

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 6TH MEETING OF STANDING COMMITTEE ON TRANSMISSION PLANNING FOR STATE SECTORS HELD ON 09.07.2018 (MONDAY) AT 11:00 HOURS AT ERPC, KOLKATA

List of participants is enclosed at **Annexure-A**.

1. **Confirmation of minutes of 5th SSCM of ERPC held on 03.08.2017.**

The minutes were circulated vide letter dated 25.08.2017 to all the constituents and also uploaded in ERPC website.

No comments have been received till date.

Members may confirm the minutes.

Deliberation in the meeting

Members confirmed the minutes.

2. **Proposal for installation of 125 MVAR Bus 420 kV Bus Reactors each at Gokarna, Kharagpur, New Chanditala, New PPSP and Durgapur 400 kV sub-stations of WBSETCL for proper reactive power management of the grid.**

In view of high ratio of peak vs off-peak demand of West Bengal it is experienced very high leading VAR dominating in the state grid due to capacitive effect of lightly loaded lines, so it is felt necessary to go for effective reactive power control for the state grid for proper reactive power management. During winter off-peak hours very high MVAR is generated from the lightly loaded EHT lines resulting very high system voltage (beyond IEGC specified limit) at different buses of important 400 kV substations of WBSETCL.

It is observed and reported that bus voltages at different 400 KV EHT substations are exceeding IEGC specified limit (+5%) during winter off-peak hours. As a result of this extremely high system voltage different equipments including LA etc are damaged and to nullify the capacitive effect of the under loaded lines, number of lightly loaded lines are made off to control the excessive leading VAR, which finally results reduction of redundancy/ network flexibility.

This scenario of the EHT grid of West Bengal is well supported by the fact that the state has paid Rs.23.76 Cr as VAR charge during the year 2016-17, in which the maximum charge is paid for leading VAR or for injecting VAR to the grid during off-peak hours.

Moreover with due consideration of upcoming 400 kV and 765 kV lines in the state, it is felt extremely needed to install additional Bus Reactors each at Gokarna, Kharagpur, New Chanditala, New PPSP and Durgapur 400 kV sub-stations of WBSETCL for proper reactive power management of the grid.

So in consultation with SLDC scheme has been formulated based of study conducted by SLDC. Study revealed the necessity of additional bus reactors, which will not only reduce

capacitive effect of lightly loaded lines in “(N-0)” condition, but also in case of outage of one Reactor in those selected sub-stations, i.e. in “(N-1)” condition, the additional reactors will be in circuit to give the VAR support up to desire level.

WBSETCL has conducted feasibility study and space is available at respective substations for installation of the proposed 420 kV Bus Reactors.

A table is given below to show the existing vs proposed status of bus reactors in the state.

Sl. No.	Name of 400 kV Sub-station	Existing Capacity (MVAR)	Capacity under Installation (MVAR)	Proposed Capacity (MVAR)	Max. Bus Volt. in Dec 17 (kV)
1	Durgapur	1x50 (BR)	-	1x125 (BR)	422
2	Kharagpur	1x80 (BR)	-	1x125 (BR)	429
3	New Chanditala	1x80 (BR)	-	1x125 (BR)	430
4	Gokarna	1x80 (BR)	-	1x125 (BR)	425
5	New PPSP (GIS)	1x80 (BR)	-	1x125 (BR)	428
6	Arambag	1x50 (BR)	1x125 (BR)	-	436
7	Jeerat	1x50+1x50 (BR) & 1x63 (LR)	-	-	428

With the above background, the matter is placed in the standing committee for approval.

Deliberation in the meeting

WBSETCL explained that they are facing severe high voltage at 400kV substations during winter off-peak hours. The high voltage problem would be further aggravated after commissioning of a number of new 400kV lines in their system within a year or two and some of the new 765 kV transmission lines of Powergrid in near future. They are planning to install 125 MVAR Bus Reactors each at Gokarna, Kharagpur, New Chanditala, New PPSP and Durgapur 400 kV substations of WBSETCL to overcome the high voltage problem.

It was also informed that the issue of high voltage in West Bengal system was discussed in monthly OCC meetings.

SSCM in principle agreed to the proposal and advised to match the schedule of installation of reactors with the commissioning of new transmission lines.

SSCM advised WBSETCL to place the schedule of new 400kV and 765 kV transmission lines (including line length & conductor type etc.) to be connected with the above substations along with the tentative schedule of installation of new reactors in 1st ERSCT meeting scheduled to be held on 16th July 2018.

3. Establishment of one 220/132/33 kV Sub-station near Falakata in Jalpaiguri/Coochbehar by LILO of Birpara - Alipurduar 220 kV D/C line of POWERGRID.

The load growth at Coochbehar, Dinhata, Falakata & Mathabanga area in Jalpaiguri & Coochbehar district is taking place rapidly. Presently, power supply in these areas are met from Coochbehar 132 kV & Mathabanga 132 kV sub-stations. One 132 kV sub-station is under construction at Dinhata which is expected to be commissioned by 2018-19.

Main source of power of this area is Alipurduar 220 kV sub-station. There is another 132 kV connectivity of Mathabanga from Moinaguri 132 kV sub-station. Again, Moinaguri 132 kV sub-station gets power from Birpara 220 kV & NJP 220 kV sub-station via Mohitnagar 132 kV sub-station. One power map is enclosed for overview of the scenario.

