Government of India
Ministry of Power
Central Electricity Authority
SP&PA Division
Sewa Bhawan, R. K. Puram, New Delhi-110066

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No. 100/1/EC (32) 2013-SP&PA/760-66 Dated: 24th September, 2014

To

1. Shri Major Singh
Member (Power System)
Central Electricity Authority
Sewa Bhawan, R.K. Puram,
New Delhi – 110 066.

2. Dr. Jaipal Singh
Member (Economic &Commercial),
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Sewa Bhawan, R.K. Puram,
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4. Shri I. S. Jha
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5. Shri Somit DasGupta
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6. Shri V. V. R. K. Rao
Former Chairperson, CEA
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7. Shri Ravinder
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147, Bhagirathi Apartment,
Sector-9, Rohini, Delhi – 110 085.
(Tel. 9971568444).

Subject: 33rd meeting of the Empowered Committee on Transmission - meeting notice and agenda

Sir,

The 33rd meeting of the Empowered Committee on Transmission is proposed to be held on **30th September, 2014 (Tuesday) at 3:30 PM** under the chairmanship of Shri Major Singh, Member (Power System), CEA in the Conference Room of CEA, 2nd Floor, Sewa Bhawan, R.K. Puram, New Delhi.

The detailed Agenda is enclosed. The major items covered in the Agenda are as following:

(1) Revised procedure for allocation of Inter State Transmission Project(s) under Tariff Based Competitive Bidding (TBCB)

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

(3) Annulment of bidding process for Transmission System for connectivity for NCC Project (1320 MW) and Baira Suil – Sarna 220 kV D/C transmission line.

(4) Abeyance of bidding process for Northern Region System Strengthening Scheme – XXXIII

(5) New transmission schemes to be taken up through Tariff Based Competitive Bidding

(6) Any other item.

The detailed agenda has also been uploaded in the CEA website www.cea.nic.in (**path to access-Home page-wing specific documents/Power System wing/Meeting of the Empowered Committee on Transmission/ Meeting Notice and Agenda**). Kindly make it convenient to attend the meeting

Yours faithfully,

KK Arya

(K. K. Arya)
Chief Engineer I/C (SP&PA)

Agenda note for the 33rd meeting of the Empowered Committee on Transmission

Date and Time: 30th September, 2014 (Tuesday) at 3:30 PM

Venue: Conference Room of CEA, 2nd Floor, Sewa Bhawan, R.K. Puram, New Delhi

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1.0 Revised procedure for allocation of Inter State Transmission Project(s) under Tariff Based Competitive Bidding (TBCB)

Ministry of Power Vide letter no. 10/89/2014-PG dated 16th July, 2014 had issued revised procedure for allocation of Inter State Transmission Project(s) under Tariff Based Competitive Bidding (TBCB), which is as under:

"Tariff Based Competitive Bidding Guidelines for Transmission Service (Proposed for revision) Bid Process Coordinator (BPC)

Bid Process Coordinator (BPC)
A Bid Process Coordinator, herein after referred to as BPC, would be responsible for coordinating the bid process for procurement of required transmission services for each inter-state Transmission Project to be implemented under tariff based competitive bidding in accordance with these guidelines.

For procurement of transmission services, required for any inter-state transmission Projects, the Chairperson Central Electricity Authority has been authorized by MoP to allocate the Projects to BPCs on the recommendations of Empowered Committee. It will be open for Ministry of Power to review the nomination of BPC at any time.

For procurement of transmission services required for intra-state transmission, the appropriate State Government may notify any Organization/State Public Sector Undertaking especially engaged for this purpose by the appropriate state government or BPC notified by the Central Government to be the BPC for the state.

All the expenditure incurred by the BPC in the process of selection of the investor in accordance with the provisions of these guidelines shall be recovered from the developer who is finally identified and assigned the task of developing that project. The amount to be recovered shall be indicated in the RFP document so that bidders can take that amount into consideration in the tariff to be quoted by them."

For information of the members please.

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

During the 32nd meeting of the Empowered Committee on Transmission held on 17/1/2014, it was decided that a cost committee would be constituted with representatives from CEA, CTU/ PGCIL and BPCs to evolve a cost matrix for estimating the project cost to be implemented through TBCB route, which would work out cost after the completion of the survey by the BPCs.

The details of cost committee is annexed at Annexure – I.

For information of the members please.

3.0 Annulment of bidding process for Transmission System for connectivity for NCC Project (1320 MW) and Baira Suil – Sarna 220 kV D/C transmission line

(i) Transmission System for connectivity for NCC Project (1320 MW)

The Transmission system for connectivity for NCC Project (1320MW) was allocated to M/s RECTPCL, who has carried out the requisite bidding process, however discovered tariff obtained through the bidding process was quite high and as such the bidding was annulled. Accordingly MoP vide its letter no. 15/9/2013-Trans dated 10th December, 2013 has allocated the project to PGCIL on cost tariff for development through regulated tariff mechanism.

For carrying out the bidding process for this transmission project, the BPC (RECTPCL) stated that they incurred an expenditure of **Rs. 1.89 Crore** and requested for reimbursement of this expenditure. During the 32nd meeting of the Empowered Committee on Transmission held on 17/1/2014, it was decided that BPC may furnish the audited expenditure, which has been furnished.

(ii) Baira Suil – Sarna 220 kV D/C transmission line

CEA vide letter no. 100/11/REC-8/SP&PA dated 2nd January, 2014 intimated to the BPC (RECTPCL) that considering the detailed survey report carried out, the revised estimated cost of the project worked out to Rs. 250 Crore. The issue of implementation of Baira Suil- Sarna 220 kV D/C line was discussed during the 33rd Standing Committee Meeting of Power System Planning for Northern Region and all the constituents were of the view that considering the very high cost and decided to abandon the implementation of this line. It was proposed that alternative proposals may be worked out for providing reliability to the existing evacuation system from Baira suil HEP. The alternative power evacuation arrangements from Baira Suil HEP was discussed in the 34th SCM of Northern Region, wherein, the constituents of NR where of the view that the alternative proposal suggested could also cost equally as the Baira Suil Sarna line and n addition there are problems of encompassing forest area as such the alternative proposal suggested were dropped. The 34th Standing Committee was of the opinion that Bairasuil is about 38 year old hydro plant and operates on full load only for 2-3 months in a year so there is no justification in making huge investment on a system which is so old and hardly have any problem in evacuation of power. As such the proposal for providing additional line may be dropped.

For carrying out the bidding process for this transmission project, the BPC (RECTPCL) have stated that they incurred an expenditure of **Rs. 1.89 Crore** and requested for reimbursement of this expenditure.

The BPC is requesting to reimburse this amount. Presently, there is no methodology for this amount. Members may like to deliberate whether at all the reimbursement is

required. For transfer of the SPV to the successful bidder, the BPCs are given a fee upto 15 Crore. One option could be that they recover the cost for unsuccessful award, from the profit money earned from other projects. **Or**

Other option could be creation of a corpus under Chairmanship, CEA, in which a certain percentage of the project cost could be taken from the concessionaire by the BPC upfront and deposited in the corpus. The money from the corpus would be given by the BPCs as reimbursement for the expenditure it incurs in case of annulment of the bidding process of the project. Accordingly, for creation of the corpus it is suggested that an amount an additional amount of 0.01% of the project cost be deducted from the successful bidders of the future schemes.

Members may like to deliberate.

4.0 Abeyance of bidding process for Northern Region System Strengthening Scheme – XXXIII

(i) Northern Region System Strengthening Scheme – XXXIII

This transmission project was kept in abeyance as there was a dispute of PPA between Essar Power (Jharkhand) Ltd (EPJL) and Noida Power Company Ltd (NPCL) for which the system strengthening scheme was agreed in the Standing Committee.

