessary prerequisites as mandated by the regulations. He also opined that developing 765kV PS is a right measure towards conserving ROW and it will be sub-optimal to develop the PS at any lower voltages and later on upgrading to higher voltages. CTUIL further added that development of the transmission system shall be in pace with the development of RE generation projects, and concerns of SR constituents in this regard have been duly taken care of.
- k) ED, SRLDC stated that they are in agreement with the scheme, as its requirement has been well established, and thoroughly studied. He further added that they have been consistently highlighting all constraints in system operation so that requisite action can be taken for necessary up-gradation or addition of new links and the same has been incorporated as part of this proposal.
- l) In this connection, Director (Grid & Tr. Mgmt), APTRANSCO enquired regarding measures proposed by NLDC in balancing load generation in the backdrop of addition of huge RE potential. He also enquired regarding backup reserves planned by NLDC to cater to intermittent nature of the developed RE. On this, ED, SRLDC responded that most of the RE potential developed in the areas of Gadag and Koppal are having LTAs with Northern and Western region and the respective control area would take measures to adjust LGB accordingly. He further added that planning of sufficient reserves is the responsibility of respective control area. All control areas shall plan for sufficient reserves considering the uncertainties in RE generation and the generation that can be deployed through RRAS. Proper planning of spinning reserves and development of appropriate ancillary services market and pumped storage plants are the way forward. CTUIL also pointed out that BESS would help in balancing the RE intermittency.
- m) MS, SRPC supported the views of POSOCO and added that deployability of the planned reserves shall take care to meet the RE uncertainty. These planned reserves should be at the disposal of system operator and should not warrant dispatch by Discoms to overcome the surplus and deficit in real time. In case the RRAS quantum falls short, then accordingly higher reserves may need to be planned, which, however, may come with attendant

financial implications. Reserves requirement can be optimised by appropriate RE forecast, load forecast, and sharing of reserves between various control areas. He also opined that if BESS is kept at RLDC's disposal, it can also be used as primary/secondary reserves.

- n) TSTRANSCO pointed out that the study files for the proposal have been made considering LGB so as to absorb the entire assessed potential of these new proposed stations, due to which export has been observed to be nearly 7000 MW. TSTRANSCO enquired that if export is more than 7000 MW, any constraint is foreseen by CTUIL in the system. CTUIL informed that system studies have been done for 9 no. scenarios as mandated by CEA covering diurnal & seasonal variations that also included the worst case scenarios. The study has taken care of entire potential of Karnataka during which export was observed to be 7000 MW. In this regard, CTUIL also informed that as per GoI mandate, they have carried out studies for development of transmission system for RE integration of 181 GW in SR by 2030, wherein the export of SR was observed to be higher than 7000 MW. But by that time frame, SR load was also expected to increase. Informed the forum that possibility of 6000 MW exports through Raigarh-Pugalur HVDC is also under assessment to increase export capability of SR. Further CTUIL is also exploring potential constraints in evacuation of RE generation, if any, to take appropriate measures, and if necessary additional inter-regional link shall be planned beyond 765 kV Bidar at appropriate time. CTUIL assured the forum that the first priority shall be to ensure full utilization of existing transmission system.
- o) TSTRANSCO enquired that in 2025-2026 the import capability of SR is projected to be 23000 MW and whether SR will be able to achieve an export capability of similar quantum as well as measures to achieve the same. CTUIL pointed out that the flow of power between SR and NEW grid plays an important role in determining import and export capabilities. ER being a generation rich region, the natural flow of power doesn't happen from SR to ER unless power is forced through some specific means through SR-ER interregional lines. Hence export of power from SR to ER over these lines has never happened. This also explains the fact that SR may not require export capability similar to its import capability. Export from SR happens to western part of western region for which SR-WR interregional links have been created.
- p) TSTRANSCO also enquired whether in 2026-27 timeframe SR would have an export capability of 11000 MW as depicted in CTUIL website with the planned and existing transmission system. CTUIL responded that they have declared SR export ATC across the year since they are unaware of scheduled maintenances and various other factors that may occur in the subject timeframe. They also informed that seasonal export ATC could be higher than the same. In this regard, SRLDC informed that currently the export ATC of SR is 5700 MW and power of more than 6000 MW has been observed to be flowing through the interregional lines at times. Once the existing constraints are addressed, SR can achieve an export ATC of 11000 MW in future. TSTRANSCO enquired regarding any bottling up of power in SR region due to any congestion and SR is unable to export the power as projected. SRLDC responded that all augmentation and strengthening as planned and proposed should materialize hand in hand with RE generation development as per the stated timelines to avoid any such unwarranted situations. SRLDC opined that export

