

# **EASTERN REGIONAL POWER COMMITTEE**

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## **AGENDA FOR 5<sup>TH</sup> MEETING OF STANDING COMMITTEE ON TRANSMISSION PLANNING FOR STATE SECTORS TO BE HELD ON 03.08.2017 (THURSDAY) AT 11:00 HOURS AT ERPC, KOLKATA**

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### **PART – A**

#### **ITEM NO. A.1: Confirmation of minutes of 4<sup>th</sup> SSCM of ERPC held on 06.06.2016.**

The minutes were circulated vide letter dated 10.06.16 to all the constituents and also uploaded in ERPC website.

No comments have been received till date.

**Members may confirm the minutes.**

### **PART – B :: AGENDA ITEMS OF 19<sup>TH</sup> STANDING COMMITTEE MEETING**

The agenda items for 19th Standing Committee Meeting on Power System Planning of Eastern Region was circulated by CEA on 13.07.2017 and already available in CEA and ERPC website. The same is placed at **Annexure-B** (text only) for discussion.

**Members may discuss. CEA/CTU may place the study results and details.**

### **PART – C :: OTHER AGENDA ITEMS FOR DISCUSSION**

#### **ITEM NO. C1: Bus Splitting of Powergrid Sub-stations**

As per decision of Standing Committee of ER CTU was entrusted to do Bus splitting at 400 kV Maithon, Durgapur & Biharsariff S/Ss or ER. The latest status on the same are:

- 400 kV Maithon ---Completed
- 400 kV Durgapur--Completed
- 400 kV Biharshariff— Completed

During third party protection of 400kV Maithon S/s on 18<sup>th</sup> May 2017, it was observed that bus splitting scheme at 400kV Maithon S/s has been commissioned but not in service.

*Subsequently in 134<sup>th</sup> OCC, it was informed that the bus splitting scheme at 400 kV Maithon & Biharshariff will be operationalized after getting the consent from CTU.*

**CTU may place the action plan to commence the split bus operation.**

#### **ITEM NO. C2: Bus and bay strengthening at Purnea (PG)**

In 134<sup>th</sup> OCC, BSPTCL informed that reconductoring of 132 kV Purnea (PG)-Purnea (BSPTCL) (T/C) transmission line from Panther to HTLS conductor has already been completed and line is charged. Now each circuit capacity is 1000 Amp. i.e. 200 MW. .

It has been planned to test the line by its loading, which requires compatibility of 132 kV main bus bar, bay etc at either Purnea (PG) and Purnea GSS end.

In BSPTCL for Purnea GSS end order has been awarded for R&M of GSS, which includes the work of bus bar & bay strength. These works are expected to be completed by 30.6.17.

For drawing optimum power at Purnea (PG) end, bus & bay strength must remain sufficient to sustain load.

PGCIL is requested to confirm status of its 132 kV bus bar, bay etc.

*Powergrid informed that 132kV bus bar and bay at Purnea (PG) are not equipped with desired loading 200 MW/ckt and no future argumentation was planned.*

*OCC advised BSPTCL to interact with CEA/CTU, so that the issue may be discussed in Standing Committee on Transmission Planning of ER.*

**BSPTCL may update.**

**ITEM NO. C3: LILO Connection of 132 KV Sonenagar-Rihand (UP,NR) Circuit-I at NPGC, Nabinagar for providing startup power to NPGC**

In 131<sup>st</sup> OCC meeting of ERPC, BSPTCL informed that NPGC, Nabinagar has applied for 65 MVA start up power and initially they will draw around 5-10 MW power through 132 kV Sonenagar-Rihand-I line LILOed at NPGC, Nabinagar. It was also pointed that 132kV Sonenagar-Rihand (UP,NR) Circuit-I is lying idle charged since last 5-6 years and presently it remains charged on no load from Sonenagar end & open at Rihand (UP) end.

It was informed that NPGC, Nabinagar will only draw startup power for commissioning activities through the above LILO as an interim arrangement and injection of power/trial-run will be done after the completion of 400 kV ATS of NPGC, Nabinagar.

The issue was discussed also with CTU and CEA. CEA vide their letter 69/2/PSPA-II/2017/362, dated 8.5.17 communicated their no objection. CTU also expressed the same.

ERPC vide fax message dated no 259 dated 09.05.17 has given the confirmation to SLDC, UPPTCL with a copy to all other utilities that as per the decision of OCC, NPGC is going to start availing the start up power from BSPTCL by closing Sonnagar-NPGC 132KV LILO section of 132kV Sonnagar-Rihand-I line keeping the line open at Rihand end.

It was also mentioned that it is an interim arrangement subject to post facto approval of Standing Committee of ER in its forthcoming meeting.

**Members may approve.**

**ITEM NO. C4: AGENDA ITEMS BY OPTCL.**

## **OPTCL Agenda for 5th SSCM**

### **Agenda-I**

#### **Evacuation Plan of 2x 660 MW of IB power at Lapanga**

OPGC plans to commission 2x660 MW of power by the end of Year 2021-22. The system study has been done for evacuation of above quantum of power. The flow diagram is attached. The flow in the connected lines are as follows.

#### **Case-I (with additional Ib-Lapnaga DC and Lapanga - Jharsuguda DC)**

Ib-Lapanga 400 kV D/C line- 1206 MW

Lapanga-Jharsuguda 400 kV D/C line (Triple snow bird) -611 MW

Sterlite-Lapanga 400 kV D/C line- 303 MW.

Sterlite-Jharsuguda 400 kV D/C line (AL 59 )894 MW

Lapanga-Meramundali 400 kV D/C line 574 MW

Flow through Lapanga ICT – 324 MW.

#### **Case-II (with Ib-Jharsuguda)**

Ib-Lapanga 400 kV D/C line- 490 MW

Ib-Jharsuguda 400 kV D/C line (Triple snow bird) -715 MW

Sterlite-Lapanga 400 kV D/C line- 397 MW.

Sterlite-Jharsuguda 400 kV D/C line (AL 59 )799 MW

Lapanga-Meramundali 400 kV D/C line 568 MW

Flow through Lapanga ICT – 320 MW.

Among the two cases Case-I is commercially and technically viable.

Under both condition, two no of 400kV bays may be reserved at Jharsuguda (Kenapalli) 765/400kV S/S for GRIDCO for evacuation of IBTPS stage –II power.

### **Agenda-2**

#### **Evacuation Plan of 3x 800 MW power of M/s OTPCL at Kamakhyanagar.**

M/s OTPCL plans to commission 3x 800 MW thermal power station by the Year 2021-22. The entire power of the S/S is to be availed by GRIDCO. OPTCL has planned to evacuate full power with the following transmission elements.

- 765 kV D/C connectivity with Angul PG.
- 765 kV D/C line from Kamakhyanagar to Begunia (proposed 765kV S/S by OPTCL)
- 765 kV Switching station at Kamakhyanagar.

- 765/400 kV Substation at Begunia.
- 400 kV D/C connectivity with LILO of Mendhashal-Khuntuni line at Begunia.
- 400 kV D/C connectivity with LILO of Pandiabil-Narendrapur line at Begunia.

Power generated at OTPCL will be connected to Begunia through 765kV DC line from the proposed 765kV Switching Station at Kamakhyanagar to facilitate seem less transfer of power. It will be stepped down to 400 kV at Begunia. This will be further connected to LILO of Mendhashal-Khuntuni D/C & LILO of Pandiabil-Narendrapur D/C line for evacuation of power to the load centres at Mendhashal, Khuntuni, Narendrapur & Duburi. The connectivity with Angul at 765kV will add stability to the evacuation plan.

The flow diagram is attached. The flow in the connected lines are as follows.

Angul-Kamakhyanagar 765 kV line- 1200 MW.

OTPCL-Begunia 765 kV line-	992 MW
Begunia-Khuntuni 400 kV line-	506 MW
Begunia-Mendhashal- 400 kV line	682 MW
Begunia-Narendrapur 400 kV line	54 MW
Begunia-Pandiabil 400 kV line	754 MW

Two nos. of 765kV Bays to be allotted to OPTCL at 765kV S/s at Angul.

### **Agenda-3**

400kV LILO of One Circuit of Kuchei-Pandiabil line at proposed 400kV Bhadrak S/s.

CEA in their 15<sup>th</sup> Standing Committee has approved in-principle the construction of 400/220kV S/s at Bhadrak and Paradeep.

#### **The Connectivity of Bhadrak 400kV S/s**

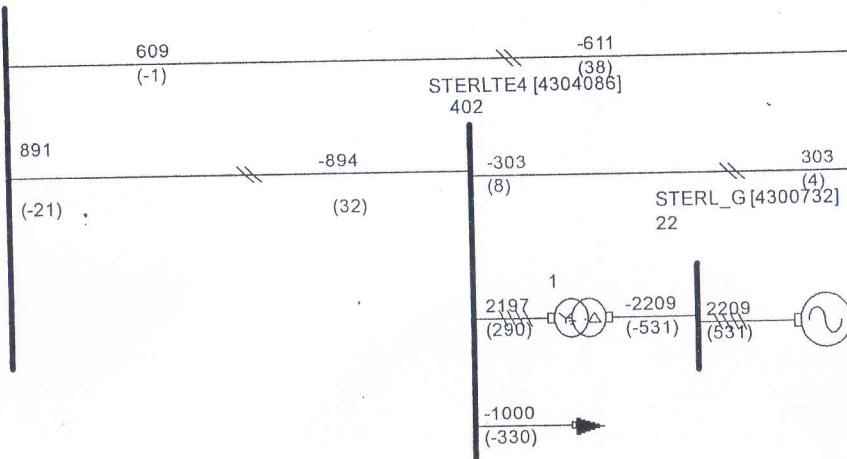
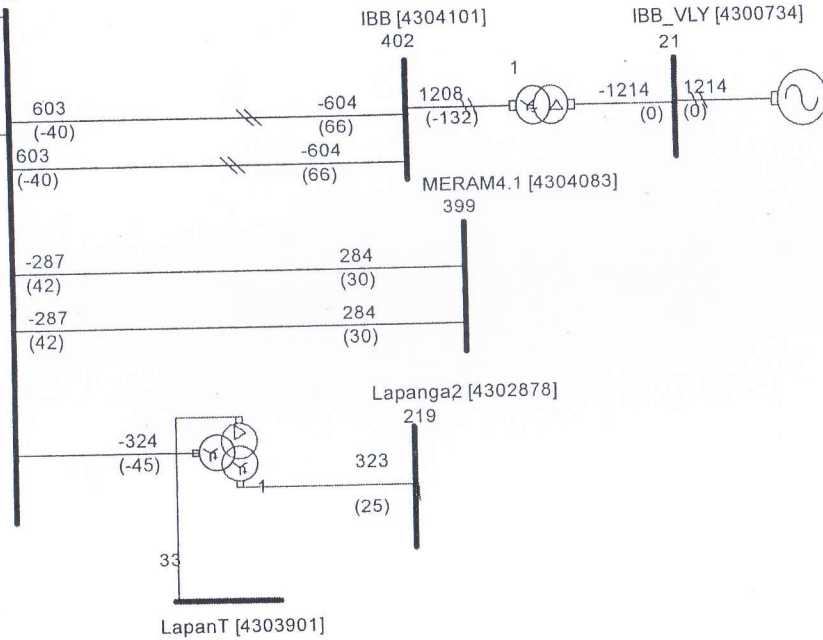
400/220kV Bhadrak S/s will be LILOed from one circuit of 400kV Kuchei-Pandiabil line

#### **The Connectivity of Paradeep 400kV S/s**

400/220kV Paradeep S/s will be connected through a 400kV DC line from existing 400/220/33kV Duburi S/s of OPTCL.