For reliable power supply in that area WBSETCL has contemplated establishment of one 220/132/33 kV sub-station with 2x160 MVA, 220/132 kV Transformers near Falakata with D/C LILO of existing Birpara (PG) – Alipurduar (PG) 220 kV D/C line and 132 kV D/C interconnections to the nearby Mathabanga, Dinhata & Coochbehar 132 kV sub-stations. The entire work would be executed by WBSETCL at their own cost.

The matter is placed for approval of the Committee.

Deliberation in the meeting

WBSETCL explained the proposal.

SSCM in principle agreed to the proposal and advised WBSETCL to submit the details of line length, type of conductor and expected load growth details of Coochbehar, Dinhata, Falakata & Mathabanga area.

4. Construction of 2 nos. 132 kV feeder bays at Malda 400 kV substation of POWERGRID for evacuation of power.

For effecting power supply at rated voltage with reliability, WBSETCL planned to establish one 132 kV sub-station at Manikchak/Paranpur in Malda district. Due to increase of load proper voltage could not be maintained at the consumer premises due to long 33 kV incoming line from Malda 132 kV sub-station of WBSETCL.

The main source of power in Malda district is 400/220/132 kV sub-station of POWERGRID at Malda. Installed capacity of Malda 400 kV sub-station is 3x160 MVA at 220/132 kV level. But for evacuation of power, there exists only one 132 kV D/C line presently with HTLS conductor.

Location map of the area is enclosed for reference. From the location map, it is observed that Manikchak/Paranpur is located nearer to Malda 400 kV sub-station of POWERGRID.

In view of above, it is proposed 132 kV D/C connectivity of Manikchak/Paranpur 132 kV sub-station with Malda (PG) 400 kV sub-station which will serve both evacuation of power as well as improvement of power supply condition in the district.

Two nos. 132 kV bays at Malda (PG) 400 kV sub-station will be constructed by WBSETCL at its own cost.

The matter is placed for approval of the committee.

Deliberation in the meeting

WBSETCL explained the proposal. WBSETCL informed that after commissioning of 220kV Gajol S/s on LILoing of 220 kV Malda-Dalkhola D/C, the loading on 220/132 kV ICTs at Malda S/s would be reduced. At present, Manikchak load is being fed from 33 kV Malda-Manikchak line from 132 kV Malda S/S of WBSETCL. 132 kV D/C connectivity of Manikchak/Paranpur 132 kV sub-station with Malda (PG) 400 kV sub-station will serve to draw higher quantum of power as well as improvement of voltage condition in the district.

SSCM in principle agreed to the proposal and advised WBSETCL to carry out detailed study and place the study results in 1st ERSCT meeting scheduled to be held on 16th July 2018.

5. Transmission system for evacuation of new power projects in Odisha

(A) 4X800MW OTPCL GENERATION EVACUATION

- (i) 765kV Angui-Kamakhyanagar-Begunia DC Line
- (ii) 400kV LILo of 400kV Pandiabii-Narendrapur DC Line to 765/400kV Begunia.

(B) 2X660MW TIPS-III GENERATION EVACUATION

- (i) 400KV TIPS-III-400KV Meramundali-B SC Line
- (ii) 400KV TIPS-III-400KV Meramundali SC Line

(C) 400KV TRANSMISSION STRENGTHENING SYSTEM

- (i) 400kV Narendrapur-400kV Jayanagar (PG) LILo at Therubali Switching Station
- (ii) 400kv Switching Station at Therubali

(D) 4X800 MW NYVELILIGNITE CORPORATION (NLC) AT TALABIRA

- (i) 400kV NLC- 400Kv Lapanga Sub-station DC Line
- (ii) 400kV Lapanga -400kV Bolangir PG DC Line

(E) 280 MW SOLAR POWER EVACUATION SCHEME

- (i) 400/220kV Pooling Sub-station at JUJUMARA with 400kV LILO of Lapanga-Meramundali DC Line
- (ii) 132/33kV POOLING Sub-station at Manmunda with LILO of 132kV Boudh-Sonepur Line.

Deliberation in the meeting

OPTCL explained the evacuation system for new power projects coming up in near future with a detailed presentation. Presentation is enclosed at Annexure-5.

Odisha informed the tentative commissioning status of the generation projects:

- *4x800 MW NLC generation project would be commissioned by 2022.*
- *4x800 MW OTPC and Odisha Mines Corp. Ltd. joint venture would be commissioned by 2022*
- *2x 660 MW Talcher stage III would be commissioned by 2023*
- *280 MW solar power plant at Jujumara and Manmunda would be commissioned by 2019*

SSCM in principle agreed to the proposals and advised Odisha to submit the details of line length, conductor type and expected date of commissioning of the transmission lines.

6. Intra-State Transmission System(Intra-STs) plan of JUSNL, Jharkhand up to 2021-22

The perspective transmission plan of JUSNL was taken-up for discussion in the 18th SCM of ER, wherein it was decided that a separate meeting may be held at CEA to discuss the perspective intra-state transmission plan of JUSNL along with DVC. Accordingly, various rounds of discussions were held with all stakeholders at CEA on 23-10-2017, 15-11-2017, 04-12-2017 and 13-12-2017, wherein the perspective intra-state transmission plan of JUSNL was finalised.