capability of SR may require an ATC of more than 11000 MW to keep in pace with the huge RE generation development. Constant feedback from POSOCO and suitable planning by CTUIL will take care of the same. CTUIL reiterated that planning of any additional interregional link will be taken up as and when required to ensure optimal utilization of existing transmission system. They also informed that worldwide the trend has been to back down of conventional generation paving way for more RE generation deployment and with the systems already in place & planned; SR is in a position to achieve the same.

- q) In this connection, KPTCL intimated the forum that recently they have been receiving a lot of enquiries regarding green hydrogen near Mangalore area due to which by 2030 nearly 4000-5000 MW load is expected near Mangalore and RE power of the order of 10-12 GW is required to power the green hydrogen. KPTCL has requested to incorporate the data as part of EPS report of CEA.
- r) MS, SRPC stated that all observations and concerns of TCC shall be put before SRPC forum for further deliberation and finally to NCT through CTUIL.
- s) **In view of above, TCC recommended that the individual views of SR-Constituents would be put up to SRPC for further deliberation. After approval of SRPC, the views of SR-Constituents would be communicated to CTUIL for further taking up with NCT.**

5.8 SRPC Deliberation:

- (i) Briefing the TCC deliberations on the subject ISTS proposal of CTUIL, MS, SRPC informed that the scheme was discussed and agreed in the Joint Study meeting of Southern Region Constituents held on 30th June - 2nd July, 2022 at SRPC, Bengaluru. The scheme was also agreed in the 9th Consultation Meeting for Evolving Transmission Scheme in SR held on 29.07.2022. The scheme proposed at an estimated cost of Rs. 4445 Crores was well deliberated in the TCC meeting and the apprised the key views of SR-Constituents to SRPC.
- (ii) Dy COO, CTUIL informed that in order to ensure appropriateness/ orderliness of the scheme, two more levels are there for validation of scheme, first at NCT and then at MoP. CTUIL will be keeping a proper check on the implementation of Renewable projects as well as having regular meetings with SECI and taking it up in monitoring meeting also.
- (iii) CMD, TANGEDCO appreciated CTUIL for their efforts in coming out the subject ISTS proposal, but pointed out that these projects being capital intensive, even though whosoever executes the project would be able to get/ recover their Return on Investment, all the burden for maintaining the transmission corridor would fall on the beneficiaries. At Koppal-II, so far only 400 MW capacity was granted under Stage-II connectivity, but the scheme was being planned on the basis on SECIs potential assessment/study. As per SECI's assessment study, RE potential for Tamil Nadu is 35 GW. He enquired whether transmission system should be created without the RE

generation schemes coming forward. He opined that it is premature to propose capital-intensive transmission system based on some possible potential. New lines should be taken after ISTS generation projects come up by 2024-25. The maintenance of all these new lines will burden the beneficiaries. Stage II approval should have been given after acquiring of the land. He also remarked whether Govt. of Karnataka can absorb all the 400 MW for local consumption, and stated that more clarity is required on these issues and new lines/ schemes should be considered only after significant quantum has been granted under Stage I & II approvals and the Scheme may be deferred by 1-2 years. Even though CTUIL may say sufficient time may not be available to execute the transmission schemes, if they are not planned & accorded approval for implementation in time, he opined that investment on the scheme may not be feasible when Stage-I approval given is not even 10% of the total envisaged capacity.

