



सत्यमेव जयते  
भारत सरकार

**Government of India**

विद्युत मंत्रालय

**Ministry of Power**

केन्द्रीय विद्युत प्राधिकरण

**Central Electricity Authority**

विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग

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**Sub: 43<sup>rd</sup> meeting of the Standing Committee on Power System Planning of Western Region**

**Sir / Madam,**

In continuation to our letters of even no. dated 27.04.2018 and 04.05.2018, it is intimated that the additional agenda notes for the 43<sup>rd</sup> meeting of Standing Committee on Power System Planning of Western Region is available CEA website ([www.cea.nic.in](http://www.cea.nic.in)) at the following link: <http://www.cea.nic.in/compsplanning.html> i.e. Home page - Wings – Power Systems -PSP&PA-I - Standing Committee on Power System Planning-Western Region). The venue details of the meeting are as follows:

**Venue: Hotel – Taj Gateway, Akota, Vadodara**

**Date & Time: 11.05.2018, 10:30 Hrs onwards**

**Coordinator: Mr. Abhinav Verma, DGM, WR – II, PGCIL, 09428504062**

Yours' faithfully,

(Awdhesh Kumar Yadav)  
Director

Special Invitee: Chief Executive, Nuclear Recycle Board, BARC, Anushakti Nagar, Mumbai – 94

**Additional Agenda notes for the 43<sup>rd</sup> Meeting of Standing Committee on Power System Planning in Western Region**

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**1. Confirmation of the minutes of 42<sup>nd</sup> meeting of the Standing Committee on Power System Planning in Western Region (SCPSPWR) held on 17.11.2017 at Mumbai**

- 1.1. The minutes of the 42<sup>nd</sup> meeting of SCPSPWR were issued vide CEA letter No. 26/10/2017/PSP&PA-I/32-47 dated 10.01.2018.
- 1.2. Ministry of Railways vide its letter no. 2012/Elect(G)/150/1bPt-11 dated 02.05.2018 has stated that the ISTS connectivity of Railways dedicated transmission line on Delhi-Bharuch route was also agreed but the same has not been reflected in the minutes of the meeting. Railway has requested for incorporation of in-principle approval for ISTS connectivity of Railway Traction Sub Stations (TSS) on Delhi-Bharuch route by the constituents and modification in the minutes of the meeting accordingly.
- 1.3. The ISTS connectivity of Railways dedicated transmission line on Delhi-Bharuch route was also deliberated in the meeting along with other Connectivity of Railways' TSS with ISTS Network but nothing has been mentioned in the conclusion at para 9.11 of the minutes. Accordingly, the following modified para 9.11 of the minutes of the meeting is proposed:

**Modified Para 9.11**

After further deliberations, members agreed to grant in principle approval for connectivity to Railways for existing demand with the ISTS points (Raigarh & Bhatapara) through 220kV D/c line along with line bays at both ends from each substation under the scope of SECR. The commercial and contractual aspects of disconnection from STU network to be deliberated separately between Railways and respective power utilities. CSPTCL representative stated that Railway is a consumer of distribution company of Chhattisgarh, therefore they would communicate their views after consultation with CSPDCL within 15 days.

Members also agreed to grant in principle approval for the connectivity of Railways dedicated transmission line at ISTS substations (Rajgarh, Dehgam, Pirana, Kota, Bassi and Vadodara) along Delhi-Bharuch route.

- 1.4. Members may deliberate the above and confirm the minutes of 42<sup>st</sup> meeting of SCPSPWR.

**2. Interconnection of MSETCL lines with ISTS**

- 2.1. In 42<sup>nd</sup> meeting of SCPSPWR, MSETCL had proposed interconnection of 12 nos. of existing or new lines / substations with ISTS network of POWERGRID. These elements were already included in their five year (from 2017-18 to 2021-22) STU transmission plan. In the meeting interconnection of 8 nos. lines/substations were agreed and for others it was decided to further deliberate along with studies.