JUSNL has informed that as per 19th EPS, the projected load of Jharkhand is 5193MW at the end of 2021-22 (including JBVNL load of 3257 MW and DVC & Tata Steel load as 1936 MW). However, for study purpose, the same have been taken as 7097MW by JUSNL [JBVNL load of 5161MW (including 2 % transmission losses) and DVC & Tata Steel load as 1936 MW]. following additional projected loads of Jharkhand, which were not envisaged in 19th EPS, have been taken into consideration for arriving at the total load projection in JUSNL's jurisdiction by 2021-22:

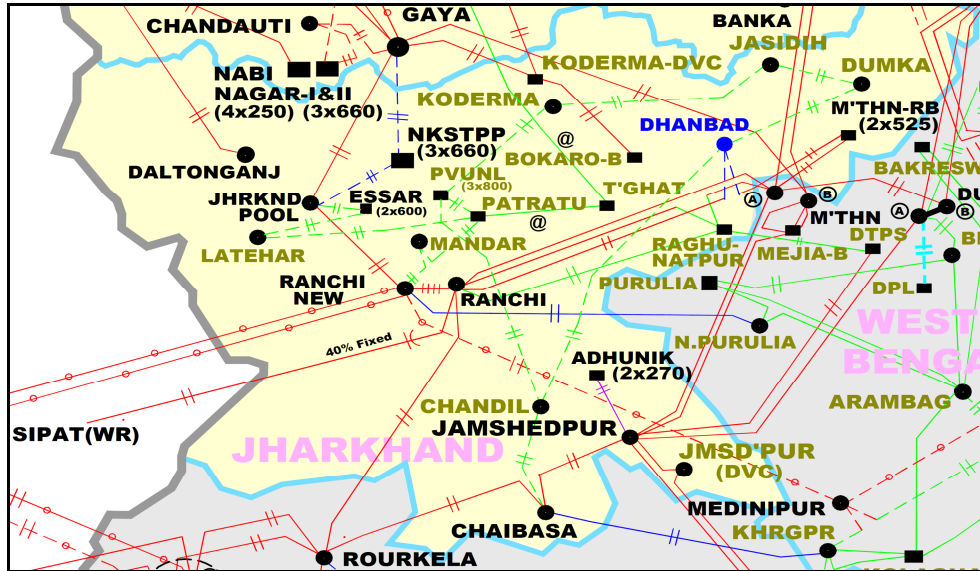
- The additional bulk industrial load of 950MW across JBVNL supply area as per the assessment of Industries Department based on the MOUs signed with Govt. of Jharkhand and JBVNL's plan for electrification of 30,29,567 number of household during 2017-2022.
- Bulk load of 70MW for supply to NTPC and SAIL.
- A load of 20MW considered for proposed Airport at Deogarh.

The details of projected load by 2021-22 in JBVNL area under JUSNL supply is as follows:

Load Calculation Parameter	Demand
Projected demand of existing domestic consumers in MW (A)	1137
Additional Projected load in domestic sector due to new house hold electrification in MW (B) (1/3 rd APL consumer= 1kW/ consumer 2/3 rd BPL consumer= 0.1kW/ consumer)	1218
Demand in existing Industrial and other sectors (except domestic sector in EPS) in MW (C)	877
Additional bulk load projected in Industrial sector as per Industries Department, Govt of Jharkhand load in MW (D)	950
Additional Bulk Industrial load projected for supply to NTPC and SAIL at 220 kV level in MW (E)	70
Additional load proposed for International Airport at Deoghar in MW (F)	20
DVC supply in JBVNL area in MW (G)	600
Distribution loss @21.25% as per 19 th EPS (2 % transmission loss excluded) in MW (H)	889
Total Load in JBVNL area under JUSNL supply in MW=(A+B+C+D+E+F-G+H)	4561

Based on the system studies, the intra-state perspective plan of JUSNL for 2021-22 was in-principle agreed in the meeting held at CEA on 13-12-2017. Major highlights of the decision is given below:

- (a) JUSNL would coordinate implementation of various transmission elements being executed through PPP/TBCB route and under World Bank funding to avoid creation of stranded transmission assets and effective utilization of the assets. On the basis of studies, following five (5) new 400/220kV substations were agreed in-principle in intra-state system of JUSNL and the matter would be taken up by JUSNL in the forthcoming Standing Committee Meeting on Power System Planning for Eastern Region (SCMPSPER) for formal approval.
- (i) Jasidih substation, (400/220kV, 2x500MVA)
 - (ii) Chandil (New) substation (400/220kV, 2x500MVA)
 - (iii) Koderma substation (400/220kV, 2x500MVA)
 - (iv) Mander substation (400/220kV, 2x500MVA)
 - (v) Dumka (New) substation (400/220kV, 2x500MVA)
- (b) Creation of above new substations and interconnections between them would complete the 400kV high-capacity ring viz. **Patratu TPS – Koderma – Jasidih – Dumka– Dhanbad (ISTS) – New Chandil – Patratu TPS** in Jharkhand, which shall improve reliability of power transfer within the state.