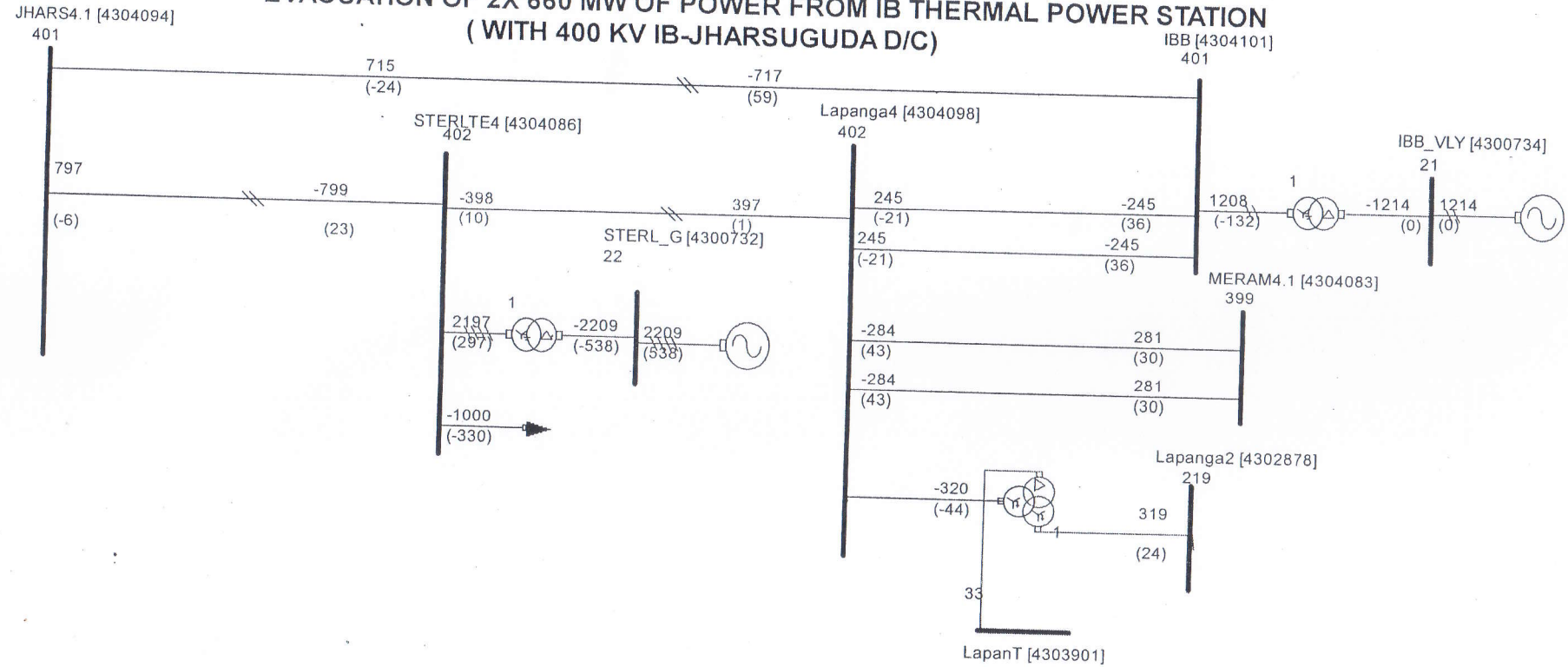
So permission may be accorded for 400kV LILO of One Circuit of 400kV Kuchei-Pandiabil Line.

# EVACUATION OF 2X 660 MW OF POWER FROM IB THERMAL POWER STATION (WITH IB-LAPANGA D/C & LAPANGA-JHARSUGUDA D/C)

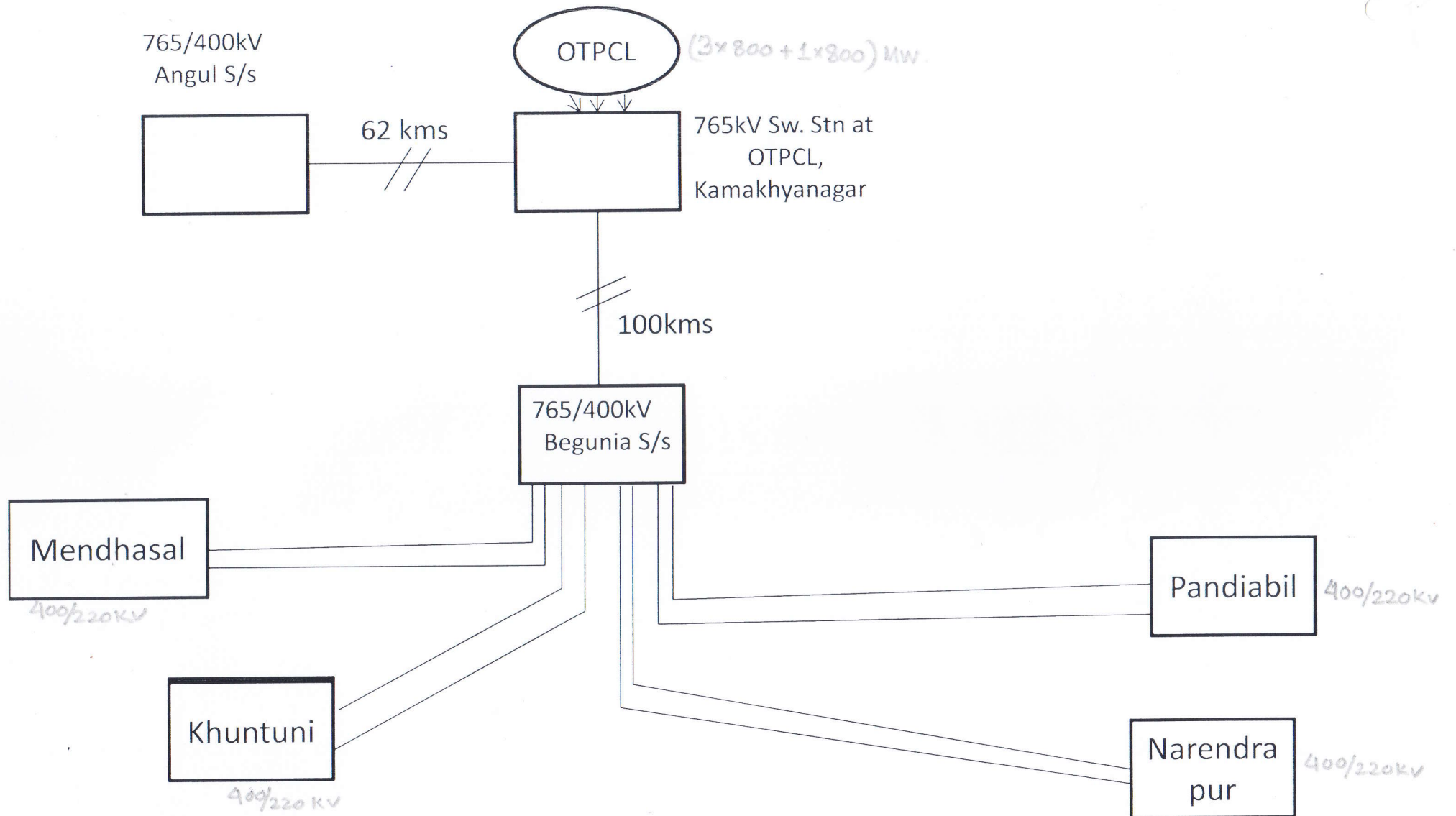
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21MERAM4.1 [4304083]  
399Lapanga2 [4302878]  
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# EVACUATION OF 2X 660 MW OF POWER FROM IB THERMAL POWER STATION ( WITH 400 KV IB-JHARSUGUDA D/C)







## **Agenda for 19<sup>th</sup> Standing Committee Meeting on Power System Planning of Eastern Region**

### **1.0 Confirmation of the minutes of 18<sup>th</sup> Standing Committee Meeting on Power System planning of Eastern Region.**

- 1.1 The minutes of the 18<sup>th</sup> meeting of the Standing Committee on Power System Planning held on 13<sup>th</sup> June, 2016 at Kolkata were circulated vide CEA letter no. 66/5/SP7PA-2016/139-150 dated 19<sup>th</sup> August, 2016. ERPC vide their letter no. ERPC/MS/2016/767 dated 06.09.2016 and POWERGRID vide their letter no. C/CTU-Plg/E/SCM dated 23-09-2016 had submitted their comments and a corrigendum was issued by CEA vide letter No. CEA/PSPA-2/66/5/2016/265-275 dated 26.09.2016. Also, 2<sup>nd</sup> Corrigendum to the minutes issued to bring clarity were circulated vide CEA letter No. 66/5/PSPA-II/2016/344-355 dated 20.10.2016. WBSETCL has also requested some modifications to the minutes vide their letter no. No. CE/CPD/CEA/1136 dated 05.10.2016 and 3<sup>rd</sup> corrigendum was circulated vide CEA letter no. 66/5/PSPA-2/2016/413-423 dated 15.11.2016.
- 1.2 Members may confirm the minutes of 18<sup>th</sup> Standing Committee Meeting and the three corrigenda of the minutes.

### **2.0 Termination of 400kV lines at Jeerat (WBSETCL) S/s under the ERSS-XV and ERSS-XVIII schemes**

- 2.1 Ministry of Power had appointed PFC Consulting Ltd (PFCCL) as BPC for ERSS-XVIII scheme. PFCCL vide its letter No. 03/16-17/ITP-23/MJTL/RfQ dated 19.08.2016 intimated CEA that there was a RoW constraint for termination/interconnection of Jeerat(New) - Jeerat(WBSETCL) 400kV D/c (Quad) to be developed under TBCB at the proposed GIS location at existing Jeerat(WBSETCL) substation.
- 2.2 In order to address the RoW constraint, a joint team of officials of WBSETCL, CEA, CTU, PFCCL, POWERGRID (ER-II) visited the Jeerat substation of WBSETCL on 09<sup>th</sup> September, 2016. This was followed by a joint meeting of the above officials on 10<sup>th</sup> September, 2016 at WBSETCL office, Kolkata. Copy of minutes of meeting dated 10.09.2016 at **Annexure-2.1.**
- 2.3 Following 400kV lines are existing / under construction / planned at 400/220kV substation of Jeerat (WBSETCL) :

#### **Existing:**

- (i) Jeerat (WBSETCL) – Baharampur/Farakka 400kV S/c line of POWERGRID
- (ii) Jeerat (WBSETCL) – Rajarhat/Subhashgram 400kV S/c line of POWERGRID
- (iii) Jeerat (WBSETCL) – Barkeshwar (WBSETCL) 400kV S/c line of WBSETCL
- (iv) Jeerat (WBSETCL) – Kolaghat (WBSETCL) 400kV S/c line of WBSETCL



**Under Construction:**

- (v) LILO of Sagardighi – Subhashgram 400kV S/c line at Jeerat (WBSETCL) as a part of ERSS-XV – by POWERGRID

**Planned:**

- (vi) Jeerat (New) – Jeerat (WBSETCL) 400kV D/c line (quad) as a part of ERSS-XVIII – to be implemented as ISTS under tariff based competitive bidding route.

- 2.4 In the meeting, WBSETCL was requested to submit the detailed survey report regarding feasibility of overhead crossing of existing lines mentioned at 2.3(i) to 2.3(iv) by two D/c lines mentioned at 2.3(v) & 2.3(vi) for termination at GIS extension of Jeerat S/s of WBSETCL. WBSETCL vide its letter dated 05.10.2016 has submitted the detailed survey report, wherein WBSETCL mentioned that overhead crossing of the existing lines are not feasible as it requires huge height of crossing towers as well as considerable space for maintaining required tower falling height.
- 2.5 Further, a meeting was held on 14.12.2016 at CEA regarding the above issue. Copy of minutes of meeting issued vide letter dated 27.01.2017 is at **Annexure-2.2**. In the meeting, it was agreed that dismantling the crossing portion of the existing lines (ISTS and State lines) and termination of the existing lines through GIS bus duct might be the appropriate option, as the new lines mentioned at 2.3(v) and 2.3(vi) can be directly terminated on separate double ckt towers at normal height (around 45 meters) to new GIS extension area. The following points were agreed in that meeting and **these needs to be ratified in this Standing Committee meeting:**
- 2.6 Following scope may be implemented at Jeerat S/s by POWERGRID as an additional scope under already approved ERSS-XV scheme:
- (i) Dismantling of dead end towers and termination of existing lines mentioned at 2.3 (i) to 2.3 (iv) through GIS duct to the existing 400kV Jeerat AIS S/s (WBSETCL).
  - (ii) It was also agreed that the termination of the WBSETCL lines mentioned at 2.3 (iii) & 2.3 (iv) through GIS duct to the existing 400kV Jeerat AIS S/s (WBSETCL) shall be implemented as ISTS and included in the approved scope of ERSS-XV being implemented by POWERGRID and cost recovered by POWERGRID as ISTS transmission tariff .
  - (iii) Further, it was also acknowledged that implementation of LILO of Sagardighi-Subhasgram 400kV at Jeerat along with associated line bays shall get delayed by about one year due to addition of above mentioned GIS duct arrangement.

- (iv) The new lines mentioned at 2.3 (v) and 2.3 (vi) can be directly terminated on separate double ckt towers at normal height (around 45 meters) to new GIS extension area.
- 2.7 WBSETCL vide letter dated 04.04.2017 (Enclosed at **Annexure-2.3**) informed that WBSETCL has considered and accepted the above mentioned scope (*Dismantling of dead end towers and termination through GIS Bus duct by POWERGRID under ISTS*) of the minutes of meeting held on 14.12.2016 at CEA.
- 2.8 Members may discuss.
- 3.0 Creation of 220kV level at the under construction 400/132kV Motihari (TBCB) – Proposal of BSPTCL**
- 3.1 400/132kV (2x200MVA) Motihari GIS substation is under construction through TBCB by M/s Essel Infra. BSPTCL had requested to create 220kV level in the 400/132kV Motihari GIS substation to avoid additional expenditure and time on creating a new 220/132kV Motihari (New) substation planned under intra-state strengthening scheme in 13<sup>th</sup> Plan. In this regard, a meeting was held at CEA on 18.01.2017 with the representatives of CTU and BSPTCL. Copy of minutes of meeting is at **Annexure-3.1**. In the meeting it was decided that shifting of the new 220/132kV S/s from Motihari (New) to Raxaul (New) with the following scope of works would be better option.
  - Raxaul (New) S/s: 220/132kV, 2x200MVA (to be implemented by BSPTCL)**
    - (a) Sitamarhi (New) – Raxaul (New) 220kV D/c (Twin Moose)
    - (b) Raxaul (New) – Gopalganj 220kV D/c (Twin Moose/ Single Zebra)
    - (c) LILO of Bettiah – Raxaul 132kV D/c line at Raxaul (New)
- 3.2 In the meeting, following was agreed:
  - (i) The available space in the Motihari substation is not adequate to accommodate the proposed 220kV extension of BSPTCL. Creation of 220kV level would restrict any future expansion plans at Motihari S/s. Load flow results also shows that Motihari (TBCB) – Raxaul and Motihari (TBCB) – Bettiah 132kV D/c lines are critically loaded, when 220kV level is created at Motihari (TBCB) S/s.
  - (ii) The new 220/132kV substation at Motihari is planned primarily to feed the loads of Gopalganj, Bettiah and Raxaul, it was decided to shift the planned substation towards Bettiah/Raxaul keeping the same connectivity. Based on the above observations and load flow studies, the new 2x200MVA, 220/132kV S/s may be created near Raxaul with Sitamarhi(New) – Raxaul(New) 220kV D/c (twin Moose) line and LILO of Bettiah – Raxaul 132kV D/c line.

