



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



[ISO: 9001:2008]

No. 66/5/2016-PSPA-2/ 340-353

Dated: 31.05.2016

-As per List Enclosed-

Sub: Additional Agenda for 18th Meeting of Standing Committee on Power System Planning in Eastern Region to be held on 13th June, 2016 at Kolkata.

Sir/Madam,

The additional agenda items received from OPTCL, Bhubaneswar, BSPTCL, Bihar and CESC Limited are attached at Annexures I ,II & III respectively. The studies carried out by PGCIL for ERSS- VII (Agenda 5) are also enclosed at Annexure IV.

The additional agenda is uploaded on the website of CEA with following link:
<http://cea.nic.in/compsplanning.html>

Yours faithfully,

Rishika
31/5/16.

(Rishika Sharan)

Director (PSPA-2)

Encl: As above

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
3. Member Secretary, Eastern Regional Power Committee, 14, Golf Club Road, Tollygange, Kolkata-700033. Tel. No. 033-24235199 Fax No.033-24171358	4. Director (Commercial), Grid Corporation of Orissa Ltd, Jan path, Bhubaneshwar-751022. Tel. No. 0674-2541127 Fax No. 0674-2541904

<p>5. Director (Transmission), Orissa Power Transmission Corporation Ltd, Jan path, Bhubaneswar-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

Additional Agenda item No 1:**ODISHA POWER TRANSMISSION CORPORATION LIMITED**

(A Government of Odisha Undertaking)
 OFFICE OF CHIEF GENERAL MANAGER(CONSTRUCTION)
 4TH FLOOR, OPTCL CORPORATE BUILDING, BHOI NAGAR,
 BHUBANESWAR-751022

PHONE NO: (0674)(2543807), FAX NO (0674)2541897, E-MAIL ID: cgm.con@optcl.co.in

File No: CGM(C) - *WK-28/14 - 467 (9)* / Dated 24.05.2016

From

CGM (Construction)
 OPTCL, Bhubaneswar

To

Central Electricity Authority,
 Sewa Bhawan, R.K.Puram,
 New-Delhi-110066
 Fax: 011-26103242

Kind Attention: Mr P.K.Jindal, Chief Engineer

**Sub: Agenda Item from OPTCL for forthcoming Standing Committee meeting to be held
 13.06.2016**

Sirs,

The following Projects may please be included in the Agenda Item for forthcoming Standing Committee meeting to be held on 13th June 2016. The Projects has already been recommended by State Committee on Transmission Planning under ERPC, Kolkatta and also discussed in 32nd ERPC meeting held in Ranchi. As per discussion all queries and compliances has also been submitted to PGCIL.

1. 400/220kV Grid Sub-station at Narendrapur with 400kV D/C line from Pandiabil to Narendrapur.
2. 400/220kV GIS Grid S/s at Meramundali "B" with associated 400kV line.
3. 400/220kV Grid S/s at Khuntuni with associated 400kV line.
4. 400kV D/C line from TTPS Expansion S/Y to 400/220kV Meramundali "B" S/s for evacuation of state share of power (50%).

Yours faithfully,

[Handwritten Signature]
 24/05/2016
 Chief General Manager (Const.)

Additional Agenda item No 2: Establishment of five numbers of 400 kV/220 kV/132 kV Grid substation in Bihar in Central sector Scheme



Bihar State Power Transmission Company Ltd., Patna
A subsidiary company of Bihar State Power (Holding) Company Ltd., Patna
CIN – U40102BR2012SGC018889
[SAVE ENERGY FOR BENEFIT OF SELF AND NATION]
Head Office, Vidyut Bhawan, Bailey Road, Patna – 800021,

Letter No. 08 /BSPTCL, Patna Dated 21.05.16
From, Bhaskar Sharma
Director(P), BSPTCL
To, Pardeep Jindal,
Chief Engineer(PSP &PA-2),
Central Electricity Authority(CEA),
PSPA Division,
Seva Bhavan, Delhi-110066

Regt. 601

Sub:- Establishment of five numbers of 400/220/132 KV Grid S/s at Potential Load Centers in Bihar under central sector scheme.

Ref:- Your Lt no.69/1/2016-PSPA-2/356 dt.05.05.2016

Sir,

With reference to the above, the justification for having 400/220 KV S/s at Ara & Munger is attached with necessary details. This may kindly be discussed in upcoming meeting of Standing Committee on Power System Planning of Eastern Region.