Noida Power Company Ltd. (NPCL)'s application for connectivity for drawl of 500 MW power for distribution in Greater Noida area in Uttar Pradesh was discussed in the 31st SCM of Northern region. It was informed that M/s NPCL had executed a Long Term PPA with M/s Essar Power (Jharkhand) Ltd for procurement of 240 MW power from April 2014 for 25 years. CTU had already granted LTA of 400 MW (for Target Beneficiaries) in Northern Region to M/s Essar Power (Jharkhand) Ltd and they have requested to approve / provide LTA of 240 MW to NPCL being the actual beneficiary, out of total approved 400MW LTA in NR. Since the existing, 400/220 kV, 3x315MVA transformers of UPPTCL at Greater Noida substation are loaded heavily and to meet the future power demand in the area. Following system was agreed in the 31st SCM of NR as system strengthening scheme NRSS-XXXIII to be implemented through TBCB route:

- Ballabhgarh – Greater Noida (New) 400 kV D/c (5 km from Ballabhgarh S/s on multi-circuit towers)
- Establishment of 2x500 MVA, 400/220 kV GIS substation at Greater Noida(New) with a short circuit current rating of 50 kA.

The implementation of NRSS-XXXIII transmission scheme was put on hold as the PPA of NPCL with M/s Essar Power had gone in dispute and is being heard in UPERC. POWERGRID during the 33rd SCM meeting had informed that NPCL has now applied for Long Term Access for 500 MW with target source from Western Region (400 MW) and Eastern Region (100 MW). However, additional Connectivity to NPCL could not be provided as it is already connected to STU grid

and for providing LTA to Noida Power Company, NOC from STU (UPPTCL) is required as per the CERC regulations.

UPPTCL was requested for early processing of NOC to M/s NPCL. However, UPPTCL vide their letter dated 11/03/2014 informed that M/s NPCL is not a consumer as it is a distribution Licensee operating at Greater Noida U.P. which does not qualify the condition of applicant for connectivity as per the conditions of connectivity of CERC regulations.

Based on the observations of UPPTCL, the matter was revisited in the 34th Standing Committee Meeting of Power System Planning for Northern Region, wherein UPPTCL again reiterated their stand that the establishment of 2x500 MVA, 400/220 kV GIS substation at Greater Noida (New) is not required as 765/400/220 kV UPPTCL S/S at Greater Noida is expected soon and the requirement of NPCL could easily be met from the new 765/400/220 kV Noida S/s of UPPTCL. It was therefore decided that NPCL may approach CERC for adjudication as UPPTCL has not granted NoC.

For information of the members please.

5.0 New transmission schemes to be taken up through Tariff Based Competitive Bidding

A. <u>New Proposals</u>

(1) Inter State Transmission System for Renewable in Northern Region

As comprehensive scheme for evacuating renewable generation, the following inter state transmission systems were agreed in the 32nd Standing Committee on Power System Planning in Northern Region held on 31st August, 2013 and 36th Standing Committee meeting on Power System Planning of Western Region held on 29th August, 2013.

Western Region (Gujarat):

i. Bhuj Pool–Banaskanta 765 kV D/c

ii. Banaskanta -Chittorgarh 765 kV D/c

iii. Banaskanta-Sankhari 400 kV D/c

iv. 765/400/220kV (765/400 kV-2x1500 MVA & 400/220kV- 2x500MVA) substation each at Bhuj Pool and Banaskanta

v. Associated reactive compensation (Bus reactors & line reactors)

Northern Region (Rajasthan):

i. Chittorgarh-Ajmer (New) 765 kV D/c

ii. Ajmer (New)-Suratgarh (New) 765 kV D/c

iii. Suratgarh (New)-Moga (PG) 765 kV D/c

iv. Chittorgarh-Chittorgarh (RVPN) 400 kV D/c (Quad)

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

vi. Suratgarh (New)- Suratgarh 400 kV D/c (Quad)

vii. 2x1500 MVA, 765/400 kV sub-station each at Chittorgarh, Ajmer (New) and Suratgarh (New)

viii. Associated reactive compensation (Bus reactors & line reactors)

All the above transmission elements except Suratgarh (New)-Moga (PG) 765 kV D/C have been notified by Ministry of Power vide there letter no. 11/43/2012-PG dated 04th Feb. 2014 to be implemented by PGCIL through regulated tariff mechanism route under para 7.1 (6) (ii) of Ministry of Power resolution dated 08.07.2011. It is now proposed to implement Suratgarh (New)-Moga (PG) 765 kV D/C under TBCB route. The scope of the transmission scheme is as under:

Scope:

Sl. No.	Transmission Scheme	Estimated Line Length (km)	Tentative Estimated Cost[1] (Rs. Crore)
1	Suratgarh -Moga 765 kV D/C transmission line	230	**1050**

Note:

- CTU to provide 2 no. of 765 kV line bays at Suratgarh
- CTU to provide 2 no. of 765 kV line bays at Moga

Members may like to deliberate.

(2) Name of the Scheme: Creation of 400/220 kV substations in NCT of Delhi during 12th plan period.

The transmission scheme has been approved in the 34th Standing Committee on Power System Planning in Northern Region held on 8th August, 2014. The scope of the transmission scheme is as under:

Sl. No.	Transmission Scheme	Capacity in MVA/ ckt. km.	Cost (Rs Crore)
1	**400/220 kV GIS at Rajghat** • 9 nos. 400 kV bays (4 incomer, 4 ICT, 1 B/C), with provision for future expansion • 23 nos 220KV bays (220 kV split bus with12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S(only one), 2 ICT	4x500	120
2	**400/220 kV GIS at Tuglakabad** • 9 nos. 400 kV bays (4 incomer, 4 ICT, 1 B/C), with provision for future expansion • 23 nos 220KV bays (220 kV split bus with12 bays	4 x 500	100

	on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S(only one), 2 ICT		
3	**400/220 kV GIS at Karmpura** • 9 nos. of 400KV bays bays (4 incomer, 4 ICT, 1 B/C) with provision for future expansion • 23 nos 220KV bays (220 kV split bus with 12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S (only one), 2 ICT)	2 x 500	180
4	**400/220 kV GIS at Papankalan-I** The 400 KV Papankalan I S/S would be created by upgrading the existing 220kV Papankalan S/S to 400 kV with the following provisons. • 7 nos. of 400KV bays bays (2 incomer, 4 ICT, 1 B/C) with provision for future expansion • 23 nos 220KV bays (220 kV split bus with 12 bays on each side = 2 incomer, 6 feeder bay, 1 B/C, 1 B/S (only one), 2 ICT)	4 x 500	200
	LILO of one circuit of Bawana –Mandola 400 kV D/C line on M/C tower at Rajghat. The line from Rajghat to Wazirabad Water Treatment plant has to pass through the Yamuna river bed/ bank area so there will be severe ROW constraint and as such to conserve the ROW the line of about 11 kilometers line length has to be constructed on 400 kV M/C tower. For the rest 14 kilometers from Wazirabad Water Treatment plant to LILO point at Tiggipur Village in P-II zone in North Delhi it would be on 400 kV D/C tower line length.	2x34	140
1	**LILO of 400 kV D/C Bamnauli – Samaypur O/H line at Tughlakabad** • 400KV M/C tower line from 400KV Tughlakabad to Dera Mandi Delhi Border, length = 15 kilometres	2 x 55	200

	• 400KV D/C tower line from Dera Mandi Delhi Border to LILO point at Alampur Village, Haryana length = 12 kilometres		
2	**400 kV Jatikalan More -Karmpura O/H M/C Line**	2 x 40	150
3	**400 kV Bawana – Karmpura O/H D/C on M/C line**	2 x 30	150
4	**400 kV S/C LILO Bamanauli-Jhatikalan at Papankalan-I** Due to scarce ROW, the existing route of the 220 kV Papankalan I- Bamnauli D/C has to be converted to Multi Circuit tower.	2 x 20	30

Since the above work of DTL has to be completed before summer peak of 2017. So the works has to be completed in a period of nearly two years time. Therefore it is proposed that the above works may be allocated to PGCIL on cost plus basis with compressed time schedule.