2.2. Accordingly, the system studies have been done for the following transmission elements which involve interconnection of Inter-state and Intra-state (MSETCL) system.

**A. LILO of Tarapur–Padghe 400 kV D/C line at Kudus (MSETCL) 400 kV substation.**

The system studies have been done for the 2021-22 scenario and results are tabulated. Load flow on various lines is given below:

	<b>Lines</b>	<b>Without LILO</b>	<b>With LILO of one circuit of TAPS - Padghe at Kudus</b>	<b>With LILO of both circuits of TAPS - Padghe at Kudus</b>
<b>1</b>	Padghe GIS - Kudus 400 kV D/c line	2x283	2x310	2x318
<b>2</b>	TAPS - Boisar 400 kV D/c line	2x283	2x294	2x298
<b>3</b>	TAPS - Padghe 400 kV D/c line	2x166	163	
<b>4</b>	TAPS - Kudus 400 kV D/c line		141	2x149
<b>5</b>	Kudus - Padghe 400 kV D/c line		238	2x211
<b>6</b>	Bableshwar - Kudus 400 kV D/c line	2x489	2x497	2x499
<b>7</b>	Bableshwar - Padghe 400 kV D/c line	2x457	2x451	2x448
<b>8</b>	Kudus – Kala 400 kV D/c line	2x232	2x225	2x223
<b>9</b>	Kudus 400/220 kV, 1500MVA	3x360	3x356	3x354

The single line diagrams with load flow are attached as Exhibit-1(A).

The fault level of 400 kV Kudus (MSETCL) S/s and other nearby substations for the 2021-22 scenario is given below:

<b>S.No.</b>	<b>Substation</b>	<b>Fault Level in kA at 400 kV level</b>		
		<b>Without LILO</b>	<b>With LILO of one ckt of Tarapur-Padghe</b>	<b>With LILO of both ckts of Tarapur-Padghe</b>
1	<b>TAPS</b>	25	26.8	27.3
2	<b>Kudus (M)</b>	36.6	42.2	44.2
3	<b>Padghe GIS</b>	37.5	40.7	41.8
4	<b>Padghe(M)</b>	34.5	38.8	40.4
5	<b>Boisar PG</b>	29	30.4	30.8
6	<b>Kalwa(M)</b>	29	29	29

Losses are almost same in all cases.

**B. LILO of 2<sup>nd</sup> Ckt of South Solapur – Kolhapur D/c at Alkud 400 kV S/s**

LILO of 1<sup>st</sup> ckt of South Solapur – Kolhapur D/c line at Alkud 400 kV S/s has already been agreed in the 32<sup>nd</sup> SCM of WR.

The power flow with and without LILO of 2<sup>nd</sup> Ckt of South Solapur – Kolhapur D/c line at Alkud 400 kV S/s is tabulated below:

S. No.	Transmission Lines	With LILO of one ckt	With LILO of both ckt.
1	Solapur (PG) - Kolhapur 400 kV S/c line	356	-
2	Solapur (PG) - Alkud 400 kV S/c line 1	458	418
3	Solapur (PG) - Alkud 400 kV S/c line 2	-	418
4	Alkud - Kolhapur 400 kV S/c line 1	233	293
5	Alkud - Kolhapur 400 kV S/c line 2	-	293
6	Alkud 400/220 kV ICTs	2x110	2x122

The single line diagrams with load flow are attached as Exhibit-1(B).