- (iii) Considering the lower projected load growth of Bihar in 19<sup>th</sup> EPS, it was suggested that the implementation of Raxaul (New) – Gopalganj 220kV D/c may be taken up at a later date.
  - (iv) BSPTCL may send their proposal on the basis of above discussion to CEA for taking up with forthcoming meeting of the Standing Committee (SCMPSPER) for finalization.
- 3.3 BSPTCL has sent agenda through their letter dated 28.03.2017 and the same is enclosed at **Annexure-3.2**. In its agenda BSPTCL proposed to construct a new GSS 220/132 kV, 2x200 MVA near Raxaul with the following scope of works to be implemented by BSPTCL.
- i) Raxaul (New) S/s: 220/132kV, 2x200MVA
  - ii) Sitamarhi (New) – Raxaul (New) 220kV D/c (Twin Moose)
  - iii) \* Raxaul (New) – Gopalganj 220kV D/c (Twin Moose/ Single Zebra)
  - iv) LILO of Bettiah – Raxaul 132kV D/c line at Raxaul (New)

*Note: \* this line may be implemented at later date.*

The above is in place of Motihari new 220/132 kV, as proposed under 13<sup>th</sup> plan with the following scope of works.

- i) Sitamarhi (New) – Motihari (New) 220kV D/c (Twin Moose)
  - ii) Motihari (New) – Gopalganj 220kV D/c (Twin Moose)
  - iii) Motihari (New) – Raxaul 132kV D/c
  - iv) Motihari (New) – Bettiah 132kV D/c ( Single Moose)
- 3.4 BSPTCL may present. Members may discuss.
- 4.0 Modifications/ additions in bay equipment of Maithon 400/220 kV sub-station of POWERGRID and generation switchyard of Maithon-RB**
- 4.1 Reconductoring of Maithon RB - Maithon 400kV D/c with HTLS conductor was approved in 18<sup>th</sup> Standing Committee Meeting held on 13.06.2016. Along with line reconductoring, necessary modifications/ additions in bay equipment at Maithon 400/220kV sub-station of POWERGRID and at generation switchyard of Maithon-RB needs to be carried out by POWERGRID. It is intimated that approval under section-68 of Electricity Act-2003 has already been issued to POWERGRID on 07.02.2017 along with scope of requisite modifications/ additions in bay equipment at Maithon 400/220kV sub-station of POWERGRID and at generation switchyard of Maithon-RB. Copy of the approval is at **Annexure-4.1**.
- 4.2 Members may approve.

**5.0 Revised dedicated transmission system for Lanco Babandh Power Pvt. Ltd. (2x660 MW)**

- 5.1 Lanco Babandh generation project (4x660MW) was granted LTOA of 1600MW (NR-650MW & WR-950MW) by CTU vide its letter C/ENG/E/00/SEF/OA dated 14.05.2009 with the following dedicated transmission system.
- a) 400kV Lanco Babandh TPS - 765/400 kV Angul Pooling station (PGCIL) 2xD/c lines with associated bays to be developed as a dedicated lines by the generation developer.
  - b) 3X1500 MVA, 765/400 kV ICTs at Angul with associated bays to be developed by the generation developer.
- 5.2 MoP vide its letter no. 11/2/2011-PG(LBPL) dated 09.06.2011 has granted prior approval of the Government under section 68 of the Electricity Act 2003 based on minutes of 11<sup>th</sup> meeting of Standing Committee Meeting on Power System Planning in Eastern Region held on 20.09.2010 with the above scope of work. This approval expired on 08.06.2014 because the implementing agency did not start the construction works within 3 years from date of grant of Sec-68 approval.
- 5.3 Subsequently, Lanco Babandh Power Pvt. Ltd. (LBPPL) has relinquished its long term access to the tune of 800MW in line with CERC order dated 08.06.2013 in petition No: 118/MP/2012 due to non-implementation of Phase-II (2x660MW). Revision of LTOA from 1600MW to 800MW was issued to LBPL with allocation of NR-650MW & WR-150MW based on the minutes of 11<sup>th</sup> Connectivity and LTA meeting of ER held on 13.06.2016. The following revised dedicated transmission system was proposed by CTU vide its letter No. C/CTU-Plg/E/LTA/Lanco Babandh dated 19.10.2016 (Copy is at **Annexure-5.1**) based on the revised LTOA quantum of 800MW.
- (a) Lanco Babandh Gen Switchyard - Angul 400kV D/c line (Equivalent to triple snow bird or higher)
  - (b) 2X1500 MVA, 765/400 kV ICT (7x500MVA single phase units) at Angul along with associated bays
- 5.4 Subsequently, Lanco vide letter dated 15-11-2016 requested for review of requirement of above mentioned revised dedicated system on mutually agreed terms in view of non-commissioning/non-implementation of certain generation projects at Angul. The revision of Lanco's dedicated system is being considered at its own request as also on its own risk and cost. Further, as Lanco had relinquished LTA for 800 MW under Petition No. 118/MP/2012 and is also presently contesting a petition (38/MP/2016) before CERC *inter alia* seeking abeyance of LTA, the revision discussed hereunder shall be without prejudice to the proceedings before CERC and to Lanco's liability(ies) towards payment of relinquishment/transmission charges as the case may be.

- 5.5 Considering the following existing/under-construction generation projects at Angul it is observed that margin is available in the existing 765/400kV, 4x1500MVA ICTs for power evacuation from Lanco.

Generation projects at Angul S/s						
Sl. No.	Project	Original Capacity (MW)	Original LTOA (MW)	Revised Capacity (MW)	Revised LTOA/LTA (MW)	Schedule
1	GMR Kamalanga Energy Ltd. (*3X350MW)	1050	800	700	647	Commissioned
2	Monnet Power Ltd. (2x525MW)	1050	900	1050	900	Uncertain
3	Jindal India Thermal Ltd. (2x600MW)	1200	1044	1200	95	Commissioned
4	Navbharat Power Pvt. Ltd. (2x525MW)	1050	720	0	0	Uncertain
5	Lanco Babandh Power Pvt. Ltd. (4x660MW)	2640	1600	1320	800	U-1: Sept'18 U-2: Jan'19
	<b>Total</b>	<b>6990</b>	<b>5064</b>	<b>4270</b>	<b>2442</b>	

Note: \* one unit has been connected to Odisha intra-state system.

- 5.6 In view to the above, it is proposed to revise the dedicated transmission system of Lanco Babandh project as mentioned below:

- Lanco Babandh Gen Switchyard - Angul 400kV D/c line (triple snow bird)

- 5.7 In the 11<sup>th</sup> Joint Coordination Committee (JCC) meeting of CTU held on 27-12-2016 LBPPL has indicated its commissioning schedule as Mar 2018. LBPPL has neither awarded construction of its dedicated line nor the line bays at Angul.

- 5.8 Members may discuss.

## 6.0 Evacuation of power from Patratu (3x800MW) TPS

- 6.1 Patratu Vidyut Utpadan Nigam Limited (PVUNL) (3X800+2X800MW) is a joint venture of NTPC Ltd. and the Jharkhand state government owned Patratu Thermal Power Station (PTPS).
- 6.2 A meeting regarding evacuation of power from Patratu (3x800MW) TPS was held on 20.01.2017 at CEA with NTPC, CTU and JUSNL. Copy of minutes of meeting is at **Annexure-6.1**. In the meeting, CTU representative informed that Patratu Vidyut Utpadan Nigam Ltd. (PVUNL) has applied for connectivity of 2400MW (Phase-I), to the ISTS system, from Dec, 2020 for their planned Patratu (3x800MW) TPS situated in Ramgarh District of Jharkhand.
- 6.3 PVUNL informed that 85% of power is allocated to Jharkhand state and 15% is kept as unallocated power. This matter was discussed and it was agreed that as majority of power of Patratu TPS is allocated to Jharkhand, it would be prudent that Patratu TPS is directly connected with JUSNL (Jharkhand

- STU) system. If remaining share (15%) of power of Patratu TPS is to be transferred outside Jharkhand, for which PVUNL may apply for ISTS Long Term Access to CTU (POWERGRID), as per CERC regulations.
- 6.4 Joint studies were carried out to evolve immediate evacuation system for Patratu (3x800MW) TPS. Studies are available at **Annexure-6.1.** and accordingly following power evacuation system from Patratu (3x800MW) TPS was evolved:
- (a) Patratu gen. switchyard – Patratu (JUSNL) S/s 400kV (Quad Moose) D/c line
  - (b) Patratu gen. switchyard – Koderma (JUSNL) S/s 400kV (Quad Moose) D/c line
  - (c) Patratu gen. switchyard – New Chandil (JUSNL) S/s 400kV (Quad Moose) D/c line
  - (d) 420kV, 2x125MVAR bus reactors at Patratu gen. switchyard and 420kV, 1x125MVAR bus reactor at Patratu 400kV bus
  - (e) From Patratu 400/220/132kV substation:
    - (i) Patratu (JUSNL) S/s to Latehar 400kV D/c line (already under construction)
    - (ii) Patratu (JUSNL) to Ranchi (POWERGRID) 765/400kV S/s 400kV D/c line (already under construction) along with LILO of both circuits at Mandar 400/220kV S/s
- 6.5 In this way, Patratu generation would also get connected to strong ISTS pooling stations viz. (i) Ranchi (POWERGRID) 765/400kV through Patratu (JUSNL) and (ii) Chandwa Pool (POWERGRID) through Patratu (JUSNL) & Latehar (JUSNL) substations of JUSNL.
- 6.6 Further, the connectivity of Patratu (3x800MW) TPS to Koderma (northern part of Jharkhand) and New Chandil (south-eastern part of Jharkhand) through 400kV high capacity (Quad Moose) double circuit lines would facilitate the transfer the power from Patratu TPS to different load centers in Jharkhand.
- 6.7 These interconnections would complete the 400kV high-capacity ring viz. **Patratu TPS – Koderma – Jasidih – Dhanbad (ISTS) – New Chandil – Patratu TPS** in Jharkhand, which shall improve reliability of power transfer within the state.
- 6.8 From the joint studies, it was also observed that three-phase fault level at both Patratu (3x800MW) TPS and Patratu (400/220kV) substation is about 50kA. Accordingly, it was decided that 400kV bus at Patratu generation switchyard as well as Patratu (400/220kV) substation (JUSNL) would be designed with 63kA fault level for 1sec.
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- 6.9 JUSNL informed that construction is yet to start at Patratu (400/220kV) substation. Therefore, it was suggested that JUSNL would explore possibility of construction of 400kV and 220kV level at Patratu (400/220kV) substation with fault level of 63kA and 50kA respectively.
- 6.10 In view of the above, after the approval of the above system in this Standing Committee Meeting, ISTS Connectivity application of PVUNL for Patratu TPS shall be closed and PVUNL may apply for connectivity of its Patratu (3x800MW) TPS to JUSNL (STU of Jharkhand).
- 6.11 Members may discuss.

**7.0 Perspective transmission plan of JUSNL up to 2021-22**

- 7.1 JUSNL informed that at present power demand of Jharkhand is about 1855.5MW (JUSNL area has 1068MW load and DVC area has 787.5MW load). The total load projected for Jharkhand for the year 2021-22 is around 5613MW (4193MW for JUSNL area + 1420MW for DVC area).
- 7.2 Load flow studies were carried out for projected peak load of Jharkhand as 4193MW for the year 2021-22.
- 7.3 JUSNL had submitted draft report on perspective transmission plan of JUSNL up to 2021-22. In the meetings held on 26.10.2017 and 20.01.2017, some modifications were proposed by CEA and CTU to incorporate in the study. The copy of Minutes of meeting held on 20.01.2017 is at **Annexure-6.1**. JUSNL incorporated these changes and submitted the compliance report vide their email dated 01.02.2017. The compliance report is available in the minutes.
- 7.4 The following 400/220kV intra-state substations along with downstream connectivity mentioned at **Annexure-7.2** were agreed under perspective transmission plan of JUSNL up to 2021-22:
- (i) Jasidih 400/220kV, 2x500MVA
  - (ii) New Chandil 400/220kV, 2x500MVA
  - (iii) Koderma 400/220kV, 2x500MVA
  - (iv) Mandar 400/220kV, 2x500MVA
  - (v) Dumka 400/220 kV , 2x500 MVA ( with commissioning of Tenughat Ph-2 (1320 MW))

**Note:** 420kV, 2x125MVAR bus reactors may be installed at all of the above new 400kV substations of JUSNL for voltage control.