- (c) Considering the actual load growth of Jharkhand state during 2017-18, which is less by 1055MW as per 19th EPS projections, JUSNL is advised to take up the implementation/construction of new transmission systems in a phased manner. JUSNL would review the requirement of new 132/33kV sub stations considering the load growth and other technical consideration.
- (d) JUSNL and DVC would hold a separate meeting along with JBVNL before finalization of following substations associated transmissions lines in DVC control area:
- i) 132kV level at 220/132/33kV, 2x200MVA+2x50MVA Hazaribagh S/s
 - ii) 220/132/33kV, 2x200MVA+2x80MVA S/s at Gomia
 - iii) 220/33kV, 2x100MVA S/s at Barkatha
 - iv) 220/132/33kV, 2x200MVA+2x50MVA S/s at Topchanchi
 - v) 132/33kV S/s at Ramgarh
 - vi) 132/33kV S/s at Gola
 - vii) 132/33kV S/s at Peterwar
 - viii) 132/33kV S/s at Putki
- (e) Suitable reactive compensations at all voltage levels for effective voltage control like bus/line reactors at 400kV level and capacitors (if required) at 33kV level etc. shall be planned. 420kV, 2x125 MVAR bus reactors are to be provided at all of the above five 400kV substations.
- (f) JUSNL would take into consideration the following points:
- i) Consider GIS substation(s) in city areas/polluted areas/populated areas/areas requiring aesthetic consideration and HTLS conductor in high capacity corridors
 - ii) To conserve Right of Way (RoW), some transmission lines could be implemented using Multi Circuit Towers/ Multi Circuit & Multi Voltage Towers, especially in forest areas and lines passing through common corridor.
 - iii) In case of termination of number of transmission lines at a substation like Mandar, Patratu (New) etc., the transmission lines in approach section of substation end may preferably be terminated on Multi Circuit Towers to avoid RoW issues.

iv) The short time rating of switchgears in all new sub stations shall be as follows:

- ✓ 400kV switchgear – 63kA (for 1sec)
- ✓ 220kV switchgear – 50kA (for 1sec)
- ✓ 132kV switchgear – 40kA (for 1sec)

(g) Based on above discussions JUSNL would finalise the perspective transmission plan ending on 2021-22 and accordingly finalise the schedule packages/schemes to be implemented through PPP/TBCB route or through World Bank funding. Single Line Diagram (SLD) for each substation is to be attached with relevant documents.

Subsequently a meeting was held among JUSNL, JBVNL and DVC officials at Ranchi on 24-01-2018 to discuss implementation of eight (8) new substations (in DVC area) as indicated above. In the meeting following was agreed:

- (a) JUSNL shall finalise the perspective intra state transmission plan of Jharkhand for 2021-22 avoiding creation of parallel/duplicate transmission infrastructure in DVC command area in line with the decision of the meeting held at CEA on 13-12-2017 for optimum utilisation of both DVC and JUSNL networks.
- (b) Out of eight no. of substations which were offered for bilateral discussion by CEA, it was concluded that all the substations may be constructed. The geographical location of the proposed JUSNL substations be planned in such a way that both DVC and JUSNL infrastructures are optimally utilised to meet the existing as well as future power demand.
- (c) JBVNL and DVC agreed that the perspective plan of JUSNL may be implemented without affecting the existing demand of JBVNL from DVC with due consideration to the aforementioned points.

JUSNL vide letter dated 14-06-2018 has forwarded the detailed scope of works included in their perspective transmission plan for 2021-22. The schemes are proposed to be implemented through PPP mode, World Bank funding and State funding. The final scope of works is given at **Annexure-6**.

JUSNL needs to indicate the following:

- (a) Commissioning schedule of Patratu (3x800MW) TPS.
- (b) Expected commissioning schedule of the proposed 400kV ring system inter alia including five (5) new 400kV substations and associated transmission lines.
- (c) Confirm that the eight (8) substations in DVC command area are being implemented at suitable locations so as avoid duplication of infrastructure and ensure optimal utilisation of both DVC and JUSNL infrastructures.

Members may discuss and approve the Intra-State Transmission System (Intra-STS) plan of JUSNL.

Deliberation in the meeting

JUSNL explained the scope of works with geographical map enclosed at Annexure-6.1.

JUSNL informed that 3x800 MW Patraru TPS stage –I would be commissioned first. 2x800 MW Patraru TPS stage –II is also under planning stage.

JUSNL informed that the total scope work is to evacuate 5x800 MW Patratu generation and also to meet the demand in Jharkhand.

JUSNL added that the scope work is also discussed with DVC to avoid duplication of infrastructure and optimum utilization of assets.

SSCM advised JUSNL divide the scope of work as per voltage level while showing the single line diagram for more clarity. JUSNL was advised to explain the scope of work once again in 1st ERSCT meeting scheduled to be held on 16th July 2018.

7. Patna (POWERGRID) – Sipara (BSPTCL) 220kV lines

Presently, there are three 220kV lines between Patna (POWERGRID) and Sipara (BSPTCL) S/s. The third line (200m) has been commissioned recently and length of the same is 50% of that of first two lines (400m). This results in uneven loading on the circuits.

Major loads of Patna are fed from 220kV Sipara substation. Further, Sipara is connected with Khagaul as well as Fatuah at 220kV level. These are also major load centres normally fed in radial mode from Patna (except Fatuah, which is usually supplied radially from Biharshariff). Whenever 220kV Sipara-Khagaul is kept in service, it leads to very high loading of 220kV Patna-Sipara D/c and it does not satisfy N-1 security criteria for most of the time. The third 220kV circuit between Patna-Sipara has been commissioned recently. However at present this line cannot be operated in parallel with the other two circuits as impedance of the third circuit is 50% of that of other two circuits. So, it is being operated as Patna-Sipara-Khagaul line with no off-take at Sipara (implemented by split-bus operation at Sipara).

