



भारत सरकार
Government of India

विद्युत मंत्रालय

Ministry of Power

केंद्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन प्रभाग

Power System Planning & Appraisal Division-2

सेवा भवन, रा. कृ. पुरम, नयी दिल्ली -110066

Sewa Bhawan, R. K. Puram, New Delhi-110066



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No. 66/5/2016-PSPA-2/ 324 - 337

Dated: 23.05.2016

-As per List Enclosed-

Sub: 18th Meeting of Standing Committee on Power System Planning in Eastern Region – Agenda and Meeting Notice

Sir/Madam,

The 18th Meeting of Standing Committee on Power System Planning in Eastern Region is scheduled to be held **on 13th June, 2016 (Monday) at Kolkata** (The exact venue of the meeting will be intimated shortly). The meeting would commence at 10.30 AM.

The Agenda of the meeting is available on the CEA website: www.cea.nic.in. (path to access-Wings of CEA/Power Systems/Standing Committee on Power System Planning/ Eastern Region.

The meeting will be chaired by Member (Power System), CEA. You are requested to kindly attend the meeting.

Yours faithfully,

(Ravinder Gupta)
Director (PSPA-2)

Copy for kind information to:

- 1) PPS to Member PS, CEA

List of addressee:

1. Managing Director, Bihar State Power Transmission Company, Vidyut Bhavan, Baily Road, Patna-800021. Tel. 0612-2504442 Fax No. 0612-2504557	2. Director (System), Damodar Valley Corporation DVC Towers, VIP Road, Kolkata-700054. Tel. 033-23557934 Fax No. 23554841
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<p>3. Member Secretary, Eastern Regional Power Committee, 14, Golf Club Road, Tollygange, Kolkata-700033. Tel. No. 033-24235199 Fax No.033-24171358</p>	<p>4. Director (Commercial), Grid Corporation of Orissa Ltd, Jan path, Bhubaneshwar-751022. Tel. No. 0674-2541127 Fax No. 0674-2541904</p>
<p>5. Director (Transmission), Orissa Power Transmission Corporation Ltd, Jan path, Bhubaneshwar-751022. Tel. No. 0674-2540098 Fax No.0674-2541904</p>	<p>6. Director (Operation), West Bengal State Electricity Transmission Company Ltd, Vidyut Bhavan, 5th Floor, Block-D, Bidhannagar, Sector-II, Kolkata-700091. Tel. No. 033-23370206 Fax No.033-23342243</p>
<p>7. Principal Chief Engineer cum Secretary, Power Department Government of Sikkim, Sikkim. Tel. No. 03592-2022440 Fax No.03592-202927</p>	<p>8. Managing Director, Jharkhand Urja Sancharan Nigam Limited Engineering Building, H.E.C., Dhurwa, Ranchi-834004. Fax-0651-2400799</p>
<p>9. CEO, POSOCO B-9, Qutub Institutional Area, Katwaria Sarai, New Delhi-110016 Tel. No. 26852843 Fax No. 2626524525, 26536901</p>	<p>10. Director (Projects), Power Grid Corporation of India "Saudamini" Plot No. 2, Sector-29, Gurgaon-122001 Tel. No. 0124-2571816 Fax No.0124-2571932</p>
<p>11. Director (Technical), NTPC Limited, Engineering Office Complex, A-8, Sector 24, Noida. Tel. No. 24362050 Fax No. 24362421</p>	<p>12. Executive Director (T&RE), NHPC Ltd, NHPC Office complex, Sector 33, Faridabad-121003. Tel. No. 0129-2255805 Fax No. 0129-2277523</p>

Copy to:

1. General Manager,
Eastern Regional Load Dispatch Center,
14, Golf Club Road, Tollygange,
Kolkata-700033.
Tel No. 033-24235867
Fax No. 033-24235809

Agenda for 18th Standing Committee Meeting on Power System Planning of Eastern Region

1.0 Confirmation of the minutes of 17th Standing Committee Meeting on Power System planning of Eastern Region.

1.1 The minutes of the 17th meeting of the Standing Committee on Power System Planning held on 25th May, 2015 at NRPC, New Delhi were circulated vide CEA letter no. 66/5/2013-SP&PA/1367-1379 dated 06th June, 2015. ERPC vide its letter no. ERPC/MS/2015/1693-94 dated 16.06.2015 had submitted its comments and a corrigendum was issued by CEA vide letter no. 66/5/SP&PA-2013/1413-25 dated 18.06.2015. Also, WBSETCL vide its letter no. CE/CPD/CEA/371 dated 27.07.2015 had submitted its comments and a corrigendum was issued by CEA vide letter no. 66/5/SP&PA-2013/ 227-239 dated 18.09.2015. BSPTCL has also requested some modifications in the minutes vide their letter no. H-IS-Cell-Misc-1151/2015/81 dated 13.10.2015 and a corrigendum was issued by CEA vide letter no. 66/5/PSP&PA-2015/556-568 dated 30.12.2015. Further, revised minutes of the 17th SCM including all corrigenda as mentioned above were uploaded on CEA website on 01-01-2016.

1.2 The revised minutes may please be confirmed.

2.0 Status of progress of ISTS and TBCB schemes:

2.1 Status of progress of various ISTS schemes under regulated tariff mechanism and under tariff based competitive bidding (TBCB) is given as under:

- i) ISTS under regulated tariff mechanism - Annexure-I
- ii) TBCB schemes under construction – Annexure-II
- iii) TBCB schemes under bidding process – Annexure-III

2.2 Members may please note / may like to comment.

3.0 Transmission System Strengthening in Indian System for Transfer of power from Mangdechhu Hydroelectric Project in Bhutan – Multi Circuit at Alipurduar end

3.1 The transmission system strengthening in Indian system for transfer of power from Mangdechhu HEP was approved in the 16th SCM of ER held on 02nd May 2014 and in the 27th TCC/ERPC held on 30th-31st May 2014 with following scope of works:

- (a) Jigmeling – Alipurduar 400kV D/c (Quad) line (Indian Portion)
- (b) Alipurduar – Siliguri 400kV D/c (Quad) line
- (c) Kishanganj – Darbhanga 400kV D/c (Quad) line

- 3.2 As decided in the 33rd Empowered Committee Meeting, element (a) is being implemented by POWERGRID, whereas elements (b) and (c) are being implemented through tariff based competitive bidding (TBCB). The TBCB portion has already been awarded to M/s Kalpatru and procurement activities for POWERGRID portion has already commenced.
- 3.3 POWERGRID has informed that severe right of way problems are being faced for line entry at Alipurduar S/s. In view of the same, it is proposed to construct the Jigmeling – Alipurduar and Alipurduar – Siliguri 400 kV lines on Multi-Circuit (M/c) tower for about 5 km at Alipurduar end. The M/c portion would be built (along with conductor stringing in all four circuits), owned, operated and maintained by POWERGRID. The Alipurduar – Siliguri line being built under TBCB would be terminated at start of the M/c portion. Accordingly, the coordinates of starting point of M/c portion has been provided in RfP document for termination of Alipurduar – Siliguri line.
- 3.4 In view of the above, members may approve the construction, operation and maintenance of Jigmeling – Alipurduar 400kV D/c line and Alipurduar – Siliguri 400kV D/c (Quad) line on Multi-Circuit (M/c) tower for about 5km at Alipurduar end by POWERGRID along with stringing of conductors in all four circuits.
- 4.0 Change of scope of the scheme under Eastern Region Strengthening Scheme-XVIII (ERSS-XVIII):**
- 4.1 ERSS-XVIII scheme: 765 kV System Strengthening in ER (Phase-I) was agreed in the 17th meeting of the Standing Committee of Power System Planning in Eastern Region (SCPSPER) held on 25th May, 2015 at New Delhi with the scope of works as given below:
- i. Establishment of 765/400kV, 2x1500MVA substations at Medinipur and Jeerat (New)
 - ii. Ranchi (New) – Medinipur 765kV D/c line
 - iii. Medinipur – Jeerat (New) 765kV D/c line
 - iv. Medinipur – Haldia New (NIZ) (WBSETCL) 400kV D/c line (quad/HTLS)
 - v. LILO of Chandithala – Kharagpur 400kV D/c line at Medinipur
 - vi. Jeerat (New) – Subhasgram 400 kV D/c line (quad/HTLS)
 - vii. Jeerat (New) – Jeerat 400 kV D/c line (quad/HTLS)
 - viii. LILO of Jeerat (WB) – Subhasgram 400 kV S/c section at Rajarhat
- 4.2 WBSETCL vide their letter no. CE/CPD/CEA dated 12th Feb., 2016 has informed that they are not implementing the Haldia NIZ 400 kV S/S. WBSETCL informed that the proposed Haldia NIZ 400 kV S/S was contemplated in anticipation that Haldia Energy Ltd.(HEL) (2x300 MW) generation project and the upcoming India Power Corporation Ltd.(IPCL) (3x150 MW) project will approach WBSETCL for connectivity for evacuation of power. Power from the HEL generation project is being evacuated through Haldia-Subhashgram (PG) 400 D/C line and M/s IPCL has approached

WBSETCL for connectivity at 220kV level. As such, WBSETCL is not implementing the 400 kV Haldia NIZ sub-station as of now.

- 4.3 A meeting was held in CEA under chairmanship of Member (PS), CEA was held on 29.03.2016 on the above issue, which was attended by officials from CEA, PGCIL/CTU, WBSETCL and PFC. in the office of Member (PS), CEA. In the meeting, deletion of Medinipur-Haldia NIZ 400kV D/C line along with associated bays at Medinipur from the scope of ERSS-XVIII was agreed.
- 4.4 In the meeting, PFCCL informed that as per the Gazette notification dated 17th November, 2015 for the scheme, WBSETCL has to provide space for construction of 2 nos. 400 kV bays at Jeerat (WBSETCL) substation for termination of Jeerat (New)-Jeerat (WBSETCL) 400 kV D/C line. As per the site condition, there is space constraint for termination of 2 nos. of bays at existing Jeerat (WBSETCL) 400 kV substation. The issue of space constraint at Jeerat (WBSETCL) S/S was discussed and WBSETCL suggested construction of GIS line bays at Jeerat (WBSETCL) for termination of Jeerat (New)-Jeerat (WBSETCL) 400 kV D/C line. The necessary space for the 2 no. 400 kV GIS line bays shall be provided by WBSETCL. The same was agreed. Minutes of the meeting are enclosed at Annexure-IVA.
- 4.5 Further, in a meeting taken by Member (PS), CEA on 12.05.2016 to resolve issues related to Tariff Based Competitive Bidding (TBCB) scheme in Eastern and North Eastern Region, it was decided to provide one spare unit of line reactor of 80 MVAR each at Medinipur and Jeerat New end of Ranchi-Medinipur 765 kV D/C line and Medinipur - Jeerat (New) 765kV D/c line. The minutes of the meeting is enclosed at Annexure-IVB.
- 4.6 In view of the deletion of Medinipur-Haldia NIZ 400kV D/C line along with associated bays at Medinipur from the scope of ERSS-XVIII, construction of GIS line bays at Jeerat (WBSETCL) for termination of Jeerat (New)-Jeerat (WBSETCL) 400 kV D/C line and provision of one spare 80 MVAR reactor at Medinipur and Jeerat New each, as discussed above, the revised scope of works for ERSS-XVIII is given below:

Scope as per Gazette Notification		Modified Scope	
1.	Establishment of 765/400kV, 2×1500MVA substation at Medinipur 765 kV <ul style="list-style-type: none"> • ICTs: 7×500 MVA, 765/400 kV (1 spare unit) • ICT bays: 2 no. • Line bays: 4 no. • Bus reactor: 7×110 MVAR single phase units including 1 spare unit • Bus reactor bay: 2 no. • Space for line bays: 4 no. • Space for ICT bays: 2 no. 	1.	Establishment of 765/400kV, 2×1500MVA substation at Medinipur 765 kV <ul style="list-style-type: none"> • ICTs: 7×500 MVA, 765/400 kV (1 spare unit) • ICT bays: 2 no. • Line bays: 4 no. • Bus reactor: 7×110 MVAR single phase units including 1 spare unit • Bus reactor bay: 2 no. • Space for line bays (Incl. space for sw. line reactor): 4 no.