- 7.5 The transmission system planned for JUSNL network along with evacuation system of PVUNL would create a high capacity 400kV ring **Patratu TPS – Koderma – Jasidih – Dhanbad (ISTS) – New Chandil – Patratu TPS** in Jharkhand, which would improve reliability of power transfer within the state.

The intra-state system of Jharkhand would also get well interconnected at various ISTS points for smooth power exchange.

- 7.6 In the meeting, it was pointed out that 220kV D/C line considered from Chaibasa (JUSNL) to Ramchandrapur 220/132kV substation was earlier envisaged as Chaibasa (POWERGRID) to Ramchandrapur 220/132kV substation. In the 18<sup>th</sup> SCM of ER, JUSNL had informed following outlets for utilization of 4 no. 220kV line bays at Chaibasa (POWERGRID) substation:

- (i) Chaibasa (POWERGRID) – Chaibasa (JUSNL) 220kV D/c
- (ii) Chaibasa (POWERGRID) – Ramchandrapur (JUSNL) 220kV D/c line

- 7.7 However, as per detailed scope of work submitted by JUSNL, the line at (ii) above is proposed to be terminated at Chaibasa (JUSNL) substation and hence connectivity considered in revised draft report studies i.e. Chaibasa (JUSNL) – Ramchandrapur 220kV D/c line is retained.

- 7.8 Accordingly, it is imperative that JUSNL may plan a new outlet from Chaibasa (POWERGRID) to utilize the remaining 2 no. 220kV line bays already constructed.

- 7.9 Jharkhand may update on utilisation of remaining 2 no. 220kV line bays constructed at Chaibasa (POWERGRID).

- 7.10 Members may discuss.

#### **8.0 Transmission system for evacuation of power from Buxar Thermal Power Project (1320 MW) – Agenda of BSPTCL**

- 8.1 BSPTCL vide their letter dated 25.10.2016 (copy at **Annexure 8.1**) requested CEA to examine their proposal for evacuation of power from Buxar Thermal Power Project. BSPTCL has proposed following evacuation system:

##### **400 kV**

- Buxar TPS - Naubatpur 400kV D/C

##### **220 kV**

- Buxar TPS - Dumraon new 220kV D/C (Twin Moose)
- Buxar TPS - Pusaoli (BSPTCL) 220kV D/C (Twin Moose)
- Buxar TPS - Dehri 220kV D/C
- 2X500MVA 400/220kV ICT at Buxar generation switchyard-under the scope of respective generation project.

- 8.2 Members may discuss.

#### **9.0 Connectivity of Railway TSS with ISTS network for Mughal Sarai – Howrah route**

- 9.1 Railway Board vide its letter dated 09.09.2016 has requested for connectivity to Railways from various ISTS points to feed their TSS (Traction Sub Station) for Mughal Sarai(NR) – Howrah(ER) route (Copy enclosed at **Annexure-9.1**).

- 9.2 A meeting was held on 07.10.2016 in CEA to discuss the connectivity of Railways' TSS with ISTS network for two routes of Railways i.e. (i) Delhi (NR) – Bharuch (WR) route (ii) MughalSarai (NR) – Howrah (ER) route (MoM enclosed at **Annexure-9.2**). In the meeting, following ISTS substations were preliminarily identified for giving connectivity to the Railways TSS for its MughalSarai (NR) – Howrah (ER) route:
- (i) Arah or Patna
  - (ii) Gaya or Chandoti
  - (iii) Maithon
  - (iv) Durgapur
  - (v) Lakhi Sarai
  - (vi) Subhashgram
- 9.3 M/s PGCIL was requested to furnish the information regarding the availability of space for 2 nos. 220 kV bays and margins in transformation capacity at each of the above substation. Railways were requested to provide information about its present connectivity (connectivity of TSS along this route) with STUs.
- 9.4 Railway board vide its letter dated 19.10.2016 has furnished the information about its TSS points and their present connectivity with state utilities.
- 9.5 A meeting was held on 20.04.2017 at CEA with STUs regarding connectivity of Railways with ISTS network for the Mughalsarai – Howrah. Minutes of the meeting enclosed at **Annexure-9.3**.
- 9.6 Members may discuss.
- 10.0 Modification in - Common Transmission System for Phase-II generation project in Odisha- agenda by POWERGRID**
- 10.1 In the 18<sup>th</sup> ER SCM, it was suggested to review the installation of 765/400kV, 2x1500MVA ICTs at Angul S/s in view of non-materialisation of some of the IPPs envisaged to be connected at Angul substation.
- 10.2 Accordingly, the matter has been reviewed by CTU (POWERGRID) and the following has been observed:
- i) In view of uncertain commissioning of NSL (connectivity cancelled) and Talcher-III (connectivity and LTA applications closed) generation projects and non-materialisation of Navbharat (applicant has filed for relinquishment in CERC) generation project, the installation of 765/400kV, 2x1500MVA ICTS at Angul is not required.*
  - ii) Accordingly, the spare 765/400kV, 500MVA ICT (single phase unit) at Angul S/s is also not required.*
  - iii) The bus splitting at Angul at both 400kV and 765kV levels is not required at present as the fault level at Angul is found to be within rated limits.*

- iv) *The split bus arrangement may be implemented in future under a different scheme upon firming of generation projects near Angul.*
  - v) *The spare 765/400kV, 500MVA ICT (single phase unit) at Sundargarh (Jharsuguda) S/s is not required.*
- 10.3 In view of the above, following elements are proposed to be deleted from POWERGRID's scope under the scheme – "Common Transmission System for Phase-2 Generation Projects in Odisha":
  - (i) 2x1500MVA, 765/400kV ICTs at Angul S/s along with associated bays
  - (ii) Split Bus Arrangement at Angul S/s at 765kV & 400kV buses
  - (iii) 500MVA, 765/400kV single phase spare ICT unit each at Angul and Sundargarh (Jharsuguda) substations
- 10.4 Members may approve.
- 11.0 Termination of 220kV side of 400/220kV, 500MVA ICT-4 at Biharsharif (POWERGRID) substation under ERSS-XX- Agenda by POWERGRID**
- 11.1 In the 18<sup>th</sup> ER SCM, installation of 400/220kV, 500MVA ICT-4 at Biharsharif (POWERGRID) substation by POWERGRID under ERSS-XX scheme was approved.
- 11.2 In this regard, it is to mention that there is no 220kV bus at Biharsharif (POWERGRID) S/s. Accordingly, 220kV side of the existing three ICTs is terminated at Biharsharif (BSPTCL) S/s which is adjacent to Biharsharif (POWERGRID) S/s. Similarly, for installation of 4<sup>th</sup> 400/220kV ICT, 220kV ICT bay needs to be constructed at Biharsharif (BSPTCL) S/s along with small 220kV interconnecting line section from 220kV ICT bushing to 220kV ICT bay.
- 11.3 Accordingly, termination of 220kV side of the 400/220kV, 500MVA ICT-4 at 220kV bus of Biharsharif (BSPTCL) S/s and laying of small 220kV interconnecting line section from 220kV ICT bushing to 220kV ICT bay under ERSS-XX is proposed by POWERGRID. This proposal has already been granted in principle approval by CEA vide our letter no. 77/7/PSPA-II/2017/12 dated 05-01-2017 (Copy at **Annexure-11.1**).
- 11.4 Members may approve.
- 12.0 Baharampur (India) – Bheramara (Bangladesh) 2<sup>nd</sup> 400kV D/c line Agenda by POWERGRID**
- 12.1 Cross border interconnection between India and Bangladesh through Baharampur (India) - Bheramara (Bangladesh) 400kV D/c line along with 500MW HVDC Back-to-Back terminal at Bheramara, was commissioned in Sept 2013. About 500MW of power is being transferred from India to Bangladesh through this link.
- 12.2 The capacity of Bheramara (Bangladesh) HVDC station is being upgraded from 500MW to 1000MW by Bangladesh. The system strengthening required

in the Indian and Bangladesh side for transfer of about 1000MW from India to Bangladesh is already under implementation. In regard to N-1 reliability criteria for 1000MW export to Bangladesh, it was decided that during single circuit outage of Baharampur – Bheramara 400kV D/c line, Bangladesh would restrict/reduce the loading on the operating circuit to the permissible extent with the help of runback control /ramping down facility on the HVDC system.

12.3 Therefore, in order to ensure reliable supply of 1000MW power to Bangladesh from Baharampur, it was decided in the 12<sup>th</sup> India-Bangladesh Joint Steering Committee (JSC) meeting (on 11<sup>th</sup> Dec 2016) to construct a 2<sup>nd</sup> 400kV D/c transmission line from Baharampur (POWERGRID) to Bheramara (Bangladesh) in matching time frame of 2<sup>nd</sup> 500MW HVDC terminal at Bheramara. Further, in the 12<sup>th</sup> JSC meeting it has also been decided that, the Indian portion of the line may be implemented by POWERGRID and the mechanism of sharing of transmission charges by Bangladesh for Indian portion of this link would be on same principles as for the first Baharampur – Bheramara link. Accordingly, MoP vide letter no. 9/5/2016-Trans-Vol-2 dated 01-03-2017 has granted approval for implementation of Indian portion of Baharampur (India) – Bheramara (Bangladesh) 2<sup>nd</sup> 400kV D/c line along with 2 no. 400kV line bays for termination of this line at Baharampur S/s through regulated tariff mechanism route.

12.4 Members may approve.

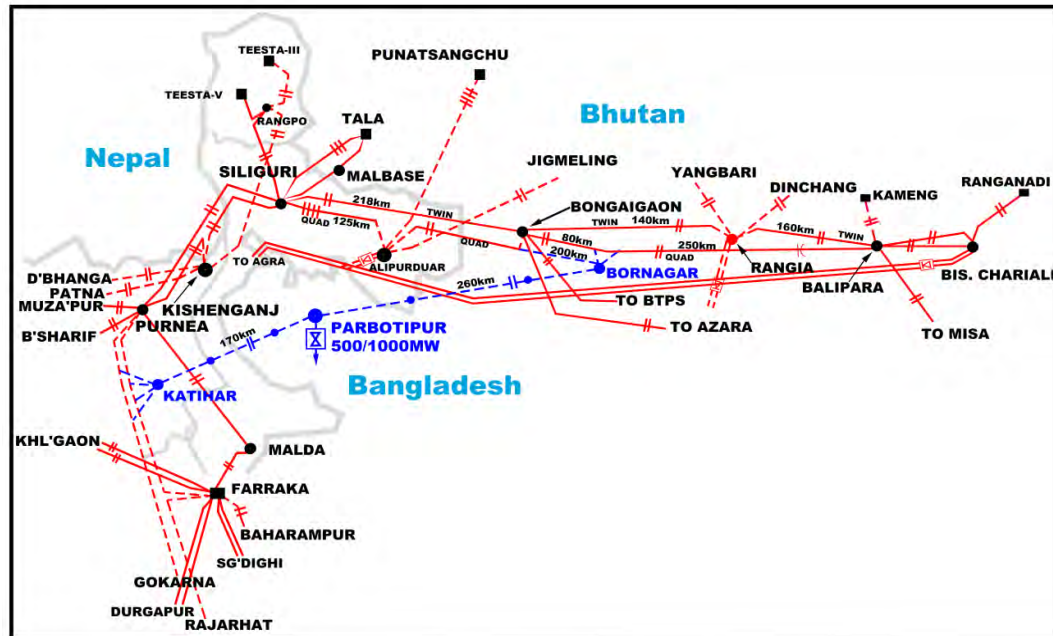
**13.0 High Capacity India-Bangladesh AC Corridor and Formation of second 400kV node in NER-ER Corridor- Agenda by POWERGRID**

13.1 In the 5<sup>th</sup> SCM of NER, it was informed that at present the ER-NER corridor is connected mainly through 400/220kV Bongaigaon S/s in NER. In case of any eventuality at Bongaigaon S/s, there is no second in feed to NER from NEW grid. Therefore, it was agreed that there is a need for 2<sup>nd</sup> 400kV AC node for interconnection with national grid. The same has been taken into account while planning new interconnection between India and Bangladesh.

13.2 The new interconnection between India and Bangladesh has been planned with high capacity AC link (765kV line to be initially operated at 400kV) to interconnect Bangladesh with Eastern Region (ER) and North Eastern Region (NER) of Indian grid. The scheme has been discussed in the 11<sup>th</sup> India-Bangladesh JSC/JWG meeting held on 13<sup>th</sup> July 2016. The scheme consists of establishment and interconnection of following substations in NER, ER and Bangladesh.

- **In NER:** In view of space constraint at Bongaigaon S/s and to provide a reliable take off point in NER, it was proposed to establish new 400kV substation (to be upgraded to 765kV level in future) at Bornagar in Assam, about 50km away from Bongaigaon, through LILO of Bongaigaon

- Balipara 400kV D/c (quad) line and extension of Alipurduar-Bongaigaon 400kV D/c line to Bornagar substation. Bornagar substation would also act as alternative in-feed to NER in addition to Bongaigaon.
- **In ER:** A new 400kV substation (to be upgraded to 765kV level in future) was proposed as a probable take-off point at Katihar (near Purnea) in ER through LILO of both ckts of Rajarhat-Purnea D/c line (one ckt via Gokarna and other ckt via Farakka).
- **In Bangladesh:** A new 400/230kV substation at Parbotipur (to be upgraded to 765kV level in future) was proposed for the drawl of power by Bangladesh. The proposed interconnection has been planned to connect Parbotipur in Bangladesh to Katihar in Eastern Region and Bornagar in North Eastern Region through 765kV D/c line to be initially operated at 400kV for supply of 500MW power to Bangladesh in Phase-I.