The Load Flow Studies will be done jointly with PGCIL and report will be submitted shortly

Encl:- As above

Yours Faithfully,
Bhaskar
21/5/16
(Bhaskar Sharma)
Director (Project)

The justification for Ara (Bhojpur) GSS and Munger GSS-

1. Name of proposed 400/220 KV Substation- Munger

Reason for 400 KV Sub-station-

In the study of transmission system planning for the 12th plan, creation of 400/220 KV Kajara Pool S/s was envisaged for evacuation of power from proposed Generation Station Pirpainti & Lakhisarai.

During study for 13th plan, 400/220 KV S/s has been proposed at Saharsa to meet load demand of 24X7. As per the studies, Kajara Pool is connected at 400 KV level with Saharsa and Darbhanga 400/220 KV GSS.

Munger is a suitable location for 400/220 KV sub-station as many 220/132 KV S/s are located around Munger (Sabour (new) (2X160) (U/C), Jamalpur (new) (2X160) (U/C), Khagaria (new) (2x160) (U/C), Sheikhpura(2X160)(U/C)). It therefore, appears appropriate to shift the location of Kajra Pool to Munger & retain the connectivity as it is. The distance between Kajara Pool & Munger is not much and therefore the studies result will hold good. This arrangement will also provide strong connectivity between North & South Bihar (Munger & Saharsa) at 400 KV level which otherwise has remained a matter of concern. Munger GSS may be connected at 400 KV level with ISTS line passing near to it.

2. Name of proposed 400/220 KV Substation- Bhojpur/Ara

Reason for 400 KV Sub-station-

1. In the absence of Buxar TPS, the power source for Dumraon GSS 220/132KV is from the LILO of both ckt. of Ara(PG) –Pusauli(PG). Pusauli(BSPTCL) is also getting power from LILO of both ckt. of Ara(PG) –Pusauli(PG). Karmanasa(New) 220/132 is getting power from Pusauli(BSPTCL). It can therefore be observed that above 220 KV GSS have inadequate source of power due to repeated LILO of same Ara(PG) –Pusauli(PG) 220 KV line.

. As part of Generation linked schemes, the power evacuation of Buxar TPS is through Naubatpur GSS at 400 KV level. At 220 KV level the power evacuation is through Dumraon, Pusauli(BSPTCL) and at Dehri GSS. Karmanasa(New) 220/132 is also getting power from Pusauli(BSPTCL). Hence Buxar TPS provides strong source to all the aforesaid 220 KV GSS.

To facilitate proper source to these GSS in the outage of Buxar TPS it is envisaged to create one 400/220 KV sub-station near Ara having connectivity with Buxar TPS and also with ISTS line at 400 KV level. All 220/132 KV GSS planned to be connected with Buxar TPS will be shifted to Ara 400/220 KV GSS. The power from Buxar TPS will be evacuated through Ara and Naubatpur 400/220/132/33 KV GSS. As such there will be no connectivity from Buxar TPS at 220 KV level. One sketch showing this arrangement is enclosed.

2. The existing and upcoming GSS within state capital would be on verge of saturation by 2019. One 400/220 KV S/S at Ara would greatly reduce the saturation and congestion for meeting demand of state capital.

3. This may also be integrated with generating project coming up at Buxar. Total land has been acquired for the TPS. The site works is in progress & it is expected to be commissioned by Yr. 2020.
 4. The land requirement for 400/220 KV S/s would be considerable and would take time in acquisition. In view of development of Buxar, it is appropriate to go ahead and take up work of 400/220 KV Ara S/s which will ensure power dispersal to area near Patna also.
- Therefore it seems appropriate to have 400/220 KV GSS at Ara.

Probable associated 400 KV line-

- i) Ara GSS(400/220 KV) to upcoming Generation Projects i.e. Buxar TPS(2x660 MW)
- ii) Buxar TPS 400/220 KV GSS to Naubatpur GSS(400/220/132/33 KV).
- iii) LILO on 400 KV Patna (PG)- Balia (PG) (D/C) transmission line or LILO on 400 KV Biharsarf (PG)-Baliala (D/C) transmission line

220 KV downlinking transmission line-

- a) 220 KV Ara GSS- Ara (PG) (D/C) transmission line.
- b) 220 KV Ara GSS - Dumroan (new) (D/C) transmission line.
- c) 220 KV Ara GSS - Dehri (D/C) transmission line.
- d) 220 KV Ara GSS - Pusauli (new) (D/C) transmission line.
- e) 220 KV Ara GSS - Karmanasa (new) (D/C) transmission line.