- (iv) KPTCL stated that the proposal would be agreeable, provided the implementation of transmission system by CTUIL is taken up in a phased manner, subject to materialization of RE projects. The Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs. Further, as per the CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020, the transmission charges will be added in the National Component. Since, Karnataka State and other SR constituents have no share, it can be considered as Regional Component of the drawl entities, relieving the burden on state towards PoC charges.
- (v) CTUIL responded that it may please be appreciated that whatever Connectivity applications they are receiving are time bound. Koppal-I and Gadag-I Stations are already exhausted. But many Developers are approaching CTUIL with applications for Connectivity in the area, accordingly requirement for Koppal-II and Gadag-II came up. Further, it may be noted that since Gadag-II would be connected to Koppal-II, the entire evacuation would be through Koppal-II only. Also other Pooling Stations in the area such as Bijapur, Davanagere would also be integrated with Koppal-II. Since they have started receiving applications for connectivity at Koppal-II & Gadag-II, they are bound to process them appropriately in line with CERC Regulations, and develop requisite infrastructure, else they would be violating the mandate given to them, and would be questioned for not following the regulatory provisions which require granting Connectivity to eligible applicants. CTUIL also stated that they would like to differ from Tamil Nadu's view on sharing of transmission charges, because in the past considering the sharing of resources and sharing of infrastructure made possibly by Raigarh - Pugalur HVDC link, they had recommended for sharing of its transmission charges by all regions and in this way, they are they are trying to keep the transmission charges to the lowest possible. In their view, the subject transmission scheme is very much essential, and has already

been delayed considering the Connectivity applications they have already received. Since the scheme was also thoroughly studied & agreed to by all SR-Constituents in the Joint Study Meeting held on 30.06.2022 – 02.07.2022, and was well deliberated & agreed to in the 9th CMETS-SR Meeting held on 29.07.2022, and nobody opposed the technical requirement of the scheme, CTUIL requested SRPC to kindly recommend the scheme.


- (vi) On this CMD, TANGEDCO stated that when CTUIL has no evacuation capacity, Stage-II approval should not have been given. CTUIL should not come and say because they had given Stage-II approval for 400 MW, they should be allowed to lay the line, and SR constituents bear the cost. People of Tamil Nadu should not be asked to bear the cost (around Rs. 30 Crores per month) when they feel it is premature to put investment in a scheme, which is being planned to facilitate uncertain, unknown RE Developers. Southern region states are the leaders in RE, around 50% of RE capacity is commissioned here. They do not require any additional RE. Therefore, the ISTS charges for transporting RE power should be borne by those who are importing it, and SR-Constituents should not be made to bear its cost. SECI bids for setting up a plant should be conditioned with the availability of evacuation capacity. Further ISTS waiver available for RE developers should be removed so that all share transmission charges resulting in lower costs.
- (vii) CTUIL responded that if Stage-II approvals are to be given on the margins available, then first margins have to be created, and then only Stage-II applications are to be entertained/ processed. This results in un-optimised transmission system. Therefore for optimal planning, Stage-II approvals are given for new transmission systems. In this regard, CTUIL narrated their experience in case of Koppal-I & Gadag-I, where many RE developers were asked to delay their schedules in view of late development of standby system for those pooling stations. CTUIL does not want that to happen in case of Koppal-II & Gadag-II. The scheme has been thoroughly studied and deliberated before it is put up to SRPC. After this also, it would go to NCT first, and then to MoP. So nearly 4 to 5 months would elapse in the approval process of the scheme itself, and the award of the scheme is far way (nearly six months); so considering the fact that Koppal-I & Gadag-I had already been exhausted, and they have Stage-I & Stage-II applications to process for Koppal-II & Gadag-II, they have got various checks and levels of validation in place before the scheme is finally awarded, any delay at this stage would lead to missing the timelines, and the RE generation projects would also be missing their target schedules, and all this may also lead to missing Govt. of India Target of RE Capacity for 2030. So CTUIL humbly requested that the scheme may kindly be recommended by SRPC. Any status required in respect of the scheme at any point of time before award of the project, CTUIL is there to furnish all details.