- Bangladesh will draw the power at Parbotipur through HVDC back-to-back.
- In Phase-II, this interconnection would be upgraded to 765kV for transfer of about 1000MW power to Bangladesh along with upgradation of associated AC substations and augmentation of HVDC terminal at Parbotipur with another block of 500MW.

13.3 Accordingly, the following scope of work is proposed:

## Phase-I

**Indian Side:**

- New 400kV substation (upgradable to 765kV at a later date) at Bornagar (Assam) with LILO of Balipara - Bongaigaon 400kV D/c (quad) line.



- Disconnection of Alipurduar-Bongaigaon 400kV D/c (quad) line from Bongaigaon and extension of the same to Bornagar with 400kV D/C (quad) line so as to form Alipurduar-Bornagar 400kV D/c (quad) line.
- New 400kV substation (upgradable to 765kV at a later date) at Katihar (Bihar) with LILO of both ckts of Purnea - Rajarhat 400kV D/c (triple snowbird) line (one ckt via Gokarna and other ckt via Farakka).

**Common:**

- Katihar (ER) - Parbotipur (Bangladesh) - Bornagar (NER) 765kV D/c line to be initially operated at 400KV

**Bangladesh Side:**

- 1x500MW, HVDC Back-to-back converter station at Parbotipur

**Phase-II**

**Indian Side:**

- Upgradation of Katihar and Bornagar substations from 400kV to 765kV
- Operation of Katihar - Parbotipur - Bornagar 765kV D/c line at its rated voltage
- Other system strengthening in ER and NER (to be identified at alter date)

**Bangladesh Side:**

- Augmentation of HVDC back-to-back substation at Parbotipur (Bangladesh) by another 1x500MW (total 2x500 MW) block
- Upgradation of Parbotipur substation from 400kV to 765kV

13.4 Detailed scope of works is at **Annexure-13.1**. This scheme has already been discussed and agreed in the 6<sup>th</sup> NER SCM held on 03<sup>rd</sup> Oct 2016 at Imphal. The project report of the above scheme was discussed in the 12<sup>th</sup> India-Bangladesh JWG/JSC meetings held on 10<sup>th</sup>-11<sup>th</sup> Dec 2016, wherein it has been agreed that the modalities of implementation and commercial arrangement etc. need to be worked out jointly by India and Bangladesh.

13.5 Member may discuss.

**14.0 Additional power supply to Nepal through Muzaffarpur-Dhalkebar transmission line**

14.1 Presently, the Muzaffarpur-Dhalkebar 400kV line is being operated at 132kV in view of non-readiness of 220kV level at Dhalkebar by Nepal. For 132kV operation of the line and supply of about 80MW power to Nepal, one 100MVA, 220/132kV ICT was installed at Muzaffarpur by POWERGRID as an interim arrangement.

14.2 In view of low hydro scenario in Nepal in winters, Govt. of Nepal requested for installation of 2<sup>nd</sup> 220/132kV, 100MVA ICT at Muzaffarpur for additional power supply.

14.3 Accordingly, a meeting was held at CEA on 02-12-2016, wherein installation of 2<sup>nd</sup> 220/132kV, 100MVA ICT at Muzaffarpur (spare ICT obtained after replacement of ICT at Purnea) by POWERGRID as a goodwill gesture for

supply of about 145MW power to Nepal was agreed with following SPS settings at Muzaffarpur S/s:

- *The power supply to Nepal would be disconnected by opening Muzaffarpur – Dhalkebar 132kV line in case,*
  - (a) *The power flow through any of the 400/220kV transformers (2x315 + 1x500MVA) at Muzaffarpur exceeds more than 310MW (for 315MVA) and 490MW (for 500MVA).*

**Or**

- (b) *If power flow through Muzaffarpur – Dhalkebar 132kV line is more than 140MW.*
- *There is no disruption of power supply to Bihar through the Muzaffarpur S/s.*

14.4 The said ICT has already been installed by POWERGRID and upto 145MW (170MVA) power is being supplied to Nepal through the cross-border link.

14.5 Accordingly, members may post facto approve utilisation of 220/132kV, 100MVA ICT released from Purnea for installation at Muzaffarpur (for supply of additional power to Nepal), till operation of Muzaffarpur – Dhalkebar line at 220kV, which is expected by September 2017.

**15.0 Modification in - Transmission System for Transfer of power from generation projects in Sikkim to NR/WR (Part-B1)- Agenda by POWERGRID**

15.1 In the 18<sup>th</sup> ER SCM, it was decided to delink the LILO of 2<sup>nd</sup> circuit of Teesta-III – Kishanganj 400kV D/c (Quad) line at Rangpo from Part-B of the scheme “Transmission System for Transfer of power from generation projects in Sikkim to NR/WR (Part-B)” and take it up as a separate part (Part-B1) of the same scheme as “Transmission System for Transfer of power from generation projects in Sikkim to NR/WR (Part-B1)”.

15.2 LILO of first circuit of Teesta-III – Kishanganj 400kV D/c (Quad) line at Rangpo has been made using HTLS conductor. Accordingly, keeping in view the anticipated problems in construction due to hilly terrain as well as requirement of land for foundation, construction of 2<sup>nd</sup> LILO line with HTLS would be a better techno commercial solution.

15.3 The two 400kV LILO lines are being constructed on two separate D/c towers, however, in view of RoW constraints near Rangpo the two LILO lines are proposed to be terminated on a Multi Circuit tower at Rangpo end. Multi circuit has been considered along with LILO of first circuit.

15.4 In view of the above, members may approve the following:

- (i) LILO of 2<sup>nd</sup> circuit of Teesta III – Kishanganj 400kV D/c (Quad) line at Rangpo with Twin HTLS conductor
- (ii) 400kV multi circuit tower/line at Rangpo end for termination of LILO of both circuits of Teesta III – Kishanganj 400kV D/c (Quad) line at Rangpo.

**16.0 Interim connectivity to generation projects through LILO arrangement - Agenda by POWERGRID**

16.1 POWERGRID has informed that numbers of generation projects in different regions were granted Connectivity / Long Term Access (LTA) with strengthening of transmission system. In few cases generation projects were to be commissioned ahead of the anticipated commissioning of the associated transmission system. In such cases, generation projects were given temporary connectivity through loop-in & loop-out (LILO) of nearby transmission lines so as to enable them connect with the grid and commission their generation projects. The temporary connectivity through LILO was to be withdrawn after commissioning of the associated transmission system. Associated transmission system of some of such generation projects have been commissioned and their temporary connectivity through LILO has been disconnected; however, some are still connected through LILO arrangement.

16.2 After hearing the tariff petition for one such case viz. transmission system associated phase-1 IPPs in Odisha (Petition No.112/TT/13), where two generation projects are still connected through temporary LILO arrangement, the Hon'ble CERC has passed the order dated 07.10.15 wherein the following direction has been given in para 65 of the order:

*"The associated transmission lines were to be constructed by the generation developer matching with the transmission system to be developed by the petitioner and the LILOs constructed by generation developers which were temporary arrangement were to be replaced by the associated transmission system. It is noticed that some of the generation developers have not commissioned the dedicated lines and are continuing to evacuate power through the temporary LILO arrangements. We direct the petitioner to discuss the issue in the Standing Committee Meeting on Transmission and finalize the timeline for replacement of the LILOs of generation developer by dedicated transmission lines within a period of six months from the date of connection of LILO of the petitioner."*

16.3 Further, CERC in its order dated 28-09-2016 in Petition no. 30/MP/2014 has directed that:

*"CTU shall take up all the existing cases of connectivity on interim LILO with the RPC of respective regions within a period of one month from the date of issue of this order for review and decision on disconnection of the interim arrangements through LILO. All such interim arrangements through LILO shall be disconnected within a period of three months of the issue of this order unless the RPC grants extension for continuation of LILO keeping in view of all relevant factors."*

16.4 The progress of dedicated transmission lines of IPPs in Eastern Region, which were connected through interim arrangement, was reviewed in the 18<sup>th</sup>

SCM of ER on 13-06-2016 and subsequently in the 34<sup>th</sup> TCC/ERPC meeting held on 19-11-2016. Dikchu HEP of Sneha Kinetic Power Projects Pvt. Ltd. is expected to be shortly commissioned on interim arrangement. Therefore, it is proposed that status of dedicated transmission system of Dikchu HEP may also be monitored.

- 16.5 The latest status of the dedicated transmission lines as reported by IPPs in recent meetings and that of Dikchu HEP is summarized below:

Generation Project in ER connected through temporary LILO arrangement					
Sl. No.	Generation Project	Installed Capacity (in MW)	Present Connectivity through LILO	Final Connectivity Arrangement (not commissioned)	Anticipated Completion Schedule
1	Vedanta Ltd. (Sterlite Energy Ltd.)	4x600	LILO of one circuit of Rourkela - Raigarh 400kV D/c line (granted in Sept'09)	Sterlite - Jharsuguda 400kV 2xD/c	15-04-2017 (as per 35 <sup>th</sup> TCC/ERPC)
2	Ind Barath Energy (Utkal) Ltd.	2x350	LILO of one circuit of Jharsuguda - Raigarh 400kV D/c line (granted in Sept'09)	Ind Barath - Jharsuguda 400kV D/c	LILO opened on 11-03-2017. The project is currently not connected to the Grid and IBEUL has placed order to increase the tower heights at 4 locations which shall be completed by Jun'17.
3	Gati Infrastructure Ltd. (Chuzachen)	2X49.5	LILO of Rangpo - Melli 132kV S/c line (granted in Nov'07)	Chuzachen - Rangpo 132kV D/c (with Zebra conductor)	Line completed. Commissioned on interim arrangement. Line bays by Govt. of Sikkim at Rangpo end are expected by Dec 2017 (as per 35 <sup>th</sup> TCC/ERPC)
4	Sneha Kinetic Power Projects Pvt. Ltd. (Dikchu)	2x48	LILO of one circuit of Teesta-III - Rangpo 400kV D/c line at Dikchu (granted in Dec'14 by CERC)	Dikchu - Dikchu Pool 132kV D/c	( <sup>®</sup> )To be informed by Sikkim and project developer

(<sup>®</sup>) Dikchu Pool S/s is being implemented under Sikkim Comprehensive Scheme of Govt. of Sikkim (being implemented by POWERGRID on consultancy). The expected commissioning schedule of Dikchu Pool S/s and Dikchu - Dikchu Pool 132kV D/c line needs to be informed by Govt. of Sikkim and project developer respectively.

- 16.6 In view of the above, generation project developers may indicate the latest status regarding commissioning of their respective dedicated line.

- 16.7 Member may discuss and finalise the date for disconnection of interim arrangement.

#### 17.0 Status of downstream 220kV or 132kV network by STUs from the various commissioned and under-construction ISTS substations

- 17.1 POWERGRID has informed that various ISTS sub-stations have been commissioned / expected to be commissioned shortly (under construction) for which the down linking system is being implemented by STUs. Following downlinking network along with expected commissioning schedule was informed by STUs in the previous meeting(s):

#### A. Existing substations

**(a) Chaibasa 400/220kV S/s**

- (i) Chaibasa (POWERGRID) – Chaibasa (JUSNL) 220kV D/c [1<sup>st</sup> line] – **Commissioned**
- (ii) Chaibasa (POWERGRID) – Ramchandrapur 220kV D/c – **JUSNL to update on the proposal**

**(b) Bolangir 400/220kV S/s**

- (i) LILO of one ckt of Sadeipalli – Kesinga 220kV D/c at Bolangir – **Oct'17**
- (ii) LILO of one ckt of Katapalli – Sadeipalli 220kV D/c at Bolangir – **Commissioned**

**(c) Keonjhar 400/220kV S/s**

- (i) Keonjhar (POWERGRID) – Keonjhar (OPTCL) 220kV D/c – **Dec'17**
- (ii) Keonjhar (POWERGRID) – Turumunga (OPTCL) 220kV D/c – **Mar'19**

**(d) Pandiabil 400/220kV S/s**

- (i) Pratapsasan (OPTCL) – Pandiabil (POWERGRID) 220kV D/c – **Oct'17**
- (ii) LILO of one circuit of Atri – Puri (Samangara) 220kV D/c line at Pandiabil (POWERGRID) – **Commissioned**

**(e) Alipurduar 400/220kV S/s**

- (i) Alipurduar (POWERGRID) – Alipurduar (State) 220kV D/c – **Matching**

**(f) Subashgram 400/220kV S/s**

- (i) Subashgram – Baraipur 220kV D/c line – **Dec'17**

**(g) Darbhanga 400/220kV S/s**

- (i) Darbhanga (ISTS) – Darbhanga (BSPTCL) 220kV D/c – **2 months after finalisation of gantry at Darbhanga (BSPTCL)**
- (ii) Darbhanga (ISTS) – Motipur 220kV D/c – **Commissioned**
- (iii) Darbhanga (ISTS) – Samastipur New 220kV D/c (S/c strung) – **Commissioned**
- (iv) Darbhanga (ISTS) – Laukhi (earlier Supaul New) 220kV D/c – **30-07-2017**

**B. Under Construction substations**

**(h) Daltonganj 400/220/132kV S/s: Expected by Dec'17**

- (i) Daltonganj (POWERGRID) – Latehar 220kV D/c – **Matching**
- (ii) Daltonganj (POWERGRID) – Garhwa 220kV D/c – **Matching**
- (iii) Daltonganj (POWERGRID) – Daltonganj (JUSNL) 132kV D/c – **Matching**
- (iv) Daltonganj (POWERGRID) – Chatarpur/Lesliganj 132kV D/c – **Matching**

**(i) Rajarhat 400/220kV S/s: Expected by Sept'17**

- (i) Rajarhat – New Town AA3 220kV D/c – **Oct'16**
- (ii) Rajarhat – New Town AA2 220kV D/c – **Oct'18**

(iii) Rajarhat – Barasat 220kV D/c – **Jun'18**

**(j) Motihari 400/132kV S/s: Expected by 15<sup>th</sup> July 2017**

- (i) Motihari (ISTS) – Motihari (BSPTCL) 132kV D/c – **Completed.**
- (ii) Motihari (ISTS) – Betiah 132kV D/c – **Completed.**
- (iii) Motihari (ISTS) – Raxaul 132kV D/c – **15-07-2017**

**(k) Dhanbad 400/220kV S/s: May'19**

- (i) Dhanbad – Jainamore 220 kV D/c – **Matching**
- (ii) Dhanbad – Govindpur 220 kV D/c – **Matching**

17.2 STUs of Bihar, Jharkhand, Odisha and West Bengal may update the status of the under-construction downstream network.