Members may like to deliberate.

(3) Establishment of 220/66kV, 2x160MVA GIS S/s at Sector 47, UT Chandigarh along with 220kV D/C line from Sector 47 to 400/220kV Panchkula substation of Powergrid as a inter state line.

The establishment of 220/66kV, 2x160MVA GIS S/s at Sector 47, UT Chandigarh along with 220kV D/C line from Sector 47 to 400/220kV Panchkula substation of POWERGRID as a inter state line was discussed and agreed in principle in the 31st SCM of NR. In that meeting it was also decided that scheme may be fine tuned later after discussion with Chandigarh, HVPNL and CTU . The issue was discussed in the 34th meeting of the Standing Committee of Northern Region, wherein the following systems were agreed

Sl. No.	Transmission Scheme	Estimated route length (km)
1.	Creation of 220/66kV, GIS S/s at Sector 47, UT Chandigarh	2x160MVA
2.	220kV D/C line from Sector 47 to 400/220kV Panchkula substation of POWERGRID	56

Members may like to deliberate.

(4) Name of the Scheme: Shongtong Karcham HEP in Himanchal Pradesh

The transmission scheme has been approved in the 30th Standing Committee on Power System Planning in Northern Region held on 19th December, 2011. The scope of the transmission scheme is as under.

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)
1.	Shongtong Karcham HEP– Wangtoo 400 kV D/C (Quad HTLC conductor	18
2.	Creation of 400/220kV, GIS S/s at Wangtoo Provision for 400 kV line bays : • 2 nos at Shongtong Karcham HEP (to be provided by HPPCL) • 6 nos at Wangtoo The provision for 2 nos. of transformer bays	2x315

The Project developer M/s HPPCL has now indicated that the civil package has already been awarded to M/s Patel Engineering Limited on 3rd August, 2012 with the completion period of 60 months. The tendering for electro- mechanical package is under process.

Members may like to deliberate.

(5) Northern Region System Strengthening Scheme-XXXIV (NRSS-XXXIV)

The NRSS XXXIV Scheme was proposed to be implemented by Power Grid in 32nd & 33rd meeting of Standing Committee on Power System Planning in Northern Region with the following scope of work:

(i) LILO of Agra – Bharatpur 220kV S/c line at Agra (PG) along with 2 Nos. of 220kV line bays at Agra (PG) substation for termination of these lines.
(ii) 1x315MVA, 400/220kV ICT at Agra (PG) along with associated 400kV and 220kV bays for termination of ICT (ICT shall be provided from the spared ICTs available after replacement of ICTs at Ballabhgarh/Mandaula Substation and shall be refurbished before installation)
(iii) 1x315MVA. 400/220kV ICT at 400Kv Kaithal substation along with associated 400kV and 220kV bays for termination of ICT (ICT shall be provided from the spared ICTs available after replacement of ICTs Ballabhgarh/ Mandaula substation and shall be refurbished before installation)
(iv) 220kV lines bays at Kaithal substation – 2 Nos.
(v) 220kV lines bays at 400/220kV Bhinmal substation (PG) – 2 Nos.
(vi) LILO of Sarna – Hiranagar 220kV S/s at 400/220kV Samba substation (the lines are to be terminated at existing 220 kV lines bays at Samba substation)

(vii) LILO of one circuit of 400kV Parbati pooling station – Amritsar D/c lines at Jalandhar substation (PG) along with 2 Nos. of 400kV lines bays at Jalandhar (PG) substation for termination of these lines

Prior approval of the GoI under section 68 of the Electricity Act, 2003 for the project with above mentioned scope (plus 2 nos. 400kV line bays at Bhiwani substation (PG) – to be matched with Monindergarh – Bhiwani 400kV D/c line proposed through TBCB) has been accorded vide MoP's letter dated 19th November, 2013. Subsequently, in line with discussion held during 33rd meeting of the Standing Committee in NR on 23rd December, 2013, approval under Section 68 for the modified scope (i.e. excluding 2 nos. 400kV line bays at Bhiwani (PG) substation), has been sought from MoP vide letter dated 12th Feb, 2014.

The transmission elements mentioned at Sl. No. (ii) to (v) above up gradation/strengthening of existing sub-station, are exempted from tariff based competitive bidding route in line with the clarification issued by MoP vide letter dated December 9, 2010 (regarding clause 5.1 and 7.1 of Tariff Policy). However, for LILO portion of the scope, i.e. elements at Sl No. (i), (vi) & (vii), approval for implementation by POWERGRID (CTU) under compressed time schedule through regulated tariff mechanism is required.

It is, requested that approval for implementation of the transmission elements at Sl. No. (i), (vi) & (vii) above by the CTU (POWERGRID) under compressed time schedule through regulated tariff mechanism route may please be considered.

Members may like to deliberate.

(6) Name of the Scheme: Name of the Scheme: Common Transmission System for Phase-II Generation Projects in Odisha and Evacuation System for OPGC (1320 MW) Project

Four generation projects in Odisha with total installed capacity of 3270 MW and LTA quantum of about 2600MW have been granted connectivity /LTA under Phase-II. The scheme includes Angul-Jharsuguda-Dharamjayagarh 765 kV D/C (2nd) line, which has already been taken up for implementation by POWERGRID as part of transmission system associated with evacuation of power from generation project of East Coast Energy Pvt. Ltd. at Srikakulum. The scheme has been approved in the meeting with constituents of Eastern Region regarding connectivity and LTA on 05-01-2013 and 24th TCC/ ERPC meeting on 26-27 April, 2013. The scope of the transmission scheme is as under:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
	Common Transmission System for Phase-II Generation Projects in Odisha		
1.	Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/C line	350	1300

2.	LILO of both circuits of Rourkela - Raigarh 400 kV D/C (2nd line) at Jharsuguda (Sundargarh)	2x400kV D/C line: each about 30 km	200
	Evacuation System for OPGC (1320 MW) Project		
3.	OPGC (IB TPS) – Jharsuguda (Sundargarh) 400kV D/C line with Triple Snowbird Conductor alongwith 2 no. 400 kV line bays at Jharsuguda (Sundergarh) substation.	50	125
	Estimated Cost		**1625**

Note:

- CTU to provide 2x240 MW switchable line reactor at Jharsuguda (Sundargarh) end on Jharsuguda
- (Sundargarh) – Raipur Pool 765 kV D/c line.
- CTU to provide 2x240 MW switchable line reactor at Raipur Pool end on Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line.
- CTU to provide 2 no. of 765kV line bays each at Jharsuguda (Sundargarh) and Raipur Pool for termination of Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line.
- CTU to provide 4 nos. of 400kV line bays at Jharsuguda (Sundargarh) for termination of LILO of both circuits of Rourkela - Raigarh 400 kV D/c (2nd line).
- Bays at OPGC end of the line would be under the scope of the generation developer.

(7) Constraints in 400kV bays extensions at 400kV Vemagiri S/S.