- (viii) CTUIL also requested to appreciate their difficulty, and consider the fact that for many of RE projects in southern regions, the beneficiaries are in Eastern Region/ Western region/ Northern region. Similarly for RE projects in other regions, the beneficiaries are in Southern Region also such as AP for RE projects in Rajasthan. In such a scheme of things, they are bound to plan & develop requisite ISTS system when approached by those RE Developers. If a state enters into agreement with RE Developers in that state for absorbing their power, then that requirement can be made to be met optimally from the concerned intra-STS system itself, and in this case the need for ISTS system does not arise. But since these things are beyond CTUIL's control, and since they are not a party to PPA's that RE Developers enter into with various beneficiaries, they are bound to plan requisite ISTS system in line with various regulatory provisions, when they are approached suitably.
- (ix) MS, SRPC stated that charges for transmission system built for RE projects will go to National component, not Regional Component, hence would be shared by all DIC's of all the regions. This way, complete CERC determined/adopted tariff of ISTS is recovered. Any waiver given to any party/ DIC, only results in the sharing ratio; and charges recovered for ISTS are same.
- (x) Chairperson, SRPC observed that since no consensus could be arrived, and suggested that individual views of SR-Utilities to CTUIL.
- (xi) **SRPC concluded that individual views of SR-Utilities would be communicated to CTUIL for further taking up with NCT. The common issues, which were agreed upon by all such as SECI to come up with location-specific bids, optimal utilization of margins in existing transmission system, etc. shall also be conveyed. SRPC forum agreed for the same.**

6. APTRANSCO Proposal for evacuation of 625 MW at M/s. SEIL-P2 (Unit-2) by STU Network

- 6.1 APTRANSCO vide letter dated 01.08.2022 (**Annexure-6a**) has proposed evacuation Transmission Scheme to evacuate 625 MW of Thermal Power from existing M/s. SEIL-P2 (Unit-2) by making LILO (3.8KM) of existing 400 kV Krishnapatnam – Manubolu Circuit-2 to SEIL-P2 400kV GIS Substation, keeping the bus sectionalizer at M/s. SEIL-P2 in permanent open condition.
- 6.2 The proposed scheme is as follows:

Email

भारतस रकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति 29, रेसकोर्स क्रॉस रोड बेंगलूर- 560 009		Government of India Central Electricity Authority Southern Regional Power Committee 29, Race Course Cross Road Bengaluru - 560 009
Web site: www.srpc.kar.nic.in	Email: mssrpc@yahoo.com	Phone: 080-22287205
सं/No. SRPC/MS/2022-23/	दिनांक/ Date	04.10.2022

To

The Chief Operating Officer
 Central Transmission Utility of India Limited (CTUIL)
 Saudamini, 1st Floor,
 Plot No.2, Sector-29,
 Gurugram, Haryana-122 001

Subject: ISTS Network Expansion scheme between Western Region & Southern Region for export of surplus power during high RE scenario in Southern Region –reg.


Sir,

CTUIL vide letter dated 29th August 2022 had submitted proposed ISTS Network Expansion scheme “Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka”.

The proposal was discussed in the 43rd SRPC meeting on 23.09.2022. The Chairperson, SRPC approved views as discussed in the 43rd SRPC meeting are enclosed for consideration of the NCT.