**18.0 Connectivity and LTA application of Odisha Integrated Power Ltd. (Odisha UMPP) and transmission system for power evacuation- Agenda by POWERGRID**

18.1 The 4000MW Connectivity and LTA applications for Odisha UMPP submitted by Odisha Integrated Power Ltd. (OIPL), wholly owned subsidiary of PFCCL, are pending since long (June'14) on account of non-firming of generation project implementation. In this regard, it is to mention that CERC vide Amendment dated 17-02-2016 has directed CTU not to hold any application in abeyance and process them within the timeline prescribed in Regulation 7 of the Connectivity Regulations.

18.2 Transmission system for Odisha UMPP was discussed in the 17<sup>th</sup> ER-SCM held on 25-05-2015, wherein it was decided to discuss the transmission system when the implementation of the generation project is firmed up. The said applications were also discussed in the 11<sup>th</sup> Connectivity and LTA meeting of ER held on 13.06.2016 wherein OIPL informed the commissioning schedule of Odisha UMPP as 2021-22 and it was decided that CEA shall convene a meeting to finalise the transmission system for Odisha UMPP. Subsequently, in association with CEA, various transmission system alternatives have been studied by CTU and a study report in this regard is enclosed at **Annexure-18.1**. As per the study report, following transmission system is proposed for Odisha UMPP:

- Split bus arrangement at Odisha UMPP (3x660MW in Section-A and 3x660MW in Section-B)
- LILO of Sundargarh-A – Dharamjaygarh 765kV D/c line at Odisha UMPP-A

**Or**

LILO of Sundargarh-A – Raipur Pool 765kV D/c line at Odisha UMPP-A

- Odisha UMPP-B to Sundargarh-B 765kV D/c line
- Ranchi (New) – Gaya 765kV D/c line



- 18.3 Further, OIPL is required to submit MoP letter regarding allocation of power to various beneficiaries from Odisha UMPP. In absence of the same, Application Bank Guarantee @ Rs. 5 lakh/MW shall be required to be submitted for further processing. OIPL is also requested to confirm the generation project unit size and commissioning schedule.
- 18.4 It is proposed to grant Connectivity and LTA to OIPL for Odisha UMPP project (4000MW) with following transmission system:

**Transmission System for Connectivity:**

- Split bus arrangement at Odisha UMPP with 3x660MW in Section-A and 3x660MW in Section-B. For connectivity of 6X660 MW, bus sectionaliser should be kept closed.
- Odisha UMPP-B – Sundargarh-B 765kV D/c line

**Transmission System for LTA**

- Split bus arrangement at Odisha UMPP with 3x660MW in Section-A and 3x660MW in Section-B. The bus sectionaliser should be kept normally open.
  - LILO of Sundargarh-A – Dharamjaygarh 765kV D/c line at Odisha UMPP-A
  - Ranchi (New) – Gaya 765kV D/c line
- 18.5 Upon grant of Connectivity and LTA, OIPL/beneficiaries need to sign requisite agreements for taking up the evacuation system for implementation, failing which the Connectivity and LTA intimations shall be liable for closure/cancellation.
- 18.6 Members may discuss.
- 19.0 Additional feed to southern Odisha to improve power supply reliability and enable maximum utilisation of Guzuwaka Back-to-Back HVDC- Agenda by POWERGRID**
- 19.1 POWERGRID has informed that, in the 18<sup>th</sup> SCM of ER it was noted that in absence of Talcher – Behrampur –Gazuwaka 400kV D/c line by M/s Reliance under TBCB, power flow through Gazuwaka 2x500MW HVDC is restricted under Low Hydro scenario in southern Odisha. Accordingly, it was decided that an additional scheme independent of Talcher – Behrampur – Gazuwaka may be planned and if in future Talcher – Behrampur – Gazuwaka 400kV D/c line is implemented, it would give additional strength to the southern Odisha transmission system and would also improve the low voltage problem in the area.
- 19.2 Accordingly, a meeting was held at CEA on 30-06-2016 among officials of CEA, CTU (POWERGRID) and OPTCL wherein following ISTS scheme was identified as an additional transmission system to improve reliability of power

supply to southern Odisha and also to enable maximum utilisation of Guzuwaka Back-to-Back HVDC:

(a) Angul – Narendrapur (New) 400kV D/c (Triple Snowbird) line

(b) Narendrapur (New) – Gazuwaka 400kV D/c (Triple Snowbird) line

**Note:** OTPCL would implement new 400/220kV, 2x500MVA Narendrapur (New) substation along with following transmission lines as an intra-state scheme:

(i) Pandiabil – Narendrapur (New) 400kV D/c line

(ii) Narendrapur (New) – Aska 220kV D/c line

(iii) LILO of both the circuits of existing Therubali – Narendrapur 220kV D/c line at Narendrapur (New)

19.3 Load flow study results for the above system was included in the minutes of 18<sup>th</sup> ER SCM. The above Angul – Narendrapur (New) – Gazuwaka corridor is proposed to be implemented independent of Talcher – Behrampur – Gazuwaka corridor. As mentioned above, if in future 400kV D/c Talcher – Behrampur – Gazuwaka line comes, it would give additional strength to the Odisha transmission system and would also improve the low voltage problem in the area.

19.4 Members may discuss.

**20.0 Proposal for stepwise completion of Rajarhat – New Purnea 400kV D/c line under ERSS-V scheme- Agenda by POWERGRID**

20.1 POWERGRID has informed that major transmission system under ERSS-V scheme is Rajarhat – New Purnea 400kV D/c (Triple Snowbird) line with LILO of one circuit at Gokarna (WBSETCL) and other circuit at Farakka (NTPC).

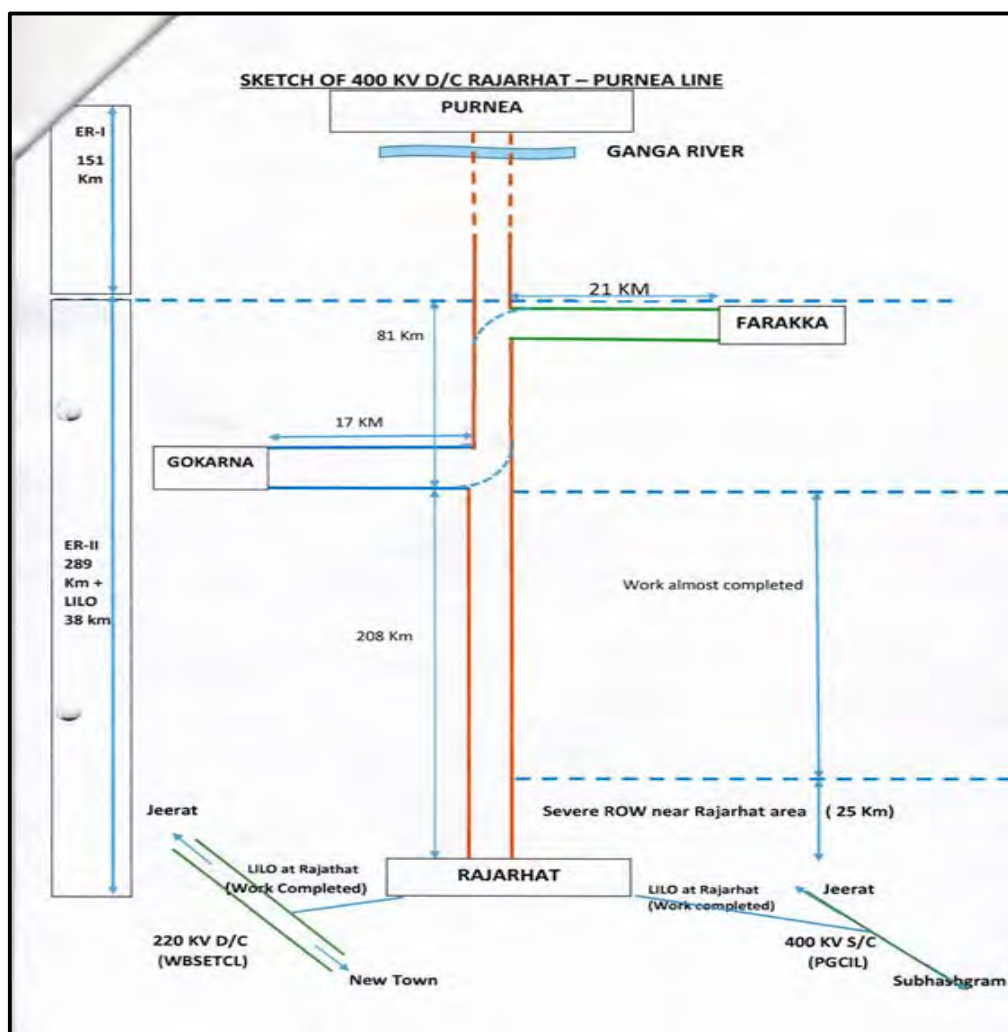
20.2 The construction work of 400/220kV GIS substation and 400kV transmission lines at Rajarhat end has been completely brought to a standstill condition due to agitation by local villagers. The West Bengal state administration has advised POWERGRID to stop construction activities at and near Rajarhat substation till further instructions.

20.3 It is likely that Rajarhat – Farakka transmission line at Rajarhat end may not be completed within FY 2016-17 due to volatile political situation. However, Farakka – Gokarna portion of the said line along with associated bays at Farakka may be completed within the FY 2016-17. Further, substation works at Gokarna viz. ICT (under scope of WBSETCL) and 400kV line bays including 80MVAR bus reactor (under scope of POWERGRID) are ready for commissioning. Accordingly, it is proposed to commission Farakka – Gokarna portion of Rajarhat – New Purnea line. Commissioning of Farakka – Gokarna portion would establish connection of Gokarna substation at 400kV level with ISTS enabling improvement of power situation in and around Gokarna and Baharampur area.

- 20.4 In view of the above facts, the Rajarhat – New Purnea line is proposed to be commissioned in steps as detailed below:

Sl. No.	Charging of elements
1	Farakka – Gokarna 400kV D/c portion of the Rajarhat – New Purnea line (including sections of LILO of one circuit of Rajarhat – New Purnea line at Farakka & other circuit at Gokarna) along with 80MVAR bus reactor at Gokarna and 80MVAR switchable line reactor at Farakka end
2	Rajarhat – Gokarna 400kV D/c portion of the Rajarhat – New Purnea line (resulting in formation of Farakka – Rajarhat and Farakka – Gokarna – Rajarhat 400kV S/c lines)
3	Farakka – New Purnea 400kV D/c portion of the Rajarhat – New Purnea line (resulting in formation of planned lines viz. New Purnea – Farakka – Rajarhat and New Purnea – Gokarna – Rajarhat 400kV S/c lines)

The schematic of Rajarhat – New Purnea line is shown below:



- 20.5 Farakka – Gokarna 400kV D/c section of the line has already been charged.

- 20.6 Members may discuss.

**21.0 Programme for 11<sup>th</sup>/12<sup>th</sup> Plan augmentation of DVC System-Submission of revised plan for approval**

- 21.1 DVC vide its letter dated 05.01.2017 (copy enclosed at **Annexure-21.1**) informed that approved 11<sup>th</sup>/ 12<sup>th</sup> Plan for network augmentation of DVC system, a 220kV new substation was proposed at Gola in Jharkhand with 220kV D/c lines connecting the new Gola S/s to Ramgarh(DVC), MTPS(DVC) and Ranchi(PGCIL) substations. Due to financial crunch and restriction imposed by MoP on investment in respect of DVC transmission System, the construction of new 220kV substation at Gola has been dropped by DVC. The above mentioned 220kV lines (proposed connecting Gola S/s with Ramgarh & MTPS substations of DVC and Ranchi-PG S/S) are complete/nearing completion. To utilize the upcoming 220kV lines to the best extent possible, a revised plan is proposed bypassing the Gola S/s (enclosed with the Annexure-22.1).
- 21.2 DVC also informed vide its e-mail dated 10.04.2017 (copy enclosed at **Annexure-21.2**) that load growth at Gola would be met by installation of third 31.5 MVA, 132/33kV power transformer.
- 21.3 DVC requested to approve the revised plan.
- 21.4 Members may discuss.