	<ul style="list-style-type: none"> • Space for 765/400 kV ICT 400 kV • ICT bays: 2 no. • Line bays: 6 no. • Bus reactor: 2×125 MVAR • Bus reactor bay: 2 no. • Space for line bays: 4 no. • Space for ICT bays: 2 no. 		<ul style="list-style-type: none"> • Space for ICT bays: 2 no. • Space for 765/400 kV ICT 400 kV • ICT bays: 2 no. • Line bays: 4 no. • Bus reactor: 2×125 MVAR • Bus reactor bay: 2 no. • Space for line bays (Incl. space for sw. line reactor): 6 no. • Space for ICT bays: 2 no.
2.	<p>Establishment of 765/400kV, 2x1500MVA substations at Jeerat (New)</p> <p>765 kV</p> <ul style="list-style-type: none"> • ICTs: 7×500MVA, 765/400 kV (1 spare unit) • ICT bays: 2 no. • Line bays: 2 no. • Bus reactor: 7×110 MVAR single phase unit including 1 spare unit • Bus reactor bay: 2 no. • Space for line bays: 4 no. • Space for ICT bays: 2 no. • Space for 765/400 kV ICT 400 kV • ICT bays: 2 no. • Line bays: 4 no. • Bus reactor: 2×125 MVAR • Bus reactor bay: 2 no. • Space for line bays: 4 no. • Space for ICT bays: 2 no. 	2.	<p>Establishment of 765/400kV, 2x1500MVA substations at Jeerat (New)</p> <p>765 kV</p> <ul style="list-style-type: none"> • ICTs: 7×500MVA, 765/400 kV (1 spare unit) • ICT bays: 2 no. • Line bays: 2 no. • Bus reactor: 7×110 MVAR single phase unit including 1 spare unit • Bus reactor bay: 2 no. • Space for line bays (Incl. space for sw. line reactor): 4 no. • Space for ICT bays: 2 no. • Space for 765/400 kV ICT 400 kV • ICT bays: 2 no. • Line bays: 4 no. • Bus reactor: 2×125 MVAR • Bus reactor bay: 2 no. • Space for line bays (Incl. space for sw. line reactor): 4 no. • Space for ICT bays: 2 no.
3.	<p>Ranchi (New) – Medinipur 765kV D/c line with Hexa ACSR Zebra conductor along with 240 MVAR 765 kV (765 kV, 3x80 MVAR single phase units) switchable line reactor in each circuit at Medinipur end.</p>	3.	<p>Ranchi (New) – Medinipur 765kV D/c line with Hexa ACSR Zebra conductor along with 2x240 MVAR 765 kV (765 kV, 7x80 MVAR single phase units, incl. one spare) switchable line reactor (one for each circuit) at Medinipur end.</p>
4	<p>Medinipur - Jeerat (New) 765kV D/c line with Hexa ACSR Zebra conductor along with 240 MVAR (765 kV, 3x80 MVAR single phase units) switchable line reactor in each circuit at Jeerat (New) end</p>	4	<p>Medinipur - Jeerat (New) 765kV D/c line with Hexa ACSR Zebra conductor along with 2x240 MVAR (765 kV, 7x80 MVAR single phase units, incl. one spare) switchable line reactor (one for each circuit) at Jeerat (New) end</p>
5	<p>Medinipur – Haldia New (NIZ) (WBSETCL) 400kV D/c line [ACSR Quad Moose/ HTLS (equivalent to ACSR Quad Moose current rating at 85° C)]</p>	5	<p>[Deleted]</p>
6	<p>LILO of both circuits of Chandithala – Kharagpur 400 kV D/c line at Medinipur</p>	6	<p>LILO of both circuits of Chandithala – Kharagpur 400 kV D/c line at Medinipur</p>

7	Jeerat (New) – Subhasgram 400 kV D/c line [ACSR Quad Moose/ HTLS (equivalent to ACSR Quad Moose current rating at 85° C)]	7	Jeerat (New) – Subhasgram 400 kV D/c line (ACSR Quad Moose current rating at 85° C)
8	Jeerat (New) – Jeerat (WB) 400 kV D/c line [ACSR Quad Moose/ HTLS (equivalent to ACSR Quad Moose current rating at 85° C)]	8	Jeerat (New) – Jeerat (WB) 400 kV D/c line (ACSR Quad Moose current rating at 85° C)
9	LILO of Jeerat (WB) – Subhasgram (PG) 400 kV S/c section at Rajarhat (PG)	9	LILO of Jeerat (WB) – Subhasgram (PG) 400 kV S/c section at Rajarhat (PG)
10	2 no. 400 kV line bays at Haldia New (NIZ) (WBSETCL)	10	[Deleted]
11	2 no. 400 kV line bays at Jeerat (WBSETCL)	11	2 no. 400 kV GIS line bays at Jeerat (WBSETCL)
12	<p>Note:</p> <ol style="list-style-type: none"> CTU (POWERGRID) would provide 2 no. 400 kV line bays at Subhasgram (PG) for termination of Jeerat (New) - Subhasgram 400 kV D/c line [ACSR Quad Moose/ HTLS] line CTU (POWERGRID) would provide 2 no. 400 kV line bays at Rajarhat (PG) for termination of LILO of Jeerat (WB) – Subhasgram (PG) 400 kV S/c section at Rajarhat (PG) CTU (POWERGRID) would provide 2 no. 765 kV line bays at Ranchi (New) (PG) along with 2X240 MVar switchable line reactor with 750 Ω NGR on each circuit for Ranchi (New)- Medinipur 765 kV D/c line. WBSETCL would provide space for 2 no. 400 kV line bays at Haldia New (NIZ) (WBSETCL) for termination of Medinipur- Haldia (New) (NIZ) (WBSETCL) 400 kV D/c line WBSETCL would provide space for 2 no. 400 kV line bays at Jeerat (WBSETCL) for termination of Jeerat (New)- Jeerat (WBSETCL) 400 kV D/c line 	12	<p>Note:</p> <ol style="list-style-type: none"> CTU (POWERGRID) would provide 2 no. 400 kV line bays at Subhasgram (PG) for termination of Jeerat (New) - Subhasgram 400 kV D/c line [ACSR Quad Moose/ HTLS] line CTU (POWERGRID) would provide 2 no. 400 kV line bays at Rajarhat (PG) for termination of LILO of Jeerat (WB) – Subhasgram (PG) 400 kV S/c section at Rajarhat (PG) CTU (POWERGRID) would provide 2 no. 765 kV line bays at Ranchi (New) (PG) along with 2X240 MVar switchable line reactor with 750 Ω NGR on each circuit for Ranchi (New)- Medinipur 765 kV D/c line. [Deleted]. WBSETCL would provide space for 2 no. 400 kV GIS bays at Jeerat (WBSETCL) for termination of Jeerat (New)- Jeerat (WBSETCL) 400 kV D/c.

4.7 Members may discuss and approve.

5.0 Ranchi (New) – Purulia PSP 400kV D/c line under ERSS-VII

5.1 Ranchi (New) – Purulia PSP 400kV D/c line under ERSS-VII is being implemented through TBCB by M/s Purulia Kharagpur Transmission Company Ltd. (PKTCL) (a subsidiary of M/s Sterlite Grid). The line was approved for termination at GIS switchyard of Purulia PSP. However, WBSETCL informed that there are space constraints at Purulia PSP generation switchyard. WBSETCL also informed that they are establishing

New Purulia 400 kV GIS near Purulia PSP generation project by LILO of one circuit of Purulia PSP-Arambagh 400 kV D/C line and has proposed to PKTCL to terminate the line at New Purulia GIS substation instead of earlier approved Purulia PSP generation switchyard. 400 kV line bays for termination of the line at both ends are under the scope POWERGRID. The change in location of the termination point at Purulia end has already been agreed in a meeting taken by Member (PS), CEA on 25-6-2015.

- 5.2 Here, it is also to mention that line bays at New Purulia and Kharagpur substations are being implemented by WBSETCL as consultancy work of POWERGRID. The awarded cost of 2 nos. AIS line bays at Kharagpur is about Rs. 10 crore, whereas the awarded cost of 2 nos. GIS line bays at New Purulia is about Rs. 35 crore.
- 5.3 Further, in a meeting taken by Member (PS), CEA on 29-3-2016, WBSETCL informed that New Purulia GIS is expected to be commissioned by Nov., 2016. M/s Sterlite informed that the Ranchi-New Purulia 400 kV D/C line will be completed by May, 2016. In view of above, Ranchi-New Purulia 400 kV D/C cannot be charged because of want of 2 no. 400 kV GIS bays at New Purulia GIS. In order that the line does not remain unutilised for about six months or till the New Purulia GIS is commissioned, it was agreed that as an interim arrangement, Ranchi-New Purulia 400 kV D/C line will be connected with one circuit of Purulia PSP-Arambagh 400 kV D/C line at suitable location, so as to form Ranchi- Purulia PSP (about 115 km), Ranchi-Arambagh (about 327 km) and Purulia PSP-Arambagh 400 kV lines. This interim arrangement would be implemented by M/s Sterlite. M/s PKTCL may approach CERC for revision of tariff for the additional cost, if any, incurred.
- 5.4 In the above meeting, it was also informed that another line under ERSS-VII being implemented by M/s PKTCL i.e. Kharagpur (WB)-Chaibasa (PG) 400 kV D/C line is ready and the bays under the scope of POWERGRID at Kharagpur (WB) implemented by WBSETCL as deposit work are not ready. In order to avoid stranding of Kharagpur (WB)-Chaibasa (PG) 400 kV D/C line till the bays at Kharagpur (WB) are commissioned, termination of the line by LILO of one circuit of Kharagpur-Kolaghat 400 kV D/c line at Kharagpur end so as to form Kharagpur (WB)-Chaibasa (PG), Chaibasa (PG)-Kologhat and Kharagpur-Kolaghat 400 kV lines as an interim arrangement was also agreed in the meeting. This interim arrangement would be implemented by M/s PKTCL with no addition cost to be recovered as tariff, was also agreed in the meeting. The decisions of the meeting are given below:
- a) PGCIL shall submit following studies:
- i. Line charging studies indicating that the Ranchi – Arambagh circuit (317 km) can be charged without any constraints. However, if there are any constraints / conditions for charging, the same may be specified upfront in the studies.
 - ii. DOV studies indicating that the dynamic over voltage remains within specified limit (i.e. 1.4 pu) during load throw-off. The studies may also

indicate the loading assumed on the line prior to load throw-off and the maximum load throw-off admissible for the DOVs. (The lines in these studies is a combination of Ranchi-Purulia and Ranchi-Purulia-Arambag and accordingly all the three nodes i.e Ranchi, Purulia and Arambag would need to be represented while carrying out DOV studies)

- iii. It is understood that the line reactors (i.e. 50MVA) at Ranchi end of this line do not have NGR. So, POWERGRID may also indicate that there would not be any problem during auto reclosing under single line to ground fault without the NGR.
- b) M/s PKTCL would terminate their Ranchi-Purulia PSP 400 kV D/C line at New Purulia GIS of WBSETCL. This change in transmission scope would be finalised in the next meeting of SCSPER and would got noted in the next Empowered committee meeting on Transmission.
- c) In view of anticipated delay in commissioning of New Purulia 400 kV GIS by WBSETCL, M/s Sterlite Grid (PKTCL) may connect Ranchi-New Purulia 400 kV D/C line at a suitable location by LILO of one circuit of Purulia-Arambagh D/C line of WBSETCL as an interim arrangement till the commissioning of 2 no. 400 kV GIS bays at New Purulia. Based on the studies furnished by PGCIL (as mentioned above), the interim arrangement would also be formalized in the next meeting of SCSPER and would got noted in the next meeting of the Empowered Committee on Transmission.

Regarding recovery of additional cost, if any, due to these changes, PKTCL may take up with CERC.

- d) WBSEDCL and WBSETCL would submit SLD and general arrangement (GA) layout of the Purulia PSP and Arambag S/S respectively to CEA through E-mail.
- e) PKTCL would interconnect their Kharagpur (WB)-Chiabasa (PG) 400 kV D/C line by LILO one circuit of Kharagpur (WB)-Kolaghat 400 kV D/C line near Kharagpur end as an interim arrangement till the 400 kV bays at Kharagpur (WB) are commissioned with no additional cost to be recovered as tariff. The interim arrangement would be formalized in next meeting of SCSPER.
- f) WBSETCL would furnish the load flow/system studies results in respect of New Purulia 400 kV s/s and associated transmission line to CEA, urgently, so that same could be taken in the forthcoming meeting of the SCSP ER.
- g) PKTCL will provide tower location and route alignments near the Purulia PSP and New Purulia for the (i) original Ranchi-Purulia PSP line (ii) re-alignment to New Purulia and (iii) alignment for terminating LILO in the Purulia PSP-Arambag line.