It is proposed that BSPTCL may re-conductor the third line with HTLS.

Deliberation in the meeting

BSPTCL informed that the third line has been charged in parallel with Patna (POWERGRID) – Sipara (BSPTCL) 220kV D/c lines with some modification.

BSPTCL was advised to submit the details of modification to ERPC and ERLDC.

8. Overvoltage at 400/220kV Arambagh (WBSETCL) S/s

Arambagh is a major load centre of West Bengal. It is connected to the grid via 5 no. 400kV lines. Depending upon mode of operation of pump storage plant at Purulia and load requirements it is observed that many a times these lines become lightly loaded. Further, after commissioning 400/220kV Chanditala S/s (on LILLO Kolaghat - Jeerat) loading of Arambagh ICTs have reduced. With no shunt reactive compensation at Arambagh, VAr injection from lightly loaded lines along with reduced drawl from

400/220kV ICTs, Bus voltage goes very high during night, particularly in lean hours during winter.

It is proposed that WBSETCL may plan installation of 420kV, 125MVA bus reactor at its Arambagh S/s.

Deliberation in the meeting

WBSETCL informed that the work has been awarded for installation of the reactor.

9. BSPTCL agenda

- a) **Requirement of 220/132 KV 160 MVA Transformer.-** One 160 MYA transformer is required at 220/132 KV Dehri / Gaurichak GSS, BSPTCL. If above transformer is available in spare in Eastern Region Pool, may kindly be allotted to BSPTCL for above GSS on prevailing terms & conditions.

Deliberation in the meeting

SSCM referred the issue to 147th OCC Meeting.

- b) **R&M of Old Grid Sub-Stations of BSPTCL:-** Following Grid Sub-Stations of BSPTCL are being proposed for their R&M under PSDF scheme:-

Sheikhpura, Mithapur, Jehanabad, Banjari, Hajipur, Samastipur, Belaganj. Banka, Khagaria & Khagaul(220 KV).

Preparation of DPR is under process.

Deliberation in the meeting

Members noted.

- c) **Installation of SAS(Sub-Station Automation System)-** Following 220 KV Grid Sub-Stations of BSPTCL are being recommended for installation of SAS system:- Hajipur, Darbhanga, Gopalganj, Begusarai, Madhepura, Fatuha, Khagaul, Gaurichak, Dehri-On-Sone, Bodhgaya, Pusauli, Biharsharif, Bihta. Feasibility report yet to submit.

Deliberation in the meeting

Members noted.

- d) **Bus-Bar Protection Scheme-** This scheme is being proposed for Gaurichak, Fatuha and Khagaul GSS under PSDF scheme.

Feasibility report yet to submit.

Deliberation in the meeting

Members noted.

- e) Request for drawal of power through 132kV Dalkhola(WB)-Baisi(BSPHCL) in radial mode:** Because of severe floods in Kishanganj area they need approx 20-30 MW power from Dalkhola on urgent basis to meet local loads of Baisi.

Deliberation in the meeting

SSCM advised WBSETCL to explore to charge 132kV Dalkhola(WB)-Baisi(BSPHCL) in radial mode at the earliest to provide power to Baisi.

WBSETCL agreed to look into.

It was decided to review the issue in 147th OCC Meeting scheduled to be held on 20th July 2018 at ERPC, Kolkata.

The draft agenda for 1st meeting of Eastern Region Standing Committee on Transmission (ERSCT) scheduled to be held on 16th July 2018 was discussed in the meeting and the concerned constituents were advised to place the latest status/ development on their respective issues in the 1st ERSCT meeting.

It was also informed that the agenda for 1st ERSCT meeting will be made available at ERPC website (www.erpc.gov.in).

Members noted.

Meeting ended with vote of thanks to the chair.

Participants in 6th SSCM Meeting of ERPC

Venue: ERPC Conference Room, Kolkata

Time: 11:00 hrs

Date: 09.07.2018 (Monday)

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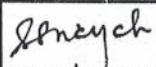
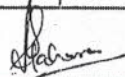

"Coming together is a beginning, staying together is progress, and working together is success." -Henry Ford

Participants in 6th SSCM Meeting of ERPC

Venue: ERPC Conference Room, Kolkata

Time: 11:00 hrs

Date: 09.07.2018 (Monday)

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**AGENDA ITEM FROM OPTCL FOR 6th STANDING
COMMITTEE
ON TRANSMISSION PLANNING
FOR
STATE SECTORS(SSCM)**



**ODISHA POWER TRANSMISSION CORPORATION LIMITED
BHUBANESWAR
09.07.2018**

EVACUATION SCHEME

1. POWER EVACUATION

1. 4X800 MW NLC at Talabira
2. 4X800 MW OTPCL at Kamakhyanagar
3. 2X660 MW at Talcher-III

2. SOLAR EVACUATION

1. 225 MW at Jujumara
2. 55 MW at Manmunda

1. 4X 800 MW NLC AT TALABIRA

Location	No. of units x Unit capacity (MW)	Total capacity (MW)
Talabira	4x800	3200
Evacuation scheme		
Odisha share is 800 MW, for evacuation its share 400kV D/C line will be laid from Talabira to Lapanga and from Lapanga to Bolangir.		