1.1 Due to space constraint at APTRANSCO's Vemagiri 400kV Sub- Station there is a difficulty in providing bay extension for bringing KV Kota-Vemagiri 400kV D/C line at Vemagiri. The line was agreed in the 36th meeting of the Standing Committee of Southern Region as a part of Transmission System for evacuation of power from 1040MW Hinduja (HNPCL) power project. APTRANSCO had proposed to remove LILO at 400 kV Vemagiri Substation and make through one circuit of 400 kV Simhadri-II – Nunna D/C line (PGCIL) LILOed at 400kV Vemagiri SS. The issue was discussed in the 37th SCM of SR and following systems were agreed:

Transmission Scheme	**Est. Line Length (km)**
i) LILO of both circuits of Gazuwaka/Simhadri-II – Vemagiri(AP) 400kV D/C line at Vemagiri-II.	
ii) Straighten Nunna- Gazuwaka 400kV D/C line (by disconnecting the LILO at Vemagiri-I) so as to make Nunna – Vemagriri-II 400 D/C link	
iii) Use one LILO D/C portion (of Gazuwaka-Nunna at Vemagiri-I) to connect with K.V. Kota. APTARNSCO is implementing KV Kota-Vemagiri 400 kV DC line agreed 36th meeting.	

iv)	Second LILO D/C portion to be extended to Vemagiri-II (by PGCIL	
v)	400 kV Bay Provisions: • 2 bays at Vemagiri-I • 6 bays at Vemagiri-II	

Members may deliberate on the above issue

(8) System for increasing capacity of Inter-State Transmission system for import of power into SR up to 2018-19

1.2 Southern Region is facing power deficit which has arisen mainly due to – (i) delay/deferment of anticipated generation projects, for example, Krishnapattam UMPP (4000 MW), Cheyyur UMPP(4000 MW), Udangudi TPS, IPP projects in Nagapatanam/ Cuddalore area (3000 to 4000 MW), Kundankulam APP (2000 MW), Kalpakkam PFPR (500 MW), East coast project in Srikakulam (1320 MW), Gas based projects in Vemagiri (about 3000 MW) etc. and (ii) also due to non-availability of gas for existing gas projects in Southern Region.

Some of the constraints in import of power into Southern Region and delivering up to Kerala and Tamil Nadu has also been due to long delay in commissioning of important 400 kV transmission lines, for example, Mysore - Kozikode 400 kV D/C line (delayed by more than 7 years), Tirunelveli-Edamon-Cochin 400 kV D/c line (delayed by about 4 years) and Narendera-Kolhapur inter-regional 765 kV D/C line. Some constraints have also been caused due to delay in the transmission systems of states, for example, the system associated with Narsaropeta, Vijaywada, Hyderabad & Kakatiya TPS in Andhra Pradesh, system associated with Yermarus TPS and non-finalisation of land for New Narendera in Karnataka and transmission system for wind projects and North Chennai TPS in Tamil Nadu.

1.3 Joint studies were carried out by CTU and CEA to facilitate import of 16000 MW power to Southern region by 2018-19 based on the pessimistic scenario of non-availability / delay in commissioning of some of the generation projects in Southern region. The system was tested for contingencies including total outage of an entire inter-regional link and other critical regional lines for reliability.

1.4 The issues were discussed in the 36th and 37th SCM of NR and the following transmission schemes were agreed:

A) Scheme-I: Additional inter-Regional AC link for import into Southern Region i.e. Warora – Warangal and Chilakaluripeta - Hyderabad - Kurnool 765kV link

Transmission Scheme	**Est. Line Length (km)**
i) Establishment of 765/400kV substations at Warangal (New) with 2x1500 MVA transformer and 2x240 MVAR bus reactors.	
ii) Warora Pool -Warangal (New) 765 kV D/c line with 240 MVAR switchable line reactor at both ends.	312
iii) Warangal (New) – Hyderabad 765 kV D/c line with 330 MVAR switchable line reactor at Warangal end.	165
iv) Warangal (New) – Warangal (existing) 400 kV (quad) D/c line.	
v) Hyderabad– Kurnool 765 kV D/c line with 240 MVAR switchable line reactor at Kurnool end.	220
vi) Warangal (New) – Chilakaluripeta 765kV D/c line with 240 MVAR switchable line reactor at both ends.	265
vii) LILO of Kurnool-Thiruvalam 765 kV D/c at Cuddapah	
viii) Cuddapah- Hoodi 400kV (quad) D/c line with 63 MVAR switchable line reactor at both ends.	250
ix) <u>765 kV line Bay Provisions:</u> • Warora Pool - 2 • Warangal (New) – 6 • Hyderabad - 4 • Kurnool - 2 • Chilakaluripeta - 2 • Cuddapah - 4 <u>400 kV line Bay Provisions</u> • Warangal (Existing) – 2 • Warangal (New) – 2	

• Cuddapah - 2 • Hoodi - 2	

B) Scheme-II: HVDC Bipole link between Western region (Raigarh, Chhattisgarh) and Southern region (Pugalur, Tamil Nadu)

Transmission Scheme	**Est. Line Length (km)**
i) Raigarh(HVDC Stn) – Pugalur (HVDC Stn) 6000 MW HVDC bipole	1750
ii) Establishment of Raigarh HVDC Stn with 6000 MW HVDC terminals	
iii) Establishment of Pugalur HVDC Stn with 6000 MW HVDC terminals **(or Alternatively**: (i) with Pugalur HVDC Stn with 4000 MW terminal, and (ii) Madakkathara, in Kerala HVDC Stn with 2000 MW terminal and inter-connection with existing 400kV AC S/S at Madakkathara**)**	
iii) Raigarh HVDC Station – Raigarh(Existing) 400kV (quad) 2xD/c lines (or with bay extension)	
iv) Pugalur HVDC Station – Pugalur (Existing) 400kV (quad) D/c line.	
v) Pugalur HVDC Station – Arasur 400kV (quad) D/c line with 80 MVAR switchable line reactor at Arasur end.	150
vi) Pugalur HVDC Station – Thiruvalam 400kV (quad) D/c line with 80 MVAR switchable line reactor at both ends.	330
vii) Pugalur HVDC Station – Edayarpalayam 400 kV (quad) D/c line with 63 MVAR switchable line reactor at Edayarpalayam end.	160
viii) Edayarpalayam – Udumulpeta 400 kV (quad) D/c line.	85
ix) Establishment of 400/220kV substation with 2x500 MVA transformers at Edayarpalayam and 2x125 MVAR bus	

reactors.	
<u>400 kV line Bay Provisions</u> • Raigarh(Existing) – 2 • Pugalur (Existing) – 2 • Arasur - 2 • Thiruvalam -2 • Edayarpalayam -2 • Udumulpeta -2	

C) Scheme-III: Strengthening of transmission system beyond Vemagiri

	Transmission Scheme	**Est. Line Length (km)**
i)	Vemagiri-II – Chilakaluripeta 765kV D/c line with 240 MVAR switchable line reactor at both ends.	390
(ii)	Chilakaluripeta – Cuddapah 765kV D/c line with 240 MVAR switchable line reactor at both ends.	320
iii)	Chilakaluripeta – Narsaraopeta 400kV (quad) D/c line	25
iv)	Cuddapah – Madhugiri 400kV (quad) D/c line with 80 MVAR switchable line reactor at both ends.	
(v)	Cuddapah-Hindupur 400kV (quad) D/c line with 80 MVAR switchable line reactor at Hindupur end.(to be implemented by APTRANSCO)	
vi)	Srikaukulam Pooling Station – Garividi 400 kV (Quad) D/c line with 80 MVAR switchable line reactor at Garividi end.	
vii)	Establishment of 765/400kV substations at Chilakaluripeta and Cuddapah with 2x1500 MVA transformers and 2x240 MVAR bus reactors each.	

x) 765 kV line Bay Provisions: • Vemagiri II - 2 • Chilakaluripeta – 4 • Cuddapah - 2 400 kV line Bay Provisions • Narsaraopeta – 2 • Chilakaluripeta – 2 • Cuddapah - 4 • Srikakulam -2 • Modhugiri 2 • Girivodoi -2	

Members may deliberate on the above issue

(9) Connectivity for Kudankulam 3&4 (2x1000MW) with interstate transmission system.