5.5 The minutes of the meeting are enclosed at Annexure-V.

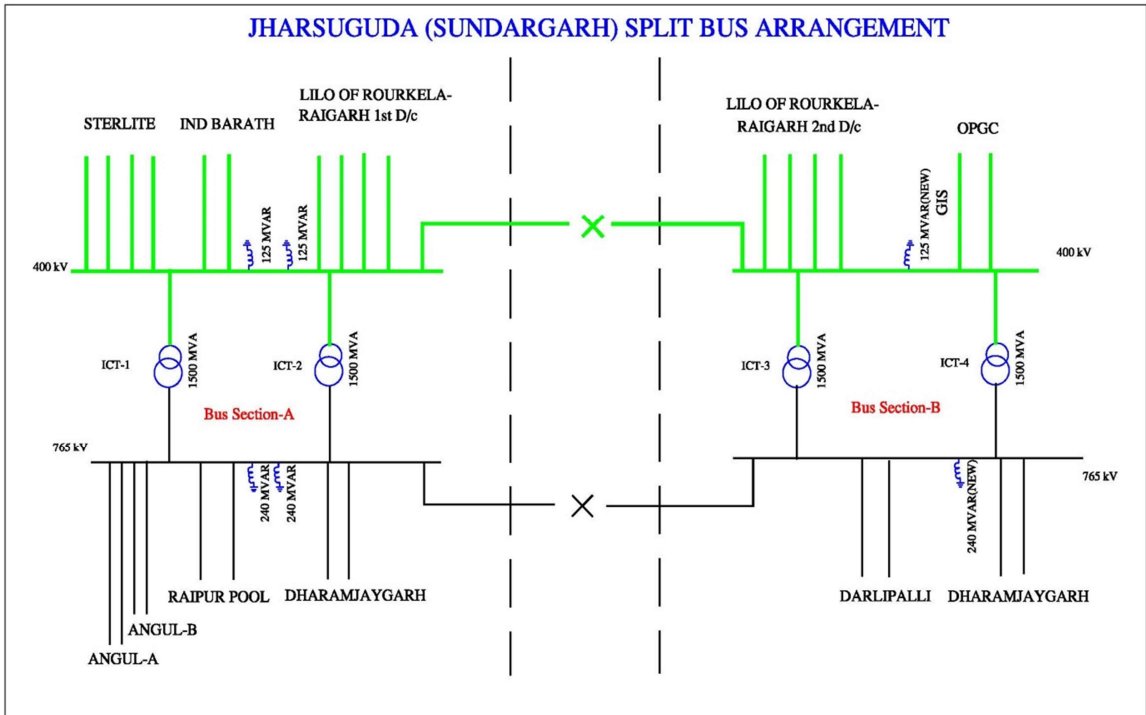
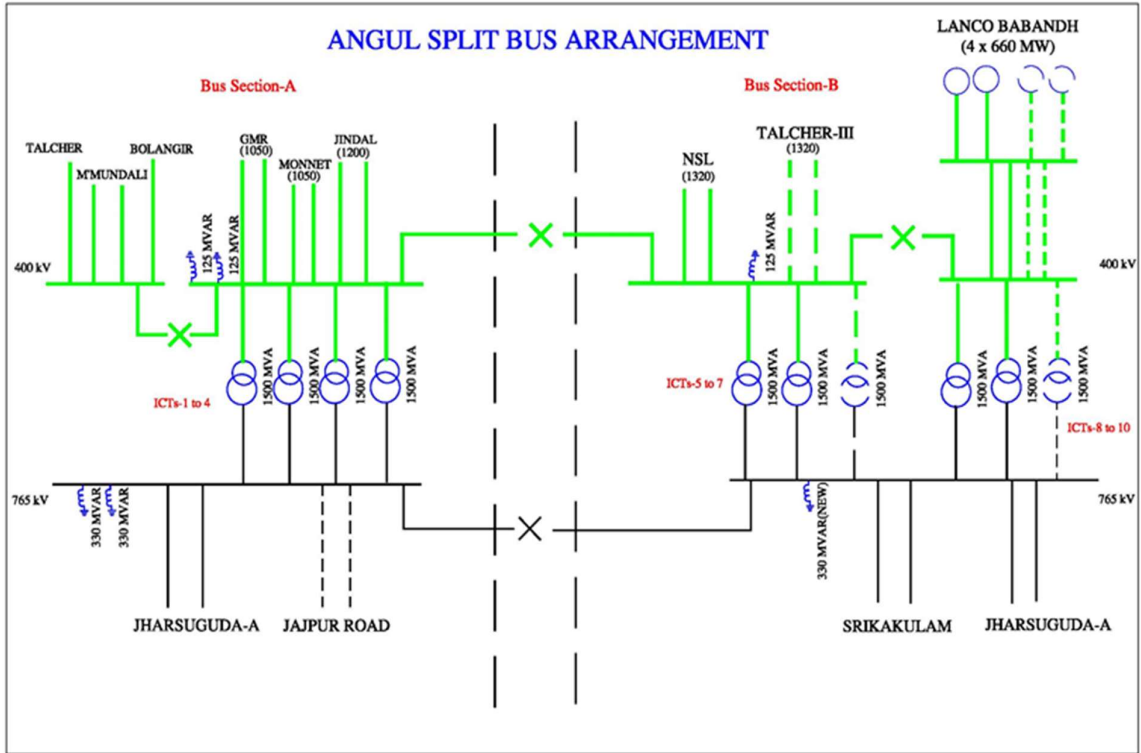
5.6 Members are requested to discuss and approve the following:

- i) Termination of Ranchi (New) – Purulia PSP 400kV D/c line from Purulia PSP to New Purulia by M/s PKTCL
- ii) 2 no. 400 kV GIS line bays at New Purulia in place of Purulia PSP for termination of Ranchi (New) – New Purulia 400kV D/c line by POWERGRID

- iii) Both the interim arrangements as mentioned above, till the commissioning of 400 kV bays at New Purulia GIS and Kharagpur (WB) respectively.
- 5.7 As mentioned above, WBSETCL is establishing 400 kV GIS at New Purulia by LILO of one circuit of 400 kV Purulia PSP-Arambag 400 kV D/C line at New Purulia. This change in system configuration / additional transmission system by WBSETCL is required to be discussed and firmed up in meeting of SCPSPER. We feel that it would be better, if WBSETCL make LILO of both circuits of Purulia PSP-Arambag 400 kV D/C line at New Purulia. Further, It is understood that power from Turga PSP (1000 MW) will be pooled at New Purulia. LILO of second circuit of Purulia PSP-Arambag 400 kV D/C line at New Purulia would help in reliable evacuation of power from Turga PSP.
- 5.8 Members may discuss and approve.
- 6.0 Termination of Banka(PG) – Deoghar 132 kV D/c line at Jasidih GSS – Proposal of JUSNL**
- 6.1 Proposal of ERPC to establish Banka (PG) - Deoghar 132kV D/C line (about 40 kms) to feed Deoghar S/S(JSEB) for reliable and uninterrupted power supply to Railways load was approved in 1st-2014 (renamed as 16th) Standing Committees Meeting on Power System planning in Eastern Region held at NRPC, New Delhi on 02-05-2014. The above line has been entrusted to POWERGRID by MoP for implementation under compressed time-frame.
- 6.2 JUSNL vide letter no. 390/GM (T) dated 31-07-2015 has requested that the line may be terminated at Jasidih instead of Deoghar, because of space constraint at Deoghar. JUSNL has also informed that 220/132/33 kV Dumka GSS has been commissioned. Also proposal for construction of 220/132/33 kV Jasidih GSS, which is about 5 km from Deoghar GSS and Jasidih GSS – Deoghar GSS 132 kV D/C line is under tendering stage. Also the Jasidih GSS, has sufficient space for termination of line from Banka(PG) to Deoghar 132 kV D/c line.
- 6.3 Members may discuss.
- 7.0 Common Transmission System for Phase-II generation project in Odisha**
- 7.1 POWERGRID has informed that following transmission system to be implemented by POWERGRID was agreed in earlier SCMs, as a part of common transmission system for phase-II generation projects in Odisha:
- (a) Addition of 2x1500MVA, 765/400kV ICTs with associated bays at Jharsuguda (Sundargarh)
 - (b) Addition of 2x1500MVA, 765/400kV ICTs with associated bays at Angul
 - (c) Split bus arrangement at 400 kV and 765 kV bus at both Angul and Jharsuguda (Sundargarh) substations [in GIS at Jharsuguda (Sundargarh)]

- (d) LILO of both circuits of Rourkela - Raigarh 400kV D/c (2nd line) at Jharsuguda (Sundargarh) substation with associated line bays in GIS at Jharsuguda (Sundargarh) substation

7.2 The split bus arrangement at 400kV and 765kV buses in both Angul and Jharsuguda (Sundargarh) substations as being implemented is shown below:



- 7.3 POWERGRID has informed that there is a space constraint at Jharsuguda (Sundargarh) S/s and accordingly, for addition of 2x1500MVA, 765/400kV ICTs has proposed that associated bays at 400kV and 765kV levels be implemented in GIS.
- 7.4 Further, in view of implementation of split bus arrangement at Angul and Jharsuguda (Sundargarh) S/s, POWERGRID has also proposed a spare single phase transformer along with installation of new 2x1500MVA, 765/400kV ICTs (i.e 7x500MVA single phase ICTs shall be installed) in the other section of the bus at both the substations (one 765/400kV, 500MVA single phase spare already available with existing ICTs in the other section).
- 7.5 During walk over survey for LILO of both circuits of Rourkela - Raigarh 400kV D/c (2nd line) at Jharsuguda (Sundargarh) S/s, severe RoW constraints have been observed due to large number of 400kV and 765kV lines being terminated at Jharsuguda. Additionally, forest involvement has also been envisaged. Accordingly, for the said LILO, about 17km of Multi-Circuit portion has been envisaged in the corridor.
- 7.6 In view of the above, POWERGRID has proposed the following:
- (a) Implementation of associated bays at 400 kV and 765 kV levels in GIS for 2x1500MVA, 765/400kV ICTs at Jharsuguda S/s
 - (b) Spare single phase transformer unit (765/400kV, 500MVA) at Angul and Jharsuguda substations for 2x1500MVA ICTs being installed.
 - (c) LILO of both circuits of Rourkela – Raigarh 400kV D/c (2nd line) at Jharsuguda (Sundargarh) on multi-circuit tower for about 17km along with associated line bays in GIS at Jharsuguda.
- 7.7 In view of non-implementation of NSL generation project (1320 MW), proposed relinquishment of about 950 MW LTA by M/s Jindal and splitting of generation units by GMR (3x350 MW) which are being pooled at Angul 400 kV bus, it is suggested that requirement of 400/765 kV ICTs at Angul may be reviewed.
- 7.8 Members may discuss.
- 8.0 Eastern Region System strengthening Scheme – XVII (ERSS-XVII)**
- 8.1 ERSS-XVII scheme was approved in the 17th standing committee meeting of ER held on 25th May 2015 with following scope of works:
- (i) Augmentation of transformation capacity at POWERGRID substations:**
 - (a) Installation of 3rd 400/220 kV, 1x315 MVA ICT at Durgapur Substation
 - (b) Replacement of 400/220 kV, 2x315MVA ICTs at Malda Substation with 400/220kV, 2x500 MVA ICTs

- (c) Installation of 3rd 400/220 kV, 1x315MVA ICT at New Siliguri Substation
- (d) Replacement of 400/220 kV, 2x315MVA ICTs at Jeypore Substation with 400/220 kV, 2x500MVA ICTs
- (e) Replacement of 400/220 kV, 2x315MVA ICTs at Rourkela Substation with 400/220 kV, 2x500MVA ICTs
- (f) Installation of 400/220 kV, 1x500 MVA ICT at Gaya Substation

Note: *Out of 6 ICTs of 315MVA released after replacement at Malda, Jeypore and Rourkela substations, one each to be used for installation at Durgapur and New Siliguri substations. The other 4 would be utilized as regional spare. In case of space constraint GIS bays may be used wherever required.*

(ii) Conversion of fixed line reactors to switchable Line reactor

- (a) Lakhisarai – Biharsharif 400kV D/c: 50MVAr fixed line reactor at Biharsharif end to be converted to switchable line reactor
- (b) Keonjhar – Rengali 400kV S/c: 63MVAr fixed line reactor at Rengali end to be converted to switchable line reactor

(iii) Additional scope of work at under construction 400/220kV Daltonganj (POWERGRID) substation (being implemented under ERSS-III)

- (a) Creation of 132kV level at Daltonganj (POWERGRID) substation along with 2x160MVA, 220/132kV ICT and associated ICT bays
- (b) 4 nos. of 132 kV line bays

(iv) Reconductoring of Maithon RB - Maithon 400kV D/c line

The existing Twin ACSR Moose line needs to be reconducted with Twin HTLS conductor of ampacity equivalent to that of Quad ACSR Moose: 4 x 798A (for 45°C ambient temperature and 85°C maximum conductor temperature)

(v) Bypassing arrangement of LILO of 400kV lines at Angul

LILO of Meramundali – Bolangir/Jeypore 400kV S/c line and LILO of one circuit of Talcher – Meramundali 400 kV D/c line has been done at Angul 765/400kV substation. It was proposed to establish a switching arrangement at Angul substation such that, the above 400kV LILOs may be operated either by-passing Angul substation or terminating at Angul sub-station as and when required depending upon the power flow condition.

8.2 With regard to the above scheme, POWERGRID has informed following:

- (a)** Establishment of 400/220kV S/s at Daltonganj was approved as a part of ERSS-III and creation of 132 kV level at Daltonganj was approved as a part of ERSS-XVII. However, implementation of the sub-station got delayed due to delay in land acquisition. The same has been acquired

recently and therefore, it has been proposed to implement the scope of works associated with Daltonganj S/s in both the schemes simultaneously for better coordination. Further, due to urgency of implementation of Daltonganj S/s, the ERSS-XVII scheme has been split into two parts to facilitate ease of implementation viz. i) ERSS-XVII (Part-A) - scope associated with creation of 132 kV level at Daltonganj substation and ii) ERSS-XVII (Part-B) - comprising remaining works of ERSS-XVII.

- (b)** Further, in regard to ICT replacements, it is to mention that number of ICTs replacements have been / are being carried out at 400/220kV level and this has resulted in availability of large number of spares of 400/220kV, 315MVA ICT. Additionally, CERC has denied tariff for these additional spare ICTs, available after replacement.

In view of the above, it is proposed to install additional 400/220kV, 2x315MVA ICTs (from pool of spares) in parallel to existing 400/220kV, 2x315MVA ICTs at Jeypore and Rourkela (resulting to 400/220kV, 2x630MVA capacity) instead of earlier agreed replacement of 2x315 MVA transformers with 2x500 MVA transformers. Further, the 3rd 400/220kV, 315MVA ICT at New Siliguri and Durgapur is also proposed to be installed from pool of spare ICTs. The spare ICTs would be installed after refurbishment, if required. The details are as mentioned below:

Present Spare ICT Location	ICT No.	Age	Proposed new location for installation
Malda	ICT-3	8 years	New Siliguri (ICT-3)
Purnea	ICT-2	4 years	Durgapur (ICT-3)
Patna	ICT-2	7 years	Jeypore (ICT-3)
Sasaram	ICT-2	11 years	Jeypore (ICT-4)
Ballabgarh	ICT-1	9 years	Rourkela (ICT-3)
Mandola	ICT-4	9 years	Rourkela (ICT-4)

(c) Conversion of fixed line reactors

- Lakhisarai – Biharsharif 400kV D/c: The 50MVA fixed line reactor at Biharsharif end was approved to be converted to switchable line reactor. The same has already been taken up for implementation.
- Keonjhar – Rengali 400kV S/c: The 63MVA fixed line reactor at Rengali end was approved to be converted to switchable line reactor. However, due to space constraints at Rengali S/s, it is now proposed to convert the same to bus reactor.