2. 4x 800 MW OTPCL AT KAMAKHYANAGAR

Location	No. of units x Unit capacity (MW)	Total capacity (MW)
Kamakhanagar	4x800	3200

Evacuation scheme

1. 765 kV D/C line from Angul to Kamakhyanagar. 765 kV D/C line from Kamakhyanagar to Begunia. At Begunia it will be stepped down to 400 kV through 2x 1500 MVA transformer. Pandiabil-Narendrpur D/C line will be LILO at Begunia.
2. Initially for system improvement, 765kV Line will be constructed from Angul to Begunia with 765/400kV Sub-station at Begunia will be constructed with 400kV LILO of Pandiabil-Narendrapur line at Begunia.
3. After firming up of OTPCL Generator 765kV Angul-Begunia will LILO at Kamakhyanagar

3. TTPS EXPANSION PROJECT

Location	No. of units x Unit capacity (MW)	Total capacity (MW)
Angul	2 x 660	1320
Evacuation scheme		
Generation is stepped up to 400kV and connected to 400kV bus of Meramundali-B substation and Meramundali through 400kV S/C line.		

SOLAR EVACUATION SCHEME

1. JUJUMARA SOLAR EVACUATION SCHEME

Location	Quantum
Jujumara	225 MW
Evacuation scheme	
<ol style="list-style-type: none">1. 2X315 MVA, 2X160 MVA , 400/220/132kV Sub-station at Jujumara2. 400kV LILO from Lapanga-Meramundali DC Line at Jujumara3. 220kV DC Line from Jujumara to Kiakata4. 132kV DC Line from Jujumara to Maneswar	

SOLAR EVACUATION SCHEME

1. MANMUNDA SOLAR EVACUATION SCHEME

Location	Quantum
Manmunda	55 MW
Evacuation scheme	
<ol style="list-style-type: none">1. 2x40 MVA, 132/33kV Sub-station at Manmaunda2. 132kV LILO Line of Sonapur-Boudh Line	

TRANSMISSION STRENGTHENING SCHEME

CONNECTIVITY

- CONNECTIVITY FROM NARENDRAPUR TO JEYPORE PG WITH LILO AT THERUBALI
- 400KV SWITCHING STATION AT THERUBALI
- SWITCHING STATION AT THERUBALI WILL BE CONVERTED TO 400/220KV SUB-STATION WHEN DEMAND GROWS

NEED

(IT WILL CLOSE THE 400KV RING SYSTEM WITH SOUTHERN AND EASTERN PART OF ODISHA WHICH WILL INCREASE THE RELIABILITY) i.e **MERAMUNDALI-MENDHASAL- PANDIABIL-NARENDRAPUR-JEYPORE-INDRAVATI-RENGALI-STPS -MERAMUNDALI**

SIGLE LINE DIAGRAM OF THE TOTAL SCHEME

POWER EVACUATION, SOLAR EVACUATION & SYSTEM STRENGTHENING SCHEME

[Odisha_2023-24 Scenerio.pdf](#)



Jharkhand Urja Sancharan Nigam Limited

ANNEXURE-I

PERSPECTIVE TRANSMISSION PROJECTS 2021-22 OF JUSNL (PPP Mode)

S.N.	Name of GSS / Trans. Line	Capacity / length	
		Capacity in MVA	Line Length in KM
A			
1	Establishment of new 400/220kV, 2x500MVA S/s at Chandil (New)	1000	
2	Patratu_New (PVUNL) – Chandil (New) 400kV D/c line with Quad Moose conductor		135
3	Dhanbad(NKTL) – Chandil (New) 400kV D/c line with Quad Moose conductor		125
4	Chaibasa(PGCIL) – Chandil (New) 400kV D/c line with Quad Moose conductor		100
5	LILO of Ranchi(PG) – Chandil_Old (JUSNL) 220kV D/C at Chandil (New). Ranchi(PG) – Chandil_Old (JUSNL) shall be LILOed at Sawal (JUSNL) and Tamar(JUSNL) also, so as to form Ranchi(PG) – Sarwal (JUSNL) – Tamar (JUSNL) - Chandil(New) – Chandil (old)		20
Sub -Total (A)		1000	380
B			
1	Establishment of new 220/132kV 2x200MVA and 132/33 kV 2x80MVA S/s at 220/132/33kV Bero	560	
2	Mander (New) – Bero 220kV D/c line with Zebra conductor		21
3	Kamdara – Bero 132 kV D/c line with Panther conductor		50
Sub-Total (B)		560	71
C			
1	Establishment of new 220/132kV 2x200MVA S/s at Noamundi (New)	400	
2	Chaibasa(PG) – Noamundi (New) 220kV D/c line with Zebra conductor		69
3	Noamundi (Old) – Noamundi(New) 132kV D/c line with Panther Conductor		7