1.1 The following connectivity arrangement for the Kudankulam units was agreed in the 36th Standing Committee meeting :

i) **Interim Arrangement for Units 1 & 2:** One 400 kV circuit from Kudankulam and one 400kV circuit from Madurai are terminating in the same diameter at Tirunelveli substation and therefore, through opening of two main breakers & keeping tie breaker in closed position in normal condition, shall provide the required bypass arrangement

Transmission Scheme	**Est. Line Length (km)**
(i) Tuticorin Pooling station – Tirunelveli section of the agreed Tuticorin Pooling station- Kudankulam 400 kV Quad D/c line to be constructed ahead of Kudankulam – 3 & 4	
ii) One of the existing Kudankulam – Tirunelveli 400 kV Quad D/c may be connected to the same making Kudnakulam –	

Tuticorin Pooling station 400kV Quad D/c line .	
<u>400 kV line Bay Provisions</u> • Ariyalur – 2 • Tuticorin Pooling station -2	

(10) Proposal of Electricity Department, Puducherry for erection of 230kV line to Karaikal

1.1 Implementation of a direct 230kV D/c line from NLC TS-I switchyard or any other switchyard/substation in NLC complex to the proposed Karaikal S/s as regional system strengthening scheme was decided in the 35th meeting of the Standing Committee of SR. For this, it was also decided that CTU would coordinate with Puducherry, TNEB and NLC to confirm the 230kV S/s, from where this line may be built. But Electricity Department, Puducherry informed that during their visit to Neyveli it was found that there is no vacant 230kV bay available at NLC TS-II at present. The TS-I switchyard would be dismantled after 2015. Thus there is no scope of bays availability at TS-I also. PGCIL in their visit report has also said that no bay is available at present. However, in the time frame of establishment of new NNTPS, bays may be available at NNTPS and Neyveli TANTRANSCO 230 kV new S/S. In view of this, it was proposed to again consider the original proposal i.e. LILO of existing 230kV Neyveli- Bahour line to proposed 230kV Auto S/s at Karaikal.

1.2 After deliberations, it was agreed to LILO of the 230kV Neyveli- Bahour line at proposed 230kV Auto S/s at Karaikal in such a way that in future as per the bay availability at NLC the 230kV Karaikal S/S may directly be connected to NLC and 230kV Neyveli-Bahour line may be restored.

1.3 It was also agreed that the Karaikal S/s would be implemented by Electricity Department, Puducherry and NLC the NLC – Karaikal 230kV D/C line(or initially in the form of LILO of the 230kV Neyveli- Bahour line at Karaikal) may be implemented by POWERGRID.

(11) Name of the Scheme: NER System Strengthening Scheme - II

This scheme was earlier a part of comprehensive scheme for strengthening of transmission and distribution system in NER and Sikkim. Later on the intra state works for six states of NER (excl. Arunachal Pradesh and Sikkim) are being taken up through World Bank funding and that for Arunachal Pradesh and Sikkim through Government of India funding (NLCPR Central). The inter State works has been approved by constituents of NER in joint standing committee meeting of ER and NER held on 03.01.2014 at Guwahati. Following is the scope under this scheme:

<u>Scope:</u>

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Biswanath Chariyalli (NER PP) – Itanagar (Zebra conductor) 132 kV D/C	95	**126**
2.	Silchar– Misa 400kV D/C (Quad) line	200	**864**
3.	Ranganadi - Nirjuli 132 kV D/C line	40	**41**
4.	Imphal - New Kohima 400 kV D/C line (to be initially operated at 132 kV)	150	**360**
5.	Surajmaninagar-P. K. Bari 400 kV D/C (initially op. at 132 kV)		
	Estimated Cost		

Note:

- CTU to provide 2 no. of 132kV line bays each at Bishwanath Chariyali (PGCIL), Nirjuli (PGCIL) and Imphal (PGCIL) S/Ss
- DoP, Arunachal Pradesh to provide 2 no. of 132kV line bays at Itanagar S/s (of DoP, Arunachal Pradesh)
- CTU to provide 2 no. of 400kV line bays each at Silchar (PGCIL) and Misa (PGCIL)
- CTU to provide 80 MVAR bus reactor at Misa (PG) along with GIS bay
- CTU to provide Switchable line reactors, 1x80 MVAR at Misa ends of the each circuit of the Silchar–Misa 400kV D/C line
- NEEPCO to provide 2 no. of 132 kV line bays (GIS) at Ranganadi Switchyard (of NEEPCO)
- DoP, Nagaland to provide 2 no. of 132kV line bays at its New Kohima S/s (of DoP, Nagaland)
- TBCB to provide 2 no. 132 kV line bays at Surajmaninagar (TSECL) and P. K. Bari

(12) Scheme: Transmission system for phase-I generation projects in Arunachal Pradesh

This scheme was approved in the 3rd Standing Committee Meeting of Power System Planning in North Eastern Region held on 21st December, 2011 at NRPC, New Delhi as evacuation system from 4 no. of hydro projects in Arunachal Pradesh in Kameng basin. Subsequently, the scheme was reviewed in a meeting among CEA, CTU and the project developers held on 30.10.2013. Based on the progress of generation projects, it was decided in the meeting that the scheme would be taken up for evacuation of power from 2 no. of generation projects viz. Dirang Energy Pvt. Ltd. (Patel Hydro Power Pvt. Ltd.) (189 MW) and Sew Nafra Power Corporation Ltd. (120MW). The same system would also be utilized subsequently for evacuation of power from other 2 generation projects viz. Adishankar Khuitam Power Pvt. Ltd. (66 MW) and KSK Dibbin Hydro Power Pvt. Ltd. (120 MW), as and when they materialize. Following is the scope under this scheme:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Dinchang-Rangia / Rowta Pooling Point 400 kV D/C (Quad)	120	**518**
2.	LILO of both ckts of Balipara-Bongaigaon 400 kV D/C (TM) line at Rangia / Rowta [2xD/C]	10	**48**

3.	Establishment of 7x105 MVA 400/220 kV Pooling station (GIS) at Dinchang **400 kV** • ICTs - 7x105 MVA, 400/220 kV (1 spare unit) • ICT Bays – 2 nos. • Line bays – 2 nos. • Bus Reactor - 80 MVAR– 2 nos. • Bus Reactor bays – 2 nos. • Space for 400 kV bays – 4 nos. **220 kV** • ICT Bays – 2 nos. • Space for bays – 16 nos.	-	**127**
4.	Establishment of 2x315 MVA, 400/220 kV Pooling station at Rangia / Rowta in Upper Assam **400 kV** • ICTs: 2x315 MVA, 400/220 kV • ICT Bays – 2 nos. • Line bays – 6 nos. • Bus Reactor: 125 MVAR– 2 nos. • Bus Reactor bays – 2 nos. • Line Reactor: 50 MVAR at Rangia / Rowta end - 2 nos. • Space for Line bays – 6 nos. **220 kV** • ICT Bays – 2 nos. • Line bays – 4 nos. • Space for Line bays – 2 nos.	-	**180**
	Estimated Cost		**873**

Note:

- M/s Sew Nafra Power Corporation Ltd. and Patel Hydro Power Pvt. Ltd. to provide 2 no. 220 kV bays each at Dinchang pooling station)

  Note: The issue may be taken up depending upon the outcome of the meeting of CTU with the Developers scheduled on 25/11/4014

(13) Common Transmission System for Phase-II Generation Projects in Odisha

4 no. generation projects in Odisha with total installed capacity of 3270MW and LTA quantum of about 2600MW have been granted connectivity /LTA under Phase-II. The list of the generation projects along with associated transmission scheme is enclosed at **Annexure-II.** Angul-Jharsuguda-Dharamjayagarh 765kV D/c (2nd) line, which has already been taken up for implementation by POWERGRID as part of transmission system associated with evacuation of power from generation project of East Coast Energy Pvt. Ltd.

at Srikakulum (1320 MW) in Andhra Pradesh will also be utilized to facilitate evacuation of about 4 no. generation projects in Odisha.