ED: 396

11th September, 2015

The Member (PS)
Central Electricity Authority
Sewa Bhawan
R.K. Puram
New Delhi - 110066.

Kind Attn.: Shri S.D. Dubey

Dear Sir,

Connectivity of CESC System with Central Transmission Utility (CTU)

We thank you for the courtesy extended during our meeting with you on 28th August, 2015.

Further to our earlier letter no. ED:391 dated 18th August, 2015 (copy enclosed) and as advised by you in the aforementioned meeting, we give below the details of our proposed Connectivity.

- Applied for Connectivity to the PGCIL 400 / 220 kV substation at Rajarhat, already under construction.
- Coñnectivity applied for 500 MW at 400kV.
- CESC is proposing a 400 / 220kV substation at Rajarhat, very close to that of PGCIL, with 2x500 MVA Transformers.
- 220kV underground Double Circuit to the Load Centre (East Calcutta substation).

A Single Line Diagram of the proposed network is attached for reference.

Considering the present peak demand & growth rate, CESC would require about 300MW power in the next 3 / 4 years & another 200 MW in 2/3 years, thereafter.

May we request your kind-self to include our application in the agenda for next Standing Committee Meeting and extend your support for the said connectivity to meet the future power demand in Kolkata, the capital of the State of West Bengal.