(d) ICT bays in GIS

In the previous Standing Committee Meeting, it was decided to install ICTs under the subject scheme using GIS bays, wherever required. Accordingly, in view of space constraints, ICTs with associated bays in GIS are being implemented for following substations:

- (i) **New Siliguri:** Installation of 3rd 400/220 kV, 1x315MVA ICT is being done with associated 400kV bay in GIS and 220kV bay in AIS.
- (ii) **Gaya:** Installation of 400/220 kV, 1x500 MVA ICT is being done with associated 400kV bay in AIS and 220kV bay in GIS.

8.3 In view of the above, the final scope of works for two parts of ERSS-XVII scheme shall be as follows:

- **ERSS-XVII (Part-A)**

- (i) 2x160MVA, 220/132kV ICT along with associated bays at Daltonganj sub-station
- (ii) 4 nos. of 132 kV line bays

- **ERSS-XVII (Part-B)**

- (i) **Augmentation of transformation capacity at POWERGRID substations:**

- (a) Installation of 400/220 kV, 1x500 MVA ICT at Gaya S/s (400kV bay in AIS and 220kV bay in GIS)
- (b) Replacement of 400/220kV, 2x315MVA ICTs at Malda S/s with 400/220kV, 2x500 MVA ICTs
- (c) Installation of 3rd 400/220kV, 1x315MVA ICT at New Siliguri S/s: to be sourced from pool of spare ICTs (400kV bay in GIS and 220kV bay in AIS)
- (d) Installation of 3rd 400/220kV, 1x315 MVA ICT at Durgapur S/s: to be sourced from pool of spare ICTs
- (e) Installation of 400/220kV, 2x315MVA ICTs at Jeypore S/s (one each in parallel to the existing ICTs): to be sourced from pool of spare ICTs
- (f) Installation of 400/220kV, 2x315MVA ICTs at Rourkela S/s (one each in parallel to the existing ICTs): to be sourced from pool of spare ICTs

Note: For elements from (c) to (f) above, sourcing of old ICTs from pool of spare ICTs shall be as given below.

New location for installation of old ICTs	Source Location of Old ICT
New Siliguri (ICT-3)	Malda (ICT-3)
Durgapur (ICT-3)	Purnea (ICT-2)
Jeypore (ICT-3)	Patna (ICT-2)
Jeypore (ICT-4)	Sasaram (ICT-2)
Rourkela (ICT-3)	Ballabgarh (ICT-1)
Rourkela (ICT-4)	Mandola (ICT-4)

(ii) Conversion of 63MVA fixed line reactor at Rengali end of Keonjhar – Rengali 400kV S/c line to bus reactor

(iii) Reconductoring of Maithon RB - Maithon 400kV D/c line

The existing Twin ACSR Moose line needs to be reconducted with Twin HTLS conductor of ampacity equivalent to that of Quad ACSR Moose: 4 x 798A (for 45°C ambient temperature and 85°C maximum conductor temperature)

(iv) Bypassing arrangement of LILO of 400kV lines at Angul

LILO of Meramundali – Bolangir/Jeypore 400kV S/c line and LILO of one circuit of Talcher – Meramundali 400 kV D/c line has been done at Angul 765/400kV substation. It was proposed to establish a switching arrangement at Angul substation such that, the above 400kV LILOs may be operated either by-passing Angul substation or terminating at Angul sub-station as and when required depending upon the power flow condition.

8.4 Members may discuss and approve the revised scope of ERSS-XVII (Part-A & B).

9.0 Installation of 400/220kV, 500MVA (4th) ICT at Biharsharif

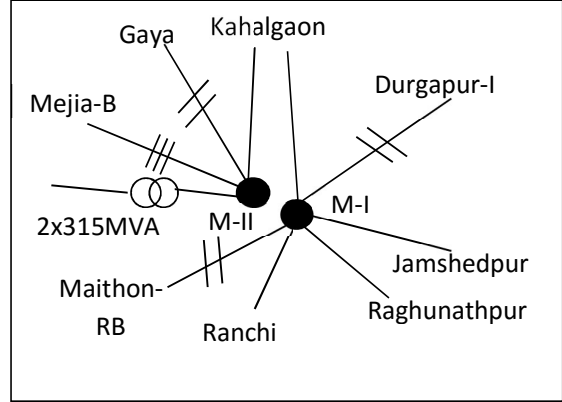
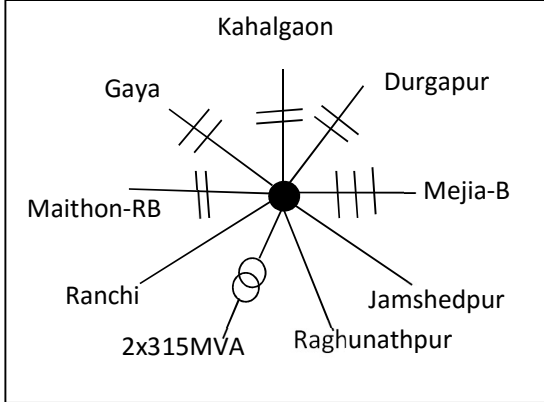
9.1 POWERGRID has informed that the peak loading on 400/220kV, 3x315MVA ICTs at Biharsharif S/s has been constantly observed in the range of about 700-750MW in recent times. Further, bus split at Biharsharif is also under advance stage of implementation. Subsequent to bus splitting, one section would have only one ICT. Thus, keeping in view the loading of ICTs and the requirement of meeting the N-1 security criteria, it is proposed to install 400/220kV, 500MVA ICT at Biharsharif S/s in the bus section having one 315MVA ICT.

9.2 Schematic showing split bus arrangement at Maithon, Durgapur, Kahalgaon and Biharsharif are given below:

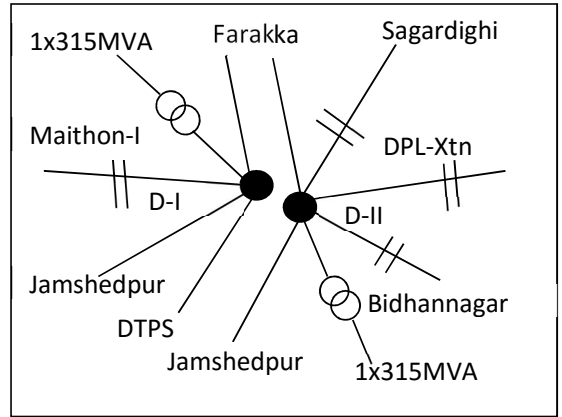
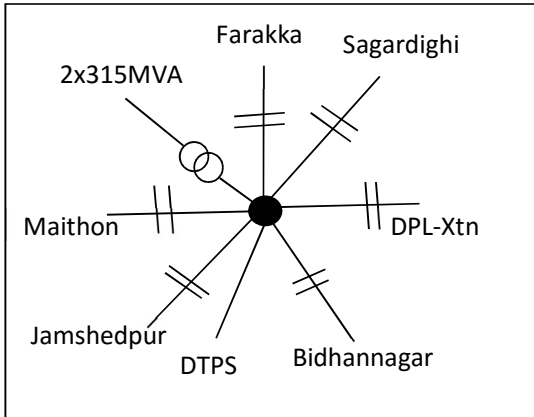
Before Splitting

After Splitting

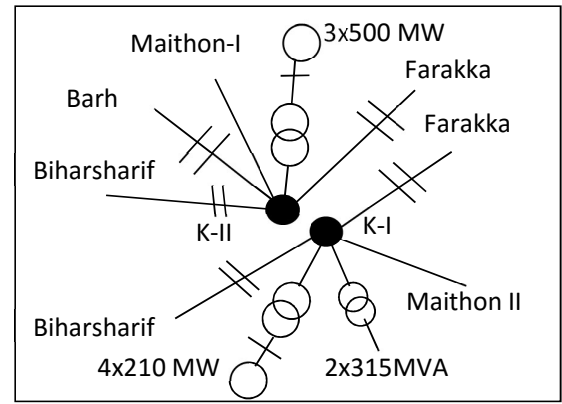
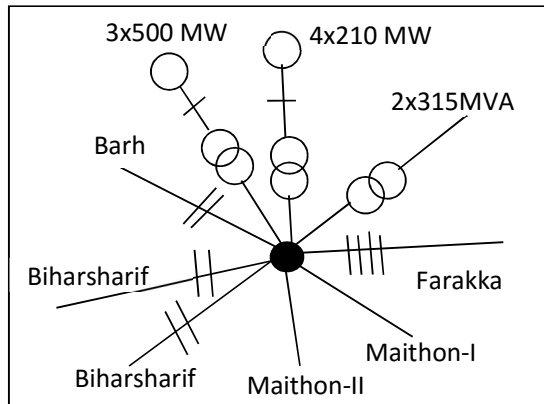
Maithon S/s



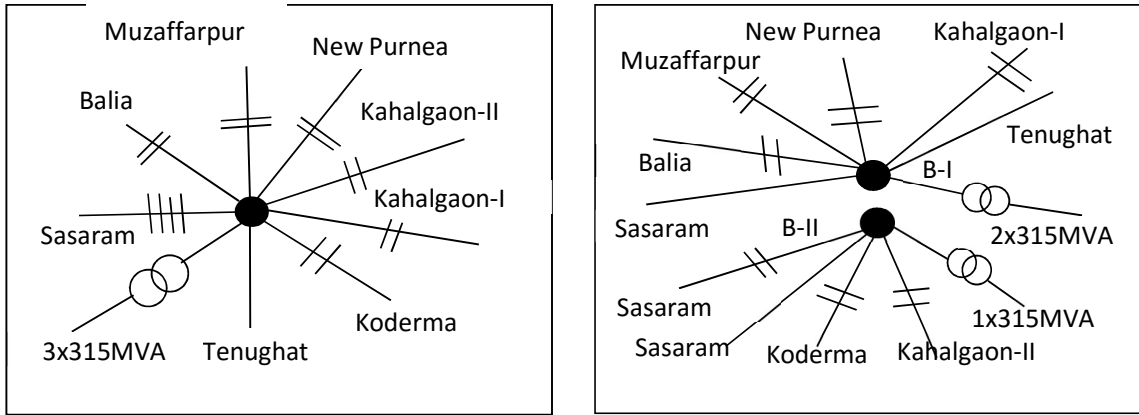
Durgapur S/s



Kahalgaon Switchyard



Biharsharif S/s



9.3 Fault level of ER substations with and without split bus arrangement for March, 2016 and 2021-22 time frame are given below:

Substation Section	kV Level	Fault Level (in kA)		
		Without Split	With Split	Design Capacity
Fault Level - ER (Substations with Bus Splitting) - Mar'16				
BIHARSHARIF-A	400	38.83	26.67	40
BIHARSHARIF-B	400	38.83	20.15	40
KAHALGAON-A	400	42.72	21.09	40
KAHALGAON-B	400	42.72	30.76	40
MAITHON-A	400	48.45	27.32	40
MAITHON-B	400	48.45	19.24	40
DURGAPUR-A	400	38.83	23.88	40
DURGAPUR-B	400	38.83	18.03	40
Fault Level - ER (Substations with Bus Splitting) - 2021-22				
ANGUL-A	765	38.85	14.74	50
ANGUL-B	765	38.85	21.34	50
ANGUL-A	400	72.41	26.83	63
ANGUL-B	400	72.41	29.90	63
JHARSUGUDA-A	765	55.31	36.08	50

JHARSUGUDA-B	765	55.31	22.46	50
JHARSUGUDA-A	400	73.07	48.05	63
JHARSUGUDA-B	400	73.07	35.66	63

9.4 POWERGRID may present necessary studies with above split arrangements.

9.5 Members may discuss.

10.0 Construction of Gaya (PG) – Sonenagar (new) 220 kV D/C line in Phase-3 scheme of BRGF under 12th Plan by BSPTCL

10.1 BSPTCL has submitted that 220 kV GSS at Sonenagar and 220 kV D/C line between Gaya (PG) – Sonenagar GSS is being constructed under Backward Region Grant Fund (BRGF) Phase-III. This is a part of scheme covered in 12th Plan, duly concurred by CEA and sanctioned by Planning Commission. The funding is done through grant.

10.2 Construction of 02 nos. 220 kV line bays at Gaya (PG) is proposed to be implemented by POWERGRID as ISTS work. The line and GSS work at Sonenagar are being done by BSPTCL. BSPTCL may indicate the commissioning schedule of the line, so as to implement the line bays in matching time-frame of the line.