As a common transmission scheme for the above thermal projects in Odisha and Andhra Pradesh, the following scheme was finalized to be implemented through Tariff based Competitive Bidding Route:

Scope:

Transmission Scheme	**Estimated Line Length (km)**
i) Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line	350
ii) LILO of both circuits of Rourkela - Raigarh 400 kV D/c (2nd line) at Jharsuguda (Sundargarh)	2x400kV D/c line : each about 30 km

Note :

- CTU to provide 2x240 MVAr switchable line reactor alongwith 700 Ohm NGR at Jharsuguda (Sundargarh) end on Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line.
- CTU to provide 2x240 MVAr switchable line reactor alongwith 700 Ohm NGR at Raipur Pool end on Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line.
- CTU to provide 2 no. of 765kV line bays each at Jharsuguda (Sundargarh) and Raipur Pool for termination of Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line.
- CTU to provide 4 nos. of 400kV line bays at Jharsuguda (Sundargarh) for termination of LILO of both circuits of Rourkela - Raigarh 400 kV D/c (2nd line).

The scheme has been approved in the meeting with constituents of Eastern Region regarding connectivity and LTA on 05-01-2013, 24th TCC/ERPC meeting on 26-27 April, 2013 and meeting of Standing Committee on Power System Planning for Eastern Region held on 02-05-2014 at New Delhi. The scheme has also been approved in 18th meeting of WR constituents regarding Connectivity/Open Access held at NRPC, New Delhi on 29-08-2013, 24th meeting of WRPC held on 09-10-2013 at Goa and 37th meeting of Standing Committee on Power System Planning for Western Region held on 05-09-2014 at Mumbai.

2. Immediate Evacuation System for OPGC (1320 MW) Project in Odisha

The immediate evacuation system for OPGC generation project, which is a part of phase-II generation projects in Orissa is proposed to be implemented through Tariff based Competitive Bidding Route.

Scope:

Transmission Scheme	**Estimated Line Length (km)**

i) OPGC (IB TPS) – Jharsuguda (Sundargarh) 400kV D/c line with Triple Snowbird Conductor alongwith 2 no. 400kV line bays at Jharsuguda (Sundergarh) substation of POWERGRID. Bays at OPGC end of the line would be under the scope of the generation developer.	50

- CTU to provide 2 nos. 400 kV line bays at Jharsuguda (Sundargarh) of POWERGRID

The scheme has been approved in the meeting with constituents of Eastern Region regarding connectivity and LTA on 05-01-2013, 24th TCC/ERPC meeting on 26-27 April, 2013 and meeting of Standing Committee on Power System Planning for Eastern Region held on 02-05-2014 at New Delhi.

(14) Transmission System Strengthening in Indian System for transfer of power from new HEPs in Bhutan

Transmission system for evacuation of power from upcoming hydro projects in Bhutan viz. Punatsangchhu-I (1200MW), Punatsangchhu II (990MW), Mangdechhu (720MW) and Wangchhu (570MW) HEPs was discussed and agreed in the meeting of Standing Committee on Power System Planning held at New Delhi on 02-05-2014 wherein the following transmission system strengthening requirements on the Indian side were agreed :

Transmission Scheme	**Estimated Line Length (km)**
i) Jigmeling - Alipurduar 400kV D/C line with Quad moose conductor (Indian Portion)	100
ii) Alipurduar - Siliguri 400kV D/c line (2nd) with Quad moose conductor	150
iii) Kishanganj - Darbhanga 400kV D/c line with Quad moose conductor alongwith: ➢ 2 nos. 400 kV line bays at Darbhanga ➢ 80 MVAR switchable line reactors (400 Ohm NGR) in each circuit at Darbhanga end of Kishanganj - Darbhanga 400kV D/c (quad) line	300

- CTU to provide 4 nos. 400 kV line bays at Alipurduar, 2 nos. 400 kV line bays at Siliguri and 2 nos. 400 kV line bays (GIS) at Kishanganj sub-stations of POWERGRID

- CTU to provide 80 MVAR switchable line reactors (400 Ohm NGR) in each circuit at Kishanganj end of Kishanganj - Darbhanga 400kV D/c line with Quad moose conductor

It is to mention that the 2nd Alipurduar-Siliguri 400kV D/c quad line was considered under system strengthening works associated with Punatsangchu-II and Mangdechu projects instead of LILO of 400 Tala-Siliguri D/C twin moose D/C line at Alipurduar and with deletion of the following works by POWERGRID in the approved scheme of "Transmission System for development of pooling station in Northern part of West Bengal and transfer of power from Bhutan to NR/WR":

- LILO of Tala-Siliguri 400kV D/c line at Alipurduar
- 4 nos. 400 kV line bays associated with above LILO at Alipurduar

The above modification was concurred by BPC, Bhutan vide their letter dated 23.09.2014.

Keeping in view the importance of the cross border power transfer from HEPs in Bhutan through the above system, it was agreed in the 1st – 2014 meeting of Standing Committee on Power System Planning of Eastern Region on 02.05.2014 at NRPC, New Delhi that above three lines should be taken up by POWERGRID for implementation on compressed time schedule.

The scheme has also been agreed in the 27th meeting of TCC/ERPC held on 30-31 May, 2014 at Gangtok.

B. Modification in the Agreed Scheme

(1) Name of the Scheme: Additional System Strengthening for Sipat STPS

This scheme was agreed in the 32nd meeting of the Empowered Committee on Transmission held on 17.01.2014. The scheme was allocated to PFCCL to be implemented through TBCB route:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Sipat – Bilaspur Pooling Station 3rd 765 kV S/C line	25	57
2.	Bilaspur Pooling Station – Dhanwahi pooling station 765 kV D/C line	300	1343
3.	LILO of both circuits of Jabalpur - Orai 765 kV D/C at Dhanwahi pooling station [2XD/C]	50	448
4.	LILO of all circuits of Vindhyachal – Jabalpur 400 kV 2xD/C line at Dhanwahi pooling station – [4XD/C]	20	127
5.	**Establishment of new 2X1500, 765/400 kV Dhanwahi Pooling Station** **765 kV** • Line bays – 6 nos. • ICTs: 7x500MVA, 765/400 kV (1 spare unit) • ICT bays – 2 nos. • Space for 765 bays – 4 nos. • Bus reactor: 3 x 110 MVAR • Line reactors: 7 x 110 MVAR (1 unit spare) • Bus reactor bay – 1 no. **400 kV** • Line bays – 8 nos. • ICT bays- 2 nos. • Space for 400 kV bays – 4 nos.		**538**
	Estimated Cost		**2473**

Note:

- CTU to provide 3 no. of 765 kV line bays at exiting Bilaspur 765/400 kV pooling station along with 2X330 MVAR switchable line reactors for Bilaspur Pooling Station – Dhanwahi pooling station 765 kV D/C line along with bays.
- CTU to provide 1 no. of 765 kV line bays at switchyard of Sipat STPP of NTPC – NTPC to provide bay space.

The modified scheme as given below was agreed in the 37th Standing Committee meeting on Power System Planning of Western Region held on 5th September, 2014. The scope of the transmission scheme is as under:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Sipat – Bilaspur Pooling Station 3rd 765 kV S/C line	25	**57**
2.	Bilaspur Pooling Station - Rajnandgaon 765 kV D/C line	180	**810**
	Estimated Cost		**867**

Note:

- CTU to provide 1 no. of 765 kV line bay at exiting Bilaspur 765/400 kV pooling station for termination of Sipat – Bilaspur Pooling Station 3rd 765 kV S/C line
- CTU to provide 2 no. of 765 kV line bays at exiting Bilaspur 765/400 kV pooling station along with 2X240 MVAR switchable line reactors for Bilaspur Pooling Station – Rajnandgaon switching station 765 kV D/C line along with bays.
- Successful bidder to provide 1 no. of 765 kV line bays at switchyard of Sipat STPP of NTPC – NTPC to provide space for one bay.