Thanking you,

Yours faithfully,

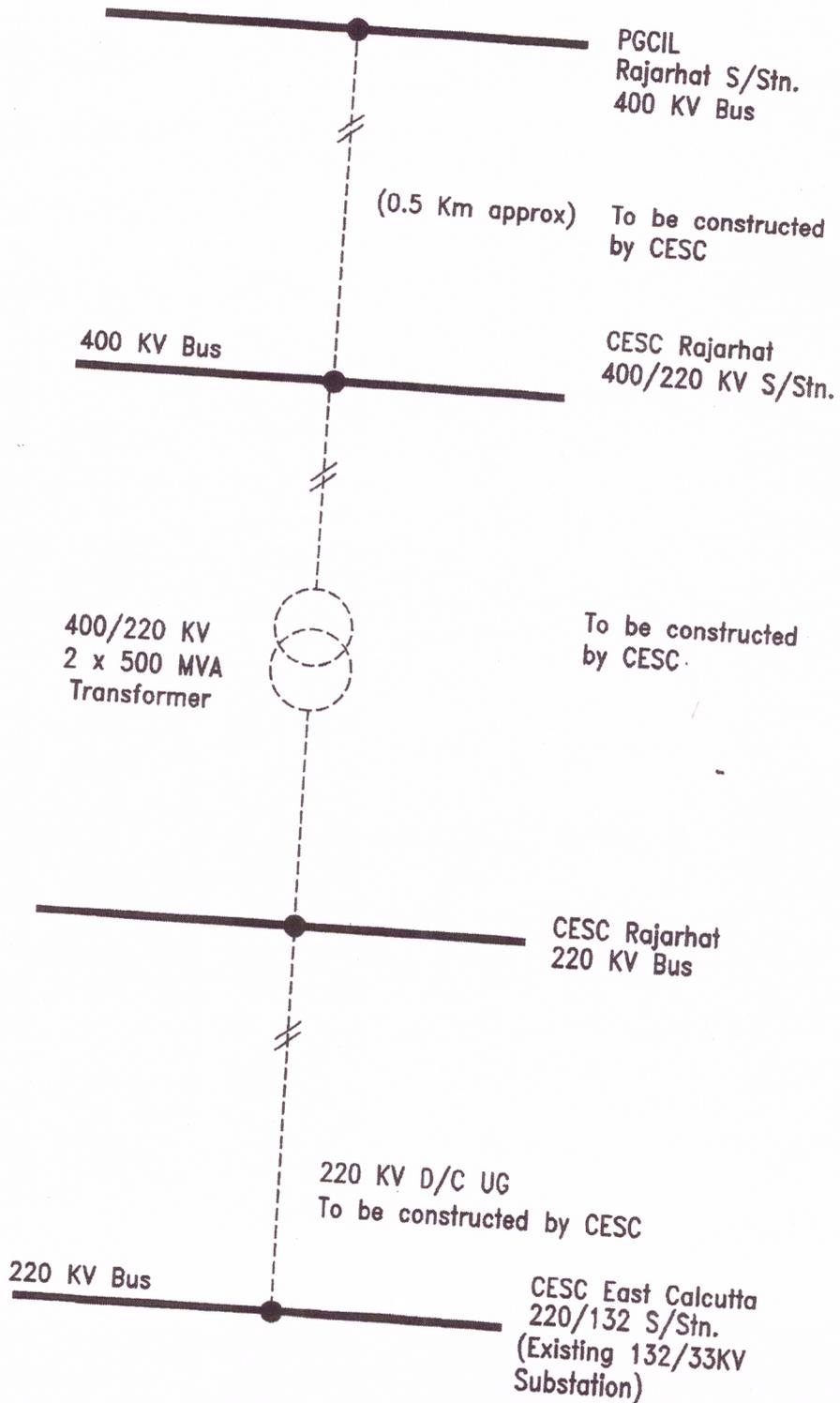

Executive Director

Encl : As above

Cc : Mr. A.K. Bandyopadhyaya,
Member Secretary (ERPC),
14, Golf Club Road,
Rajendra Prasad Colony, Tollygunj,
Kolkata - 700 033

Cc: ED (P)
Cc: GM (SO)
Cc: GM (PLNG)

SINGLE LINE DIAGRAM OF PROPOSED NETWORK



पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड

(भारत सरकार का उद्यम)

POWER GRID CORPORATION OF INDIA LIMITED

(A Government of India Enterprise)



केन्द्रीय कार्यालय : "सौदामिनी" प्लॉट सं. 2, सैक्टर-29, गुडगाँव-122 001, हरियाणा

फोन : 2571700 - 719 फैक्स : 2571760, 2571761 तार 'नेटग्रिड'

Corporate office : "Saudamini" Plot No. 2, Sector-29, Gurgaon-122 001 Haryana

Tel. : 2571700 - 719, Fax : 2571760, 2571761 Gram : 'NATGRID'

संदर्भ संख्या/Ref. Number

C\CTU\E\PLG

Date: 23-05-2016

Shri Pardeep Jindal
Chief Engineer (PSP&A-II)
Central Electricity Authority
Sewa Bhawan, R.K.Puram
New Delhi - 110066

Sub: Interim arrangement for Ranchi (New) - Purulia PSP (New) 400kV D/c line by M/s Purulia Kharagppur Transmission Company Ltd. (PKTCL) till the commissioning of Purulia PSP (New) substation by WBSETCL

Sir,

This is with reference to the minutes of meeting dated 29th Mar 2016 on the above subject mentioning that CTU (POWERGRID) shall submit the following studies regarding Ranchi - Arambagh 400kV S/c section formed through interim arrangement by connecting Ranchi (New) - Purulia 400kV D/c line to one circuit of Purulia - Arambagh D/c line:

- i. **Line charging studies:** Studies have been carried out and it is observed that total voltage rise on charging Ranchi - Arambagh 400kV circuit from Ranchi (New) end is about 30kV and from Arambagh end is about 18kV and thus line can be charged- Study report enclosed at **Annexure-I**
- ii. **DOV studies:** From load flow studies under various scenarios, it is observed that due to longer length of Ranchi (New) - Arambagh 400kV line section (about 327km), the loading in this line remains within 450MW and in this situation the DOV is about 1.37pu which is very much within the limit. Further, DOV Studies have been carried out considering different power flows on this line and it is observed that the dynamic over voltage due to load throw-off remains within limit (i.e. 1.5pu) upto about 625MW power flow on this line, the probability of which is quite low. - Study report enclosed at **Annexure-II**

पंजीकृत कार्यालय : बी-9, कुतब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली-110016 दूरभाष : 26560121 फैक्स : 011-26560039 तार 'नेटग्रिड'
Registered Office : B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi-110016 Tel. : 26560121 Fax : 011-26560039 Gram : 'NATGRID'

स्वहित एवं राष्ट्रहित में ऊर्जा बचाएं
Save Energy for Benefit of Self and Nation

CIN : L40101DL1989GOI038121

- iii. NGR study: 400Ω NGR is being implemented along with 50MVAR Line Reactor at Ranchi (New) end of Ranchi (New) – Arambagh 400kV line. Studies have been carried out and no issues are anticipated regarding single pole auto-reclosure in the subject line.