Thanking You,

भवदीय/Yours faithfully,


 (असित सिंह / Asit Singh)

सदस्य सचिव / Member Secretary

Consolidated Views of SRPC on the CTUIL’s Proposal “Transmission Scheme for integration of additional RE potential in Koppal, Gadag, Davangere, Bijapur and Bellary area of Karnataka “received vide letter dated 29.08.2022 are as under:

Summarized views (Basis: SRPC-43 Meeting held on 23.09.2022)	
Constituents	Comments/ Observations
APTRANSCO:	<p>a) Expressed their concern that it shall be ensured that any transmission scheme planned for RE projects is fully utilized by ensuring that the concerned RE developers develop their RE generation projects well in time. They opined that no transmission system planned shall remain stranded with a burden on end consumers.</p>
TANGEDCO:	<p>a) The scheme was approved in 9th CMETS-SR meeting with the observation that SECI shall share RE potential assessment report and location specific bids floated by SECI. SECI was also requested to share the modality of implementation of BESS. However, no update in this regard was communicated by SECI. Opined that a huge transmission system should not be planned without appropriately assessing the “developable” potential considering the availability of land in consultation with the regional constituents. The transmission system should not be evolved merely on the basis of envisaged potential without identification of likely generation developers and identified beneficiaries.</p> <p>b) Pointed out that these projects being capital intensive, even though whosoever executes the project would be able to get/ recover their Return on Investment, all the burden for maintaining the transmission corridor would fall on the beneficiaries. At Koppal-II, so far only 400 MW capacity was granted under Stage-II connectivity, but the scheme was being planned on the basis on SECI’s potential assessment/study. Therefore, it is premature to propose such a capital-intensive transmission system based on some possible potential, and new lines should be taken after ISTS generation projects come up by 2024-25. Stage II approval should have been given after acquiring of the land, and stated that more clarity is required on these issues and new lines/ schemes should be considered only after significant quantum has been granted under Stage I & II approvals.</p> <p>c) Expressed that the ISTS charges for transporting RE power should be borne by those who are importing it, and SR-Constituents should not be made to bear its cost. SECI bids for setting up a plant should also be conditioned with the availability of evacuation capacity. Further ISTS waiver available for RE developers should be removed so that all share transmission charges resulting in lower costs. Thus, from Tamil Nadu perspective, it is too premature when the Stage-I approvals given do not even make up 10 %, hence the scheme should be deferred for at least two years so that there would be sufficient clarity on the development of these RE developers in those areas.</p> <p>d) Reiterated that it is premature to go for developing the subject scheme considering its high cost & the low volume of Stage-I applications, and expressed concern on the huge financial burden that it may bring on to</p>

	Tamil Nadu (around Rs. 30 Crores per month).
KPTCL:	<p>a) CTUIL has planned for phased implementation of the transmission project; implementation of the same may be taken up only after grant of LTA. No land has been allotted to the RE developers by State Government in this connection and expressed concern that planning of such a huge transmission system merely on the basis of assessed potentials need to be examined.</p> <p>b) Stated that the proposal would be agreeable, provided the implementation of transmission system by CTU is taken up in a phased manner, subject to materialization of RE projects. The Phase-B transmission system of Koppal-II shall be implemented after cumulative grant of Connectivity / LTA beyond 2500 MW at Koppal-II and Gadag-II REZs. Further, as per the CERC (Sharing of Inter-State Transmission Charges and Losses) Regulations, 2020, the transmission charges will be added in the national component. Since, Karnataka State and other SR constituents have no share, it can be considered as regional component of the drawl entities, relieving the burden on state towards PoC charges.</p>
KSEBL:	<p>a) Raised their concern regarding non-materialization of SECI RE projects in time as per the stated timelines. CTUIL to keep track of the same. Unnecessary burden to the beneficiaries & system operator should be avoided.</p>
TSTRANSCO:	<p>a) For RE projects, efforts should first be made to utilize the margins available in the existing transmission system and to avoid planning/implement redundant transmission system. It was pointed out that bidding of the RE projects should be in sync with the development of associated transmission network and requested a meeting with SECI to ensure the same.</p> <p>b) Requested CTUIL to ensure that no constraints are faced in exporting power out of southern region in the coming years by ensuring optimal utilization existing transmission assets, and optimally planning any new ISTS systems.</p>
Common Issues of States	<p>a) Optimal utilization of margins in existing/under implementation transmission system</p> <p>b) Location based bidding by SECI to optimize the transmission evacuation.</p> <p>c) SECI may share RE potential assessment report.</p> <p>c) Modality of implementation of BESS.</p>
SRLDC:	<p>a) Requirement of the scheme has been well established and thoroughly studied in Joint Study and it may be taken up. POSOCO have been consistently highlighting all constraints in system operation so that requisite action can be taken for necessary up-gradation or addition of new links, and the same has been incorporated as part of this proposal.</p>
CTUIL:	<p>a) At Koppal II 700 MW of Stage I and 400 MW of Stage II applications are received. While at Gadag 1100 MW of Stage I and 500 MW of Stage II applications are received. All the concerns of SR constituents raised during Joint study meeting as well as CMETS-SR meetings in respect of SECI was forwarded to SECI for necessary action. SECI is planning to come up with location specific bids for development of RE potential at multiple locations.</p>