(2) Name of the Scheme: Additional System Strengthening Scheme for Chhattisgarh IPPs – Part B

This scheme was agreed in the 32nd meeting of the Empowered Committee on Transmission held on 17.01.2014 . The scheme was allocated to PFCCL to be implemented through TBCB route:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Raipur (Pool) – Rajnandgaon 765 kV D/C line	150	**671**
2.	Rajnandgaon – **New** Pooling station near Warora 765 kV D/C line	200	**895**
3.	LILO of all (4) circuits of Raipur/Bhilai – Bhadrawati 400 kV lines at Rajnandgaon	20	**127**

4.	**Establishment of new substation near Rajnandgaon 765/400 kV, 2x1500 MVA substation** **765 kV** • ICTs - 7x500MVA 765/400 kV (1 spare unit) • ICT bays – 2 no. • Line bays – 4 no. • Bus reactor – 3x110 MVAR • Bus reactor bay - 1 no. • Line reactors - 7x110 MVAR (1 unit spare) (switchable for Warora line) • Space for 765 kV bays – 4 nos. **400 kV** • ICT bays – 2 no. • Line bays – 8 no. • Space for 400 kV bays – 4 nos.		**498**
	Estimated Cost		**2191**

Note:

- CTU to provide 2 no. of 765 kV line bays at Raipur 765/400 kV pooling station of PGCIL.

The modified scheme as given below was agreed in the 37th Standing Committee meeting on Power System Planning of Western Region held on 5th September, 2014. The scope of the transmission scheme is as under:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Raipur (Pool) – Rajnandgaon 765 kV D/C line	60	**270**
2.	Rajnandgaon – **New** Pooling station near Warora 765 kV D/C line	270	**1210**
3.	**Establishment of new switching station near Rajnandgaon** **765 kV** • Line bays – 6 no. • Bus reactor – 3x110 MVAR • Bus reactor bay - 1 no. • Line reactors - 7x110 MVAR (1 unit spare) (switchable for Warora line) • Space for 765 kV bays – 4 nos. • Space for 765 kV ICT bays – 3 nos **400 kV** • Space for 400 kV ICT bays – 3 nos • Space for 400 kV line bays – 4 nos.		**450**
	Estimated Cost		**1930**

Note:

- CTU to provide 2 no. of 765 kV line bays at Raipur 765/400 kV pooling station of PGCIL.

(3) Name of the Scheme: Transmission system associated with Gadarwara STPS (2x800 MW) of NTPC (Part - A)

This scheme was agreed in the 32nd meeting of the Empowered Committee on Transmission held on 17.01.2014. The project has been allocated to M/S RECTPCL to be implemented through TBCB route:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Gadarwara STPS - Jabalpur Pool 765 kV D/C line **As per the interim arrangement, LILO of existing Seoni-Bina 765 kV S/C line at Gadarwara STPP would be established. At a later date, LILO portion would be delinked from Seoni-Bina 765 kV S/C line to restore the Seoni-Bina 765 kV S/C direct line, and the LILO portion would be extended to the Jabalpur 765/400 kV Polling Station to form the proposed Gadarwara STPS – Jabalpur Pool 765 kV D/C line.**	120	**537**
2.	Gadarwara STPS-New Pooling Station near Warora 765 kV D/C line	300	**1343**
3.	LILO of both circuits of Wardha-Parli (PG) 400 kV D/C line at Warora (Pooling Station) (Quad) line [2xD/C]	20	**114**
4.	**Establishment of 2x1500 MVA 765/400 kV New Pooling Station near Warora** **765 kV** • ICTs: 7x500MVA 765/400 kV (1 spare unit) • ICT bays – 2 no. • Line bays – 6 no. • Bus reactor – 3x110 MVAR • Bus reactor bay – 1 no. • Line reactors - 7x110 MVAR (1 unit spare) (for Gadarwara line) • Line reactors switchable - 6x110 MVAR (for Parli line) • Space for 765 kV bays – 4 no. **400 kV** • ICT bays – 2 no. • Line bays – 4 no. • Space for 400 kV bays – 4 no.		**531**
	Estimated Cost		**2525**

Note:

- **Transmission system associated with Gadarwara STPS (2x800 MW) both Part – A and Part – B transmission systems are to be implemented in the same time frame.**

- CTU to provide 2 no. of 765 kV line bay at under construction Jabalpur 765/400 kV pooling station of POWERGRID,
- NTPC to provide to provide 4 no. of 765 kV line bay, 1X330 MVAR bus reactor and 2X330 MVAR switchable line reactor at their Gadarwara TPS switchyard for Gadarwara – Warora 765 kV D/C line.
- 6 nos. of 765 kV line bays includes 2 no. 765 kV line bays for Rajnandgaon-Warora Pooling s/s 765 kV D/C line.

The modified scheme as given below was agreed in the 37th Standing Committee meeting on Power System Planning of Western Region held on 5th September, 2014 subject to confirmation of 2 no. 400 kV bays at Warora (MSETCL). The scope of the transmission scheme is as under:

Scope:

Sl. No.	Transmission Scheme	Estimated route length (km)	Estimated Cost (Rs. Crore)
1.	Gadarwara STPS - Jabalpur Pool 765 kV D/C line **As per the interim arrangement, LILO of existing Seoni-Bina 765 kV S/C line at Gadarwara STPP would be established. At a later date, LILO portion would be delinked from Seoni-Bina 765 kV S/C line to restore the Seoni-Bina 765 kV S/C direct line, and the LILO portion would be extended to the Jabalpur 765/400 kV Polling Station to form the proposed Gadarwara STPS – Jabalpur Pool 765 kV D/C line.**	120	**537**
2.	Gadarwara STPS-Warora (Pooling Station) **(New)** 765 kV D/C line	300	**1343**
3.	Warora 765/400 kV (Pooling Station) – Warora (MSETCL) 400 kV D/C Quad line	20	**60**
4.	**Establishment of 2x1500 MVA 765/400 kV Warora (Pooling Station) (New)** **765 kV** • ICTs: 7x500MVA 765/400 kV (1 spare unit) • ICT bays – 2 no. • Line bays – 6 no. • Bus reactor – 3x110 MVAR • Bus reactor bay – 1 no. • Line reactors - 7x110 MVAR (1 unit spare) (for Gadarwara line) • Line reactors - 6x110 MVAR (for Rajnandangaon line) • Line reactors switchable - 6x110 MVAR (for Parli line) • Space for 765 kV bays – 4 no. **400 kV** • ICT bays – 2 no. • Line bays – 2 no. • Space for 400 kV bays – 4 no.		**590**
	Estimated Cost		**2530**

Note:

- **Transmission system associated with Gadarwara STPS (2x800 MW) both Part – A and Part – B transmission systems are to be implemented in the same time frame.**
- CTU to provide 2 no. of 765 kV line bay at under construction Jabalpur 765/400 kV pooling station of POWERGRID,
- NTPC to provide to provide 4 no. of 765 kV line bay, 1X330 MVAR bus reactor and 2X330 MVAR switchable line reactor at their Gadarwara TPS switchyard for Gadarwara – Warora 765 kV D/C line.
- 6 nos. of 765 kV line bays includes 2 no. 765 kV line bays for Rajnandgaon-Warora Pooling s/s 765 kV D/C line.
- Successful bidder to provide 2 no. 400 kV bays at Warora (MSETCL) – MSETCL to provide space for 2 no. 400 kV line bays.