In view of the above, it may be mentioned that the subject interim arrangement can be charged and operated without constraints.

Thanking you.

Yours faithfully,

Ashok Pal

(Ashok Pal)

GM (CTU-Planning)

Copy:

1. Chief Engineer (CPD)

WBSETCL

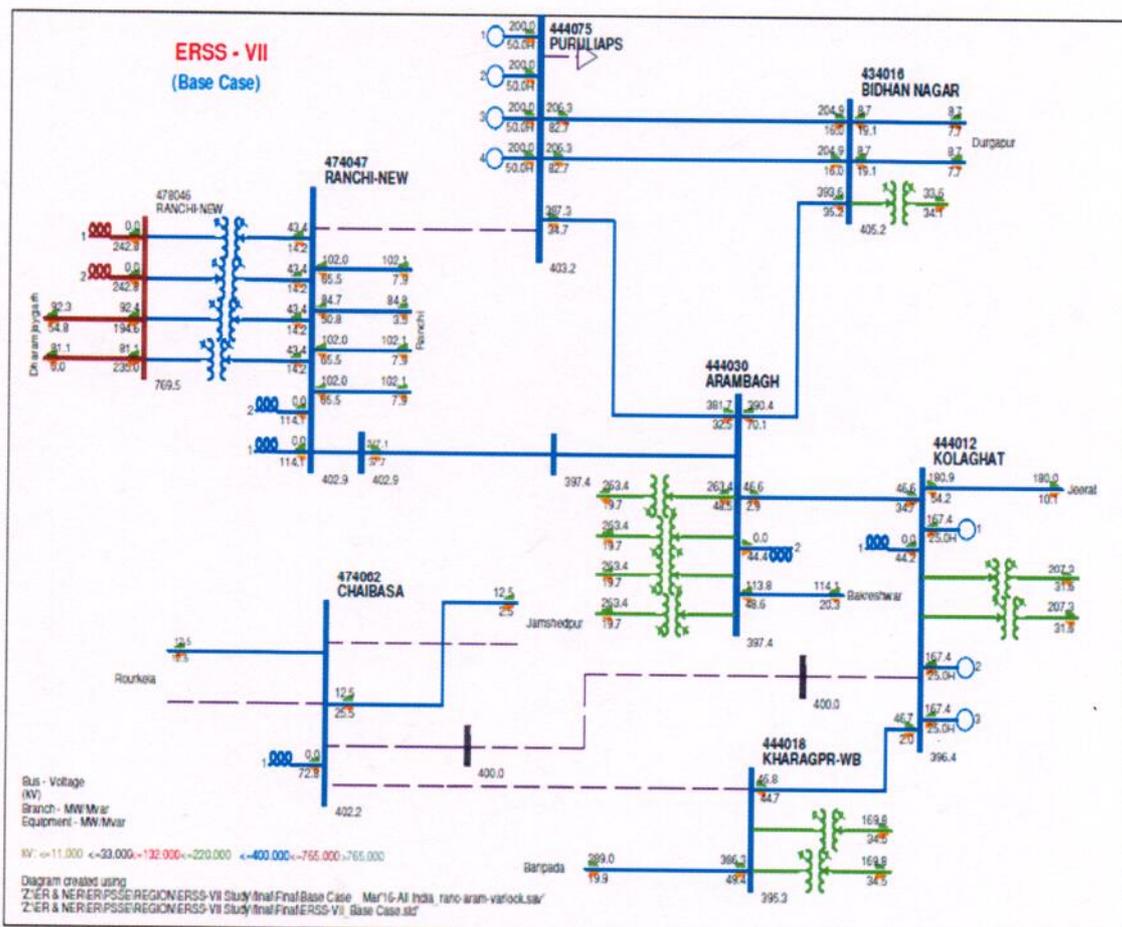
Vidyut Bhavan, 9th Floor, Block-D,
Sector-II, Salt Lake, Kolkata-700091

Charging Study for Interim Arrangement for Ranchi (New) – Arambagh 400kV S/c line

In view of delay in construction of line bays at Purulia PSP, the following interim arrangement has been proposed:

1. Connection of Ranchi (New) – Purulia PSP 400kV D/c line to LILO point on one circuit of Purulia PSP – Arambagh 400kV D/c line, to form Ranchi (New) – Purulia 400kV S/c line and Ranchi (New) – Arambagh 400kV S/c line.