10.3 Members may discuss.

11.0 Establishment of 400/220/132kV Grid Sub-stations at potential load centres in Bihar – Agenda from BSPTCL

11.1 Chief Engineer (Transmission) BSPTCL vide letter dated 19-4-2016 has informed that CEA vide letter no. 69/1/2012-SP&PA-1203-05 dated 15-11-2012 has agreed Transmission System requirement of Bihar for the 12th plan in three parts. Due to better convenience, the entire works covered under Part-2 (Phase-2) i.e. Annexure-II (b) has been divided into two groups by Bihar Grid Company Ltd. (BGCL - a joint venture of BSP(H)CL and POWERGRID) under new head Phase-IV Part-I and Phase-IV Part-II. It is mentioned in the letter that the works covered under Phase-IV Part-I are under execution by BGCL. BSPTCL has forwarded the list of works covered under Phase-IV Part-I to CEA through E-mail, which is given below:

A: Substation

Sl. No.	Details of S/S work
01	Construction of 2x160 MVA + 2x50 MVA 220/132/33 kV new GIS S/S at Chapra

02	Construction of 2x160 MVA + 3x50 MVA, 220/132/33 kV new GIS S/S at Gaya (Manpur)
03	Construction of 2x160 MVA + 2x50 MVA, 220/132/33 kV new GIS S/S at Nawada
04	Construction of 2x160 MVA + 2x50 MVA, 220/132/33 kV new GIS S/S at Sheikhpura
05	Construction of 2x160 MVA + 2x50 MVA, 220/132/33 kV new GIS S/S at Hathidah
06	Construction of 2x160 MVA + 2x50 MVA, 220/132/33 kV new GIS S/S at Jamalpur
07	Construction of 2x160 MVA + 2x50 MVA, 220/132/33 kV new GIS S/S at Sabour

B: LINES

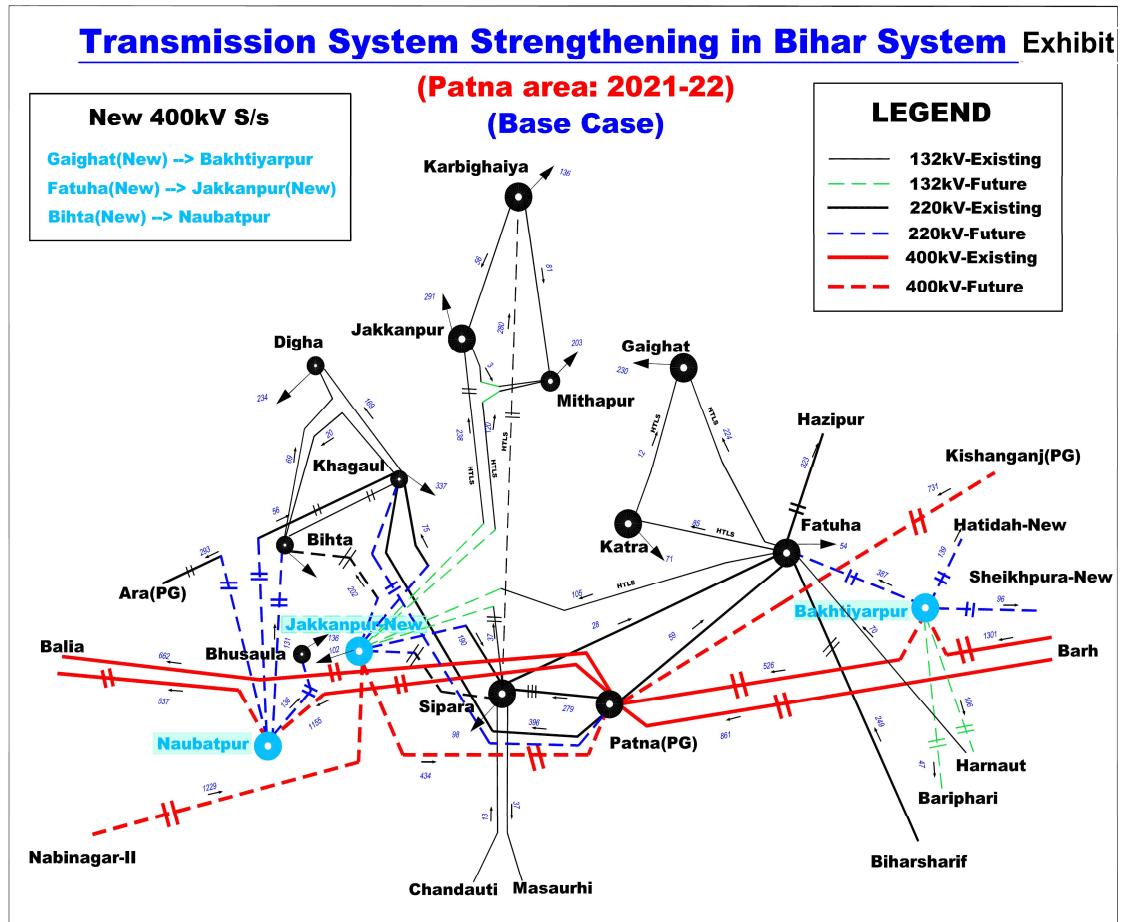
Sl. No.	Details of transmission work	Line Length (Km)
01	Chapra 220/132 kV new S/S – Chapra 132/33 kV S/S, 132 kV D/C line (Zebra conductor)	24
02	Hazipur 220/132 kV new S/S – Chapra 220/132 kV S/S, 220 kV D/C line	47
03	Chapra 220/132 kV S/S – Siwan, 132 kV D/C line	66
04	LILO of one circuit of 132 kV D/C Khagual-Digha line at Bihta	27
05	Patna (POWERGRID)-Khagaul, 220 kV D/C line	26
06	LILO of 220 kV D/C Biharsharif – Bodhgaya line at Gaya (new) (Manpur) S/S	14
07	LILO of 132 kV D/C Bodhgaya-Chandauti (ckt 3 & 4) at Gaya new (Manpur) S/S	Deleted
07.a	132KV D/C Gaya(new) – Jehanabad line	35
08	LILO of 132 kV S/C Bodhgaya-Wazirganj line at Gaya new (Manpur) S/ S	29
09	132 kV S/C (on D/C Tower) Gaya new (Manpur)-Hulasganj line	10
10	220 kV D/C (High Capacity) Gaya (POWERGRID)-Gaya new (Manpur) line	56
11	220 kV D/C (High Capacity) Nawada new-Gaya new (Manpur) line	55
12	132 kV D/C Sheikhpura(New) – Sheikhpura (Old) transmission line (High Capacity)	24
13	220 kV D/C Sheikhpura (New) – Nawada (New) transmission line (High Capacity)	51

14	220 kV D/C (High Capacity) Jamalpur new-Sheikhpura (New) transmission line	125
15	132 kV S/C (on D/C tower) Sheikhpura new – Biharsharif transmission line	40
16	132 kV D/C Nawada (New) – Nawada 132/33 kV (High Capacity) S/S	17
17	LILO of 220 kV Begusarai-Biharsharif line at 220 kV Hathidah	30
18	132 KV D/C Hathidah (New) –Hathidah (Old) transmission line (Zebra Conductor)	8
19	LILO of 132 kV D/C (High Capacity) Sultanganj-Lakhisarai transmission line at Jamalpur	44
20	132 kV D/C Jamalpur (New) – Jamalpur (Old) transmission line (Zebra Conductor)	34
21	132 kV D/C Sabour (New) – Sabour (Old) transmission line (Zebra Conductor)	13
22	LILO of 132 kV D/C Kahalgaon-Sultanganj line at Sabour	18
23	220 kV D/C (High Capacity) Sabour (New) – Jamalpur (New) transmission line	60
Total		852

11.2 The works covered under Phase-IV Part-II which, inter alia, includes transmission system associated with establishment of 3 no. 2x500 MVA 400/220 kV sub-stations around Patna under state sector at Bihta, Fatuha and Gaighat along with downlinking 220 kV & 132 kV system has been revised due to non-availability of land at these locations. In this context, the joint studies carried out by BSPTCL and POWERGRID for the 12th plan has been revised considering new substations at Naubatpur, Bakhtiyarpur and Jakkanpur in place of Bihta, Gaighat and Fatuha respectively. The revised system proposed by BSPTCL associated with above sub-stations along with power flows and other transmission works under Phase-IV part-II are given below:

- a) Naubatpur 400/220/132/33 kV GIS S/s
 - i) Establishment of 2x500 MVA +2x160 MVA+2x80 MVA 400/220/132 kV S/S at Naubatpur
 - ii) LILO of circuits 3 & 4 of Patna (PG)-Balua 400 kV D/c (Quad) line at Naubatpur 400 kV 2x D/C line
 - iii) LILO of both circuits of Ara (PG) – Khagaul (BSPTCL) line at Naubatpur (New) 220 kV 2xD/C

- iv) Naubatpur (New)-Bihta (BSPTCL) 220 kV D/C line
- v) Naubatpur (New)-Bhusaula (New) 220 KV D/C Transmission line
- b) Bakhtiyarpur 400/220/132 kV GIS S/s
 - i) Establishment of 2x500 MVA +2x160 MVA 400/220/132 kV GIS S/S at Bakhtiyarpur
 - ii) LILO of both circuits of Barh – Patna (PG) 400kV D/c (Quad) line-1 at Bakhtiyarpur 400 kV 2xD/C
 - iii) Bakhtiyarpur (New) - Sheikhpura (New) 220 kV D/C line.
 - iv) Bakhtiyarpur (New) - Hathidah (New) 220 kV D/C line.
 - v) Bakhtiyarpur (New) - Fatuha (BSPTCL) 220 kV D/C line.
 - vi) Bakhtiyarpur (New) - Harnaut (BSPTCL) 132 kV D/C line
 - vii) Bakhtiyarpur (New) - Baripahari (BSPTCL) 132 kV D/C line.
 - viii) 132 kV D/C Bakhtiyarpur (New) - Baripahari (BSPTCL) line.
- c) Jakkampur 400/220/132/33 kV GIS S/s
 - i) Establishment of 2x500 MVA +3x160 MVA+3x80 MVA 400/220/132/33 kV GIS S/S at Jakkampur
 - ii) LILO of both circuits of Nabinagar-II – Patna (PG) 400kV D/c at Jakkampur 400 kV 2xD/C
 - iii) LILO of both circuits of Sipara (BSPTCL)-Bihta (BSPTCL) line at Jakkampur (new) 2x220 kV D/C
 - iv) LILO of Khagaul (BSPTCL) - Sipara (BSPTCL) 220 kV S/C line at Jakkampur (New) 220 kV D/C
 - v) LILO of both circuits of Jakkampur-Sipara line at Jakkampur New (being re-conducted with HTLS by BSPTCL) 2x132 kV D/C
 - vi) LILO of 132 KV S/C Jakkampur/Mithapur-Fatuha line at Jakkampur New (being re-conducted with HTLS by BSPTCL) 132 kV D/C
- d) Bhusaula 220/33 kV GIS sub-station
 - i) Establishment of 2x100 MVA 220/33 kV GIS S/S at Bhusaula
- e) Dumraon 220/132/33 kV GIS sub-station
 - i) Establishment of 2x160 MVA+2x80 MVA 220/33 kV GIS S/S at Dumraon
 - ii) LILO of both circuits of 220 kV Ara (PG)-Pusauli (PG) D/c line at Dumraon (New) 2x220 kV D/C
 - iii) Dumraon (New)- Dumraon (BSPTCL) 132 kV D/C
 - iv) Dumraon (New)- Buxarn (BSPTCL) 132 kV D/C
 - v) Dumraon (New)- Jagdishpur (BSPTCL) 132 kV D/C
- f) LILO of one circuit of Purnea-Naugachia / Khagaria 132 kV D/C line at Katihar (BSPTCL) 132 kV D/C



11.3 Managing Director, BSPTCL vide letter dated 18-9-2015 addressed to Chairman, CEA has stated that the demand of Bihar has increased to 3226 MW under unrestricted condition on 18-09-2015 and some of potential load centres in North & South Bihar are unable to meet full demand due to constraint in intra state transmission & distribution system and also transformation constraint at 400/220 kV S/S of POWERGRID at Kafan, Muzaffarpur. The demand may go up to 8774 MW by 2018-19 due to segregation of agricultural feeders. The existing intra-state transmission and distribution system may not be able to cater to this demand effectively unless it is provided with additional inter-connection with inter-state transmission system. In view of above and to meet to meet the 24x7 power for all objective by 2018-19, BSPTCL has proposed establishment of five no. 400/220 kV sub-stations namely Begusarai, Chhapra, & Saharsa in North Bihar and Bhojpur/Bikramganj and Munger in South Bihar. In response to the proposal of BSPTCL, CEA has requested justification for establishment of the above sub-stations and requested BSPTCL to provide certain information regarding a) interconnection of the proposed sub-stations with ISTS system b) Down linking 220 kV/132kV system proposed for drawal of power from these sub-stations c) Present peak load and peak load at the end of 2018-19 anticipated at 220kV/132kV sub-stations to be fed from the above sub-stations, so that

these proposals could be taken up for discussions in the next Standing Committee of Power System Planning for ER.

- 11.4 Director (Projects), BSPTCL vide letter dated 6-4-2016 has stated that BSPTCL and POWERGRID have carried out detailed load flow studies jointly to evolve transmission system requirement for 13th plan time frame i.e. 2017-22 at POWERGRID, Gurgaon. The studies have recommended establishment of 2 no. 400/220/132 kV sub-stations in North Bihar at Sitamarhi and Saharsa and one no. 400/220/132 kV sub-stations in South Bihar i.e. Chandauti (Gaya). Apart from above, BSPTCL has also requested 400/220/132 kV sub-stations at Ara (Bhojpur) and Munger in South Bihar. But no studies / justification have been submitted by the BSPTCL for supporting these two additional sub-stations. The joint studies carried out for the 13th plan is briefly given below:

11.5 **System Study for 13th Plan end condition (2021-22)**

The load demand of Bihar considered in the studies is 11,000MW. The study report is enclosed at **Annexure-VI**.

Base Case:

No additional system strengthening except those already approved & under construction and 3 revised 400/220/132 kV sub-stations proposed around Patna area as discussed above at 11.1 has been considered in the base case.