4	Manoharpur – Noamundi(New) 132kV D/c line with Panther Conductor		40
Sub -Total (C)		400	116
D			
1	Establishment of new 220/132 kV, 2x200MVA S/s at Khunti (New)	400	
2	Mander (New) – Khunti (New) 220kV D/c line with Zebra conductor		57
3	Simdega (New) – Khunti (New) 220kV D/c line with Zebra conductor		87
4	Khunti (New) – Khunti (Old) 132 kV D/c line with Panther conductor		14
5	LILO of Hatia (Old) – Kamdara 132 kV S/c line with HTLS (minimum 1050A) conductor at Khunti (New)		8
Sub -Total (D)		400	166
E			
1	Establishment of new 400/220kV, 2x500MVA S/s at Dumka(New)	1000	
2	Jasidih – Dumka 400kV D/c line with Quad Moose conductor		131
3	Dhanbad – Dumka 400kV D/c line with Quad Moose conductor		122
4	LILO of Dumka – Godda 220kV D/c line at Dumka (New) with Zebra conductor		5
Sub-Total (E)		1000	258
F			
1	Establishment of new 400/220kV 2x500MVA, 220/132 kV 2x200MVA and 132/33 kV 2x80MVA S/s at 400/220/132/33kV Koderma	1560	
2	Patratu(PUVNL) - Koderma 400kV D/c Quad Moose line along with 2x63MVAR switchable line reactor in both the circuits at Koderma end		150
4	Jasidih – Koderma 400 kV D/c line with Quad Moose conductor		135
5	Koderma – Giridih 220kV D/c line with Zebra conductor		80
Sub-Total (F)		1560	365
G			

1	Establishment of new 220/132kV 2x200MVA and 132/33kV 2x80MVA S/s at 220/132/33kV Sarwal	560	
2	LILO of both circuits of Ranchi (PGCIL) – Tamar at Sarwal on Multi ckt. Tower..so as to form Ranchi(PG) – Sarwal (JUSNL) – Tamar (JUSNL) - Chandil(New) – Chandil (old).		10
Sub-Total (G)		560	10

H

1	Establishment of new 220/132kV, 2x200MVA S/s at Jadugoda(New)	400	
2	Chandil (New) – Jadugoda (New) 220kV D/c line with Zebra conductor		80
3	Chaibasa(PGCIL) – Jadugoda (New) 220kV D/c line with Zebra conductor		60
4	Jadugoda (New) – Dhalbhumgarh 132kV D/c line with HTLS(1000A) conductor (1000A)		10
Sub-Total (H)		400	150

I

1	Up-gradation of existing 132/33 kV Tamar S/s with 220/132 kV 2x200MVA ICT to form 220/132/33kV S/s	400	
2	Operation of Chandil(Old) – Ranchi 220 kV line (presently operated at 132 kV) at rated voltage. Dismantling of existing 132 kV LILO section at Tamar. LILO of both circuits of Chandil (JUSNL) – Ranchi (PGCIL) 220 kV D/C line at Tamar on Multi ckt. Tower.		10
Sub-Total (I)		400	10

J

1	Establishment of new 400/220kV, 2x500MVA S/s at Mander	1000	
2	LILO of both the circuits of Ranchi(PG) – Patratu (New) 400 kV D/C Quad Moose line at Mander		10
3	220 kV D/C line : Mandar - Ratu (JUSNL)		15
4	LILO of Hatia - Lohardaga 220 kV D/C line at Mandar		10
Sub-Total (J)		1000	35