Line Charging studies have been carried out for the Ranchi (New) – Purulia 400kV S/c line section formed as above. The connectivity considered at various substations is shown below:



The results of the studies carried for Ranchi (New) – Arambagh 400kV S/c line sections formed due to interim arrangement are given below:

1. Charging of Ranchi (New) – Arambagh 400kV S/c line : Length 327km

Line Reactors:

1. Ranchi (New) : 50MVAR
2. Arambagh : Nil

Charging of Transmission Line

A: Ranchi New

B: Arambagh

	Voltage			Source Rise	Line Rise	Total Rise
	A	B	Open End			
Charging from A end						
Precharging	402.3	394.3	-	-	-	-
On Charging	405.6	394.3	432.4	3.3	27	30.1
Post Charging	402.9	397.4	-	-	-	-
	Voltage			Source Rise	Line Rise	Total Rise
	B	A	Open End			
Charging of from B end						
Precharging	394.3	402.3	-	-	-	-
On Charging	398.4	402.4	412.4	4.1	14	18.1
Post Charging	397.4	402.9	-	-	-	-

Conclusion

- Total voltage rise on charging subject transmission line from Ranchi (New) is about 30kV and from Arambagh is about 18kV.
- Accordingly, the subject line may preferably be charged from Arambagh end.

Study report for Dynamic Over-voltage due to load rejection

Objective: To study the over-voltages in Ranchi (New) – Arambagh 400kV S/c line (formed by Interim connection of Ranchi (New) – Purulia PSP 400kV D/c line to one ckt of Purulia PSP – Armbagh 400kV D/c) due to load rejection.

System Studies

Studies were carried out considering the situation formed by Interim connection of Ranchi (New) – Purulia PSP 400kV D/c line to one ckt of Purulia PSP – Armbagh 400kV D/c as shown in Fig. 1.