	<p>b) Keeping in view the volume of Connectivity applications being received in Koppal & Gadag areas, exhaustion of the margins at existing Koppal and Gadag, and the need to conserve RoW, the subject proposal with 765 kV PS at Koppal has been planned. Assured that the development of the transmission system shall be in pace with the development of RE generation projects, and concerns of SR constituents in this regard has been taken care.</p> <p>c) Regarding the RE monitoring and realization of RE generation projects, it was informed that all projects are being monitored continuously by them, and SECI has also been requested to come up with location specific bids to ensure optimal utilization of transmission system, and all information regarding spare capacity available in any bay as well as complete information regarding all transmission systems have been made available on CTU website for all RE developers as well as all constituents.</p> <p>d) Since they have started receiving applications for connectivity at Koppal-II & Gadag-II, they are bound to process them appropriately in line with CERC Regulations, and develop requisite infrastructure, else they would be violating the mandate given to them, and would be questioned for not following the regulatory provisions which require granting connectivity to eligible applicants.</p> <p>e) Informed that if Stage-II approvals are to be given on the margins available, then first margins have to be created, and then only Stage-II applications are to be entertained/ processed. This results in un-optimised transmission system. Therefore for optimal planning, Stage-II approvals are given for new transmission systems. In this regard, CTU narrated their experience in case of Koppal-I & Gadag-I, where many RE developers were asked to delay their schedules in view of late development of standby system for those pooling stations. CTU does not want that to happen in case of Koppal-II & Gadag-II. The scheme has been thoroughly studied and deliberated before it is put up to SRPC. After this also, it would go to NCT first, and then to MoP. So nearly 4 to 5 months would elapse in the approval process of the scheme itself, and the award of the scheme is far way (nearly six months); so considering the fact that Koppal-I & Gadag-I had already been exhausted, and they have Stage-I & Stage-II applications to process for Koppal-II & Gadag-II, they have got various checks and levels of validation in place before the scheme is finally awarded, humbly requested that the scheme may kindly be recommended by SRPC.</p> <p>f) Also informed that various measures are being taken to relieve congestion during export of power from SR to NEW grid. Some of these include (i) upgradation of Kolhapur PG to Kolhapur line to HTLS conductor, which would aid in export of more power from SR to NEW grid, (ii) Augmentation of the ICT's at Raigarh bus to export 3000 MW export of power from Pugalur to Raigarh in reverse mode of Pugalur HVDC is under implementation and export of 6000 MW is also being examined.</p>
SRPC Secretariat	<p>a) As per the Joint Studies conducted, the system is required and endorsed the views of CTUIL and POSOCO.</p>