Following are the observations of Base Case system studies of Bihar grid for 2021-22 time frame:

Observations:

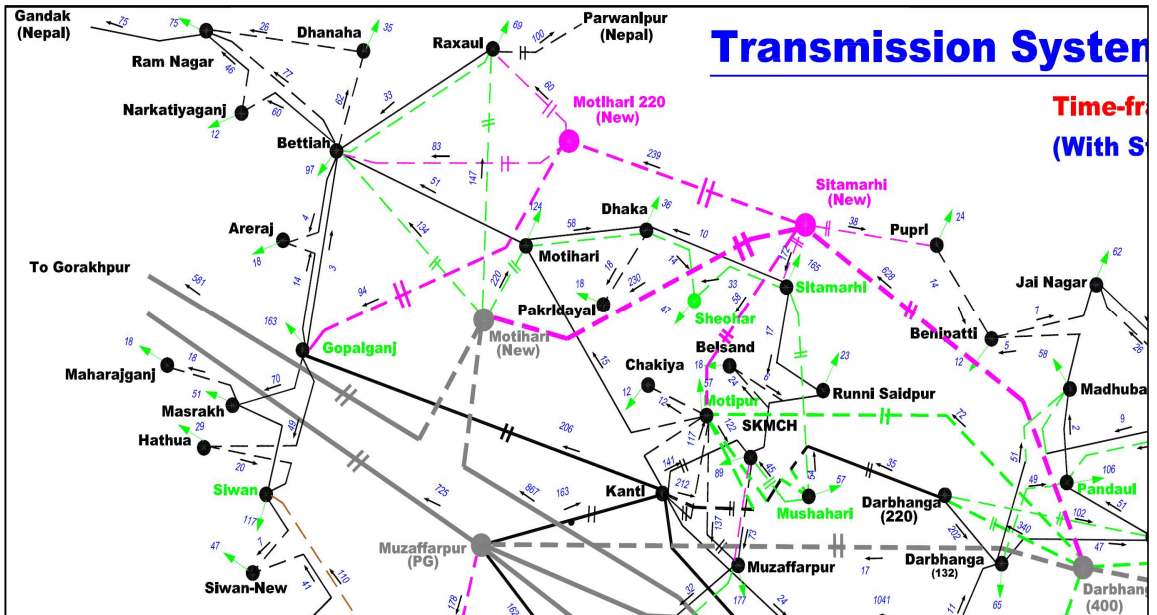
Study results shows that a numbers of transmission lines and ICTs are overloaded in the following areas:

- (i) West Champaran, East Champaran & Sitamarhi districts – Motihari & Sitamarhi areas
- (ii) Gaya, Aurangabad, Rohtas & Bhabua districts – Gaya & Sasaram areas
- (iii) Saharsa, Khagaria and Begusarai districts

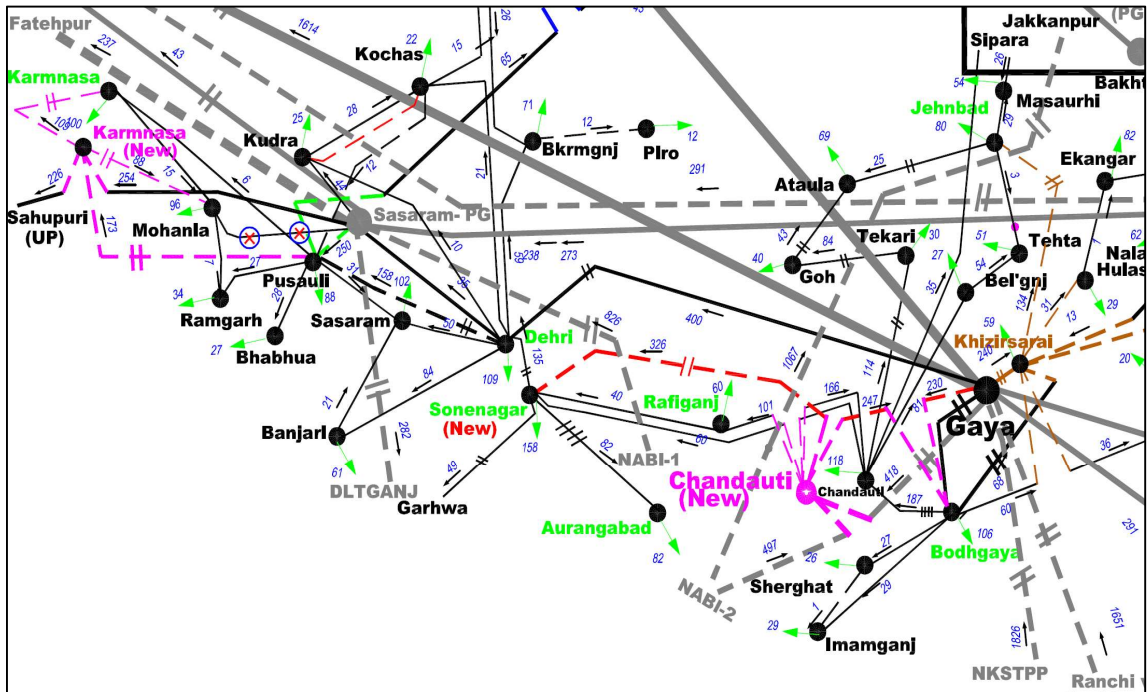
Remedial measures:

- (a) Establishment of three new 400kV substations have been proposed at Sitamarhi, Chandauti and Saharsa and three new 220kV substations have been proposed at Karmnasa, Motihari and Korha (near Katihar).
- (b) The new three 400kV substations at Sitamarhi, Chandauti and Saharsa are proposed to be implemented as an ISTS scheme, whereas the three 220kV substations shall be implemented by BSPTCL.
- (c) Snapshot of load flow study results (Base Case) of the Sitamarhi, Chandauti and Saharsa areas are shown below:

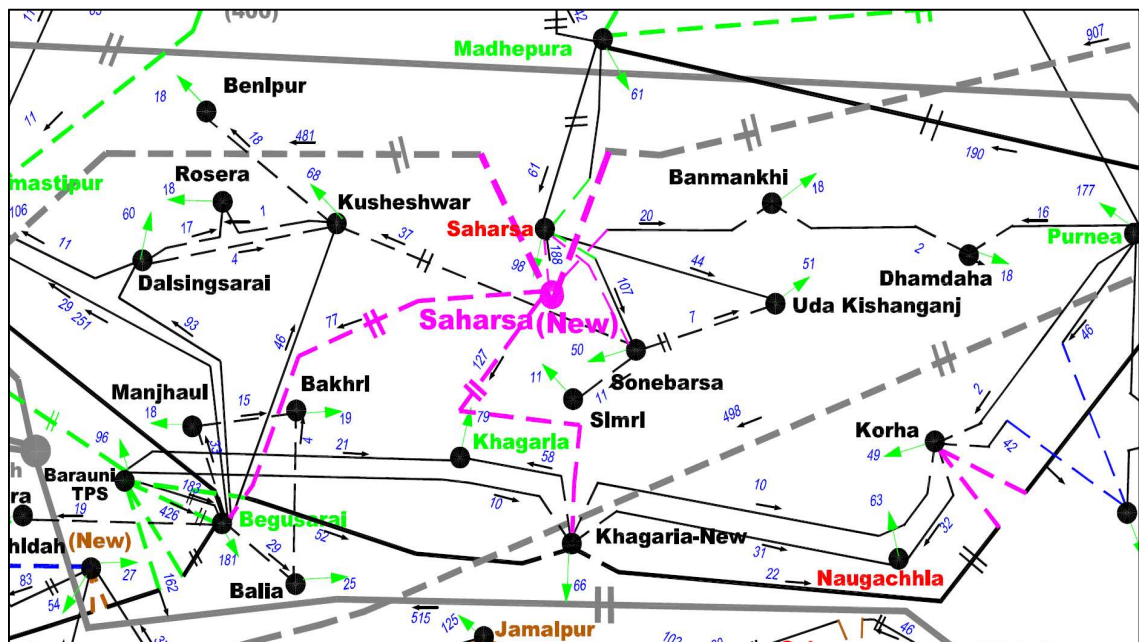
(i) Sitamarhi 400/220/132kV S/s



(ii) Chandauti 400/220/132kV S/s



(iii) Saharsa 400/220/132kV S/s



11.6 The scope of works is proposed with three new ISTS substations in Bihar to meet 13th Plan end demand of the state along with down linking system is given below:

A. To be implemented through TBCB:

(1) Sitamarhi (New) S/s

- i) 400/220/132kV, 2x500MVA + 2x200MVA new S/s at Sitamarhi
- ii) Darbhanga – Sitamarhi (New) 400kV D/c (Triple Snowbird) line
- iii) Sitamarhi (New) – Motihari 400kV D/c (Triple Snowbird) line
- iv) 2x125MVA, 420kV bus reactors along with bays
- v) **400kV Line bays:** 4 nos. for above lines
- vi) **220kV Line bays:** 4 nos. for Sitamarhi (New) – Motipur 220kV D/c and Sitamarhi (New) – Motihari (New) 220kV D/c lines (lines to be constructed by BSPTCL)
- vii) **132kV Line bays:** 4 nos. for Sitamarhi (New) – Sitamarhi 132kV D/c (Single Moose) and Sitamarhi (New) – Pupri 132kV D/c lines (lines to be constructed by BSPTCL)
- viii) **Space for**
 - 400/220kV, 2x500MVA ICT along with associated bays
 - 220/132kV, 2x200MVA ICTs along with associated bays
 - 400kV line bays (including space for line reactor): 6 nos.
 - 220kV line bays: 4 nos.
 - 132kV line bays: 4 nos.

(2) Chandauti (New) S/s

- i) 400/220/132kV, 3x500MVA + 3x200MVA new S/s at Chandauti
- ii) LILO of both circuits of Nabinagar-II – Gaya 400kV D/c (Quad) line of POWERGRID at Chandauti (New)

- iii) 2x125MVA, 420kV bus reactors along with bays
- iv) **400kV Line bays:** 4 nos. for above LILO lines
- v) **220kV Line bays:** 4 nos. for LILO of Gaya (POWERGRID) – Sonenagar 220kV D/c at both Bodhgaya (BSPTCL) and Chandauti (New) substations, so as to form Gaya (POWERGRID) – Bodhgaya (BSPTCL) – Chandauti (New) – Sonenagar 220kV D/c line (LILO to be done by BSPTCL)
- vi) **132kV Line Bays:** 4 nos. for LILO of Chandauti – Rafiganj and Chandauti – Sonenagar 132kV S/c lines (LILO to be done by BSPTCL)
- ix) **Space for**
 - 400/220kV, 2x500MVA ICT along with associated bays
 - 220/132kV, 2x200MVA ICTs along with associated bays
 - 400kV line bays (including space for line reactor): 6 nos.
 - 220kV line bays: 4 nos.
 - 132kV line bays: 4 nos.

Note: Under the scope of BSPTCL

- (i) Reconductoring of Chandauti – Rafiganj – Sonenagar 132kV S/c line with HTLS conductor of 240MVA (ampacity - 1050A)
- (ii) LILO of Chandauti – Rafiganj 132kV S/c line at Chandauti (New)
- (iii) Reconductoring of Chandauti – Sonenagar 132kV S/c line with HTLS conductor of 240MVA (ampacity - 1050A)
- (iv) LILO of Chandauti – Sonenagar 132kV S/c line at Chandauti (New)

(3) Saharsa (New) S/s

- i) 400/220/132kV, 2x500MVA + 2x200MVA new S/s at Saharsa
- ii) LILO of Kishanganj – Patna 400kV D/c (Quad) line of POWERGRID at Saharsa (New)
- iii) 2x125MVA, 420kV bus reactors along with bays
- iv) **400kV Line bays:** 4 nos. for above LILO lines
- v) **220kV line bays:** 4 nos. for Saharsa (New) – Begusarai 220kV D/c and Saharsa (New) – Khagaria (New) 220kV D/c lines (lines to be constructed by BSPTCL)
- vi) **132kV line bays:** 2 nos. for Saharsa (New) – Saharsa 132kV D/c (Single Moose) line (lines to be constructed by BSPTCL)
- x) **Space for**
 - 400/220kV, 2x500MVA ICT along with associated bays
 - 220/132kV, 2x200MVA ICTs along with associated bays
 - 400kV line bays (including space for line reactor): 6 nos.
 - 220kV line bays: 4 nos.
 - 132kV line bays: 6 nos.