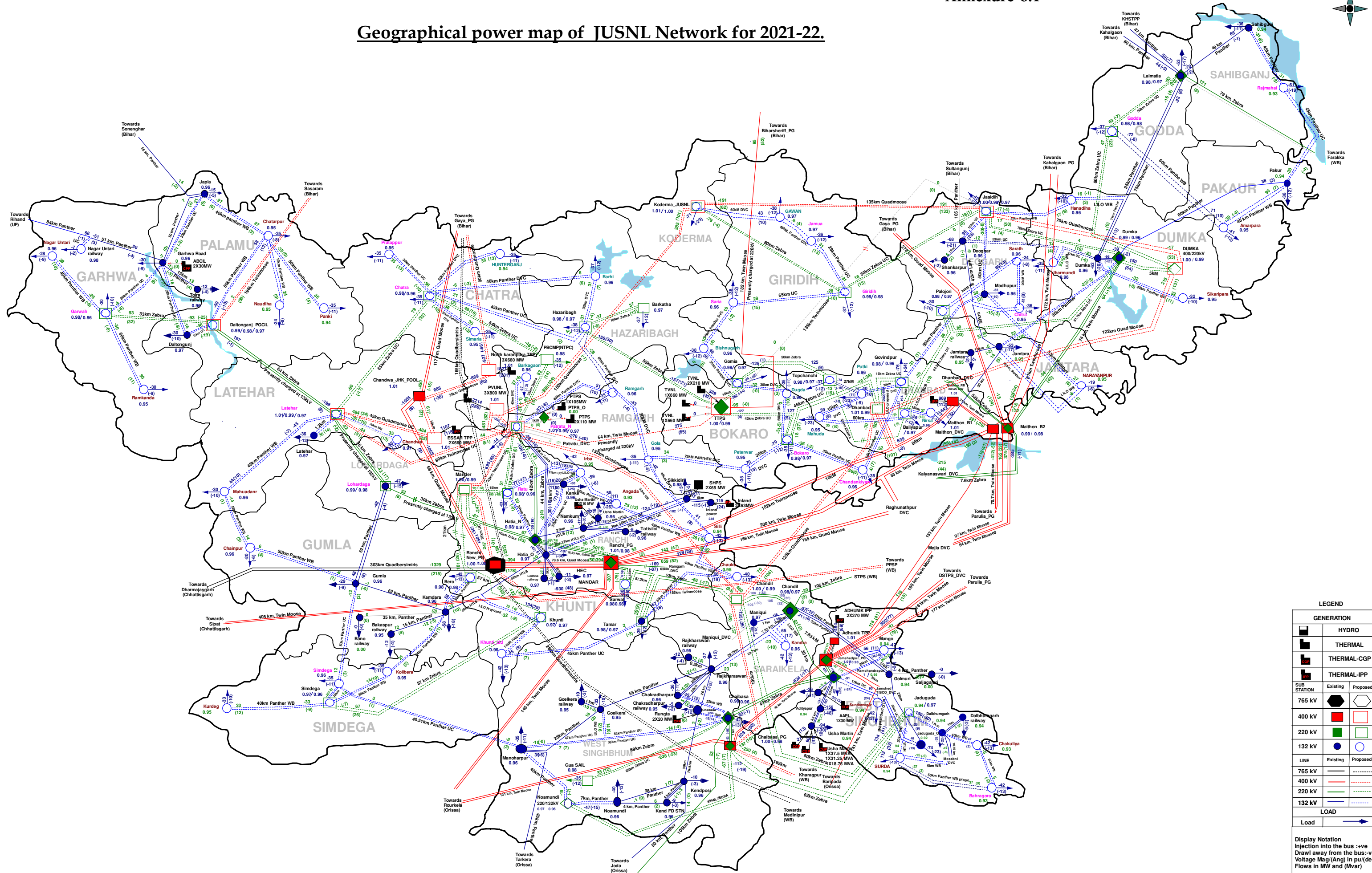
K

1	Establishment of new 220/132kV 2x200MVA and 132/33 kV 2x50MVA S/s at 220/132/33 kV Palojori	500	
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2	LILO of 220 kV D/C Dumka –Govindpur Line at Palojori GSS		10
Sub-Total (K)		500	10
L			
1	Establishment of new 220/132kV, 2x200MVA S/s at Simdega(New)	400	
2	Simdega(New) – Simdega(Old) 132 kV D/c line with Panther conductor .		10
Sub-Total (L)		400	10
M			
1	Up-gradation of 220/132kV Jasidih S/S with 400/220kV, 2x500MVA ICT to form Jasidih 400/220/132 S/s	1000	
Sub -Total (M)		1000	0
N			
1	Extension at 400/220kV Patratu(New) JUSNL S/S with 220/132kV 2x200MVA and 132/33kV 2x50MVA ICT to form Patratu 400/220/132/33kV S/s	500	
2	220 kV D/C line for termination of existing PTPS (Old) – Hatia(New) 220 kV D/c line at Patratu (New) so as to form Patratu(New) – Hatia (New) 220 kV D/c line.		2
3	132kV D/c line for termination of existing PTPS(Old) – Hatia(Old) D/C (with one circuit LILO at Kanke) from PTPS(Old) to Patratu (New) so as to form Patratu(New) – Hatia (Old) D/c line (with one circuit LILO at Kanke)		2
Sub-Total (N)		500	4
O			
1	Establishment of new 220/132kV, 2x200MVA and 132/33 kV 2x50MVA S/s at 220/132/33kV Hazaribagh	500	
	Tenughat TPS – Hazaribagh 220kV D/c line with Zebra conductor		58
Sub-Total (O)		500	58
P			
1	Establishment of new 220/132kV 2x200MVA and 132/33kV 2x80MVA S/s at 220/132/33kV Gomia	560	
2	Topchachi – Gomia 220 kV D/c line with Zebra conductor		50

3	Tenughat (TPS) – Gomia 220 kV D/C line with HTLS(1600A) conductor		10
Sub-Total (P)		560	60
Q			
1	Establishment of new 220/33kV, 2x100MVA S/s at Barkatha	200	
2	Barkatha – Hazaribagh 220kV D/c line with Zebra conductor		18
Sub-Total (Q)		200	18
R			
1	Establishment of new 220/132kV 2x200MVA and 132/33kV 2x50MVA S/s at 220/132/33kV Topchanchi	500	
2	Baliyapur – Topchanchi 220kV D/C line with Zebra Conductor		50
3	Putki – Topchanchi 132kV D/C line with Panther Conductor		27
Sub-Total (R)		500	77
S			
1	Establishment of new 220/132kV 2x200MVA and 132/33kV 2x50MVA S/s at 220/132/33kV Baliyapur	500	
	LILO of 220 kV D/C Dumka –Govindpur Line at Baliyapur GSS		7
Sub-Total (S)		500	7

Geographical power map of JUSNL Network for 2021-22.



	Debarati Basu	Anirban Banerjee	LFA	R3	23/12/2017	
	Debarati Basu	Anirban Banerjee	LFA	R2	23/11/2017	
	Debarati Basu	Anirban Banerjee	LFA	R1	07/11/2017	
	Debarati Basu	Sanjit Guhathakurta	LFA	R0	22/10/2017	
APPROVED	REVIEWED	CHECKED	DRAWN	DESCRIPTION	REVISION	DATE
						REMARKS

Geographical power map of JUSNL transmission network for the year 2021-22 without Tenughat generation 2X660MW



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