Subsequently, MSETCL vide their letter dated 24.09.2014 informed that there is space constraint at their Warora 400 kV S/S. and has suggested to explore the possibility of LILO of both circuits of Wardha (PG)-Warora (MSETCL) 400 kV D/C at Warora (PG) 765/400 kV S/S.

In view of space constraint at Warora (MSETCL) 400 kV S/S, no modification is suggested in Transmission system associated with Gadarwara STPS (2x800 MW) both Part – A as agreed in the previous Empowered Committee meeting.

(4) Transmission System for evacuation of power from 2x500 MW Neyveli Lignite Corp. Ltd. TS-I (Replacement) (NNTPS) in Neyveli, Tamil Nadu:

1.1 The transmission system for evacuation of power from 2x500 MW Neyveli Lignite Corporation Ltd. TS-I (Replacement) (NNTPS) in Neyveli, Tamil Nadu, as agreed in 35th SCM of SR and was allocated to RECTPCL to be implemented through TBCB route. Some small modification was envisaged in the scheme and the same was discussed in the 37th SCM of NR. The system as agreed almost remains same except for minor modification in terms of type of conductor of Neyveli TPS-II - Neyveli(TANTRANSCO 230kV S/S), 230kV D/C line (by TNEB) which shall also be with HTLS conductor. Accordingly, the following scope of System Strengthening in Tamil Nadu was agreed :

Transmission Scheme	**Est. Line Length (km)**
(i) NNTPS switchyard – Ariyalur (Villupuram) 400kV D/c line	80
<u>400 kV line Bay Provisions</u> • Ariyalur – 2	

Note: The 400 kV Ariyalur (Villupuram) S/S with 2x500 MVA S/S would be implemented by TRANSCO, along with the bays for termination of line from NNTPS at Ariyalur

6.0 Constitution of the Bid Evaluation Committees (BEC's) for the new transmission schemes

(1) Bid Evaluation Committee (BEC) for Projects allotted to RECTPCL & (PFCCL)

S. No.	Name	Designation
1.	Head, SBI Capital Markets, 6th floor, World Trade Tower, Barakhamba Lane, Connaught Place, New Delhi- 110001 Phone No. 011-23418770 Fax: 011 -23418773	Chairman
2.	Shri Anil Kaplush, Chief Engineer (TS) Punjab State Transmission Corporation Ltd., The Mall, PATIALA-147 001. Tel.No. 0175-2303676, Fax No. 0175-2301536 Mob. No. 9646117802	Member (Northern Region)
3.	Shri S.B. Moudgil, Chief Engineer (SO&Comml.) Haryana Vidyut Prasaran Nigam Ltd., Shakti Bhawan, Sector-6, PANCHKULA-134 109. Tel.No. 0172-2560547, Fax No. 0172-2560622 Mob. No. 09316369240	Member (Northern Region)
4.	Shri SK Nagesh, Director (Technical), M.P. Power Transmission Company Ltd., Shakti Bhawan, Rampur, Jabalpur Madhya Pradesh - 482 008	Member (Western Region)
5.	Shri O.K. Yempal, Director (Operation), MSETCL, Prakashganga, Plot No. C-19, E-Block, Bandra Kurla Compex, Bandra (East), Mumbai – 400 051 (M) 9920174232, Tel No. 022-2659 5403, 2659 5003, Fax 022-2659 0383, 2659 1254 e-mail: dirop@mahatransco.in	Member (Western Region)
6.	Mohd. Anwaruddin Director (Project, Grid & Finance), Telangana TRANSCO Hyderabad	Member (Southern Region)
7.	Shri S Sumamth Director (Transmission), Karnataka Power Transmission Company Ltd., Bengaluru, Karnataka	Member (Southern Region)

8.	Shri Pankaj Batra, Chief Engineer (F&CA) Central Electricity Authority Room No. 626, 6th floor, Sewa Bhawan, R.K.Puram, New Delhi-110066 Phone No. 011-26732688, 26732668, Mobile: 9350981062	Member (CEA)
9.	Shri Goutam Roy Director (SP&PA) Central Electricity Authority Sewa Bhawan, R.K.Puram, New Delhi-110066 Phone No. 011-26711015, Mobile: 8376817933	Member (CEA)
10.	Chairman of SPV constituted by **PFCCL & RECPTCCL**	Convener - Member

7.0 Briefing by BPCs on the schemes under bidding process

RECTPCL and PFCCL may brief the committee about progress of schemes that are under bidding process.

8.0 Any other item.

Any other item with the permission of Chair.

Annexure – I

Details of cost committee for estimated the transmission project cost

	Name (Shri/Smt.)	Designation/ Organisation	
1.	Shri K K Arya,	Chief Engineer (SP&PA), CEA	– Chairman
2.	Shri Goutam Roy	Director(SP&PA), CEA	– Member
3.	Shri S K Roy Mohapatra	Director(SETD), CEA	– Member
4.	Shri D K Sarkar	General Manager (Cost Engg), PGCIL	– Member
5.	Shri R K Shahi	AVP, PFCCL	– Member
6.	Shri Bupender Gupta	ACEO, RECTPCL	– Member

Annexure-II

Phase-II IPPs in Odisha & associated Transmission System

A. Generation Projects

Sl No	Applicant	Installed Capacity (MW)	LTA Quantum (MW)	Commissioning Schedule	Target Beneficiary Regions			
					WR	SR	NR	ER
1.	Sterlite Energy Ltd.	Included under Phase-I (2400 MW)	1000	Already Commissioned	400	-	400	200
2.	GMR Kamalanga Energy Ltd	350 (1x350)	220	Sep, 2017	220	-	-	-
3.	OPGC	1320 (2x660)	600	July, 2017	200	200	200	-
4.	Darlipalli	1600 (2x800)	793.25	Oct 2016	-	-	-	793.25
	Sub-Total	**3270**	**2613.25**		**820**	**200**	**600**	**993.25**
5.	Srikakulam	1320 (2x660)	1240	Jun'15		1240		
	Total	**6990**	**3853.25**		**820**	**1440**	**600**	**993.25**

B. Transmission System

B1. Transmission System for Immediate Evacuation of Generation Projects

1. **GMR Kamalanga Energy Ltd (350 MW) :** Through Ph-I System i.e. GMR-Angul 400kV D/c line

2. **Sterlite Energy Ltd. (2400 MW) :** Sterlite – Jharsuguda 400 kV D/c line

3. **OPGC (1320 MW) :** OPGC – Jharsuguda 400 kV D/c (triple snowbird) line

4. **Darlipalli (1600 MW) :** Darlipalli – Jharsuguda 765 kV D/c line

5. **Srikakulam (1320 MW) :** Srikakulam – Srikakulam Pool 400 kV D/c line

B2. Common transmission system:

1. Being Implemented by POWERGRID

- Angul – Jharsuguda (Sundargarh) – Dharamjaygarh 765 kV D/c line.

  This line is being implemented by POWERGRID as a part of evacuation system from generation projects in Srikakulam area of Andhra Pradesh in Southern region. The same would also be utilized for evacuation of power phase-II generation projects in Odisha.

2. To be implemented through Tariff based Competitive Bidding Route

- Jharsuguda (Sundargarh) – Raipur Pool 765 kV D/c line. (350 km)
- LILO of both circuits of Rourkela - Raigarh 400 kV D/c (2^{nd} line) at Jharsuguda (Sundargarh). (50 km)

3. To be implemented by POWERGRID

- Addition of 2x1500MVA, 765/400kV ICT at Jharsuguda (Sundargarh).
- Addition of 2x1500MVA, 765/400kV ICT at Angul
- Split bus arrangement at 400kV and 765kV bus in both Angul and Jharsuguda (Sundargarh) substations.