- (4) Installation of 400/132kV, 315MVA (3rd) ICT at Motihari substations of Essel Infra

B. To be implemented by POWERGRID:

- (1) Installation of 400/132kV, 315MVA (3rd) ICT at Banka and Lakhisarai substations of POWERGRID
- 11.7 Bihar shall ensure completion of downstream network from the above proposed three ISTS substations in matching time-frame of the substations for better utilisation.
- 11.8 Members may discuss and approve.
- 12.0 Standardisation of OPGW in lieu of One Earth wire in all Transmission lines**
- 12.1 The Power System requirement for Communication is increasing multi fold due to:
- (a) Special Protection Scheme
 - (b) Ever increasing data reporting to Load Dispatch Centre
 - (c) Phasor measurements based data collection and reporting
 - (d) Remote monitoring/operation of sub-station/elements
 - (e) Differential protection on Lines
- 12.2 The practice of putting fibre in select lines leads to situation where station connectivity is held up due to identified line delay, LILO of under construction line etc.
- 12.3 OPGW installation on existing lines is taking long time/delayed due to shut down, ROW issues as well as capacity constraints of executing agencies.
- 12.4 It is proposed to include one 24 Fibre (OPGW) in all transmission lines which will ensure availability of wideband Communication from all substations to cater bandwidth for various power system application for which communication equipment (SDH– STM-16) shall be provided at all upcoming substations.
- 12.5 Members may discuss and approve.
- 13.0 Downstream 220kV or 132kV system development by STUs from the various commissioned and on-going ISTS substations**
- 13.1 Under the ERSS-III scheme, following new 400kV substations have been / are being implemented by POWERGRID:
- 2x200 MVA, 400/132kV S/s at Lakhisarai and Banka in Bihar
 - 2x315 MVA, 400/220kV S/s at Chaibasa in Jharkhand
 - 2x315MVA+2x160MVA, 400/220/132kV S/s at Daltonganj in Jharkhand

- 2x315 MVA, 400/220kV S/s at Bolangir & Keonjhar and 2x500 MVA, 400/220kV S/s at Pandiabil in Odisha

13.2 The substations at Lakhisarai, Banka, Chaibasa, Bolangir and Keonjhar have been commissioned and that at Pandiabil is expected to be commissioned shortly. Daltonganj S/s is expected by Mar'17. Following downlinking network along with expected commissioning schedule was informed by STUs in the previous meeting(s):

(a) Banka 400/132kV S/s: Existing

- (i) LILO of both circuits of Banka (BSPTCL) – Sabour (BSPTCL) 132kV D/c line at Banka (POWERGRID) – *June'15*
- (ii) Banka (POWERGRID) – Sultanganj (BSPTCL) 132kV D/c line – *May'15*

(b) Lakhisarai 400/132kV S/s: Existing

- (i) Lakhisarai (POWERGRID) – Lakhisarai (BSPTCL) 132kV D/c line – *completed except railway crossing*
- (ii) Lakhisarai (POWERGRID) – Jamui (BSPTCL) 132kV D/c line – *June'15*

(c) Chaibasa 400/220kV S/s: Existing

- (i) Chaibasa (POWERGRID) – Chaibasa (JUSNL) 220kV D/c [1st line]
- (ii) Chaibasa (POWERGRID) – Chaibasa (JUSNL) 220kV D/c [2nd line]

(d) Daltonganj 400/220/132kV S/s: Expected by Mar'17

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

(e) Bolangir 400/220kV S/s: Existing

- (i) LILO of one ckt of Sadeipalli – Kesinga 220kV D/c at Bolangir – *July'15*
- (ii) LILO of one ckt of Katapalli - Sadeipalli 220kV D/c at Bolangir – *June'15*

(f) Keonjhar 400/220kV S/s: Existing

- (i) Keonjhar (POWERGRID) – Keonjhar (OPTCL) 220kV D/c – *by 2019*
- (ii) Keonjhar (POWERGRID) – Turumunga (OPTCL) 220kV D/c – *by 2019*

(g) Pandiabil 400/220kV S/s: Expected by Apr'16

- (i) Pratapsasan (OPTCL) – Pandiabil (POWERGRID) 220kV D/c – *Dec'15*
- (ii) LILO of one circuit of Atri – Puri (Samangara) 220kV D/c line at Pandiabil (POWERGRID) – *Dec'15*

13.3 STUs of Odisha, Bihar and Jharkhand may update the status.

13.4 Additionally, Bihar and West Bengal may indicate status of downlinking network from following under construction ISTS substations:

(a) Kishanganj: 2x500MVA, 400/220kV – Bihar

(i) Kishanganj (POWERGRID) – Kishanganj (BSPTCL) 220kV 2xD/c

(b) Darbhanga: 2x500MVA, 400/220kV – Bihar

(i) Darbhanga (ISTS) – Darbhanga (BSPTCL) 220kV D/c

(ii) Darbhanga (ISTS) – Motipur 220kV D/c

(iii) Darbhanga (ISTS) – Samastipur New 220kV D/c (S/c strung)

(iv) Darbhanga (ISTS) – Laukhi (earlier Supaul New) 220kV D/c

(c) Motihari: 2x200MVA, 400/132kV – Bihar

(i) Motihari (ISTS) – Motihari (BSPTCL) 132kV D/c

(ii) Motihari (ISTS) – Betiah 132kV D/c

(iii) Motihari (ISTS) – Raxaul 132kV D/c

(d) Alipurduar: 2x315MVA, 400/220kV – West Bengal

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

13.5 States may also indicate the planned downlinking network from following under construction substations:

(a) Rajarhat 400/220kV S/s – West Bengal

(b) Dhanbad 400/220kV S/s – Jharkhand

14.0 2 nos. 400kV line bays at Muzaffarpur for Muzaffarpur – Dhalkebar 400kV D/c line

14.1 The interconnection between India and Nepal through Muzaffarpur – Dhalkebar (Nepal) 400kV D/c (to be initially operated at 220kV) line has been recently commissioned and is being operated at 132 kV, due to delay in implementation of 220 kV S/S at Dhalkebar (Nepal). In the 2nd Joint Steering Committee meeting on India-Nepal Cooperation in Power Sector held on 29th Jan 2016 at Kathmandu, Nepal, it was decided to operate the line at 220kV level by Oct 2016 and at rated voltage level of 400kV by Dec 2017. To operate the line at 400kV, 2 nos. 400kV line bays shall be required at Muzaffarpur 400/220kV S/s and 400/220kV substation needs to be established at Dhalkebar (Nepal).

14.2 Accordingly, it is proposed to construct 2 nos. 400kV line bays at Muzaffarpur substation of POWERGRID for operation of Muzaffarpur – Dhalkebar 400kV D/c line (presently operated at 132kV) at its rated voltage level of 400kV.

These line bays are proposed to be constructed by POWERGRID as part of ISTS.

14.3 Members may approve.

15.0 Re-conductoring of Rangpo – New Siliguri 400kV D/c (Twin Moose) line and new 220/132kV, 100MVA (4th) ICT at Rangpo

15.1 POWERGRID has informed that power from following generation project in Sikkim, is to be evacuated from Rangpo:

Sl. No.	Generation Project	Unit size (in MW)	Installed Capacity (in MW)	Pooling Point
Phase – 1				
1	Teesta Urja Ltd. / PTC (Teesta-III)	6x200	1200	Rangpo
2	Lanco Energy Pvt. Ltd. (Teesta-VI)	4x125	500	Rangpo
3	DANS Energy Pvt. Ltd. (Jorethang)	2x48	96	New Melli
4	JAL Power Corporation (Rangit-IV)	3x40	120	New Melli
5	Madhya Bharat Power Corporation Ltd. (Rongnichu)	2x48	96	Rangpo
6	Gati Infrastructure Ltd (Chuzachen)	2x49.5	99	Rangpo
7	Gati Infrastructure Bhasmey Power Pvt. Ltd. (Bhasmey)	2x25.5	51	Rangpo
		Sub-Total	2162	
Phase-2				
8	Shiga Energy Pvt. Ltd. (Tashiding)	2x48.5	97	Legship Pool
9	Sneha Kinetic Power Projects Ltd. (Dickchu)	2x48	96	Dikchu Pool
10	Panan Himagiri Hydro Energy Ltd.	4x75	300	Mangan
		Sub-Total	493	
Others				
11	Sikkim Hydro Power Ventures Ltd. (Rangit-II)	2x33	66	Legship Pool
Existing				
12	Teesta-V (NHPC)	3x170	510	Rangpo

Sl. No.	Generation Project	Unit size (in MW)	Installed Capacity (in MW)	Pooling Point
		Total	3231	

Note: Projects at Sl. No. 3 & 6 have been commissioned and the one at Sl. No. 12 exists.

15.2 Following transmission system is existing / under construction for power evacuation from above projects:

- (a) Legship Pool – New Melli 220kV D/c
- (b) New Melli – Rangpo 220kV D/c
- (c) Dikchu Pool – Samardong – Rangpo 220kV D/c
- (d) Rangpo – Siliguri 400kV D/c (Twin)
(Formed after LILO of Teesta-V – Siliguri 400kV D/c at Rangpo)
- (e) Rangpo – Kishanganj 400kV D/c (Quad)
(Formed after LILO of Teest-III – Kishanganj 400kV (Quad) D/c at Rangpo)

15.3 From above, it is seen that about 3250MW of power is incident at Rangpo 400kV level and for power evacuation there are only two 400kV links as mentioned above. In case of N-1-1 outage of 400kV Quad Moose lines emanating from Rangpo S/s, the twin lines would get overloaded. Accordingly, it is proposed to reconductor the Rangpo – Siliguri 400kV D/c Twin Moose line with Twin HTLS conductor.

15.4 Initially power from only two generation projects – Chuzachen and Bhasmey (total about 150MW) was planned to be pooled at Rangpo 132kV level and accordingly 3x100MVA was planned (considering N-1 security). Now, in view of modification in Sikkim Comprehensive scheme (of Govt. of Sikkim), power from Dikchu HEP will also be pooled at Rangpo at 132kV level.

In view of the above, about 250MW power from three generation projects viz. Chuzachen, Bhasmey and Dikchu would be injected at 132kV level at Rangpo S/s. In case of outage of one 220/132kV ICT at Rangpo during off-peak condition when drawl by Sikkim at Gangtok S/s is very less, the other two ICTs would get overloaded. Therefore, it is proposed to install new 220/132kV, 100MVA ICT at Rangpo.

15.5 POWERGRID may provide LTA quantum sought by each generation project in Sikkim and expected time of commissioning / commencement of LTA.

15.6 In view of the above, members may discuss the following:

- (a) Reconductoring of Rangpo – Siliguri 400kV D/c Twin Moose line with Twin HTLS conductor along with suitable modification in line bay equipment at both ends (*Ampacity of single HTLS shall be 1596A – equivalent to Twin*

ACSR Moose cond. for 45°C ambient and 85°C maximum conductor temperature).

(b) Installation of 4th 220/132kV, 100MVA ICT at Rangpo S/s

16.0 Conversion of fixed line reactor at Purnea end of Kishanganj – Purnea 400kV D/c line to switchable line reactor

16.1 POWERGRID has informed that Siliguri – Purnea 400kV D/c (Quad) line is being LILO at Kishanganj S/s and the same is expected to be commissioned shortly. Presently, one circuit of Siliguri – Purnea 400kV D/c line has 63MVAR fixed line reactor at Purnea end. After LILO of the subject line at Kishanganj S/s, length of Kishanganj – Purnea section would be about 72km.

16.2 In view of the above, it is observed that the one circuit of Purnea – Kishanganj 400kV D/c (after LILO) is becoming over compensated (about 108%). Accordingly, it is proposed that the 63MVAR fixed line reactor at Purnea end in one circuit of Kishanganj – Purnea 400kV D/c (Quad) line may be converted to switchable line reactor.

16.3 POWERGRID may present the agenda item.

16.4 Members may discuss.

17.0 Transmission system for evacuation of power from Nabinagar-II STPP (1980MW) of NTPC

17.1 POWERGRID has informed that the transmission system for evacuation of power from Nabinagar-II STPP of NTPC is being implemented by POWERGRID with following scope of works:

- (a) Nabinagar-II – Gaya 400kV D/c line with Quad moose conductor
- (b) Nabinagar-II – Patna 400kV D/c line with Quad moose conductor
- (c) Additional 1x1500MVA, 765/400kV ICT at Gaya

17.2 POWERGRID has informed that there are corridor constraints near Nabinagar-II generation project due to thick population in the area. Accordingly, about 7km Multi-Circuit section has been considered at Nabinagar-II end for both the evacuating lines.

17.3 In view of the above, members may approve construction of 7km Multi-Circuit section for both lines viz. Nabinagar-II – Gaya 400kV D/c (Quad) and Nabinagar-II – Patna 400kV D/c (Quad) at Nabinagar-II end.

18.0 Talcher Stage-III (2x660MW): Application for Connectivity of 1320MW and Long Term Access (LTA) of 622.05MW

18.1 The Connectivity & LTA application of NTPC for Talcher-III generation project was discussed in the 10th Connectivity and LTA meeting held on 25th May 2015, wherein following system was proposed for LTA:

- Talcher-III – Angul 400kV D/c line (HTLS equivalent to Quad Moose)
- 18.2 In the meeting, Odisha proposed construction of Talcher-III – Meramundli-B 400kV D/c line for drawl of its share. In view of Odisha's proposal, issue of paralleling of ISTS & STU (Odisha) network at Talcher-III generation switchyard was discussed and it was decided to resolve the matter in a separate meeting.
- 18.3 In view of the same, CEA convened a meeting on 04th Nov 2015 to resolve the issue of drawl of power by Odisha. In the meeting it was decided that, GRIDCO would apply for LTA of 622MW (Odisha's share) from Talcher-III project and OPTCL would submit details regarding drawl of Odisha's share. The same is still awaited. Further, in the meeting, it was decided that the evacuation system would be finalised in the Standing Committee Meeting on Power System Planning of Eastern Region.
- 18.4 For evacuation and transfer of power from Tacher-III to beneficiaries, it is proposed to connect the generation project to Angul S/s of POWERGRID through high capacity 400kV D/c line. Accordingly, it is proposed to grant LTA of 622.05MW to NTPC for Talcher-III generation project with following connectivity transmission line:
- (i) Talcher-III – Angul 400kV D/c (Triple Snowbird)

18.5 Member may discuss.

19.0 Interim connectivity to generation projects through LILO arrangement

- 19.1 A number of generation projects in 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.
- 19.2 Hon'ble CERC, after hearing the tariff petition for one such case viz. Transmission System Associated with Phase-1 IPPs in Odisha (Petition No.112/TT/13), where two generation projects (Sterlite and Ind-Barath) are still connected through temporary LILO arrangement, 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."