**22.0 Installation of bus reactors at 400kV level at substations of STU**

- 22.1 POWERGRID has informed that following 400kV intra-state substations were approved for implementation by respective STUs of Bihar and Odisha in the 18<sup>th</sup> ER Standing Committee Meeting:

**(a) Bihar (to be implemented by BSPTCL)**

- (i) *2x500MVA+2x160MVA+2x80MVA, 400/220/132/33kV GIS S/s at Naubatpur*
- (ii) *2x500MVA+2x160 MVA, 400/220/132kV GIS S/S at Bakhtiyarpur*
- (iii) *2x500MVA+3x160MVA+4x80MVA, 400/220/132/33kV GIS S/s at Jakkanpur*

**(b) Odisha (to be implemented by OPTCL)**

- (i) *2x500MVA, 400/220kV sub-station at Meramundali-B*
- (ii) *2x500MVA, 400/220kV sub-station at Narendrapur (New)*
- (iii) *2x500MVA, 400/220kV sub-station at Khuntuni*

- 22.2 With the above mentioned 400kV intra-state substations no bus reactors have been planned by BSPTCL and OPTCL. In order to keep operational flexibility/control over voltages, it is suggested to install suitable bus reactors at 400kV levels in STU system also like in ISTS system. Accordingly, it is proposed that OPTCL and BSPTCL may install 420kV, 2x125MVA<sub>r</sub> bus reactors at above planned substations except Narendrapur (New) where 420kV, 2x80MVA<sub>r</sub> may be installed.
- 22.3 Members may discuss.

**23.0 Constraint in transportation of ICT to Farakka (NTPC) under ERSS-XII-Agenda by POWERGRID**

- 23.1 POWERGRID has informed that replacement of 400/220kV, 2x315MVA ICTs with 400/220kV, 2x500MVA ICTs was approved at Patna, New Purnea and Sasaram (Pusauli) substations in the 15<sup>th</sup> ER Standing Committee Meeting held on 27-08-2013. Therein, it was also decided to install one of the 315MVA ICT released from Patna, New Purnea and Sasaram after replacement at Farakka generation switchyard as 2<sup>nd</sup> ICT by POWERGRID. The said scopes are being implemented by POWERGRID as part of ERSS-XII scheme. One 400/220kV, 315MVA ICT released from Sasaram (Pusauli) was identified for installation at Farakka.
- 23.2 The 400kV & 220kV switchyard equipment and Control & Relay equipment associated with installation of 400/220kV ICT are in place at Farakka. While in transit the main ICT tank was stopped by CISF at Farakka Barrage Project (under Ministry of Water Resources). POWERGRID vide letter dated 19-08-2016 requested permission from Farakka Barrage Project for transportation of the ICT. However, the Barrage Authority vide letter dated 05-09-2016 denied permission for the same. Subsequently, POWERGRID approached The Secretary, Ministry of Water Resources (apex body for Farakka Barrage Project) on 08-09-2016. However, the Ministry of Water Resources declined permission vide their letter dated 23-09-2016 and requested POWERGRID to explore for alternate routes. Previously, all other consignments were transported to Farakka generation project through this route only.
- 23.3 Accordingly, POWERGRID explored following routes for transportation of the ICT:
- (a) Via **NEW FARAKKA** where a **railway underpass (14 ft.) physically prevented the consignment of 17.5 ft. height.**
  - (b) Via **DHULIAN-SHANKARPUR**, but one intermediate bridge on feeder canal of nearly 500 mtr length is **unfit for movement of even LMV**: very risky as the condition of the bridge is dilapidated.
  - (c) Via **PAKUR – BARHARWA – NTPC FARAKKA**: explored and physically surveyed by POWERGRID & transporter but found not feasible as **Major civil work are required for construction of road/bypass over bridges/culverts; en-route, for Trailer with such dimension and weight.**
- 23.4 From above it emerges that the ICT can be transported to Farakka only through the road of Farakka Barrage Project, which has been denied by the apex body (Ministry of Water Resources).
- 23.5 Thus with no possible transportation options, the ICT has been diverted and stationed at Durgapur S/s of POWERGRID.
-

- 23.6 In the 18<sup>th</sup> ER Standing Committee Meeting held on 13-06-2016, installation of 3<sup>rd</sup> 400/220kV, 315MVA ICT at Durgapur (ICT-2 released after replacement at New Purnea S/s) was approved. This is being implemented by POWERGRID under ERSS-XVII (Part-B) scheme.
- 23.7 In view of the above mentioned transportation constraints it is proposed that ICT diverted from Sasaram S/s (identified for installation at Farakka under ERSS-XII) may be installed at Durgapur S/s as 3<sup>rd</sup> ICT (under ERSS-XVII Part-B).
- 23.8 Accordingly, the following modifications in the scope of ERSS-XII and ERSS-XVII (Part-B) schemes are proposed:
- (a) Deletion of scope of installation of Sasaram (Pusauli) 400/220kV, 315MVA ICT-2 as 2<sup>nd</sup> 400/220kV, 315MVA ICT at Farakka generation switchyard from ERSS-XII scheme.
  - (b) Modification in ERSS-XVII (Part-B) scheme: Installation of above mentioned Pusauli 400/220kV, 315MVA ICT-2 as 3<sup>rd</sup> 400/220kV, 315MVA ICT at Durgapur instead of earlier approved New Purnea 400/220kV, 315MVA ICT-2.
  - (c) Shifting of New Purnea (ICT-2) to Durgapur under ERSS-XVII (Part-B) scheme is not required; hence the same may be kept as spare ICT at New Purnea itself.
- 23.9 Members may discuss.
- 24.0 Conversion of 50MVAR (3x16.67) bus reactor at Farakka to switchable line reactor under the ERSS-XV due to space constraints in termination of Farakka – Baharampur 400kV D/c (Twin HTLS) line- Agenda by POWERGRID**
- 24.1 POWERGRID has informed that ERSS-XV scheme inter alia includes construction of Farakka – Baharampur 400kV D/c (Twin HTLS) line. One spare future bay has been selected for termination of one circuit of Farakka – Baharampur D/c line at 400kV bus at Farakka generation switchyard, however, due to non-availability of adjacent bay for termination of the other circuit it is proposed to terminate the second circuit in the exiting 50MVAR bus reactor bay along with conversion of this reactor to switchable line reactor. This arrangement would result in connection of 50MVAR switchable line reactor in one circuit of Farakka – Baharampur 400kV D/c line at Farakka end.
- 24.2 Members may approve.
- 25.0 Modification in transmission system required for power evacuation from Sikkim IPPs and Operationalization of LTOA/LTA- Agenda by POWERGRID**
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## 25.1 **Sikkim Phase-1 IPPs**

25.1.1 POWERGRID has informed that following seven IPPs envisaged under Phase-1 in Sikkim, the High Capacity Power Transmission Corridor-III was planned:

Sl. No.	Name of the Developer/ Open Access Applicant	Commissioning Schedule (as per 12 <sup>th</sup> JCC)	Installed Capacity (MW)	LTOA Quantum (MW)
1	Teesta Urja Ltd. / PTC (Teesta-III)	Commissioned	1200 (6x200)	1200
2	Lanco Energy Pvt. Ltd. (Teesta-VI)	U-1: Feb'20, U-2, 3 & 4: Mar'20	500 (4x125)	500
3	DANS Energy Pvt. Ltd. (Jorethang)	Commissioned	96 (2x48)	96
4	JAL Power Corporation (Rangit-IV)	U-1: Sep'19 U-2 & 3: Oct'19	120 (3x40)	120
5	Madhya Bharat Power Corporation Ltd. (Rongnichu)	U-1: Nov'18 U-2: Dec'18	96 (2x48)	96
6	Gati Infrastructure Ltd (Chuzachen)	Commissioned	99 (2x49.5)	99
7	Gati Infrastructure Bhasmey Power Pvt. Ltd. (Bhasmey)	U-1: Apr'18 U-2: May'18	51 (2x25.5)	51
		<b>Total</b>	<b>2162</b>	<b>2162</b>

Based on the decisions of various Standing Committee Meetings of ER and Connectivity & LTA meetings of ER, following common transmission system is being implemented under the High Capacity Power Transmission Corridor-III:

- **Substation**

- (A) Establishment of new 400/220kV, 2x500MVA GIS S/s at Kishanganj
- (B) Establishment of 400/220/132kV (400/220kV, 16x105 MVA, Single Phase transformers and 220/132kV, 3x100MVA) GIS S/s at Rangpo
- (C) Establishment of 220kV GIS switching station at New Melli

- **Transmission Line**

- (D) LILO of Gangtok – Melli 132kV S/c line at Rangpo
- (E) LILO of Gangtok – Rangit 132kV S/c line at Rangpo
- (F) Rangpo – New Melli 220kV D/c line (with single HTLS conductor)
- (G) LILO of Siliguri – Dalkhola 220kV D/c line at Kishanganj
- (H) LILO of New Siliguri – New Purnea 400kV D/c line (quad) at Kishanganj
- (I) LILO of Teesta V – Siliguri 400kV D/c line at Rangpo
- (J) Kishanganj – Patna 400kV D/c (quad) line
- (K) Teesta III – Kishanganj 400kV D/c line (quad)
- (L) LILO of both circuits of Teesta III – Kishanganj 400kV D/c line at Rangpo with Twin HTLS conductor

**Note:**

- (i) Elements at (A) to (J): Commissioned by POWERGRID.
- (ii) Element at (K): Being implemented by TPTL (JV of POWERGRID and Teesta Urja Ltd.). Teesta-III to Rangpo section has been commissioned and Rangpo to

*Kishanganj section is expected by Mar 2018 (as informed in 12<sup>th</sup> JCC of Eastern Region held on 27-03-2017).*

*(iii) Element (L): LILO of one circuit has been commissioned by POWERGRID.*

25.1.2 The dedicated and above mentioned common transmission system associated with Phase-I generation projects in Sikkim (except Chuzchen which was granted LTA separately) were intimated by CTU vide letter dated 07-10-2015. Therein, the dedicated transmission system of Bhasmey HEP was modified from “LILO of one ckt of Chuzachen – Rangpo 132kV D/c line with Zebra conductor at Bhasmey along with associated line bays” to “Bhasmey – Rangpo 132kV D/c line along with associated line bays”.

25.1.3 In the 18<sup>th</sup> Standing Committee Meeting of ER held on 13-06-2016, it was decided to delink the LILO of 2<sup>nd</sup> circuit of Teesta-III – Kishanganj 400kV D/c line at Rangpo from the scheme “Transmission System for Transfer of power from generation projects in Sikkim to NR/WR (Part-B)” for Phase-1 IPPs in Sikkim and take it up as a separate part (Part-B1) as “Transmission System for Transfer of power from generation projects in Sikkim to NR/WR (Part-B1)”. From system studies it has been observed that power from the above mentioned Phase-I IPPs can be evacuated with LILO of one circuit of Teesta-III – Kishanganj line at Rangpo with N-1 security criteria (the original transmission system was planned keeping in view N-1 criteria). The 2<sup>nd</sup> LILO at Rangpo, which is required for meeting the N-1-1 reliability criteria is under DPR stage.

25.1.4 In view of the above, it is found that the following Transmission System for Transfer of power from generation projects in Sikkim to NR/WR from Phase-I Sikkim IPPs (without LILO of 2<sup>nd</sup> circuit of Teesta-III – Kishanganj 400kV D/c line at Rangpo ) is capable of power evacuation from Phase-I Sikkim IPPs:

**Common Transmission System (under scope of ISTS)**

- (a) Establishment of 2x500MVA, 400/220kV GIS sub-station at Kishanganj
- (b) Establishment of 16x105MVA (single phase), 400/220kV and 3x100MVA, 220/132kV GIS substation at Rangpo
- (c) Establishment of 220kV GIS switching station at New Melli
- (d) Teesta-III – Kishanganj 400kV D/c line (quad)
- (e) Kishanganj – Patna 400kV D/c (quad) line
- (f) LILO of New Siliguri – New Purnea 400kV D/c line (quad) at Kishanganj
- (g) LILO of Siliguri – Dalkhola 220kV D/c line at Kishanganj
- (h) LILO of Teesta-V – New Siliguri 400kV D/c line at Rangpo
- (i) LILO of one circuit of Teesta-III – Kishanganj 400kV D/c line (quad) at Rangpo (with Twin HTLS)
- (j) Rangpo – New Melli 220kV D/c line (with Single HTLS)
- (k) LILO of Rangit – Gangtok 132kV S/c line at Rangpo
- (l) LILO of Gangtok – Melli 132kV S/c line at Rangpo

**Dedicated Transmission System**

	<b>under scope of generation developer</b>	
(a)	Teesta-VI	Teesta-VI – Rangpo 220kV D/c line with Twin Moose conductor along with associated line bays.
(b)	Jorethang	Jorethang – New Melli 220kV D/c line with Zebra Conductor along with associated line bays.
(c)	Rangit-IV	Rangit-IV – New Melli 220kV D/c line with Zebra Conductor along with associated line bays
(d)	Rongnichu	Rongnichu – Rangpo 220kV D/c line with Zebra conductor along with associated line bays
	<b>under scope of generation developer / Govt. of Sikkim</b>	
(e)	Chuzachen	Chuzachen – Rangpo 132kV D/c with Zebra conductor along with associated line bays
(f)	Bhasmey	Bhasmey – Rangpo 132kV D/c line along with associated line bays

25.1.5 Govt. of Sikkim and the project developers of Chuzachen and Bhasmey HEPs need to clarify regarding ownership of dedicated transmission lines (viz. Chuzachen – Rangpo and Bhasmey – Rangpo 132kV D/c lines) of the Chuzachen and Bhasmey HEPs.