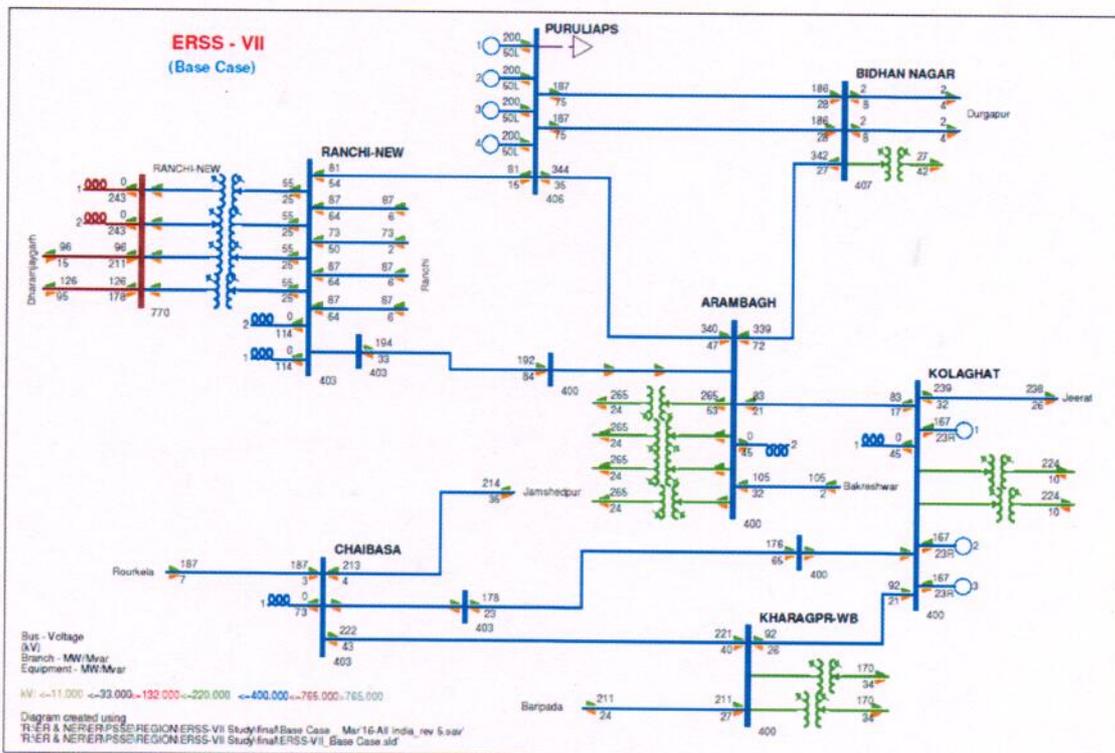


Fig. 1 Schematic Diagram for ERSS-VII Interim Arrangement

From the above figure it is observed that there are two parallel paths from Ranchi (New) to Arambagh, (i) Ranchi (New) – Arambagh 400kV S/c line and (ii) Ranchi (New) – Purulia PSP – Arambagh 400kV S/c line. This situation has been simulated as shown in Fig. 3.

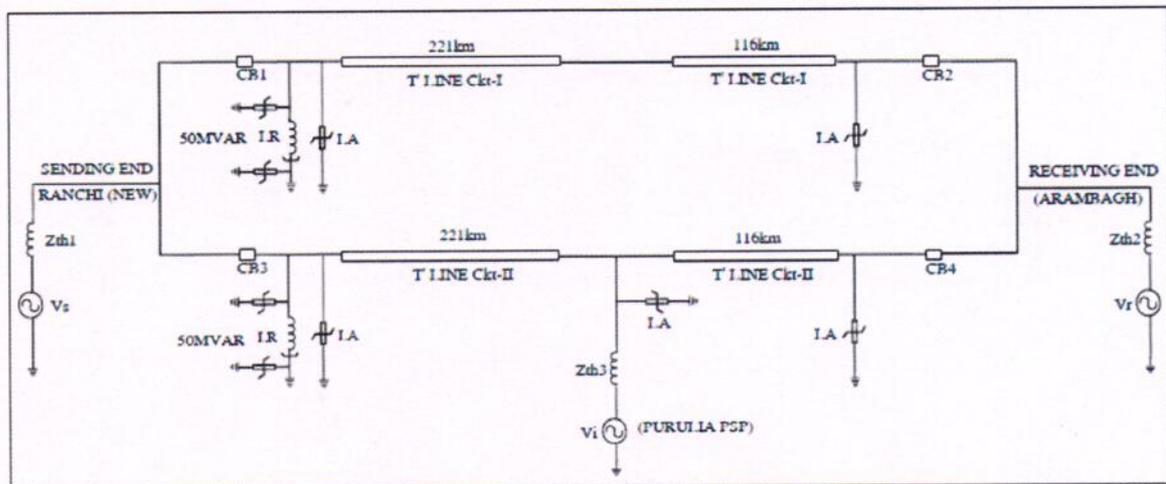


Fig. 3 Three Bus model for DOV study

Ranchi (New) is supplying power to Arambagh through both transmission lines. At 0.2 sec, three phase breakers at receiving end (CB2) of Ckt-I are opened with inter-phase discrepancy of 3msec. Further, the opening instant is varied over 10 msec in 10 iterations. The switching sequence is as given below:

Time Instant	0	0.2 sec
Breaker	CB1 – ON	CB1 – ON
State	CB2 – ON	CB2 – OFF
	CB3 – ON	CB3 – ON
	CB4 – ON	CB4 – ON

The results obtained are summarized in the Table-2 below:

Table-2

Sr. No.	Power Flow through line		DOV Peak Voltage (kV)	DOV Peak Voltage (in pu)
	MW	MVAR		
1	627	159	500	1.46
2	540	136	483	1.41
3	472	111	470	1.37
4	368	82	451	1.31
5	282	66	437	1.27

From load flow studies under various scenarios, it is observed that due to longer length of Ranchi (New) - Arambagh 400kV line section (about 327km), the loading in

this line remains within 450MW and in this situation the DOV is about 1.37pu which is very much within the limit. Further, DOV Studies have been carried out considering different power flows on this line and it is observed that the dynamic over voltage due to load throw-off remains within limit (i.e. 1.5pu) upto about 625MW power flow on this line, the probability of which is quite low.