- 19.3 In this regard, it may be mentioned that there are number of generation projects in Eastern region connected / to be connected through temporary LILO arrangements. List of such generation projects along with anticipated time line as informed by project developers in various meetings is mentioned 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	Sterlite Energy Ltd.	4x600	LILO of one circuit of Rourkela - Raigarh 400kV D/c line (<i>granted in Sept'09</i>)	Sterlite - Jharsuguda 400kV 2xD/c	July'16
2	Ind Barath Energy (Utkal) Ltd.	2x350	LILO of one circuit of Jharsuguda - Raigarh 400kV D/c line (<i>granted in Sept'09</i>)	Ind Barath - Jharsuguda 400kV D/c	Apr'16
3	Gati Infrastructure Ltd. (Chuzachen)	2X49.5	LILO of Rangpo - Melli 132kV S/c line (<i>granted in Nov'07</i>)	Chuzachen - Rangpo 132kV D/c (with Zebra conductor)	EP&D Sikkim may update status of bay
4	DANS Energy Pvt. Ltd. (Jorethang)	2x49	LILO of one circuit of Rangpo - New Melli 220kV D/c line (<i>granted in May'15</i>)	Jorethang - New Melli 220kV D/c	(#)Mar'16

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
5	Sneha Kinetic Power Projects Pvt. Ltd. (Dikchu)	2x48	(*) LILO of one circuit of Teesta-III – Rangpo 400kV D/c line (granted in Dec'14 by CERC)	Dikchu – Dikchu Pool 132kV D/c	(\$)

(*) Under Implementation. Interim granted vide CERC order in Petition no. 157/MP/2014 dated 03rd Dec 2014.

(\$) 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 is Mar/Apr 2019. Developer needs to complete the line in matching time-frame.

(#) DANS Energy Pvt. Ltd. (Jorethang)

In view of delay in completion of Jorethang – New Melli line by generation project developer, Jorethang HEP of Dans Energy Pvt. Ltd. was provided interim connectivity through LILO of one circuit of New Melli – Rangpo 220kV D/c line at Jorethang HEP in the 17th SCM held on 25th May 2015. Therein it was also decided that DEPL shall complete balance portion (from LILO point to New Melli S/s) of its dedicated line along with 2 nos. 220kV line bays at New Melli by Mar'16.

Now, DEPL vide its letters dated 09th Feb 2016 & 25th Feb 2016 has informed that they are making all efforts to complete the transmission line by Mar'16. However, due to floods in Chennai, manufacturing of GIS bay equipment by Alstom (T&D) has been affected and is expected only by May'16. Accordingly, DEPL has requested for allowing extension of completion period by 2 months i.e. to May'16.

19.4 In line with the direction from CERC, the above matter needs to be discussed in Standing Committee meetings and timeline for replacement of LILOs of generation developer by dedicated transmission lines along with further course of action in case of default in meeting the deadlines is to be finalised.

18.1 Member may discuss.

20.0 Tashiding HE Project, Sikkim: Evacuation of Power (Interim Arrangement) – Proposal of Shiga Energy Private Ltd.

- 20.1 Tashiding HEP in Sikkim is in advanced stage of construction and expected to be commissioned by December 2016. The power evacuation system for the project comprises of the following:
- (i) **Immediate Evacuation System (under scope of Gen. Developer)**
 - Tashiding - Legship 220kV D/c line (7km)
 - (ii) **Common Transmission System (under scope of Govt. of Sikkim)**
 - Establishment of 220kV substation at Legship
 - Legship - New Melli 220kV D/c with twin moose conductor
- 20.2 The Legship Pooling station and 220 kV D/C transmission line from Legship Pooling station to New Melli substation, with 2 number GIS bays at New Melli are being implemented by Department of Power, Govt. of Sikkim as a part of Comprehensive Scheme for strengthening of Transmission and Distribution system in Sikkim (being implemented by POWERGRID on consultancy basis).
- 20.3 In the meeting held in CEA with representatives from NLDC, CTU-PGCIL & Shiga Energy on 23.11.2015, it was agreed that in case of delay in Legship Pooling station, the transmission line from Tashiding HEP to Legship Pooling station and transmission line from Legship pooling station to New Melli substation may be directly connected bypassing the Legship Pooling station as an interim arrangement to ensure power evacuation.
- 20.4 In the above said meeting it was also agreed that POWERGRID would expedite the commissioning of 220 kV D/c line from Legship Pooling station to New Melli substation and associated GIS bays to match with the commissioning schedule of THEP (i.e. Dec., 2016). Therefore Shiga Energy has requested for taking the work related to 220 kV D/c transmission line from Legship pooling station to New Melli substation and associated 2 nos. GIS line bays at New Melli on top priority so that the power could be evacuated without any hold up.
- 20.5 In view of the above, members may approve interim connection of Tashiding HEP – Legship Pool and Legship Pool – New Melli 220kV D/c lines by bypassing Legship Pool substation till completion of Legship Pool S/s.
- 21.0 Additional 400 kV D/C line from Derang (Generation project of JITPL) to Angul Pooling Station(PG) – Proposal of JITPL**
- 21.1 JITPL has established a 2x600 MW generating plant at Derang, Odisha. Both the units have been declared under commercial operation and power is being evacuated through Derang-Angul (PG) 400 kV D/C line. M/s JITPL had applied for 1044 MW LTOA after considering drawl of 156 MW by Odisha (GRIDCO) from bus bar of the generating switchyard as per PPA signed with Odisha. Accordingly, M/s JITPL was granted Long Term Open Access (LTOA) of 1044 MW under CERC Regulation. However, POSOCO has granted NOC for 980 MW citing congestion in the transmission system. Therefore, an NOC of 980

MW combined with the connectivity of 1044 MW instead of 1200 MW is resulting into under generation of about 220 MW by JITPL.

- 21.2 Further, Derang - Angul Pool 400 kV D/C line was to be designed for maximum conductor temperature of 95°C as per the minutes of the meeting held on 8-12-2008 and 15-12-2008 at POWERGRID office, Gurgaon regarding grant of LTOA for generation projects in advance stage in Odisha. However, the above dedicated line (Twin Moose with ACSR conductor) has been designed with maximum conductor temperature of 75°C. Hence, in the event of N-1 contingency, the above dedicated line is not able to evacuate full power from the project
- 21.3 In this regard, a meeting was held in the CEA on 16.12.2015 with CEA, CTU, POSOCO & JITPL and JITPL was advised to construct an additional Derang - Angul 400 kV D/C line to meet the N-1 contingency criteria and to cater to the additional units planned at Derang as expansion in future.
- 21.4 Members may discuss.

22.0 Installation of 400/220kV, 500MVA ICT (3rd) at Maithon

- 23.1 POWERGRID has informed that presently, there are 2 nos. 315MVA, 400/220kV ICTs at Maithon S/s of POWERGRID. The split bus arrangement has been made at Maithon sub-station at 400kV level and both the ICTs are located on one side of the bus sectionalizer. In view of growing ICT loading, transformation capacity augmentation by replacement of 2x315MVA ICTs with 2x500MVA ICTs along with addition of 1x125MVA bus reactor was approved in the 14th SCM held in January-2013. The loading of Maithon ICTs has grown to more than 600MVA. Thus, even after replacement of ICTs, the N-1 criteria shall not be met during peak load condition.
- 23.2 Accordingly, members may discuss the installation of one more 400/220kV, 500MVA ICT (3rd) at Maithon S/s. Thus, the total transformation capacity at Maithon S/s shall be 3x500MVA.

23.0 Replacement of 220/132kV, 1x50MVA ICT at Malda with 220/132kV, 200MVA ICT

- 24.1 POWERGRID has informed that at present, there are 220/132kV, 2x160MVA+1x50MVA ICTs at Malda S/s. During the last summer, a peak demand to the tune of 270MVA was observed against an installed transformation capacity of 370MVA. It may be noted that 50MVA ICT is getting heavily loaded during summer and tripping of any 220/132kV ICT would lead to cascaded tripping. Further, it may be noted that the existing 50MVA ICT is more than 20 years old. In view of the above, it is proposed to replace the

existing 50MVA, 200/132 kV ICT at with new 200MVA, 220/132 kV ICT at Malda S/s.

24.2 Members may discuss.

24.0 Installation of 420kV, 1x125MVAR bus reactor at Subhasgram S/s of POWERGRID

25.1 POWERGRID has informed that in the recent past, high voltage (upto 430kV) has been observed at Subhasgram sub-station of POWERGRID. This has at times led to over voltage tripping of lines. Presently, there is no bus reactor at Subhasgram S/s and there is only one 50MVAR line reactor at Subhasgram end of Sagardighi – Subhasgram 400kV S/c line. Accordingly, it is proposed to install 1x125MVAR bus reactor at Subhasgram S/s of POWERGRID for better voltage management.

25.2 Members may discuss.

25.0 Provision of 765kV, 80MVA single phase spare reactor at Ranchi (New) substation of POWERGRID

26.1 POWERGRID has informed that the switchyard layout of 765/400kV Ranchi (New) S/s is Breaker and a half scheme. There are two bus reactors and one line reactor (in Ranchi-New – Dharamjaygarh 765kV S/c, ckt-1) of 765kV, 240MVA capacity on one side (side-1) of the substation (total 10x80 MVA single phase units including one 765kV, 80MVA single phase spare reactor). There are 3 nos. of 240MVA line reactors (1 no. with Ranchi New – Dharamjaygarh 765kV S/c, ckt-2 & 2 nos. with Ranchi New – Medinipur 765kV D/c line under ERSS-XVIII) on the other side (side-2). However, this side (side-2) is not having any spare reactor unit.

26.2 The 765kV, 1-ph spare reactor is installed as ready standby along with 765kV auxiliary bus and 145kV neutral bus arrangement on side-1 such that in case of failure of any single phase reactor on that side the spare reactor can be taken into service in short span of time (without any physical movement of spare reactor). However, in case of failure of any single phase reactor on the side-2, there is no single phase spare reactor available for replacement.

26.3 In view of the above, members may discuss installation of 765kV, 1x80MVA single phase spare reactor at Ranchi (New) substation of POWERGRID on the side-2 also.

26.0 Modification in “Transfer of power from generation projects in Sikkim to NR/WR scheme (HCPTC-3)” for Phase-1 IPPs in Sikkim

27.1 POWERGRID has informed that the LILO of both circuits of Teesta-III – Kishanganj 400kV D/c at Rangpo was agreed as a part of transmission system associated with Sikkim Phase-I generation projects and the LILO lines i.e. 400kV 2xD/C are under construction. One 400kV D/c LILO line is expected to be commissioned shortly; however, the 2nd 400kV D/c LILO line has got

delayed due to forest clearance issues. About 8km stretch of the 2nd LILO line involves Tandong Reserve forest. The matter was discussed in the 17th meeting of Standing Committee on Power System Planning in Eastern Region held on 25-05-2015 wherein POWERGRID informed that the 2nd 400 kV D/c LILO section is likely be completed by March, 2017.

27.2 POWERGRID site officials have indicated that obtaining forest clearance for 2nd 400kV D/c LILO may take substantial time and it may not be feasible to construct the same in near future.

27.3 POWERGRID may present the agenda item.

27.0 Construction of 01 no. 220 kV line bay at Darbhanga (400/220 kV) GSS under DMTCL (Darbhanga – Motihari Transmission Company Ltd.)

28.1 BSPTCL vide letter no. 2027/BSPTCL dated 06.04.2016 has requested for construction of 01 no. 220 kV line bay at Darbhanga (400/220 kV) GSS for termination of 2nd circuit of 220 kV Darbhanga (400/220 kV)-Samastipur (new) (220/132/33 kV) transmission line.

28.2 CEA vide letter no. 69/1/2012-SP&PA/1203-05 dated 15.11.2012 has cleared following transmission system of Bihar as a part of 12th plan transmission & sub-transmission system strengthening in Bihar-Phase-1 for delivery of power from Darbhanga 400/220 kV sub-staion:

- i. 220kV D/C Darbhanga (400/220 kV) –**Bikhanpura new** transmission line
- ii. 220kV D/C Darbhanga (400/220 kV) – Darbhanga (220 kV BSPTCL) transmission line
- iii. 220kV D/C Darbhanga (400/220 kV) – Supoul (Laukahi) (220/132 kV) transmission line
- iv. 220kV DCSS Darbhanga (400/220 kV) – Samastipur (new) (220/132/33 kV) transmission line

28.3 BSPTCL has informed that 2nd circuit stringing of 220kV Darbhanga (400/220 kV) – Samastipur (new) (220/132/33 kV) DCSS transmission line is required to be done at this stage due to the following reasons-

- a) To have extra source at 220 kV level from Darbhanga (400/220 kV).
- b) To cater rising demand of electricity in future as demand is increasing exponentially due to implementation of different scheme of DISCOMS and PFA (24x7) scheme of GOI.
- c) To avoid ROW, if this worked is delayed and taken up at later stage. ROW is increasing day by day. Presently sever ROW is being faced in construction of transmission lines.

28.4 Darbhanga 400/220 kV GSS is under construction by M/s DMTCL under TBCB route. As per the scope of work given to M/s DMTCL, there is provision of 7 Nos. 220 kV line bays and space for 6 Nos. 220 kV future line bays.

28.5 The seven (7) no. of 220 kV line bays at Darbhanga are being utilized by BSPTCL for termination of the double circuit line to Motipur, Darbhanga (BSPTCL) and Supoul

(Laukahi), and 220 kV DCSS line to Samastipur (new). Beyond these 7 bays, M/s DMTCL is to provide only space for six (6) bays.

- 28.6 CEA has given no objection for construction of 01 no. 220 kV line bay at Darbhanga (400/220 kV) GSS for termination of 2nd circuit of 220 kV Darbhanga (400/220 kV)-Samastipur (new) (220/132/33 kV) transmission line. The cost of line bay will be borne by BSPTCL.
- 28.7 Members may take note of it.