25.1.6 All the elements of the above mentioned Common Transmission System( mentioned at Para 25.1.4) for Phase-I IPPs except Teesta-III – Kishanganj 400kV D/c (Quad) line has been commissioned. This line (under construction by TPTL) is expected by March 2018. With the completion of this line, the LTOA/LTA of Sikkim Phase-I IPPs shall be operationalised and the generation developers shall be liable for payment of applicable transmission charges. The 2<sup>nd</sup> LILO at Rangpo, which is under DPR stage would be commissioned at later stage.

25.2 From system studies it has also been observed that common transmission system identified for Phase-1 IPPs is also capable of evacuating power from Tashiding HEP (of Shiga Energy Pvt. Ltd.). Accordingly, it is proposed to modify the LTOA system of Tashiding HEP incorporating the common transmission system for Sikkim Phase-1 IPPs mentioned at Para 25.1.4 above.

25.3 Members may discuss and approve.

## **26.0 Connectivity granted to Vedanta Ltd. (erstwhile Sterlite Energy Ltd.)- Agenda by POWERGRID**

26.1 POWERGRID has informed that Vedanta Ltd. (4x600MW) was granted LTOA of 400MW along with other Phase-1 IPPs in Odisha and LTA of 1000MW along with Phase-2 IPPs in Odisha. For connectivity, Vedanta was to construct two 400kV D/c lines (one for 400MW LTOA and another for 1000MW LTA) from the generation switchyard to Sundargarh (Jharsuguda) S/s of POWERGRID. Subsequently, Vedanta Ltd. has relinquished its entire LT(O)A quantum of 1400MW (Phase-I: 400MW & Phase-II: 1000MW). The first dedicated line is still under construction, whereas the second dedicated

line has not been taken up for implementation. Connection agreements have been signed between CTU (POWERGRID) and Vedanta Ltd. for both the dedicated transmission lines.

26.2 Vedanta has connected Unit-1, 3 & 4 of the generation project to ISTS system and Unit-2 to Odisha grid. In the 125<sup>th</sup> OCC meeting of ERPC held on 20-09-2016 under the agenda item no. B.7 – “Persistent under generation and inappropriate operational methodologies vis-à-vis grid requirements in operation of Vedanta, Jharsuguda”, it has emerged that Vedanta has got converted the status of ISTS connected units from IPP to CPP. Accordingly, following was decided in the meeting:

- (a) *Vedanta has to get a fresh connectivity from CTU for their CPP units #1, 3 & 4 (as these units were converted from IPPs to CPPs) as per the decision of 11th Connectivity and LTA meeting of ER held on 13.06.2016.*
- (b) *Vedanta has to get NOC from SLDC Odisha for scheduling of their units through ERLDC.*
- (c) *Vedanta will be allowed to connect to CTU system only after submission of the above two documents.*
- (d) *ERLDC will start scheduling Vedanta CPP Units #1, 3 & 4 only after getting a fresh NOC from SLDC Odisha and with grant of fresh connectivity by CTU.*
- (e) *Till then Vedanta would be treated as an embedded customer under the jurisdiction of SLDC Odisha and may remain connected to grid through STU system only (as presently its units are connected to OPTCL system) and do their STOA transaction through SLDC Odisha.*
- (f) *In view of all of above, the NOC granted to Vedanta would stand revoked and fresh NOC could be issued subject to fulfillment of the stated conditions*
- (g) *Vedanta has to complete the dedicated line within the schedule (i.e. November, 2016) otherwise the LILO may be removed as per the decision of 33rd ERPC and the meeting convened by CEA held on 16.09.2016.*

26.3 The matter related to Vedanta was subsequently discussed in a meeting at ERPC on 14-10-2016, wherein following was decided:

- (a) *Control area jurisdiction of Vedanta will be shifted from ERLDC to SLDC, Odisha.*
- (b) *CPP units (unit #1, 3 & 4) and IPP unit (#2) of Vedanta Ltd along with SEZ (smelter) load shall be kept at 400 kV bus of Vedanta Ltd Switchyard without bus splitting and shall be connected to STU network through 400 kV Vedanta Ltd-Meramundali D/C line.*

*There will be no need to operate the 400kV buses of Vedanta in split bus mode and they should be coupled by completing all the dias.*

- (c) *One unit shall be kept as standby till the completion of 400 kV Sterlite-Jharsuguda D/C line.*
- (d) *Vedanta Ltd shall be a State embedded entity for all purposes and requisite STU connection would be obtained by Vedanta Ltd i.r.o above.*

- (e) *The CTU connectivity of Vedanta may be kept in abeyance. The same may be closed/withdrawn from the date of getting the STU connectivity.*
- (f) *On change of control area jurisdiction the NOC granted by ERLDC to Vedanta Ltd shall stand revoked.*
- (g) *After changeover of control area jurisdiction, the LILO point of 400 kV Rourkela-Raigarh at Vedanta will be interface point of Odisha STU till 30th November, 2016.*
- (h) *Subsequently, after the completion of 400kV Sterlite-Jharsuguda D/C line the interface point of Odisha STU will be shifted to Jharsugada.*
- (i) *With the change of control area jurisdiction the status of 400kV Sterlite-Jharsuguda D/C line will no more be a dedicated line. So, Vedanta agreed to hand over the line to OPTCL which can be treated as an ISTS tie of OPTCL.*
- (j) *Vedanta has to strictly adhere to the schedule for completion of 400kV Sterlite-Jharsuguda D/C line (i.e. 30th November, 2016) as per the decision of 33rd TCC/ERPC and decided in the meetings held in CEA on 16.9.16. In case 400kV Vedanta-Jharsuguda D/C line is not commissioned by that date, the LILO connection to Vedanta shall be withdrawn.*
- (k) *Due to change of control area jurisdiction from ERLDC to SLDC Odisha. Vedanta Ltd has to settle the following:*
  - (i) *ERLDC fees and charges shall be paid by Vedanta Limited as applicable up to the cutoff date.*
  - (ii) *Previous dues up to cut off date of the pool accounts such as DSM charges along with interest, RTDA, any others has to be settled by Vedanta.*
  - (iii) *Henceforth, any deviation of Vedanta Limited will be treated as deviation of OPTCL.*
  - (iv) *After changeover of jurisdiction if in future it is found that any amount in pool account had remained unaccounted by mistake against Vedanta Limited, Vedanta Limited will have to pay the amount into the pool account.*
  - (v) *For calculation of POC charges and losses Vedanta Limited generation will be considered as generation of Odisha.*
  - (vi) *Vedanta Limited has to get registered afresh at each RLDC for Short Term Open Access as embedded entity in OPTCL.*
  - (vii) *Reconciliation of accounts is also required to be done up to the cutoff date by Vedanta.*
  - (viii) *OPTCL in coordination with Vedanta has to send weekly SEM data to ERLDC by Tuesday Noon.*

26.4 For above mentioned deliberations of OCC and ERPC meetings, it emerges that ISTS connected units (Unit-1, 3 & 4) of Vedanta has been converted from IPP to CPP and the same shall now be kept connected with STU connected unit (Unit-2). This would result in connection of all four generation units, Vedanta – Meramundali 400kV D/c line (STU connection) and Vedanta – Sundargarh (Jharsuguda) 400kV D/c line (ISTS connection) to common

400kV bus. Further, it has been decided that Vedanta shall be embedded entity of Odisha upon completion of Vedanta – Sundargarh (Jharsuguda) line as Vedanta Ltd. has agreed to hand over the line to OPTCL. In such case, the status of the line would change from dedicated transmission line to STU line.

- 26.5 In regard to connectivity of Vedanta Ltd. with ISTS, interim connectivity arrangement through LILO of one circuit of Rourkela - Raigarh 400kV D/c line at generation switchyard was discussed in the 35<sup>th</sup> meeting of ERPC held on 25-02-2017 wherein Vedanta Ltd. was provided time extension till 15-04-2017 for completion of the dedicated line and it was decided to open the interim connectivity on 16-04-2017. Accordingly, CTU (POWERGRID) vide letter dated 11-04-2017 requested ERLDC to initiate necessary actions regarding disconnection of the interim arrangement of M/s Vedanta Ltd as per decision of 35<sup>th</sup> EPRC meeting.
- 26.6 Member Secretary, ERPC vide email dated 25-04-2017 has informed that the above issue was discussed in 132<sup>nd</sup> OCC meeting held on 21.04.2017 at ERPC, Kolkata, wherein OCC agreed to extend the interim LILO connectivity till 30<sup>th</sup> June, 2017 in view of requirement of above mentioned LILO for OPTCL to meet peak summer demand.
- 26.7 It is understood that interim arrangement of Vedanta Ltd. is yet to be opened. Accordingly, CTU (POWERGRID) vide letter dated 11-05-2017 has requested Member Secretary, ERPC to take suitable necessary action.
- 26.8 In view of the above, the connection agreement of the first dedicated transmission line shall become null and void upon transfer of the line by Vedanta Ltd. to OPTCL. Accordingly, OPTCL or Vedanta Ltd. need to confirm regarding transfer of above mentioned asset from Vedanta Ltd. to OPTCL.
- 26.9 Further, with relinquishment of LTA of 1000MW (Phase-II) by Vedanta Ltd. the 2<sup>nd</sup> dedicated line viz. Vedanta generation switchyard – Sundargarh (Jharsuguda) 400kV D/c 2<sup>nd</sup> line may not be required.
- 26.10 Members may discuss.
- 27.0 Dropping of Banka (PG) – Deoghar 132kV D/c line, which had proposed in 16<sup>th</sup> SCM-ER meeting**
- 27.1 In the 16<sup>th</sup> SCM-ER meeting, ERPC had informed that the 132kV Deoghar S/S (JSEB) is being fed through 132kV line(s) from DVC source (132kV Maithon-Jamtara-Deoghar S/C) or from NTPC source (Lalmatia). There is also a feed from BSPTCL source through 132kV Sultanganj- Deoghar S/C line, which is normally kept open due to overloading in Kahalgaon-Sabour-Sultanganj section of BSPTCL system. The Deoghar & Jamtara sub-stations feed important railway loads of 10MW each to Shankarpur TSS & Jamtara TSS and loading on Maithon – Jamtara – Deoghar 132kV S/C line sometimes exceeds 75MW. The reliability of supply to railway loads is being



affected. In view of above, it was agreed to provide an additional supply to Deoghar S/S (JSEB) from 400/132kV Banka S/S (PG) by creating a 132kV Banka- Deoghar D/C lines (about 40 Kms).

- 27.2 JUSNL vide their letter dated 30.07.2015 addressed to POWERGRID informed that termination of above line at Deoghar is not possible due to space constraint. Further, JUSNL informed that after commissioning of 132kV Jasidih – Deoghar line (about 5km), Deoghar S/s will be able to receive 250MVA of power through Jasidih S/s and Dumka S/s, whereas the transformation capacity at Deoghar is only 150MVA. The matter was discussed in 18th SCMPSP(ER) meeting and it was decided to review the possible interconnections at Deoghar in a separate meeting at CEA with Railways & other stakeholders.
- 27.3 In regard to above, a meeting was held on 13.06.2017 (MoM is at **Annexure-27.1**), in which representative of CTU informed that POWERGRID has closed the ERSS-XVI project involving construction of Banka (PG) - Deoghar 132kV D/C line and the same was informed to CEA vide letter dated 27-10-2016.
- 27.4 Representative of BSPTCL stated that BSPTCL can supply power with exiting system to Deoghar (Jharkhand) through 132kV Sultanganj- Deoghar S/C line during off-peak hours only, as the bus bars capacity at Sultanganj is inadequate. However, supply during peak hours would be possible only after strengthening of bus bar at Sultanganj, which is likely to be completed in next 6 months.
- 27.5 Chief Engineer (PSPA-II), CEA expressed that in absence of representatives from JUSNL (Jharkhand) and Railways, it is difficult to assess the loading of the network in present situation.
- 27.6 The proposed Deoghar-Jasidih 132kV D/C line (by JUSNL) and strengthening of 132kV bus at Sultanganj (by BSPTCL) are likely to enhance the reliability of power supply to the Railways TSS at Deoghar. In view of above, it was decided to drop the proposal of construction of Banka (PG) - Deoghar 132kV D/C line.
- 27.7 Members may discuss.