The fault level at Alkud 400 kV S/s and other nearby substations is tabulated below:

S.No.	Substation	Fault Level in kA at 400 kV level	
		With LILO of one ckt	With LILO of both ckt
1	Alkud	14.3	20.3
2	Solapur PG	41.0	41.2
3	Kolhapur	24.7	24.9
4	Kolhapur PG	20.3	20.4
5	Karad	24.3	24.3

### C. LILO of both ckts of Parli (PG) – Pune (PG) 400 kV D/C at Lonikhand II

The power flow with and without LILO of both circuits of Parli (PG) – Pune (PG) 400 kV D/C at Lonikhand II is tabulated below:

S. No.	Transmission Lines	Without LILO	With LILO
1	Parli (PG) - Pune(PG) 400 kV D/c line	2x255	
2	Parli (PG) - Lonikhand II 400 kV D/c line		2x311
3	Pune(PG) - Lonikhand II 400 kV D/c line		2x330
4	Pune(PG) - Talegaon 400 kV 2xD/c line	4x634	4x397
5	Talegaon - Lonikhand I 400 kV S/c line	483	6
6	Talegaon - Chakan 400 kV S/c line	643	275

7	Chakan - Lonikhand I 400 kV S/c line	207	[127]
8	Lonikhand I - Lonikhand II D/c line	2x64	[2x468]
9	Retwadi - Lonikhand II 400 kV D/c line	2x165	2x89
10	Lonikhand II 2x500, 400/220 kV ICTS	2x229	2x260

The single line diagrams with load flow are attached as Exhibit-1(C).

The fault level at Lonikhand-II 400 kV S/s and other nearby substations is tabulated below:

S.No.	Substation	Fault Level in kA at 400 kV level	
		Without LILO	With LILO of both circuits
1	Lonikhand I	26.1	33.6
2	Lonikhand II	26.0	33.7
3	Pune GIS	34.9	36.5
4	Pune (Talegaon)	34.0	34.1
5	Chakan	22.9	23.3
6	Parli PG	33.5	33.4

Losses of Western Region without LILO and with LILO of both circuits of Parli (PG) – Pune (PG) 400 kV D/C at Lonikhand II are 3876.5 MW and 3869 MW respectively.

**Members may deliberate.**

### 3. Conversion of 400kV Line Reactors at Itarsi & Indore (MPPTCL) as switchable line reactor

- 3.1. In the 39<sup>th</sup> meeting of SCSPWR held on 30.11.2015, conversion of 400 kV fixed line reactors at each end of Itarsi – Indore 400kV 2xS/c lines into switchable line reactors was agreed on account of over-compensation of the lines (about 85%) and it was decided that, after making them switchable, these reactors can be utilized as Bus Reactors (with NGR bypassing) to improve voltage profile. POWERGRID has intimated that during execution of the same at Itarsi S/s, it was observed that adequate electrical clearance is not available to install 400 kV circuit breakers.
- 3.2. In regards to line reactors at 400 kV Indore (MPPTCL) S/s, POWERGRID has intimated that the existing bus bar scheme is Double Main and Transfer and the line reactor at 400 kV Indore (MPPTCL) S/s cannot be used as Bus Reactor since the existing scheme has takeoff for line Reactor after line isolator towards the line and there is also some space constraint in one of the circuits. As the line reactor cannot be used as bus reactor, NGR by-passing scheme is not required.
- 3.3. In view of the above, POWERGRID has proposed to delete the scope of converting the fixed line Reactor at Itarsi S/s on Itarsi – Indore(MP) 400kV 2xS/c lines into switchable line Reactor and NGR removal/bypassing at Indore(MP) S/s end.

However, it would not be possible to utilize the Indore (MP) end line reactors as bus reactors on account of reasons elaborated above.

**Members may deliberate.**

**4. Implementation modalities on provision of 400/220 kV, 315 MVA or 500 MVA ICT along with one no. of 400 kV ICT bay and one no. of 220 kV ICT bay at M/s CGPL Switchyard**

- 4.1. In 40<sup>th</sup> meeting of SCPSPWR held on 01.06.2016, in order to provide an interconnection between CGPL UMPP and APL Mundra STPS, provision of one no. of 400/220 kV, 315 or 500 MVA transformer along with one no. of 400 kV ICT bay and one no. of 220 kV ICT bay at M/s CGPL 400 kV/220 kV switchyard was agreed. It was also agreed that the implementation modalities of the scheme may be finalized in the WRPC.
- 4.2. Regarding the implementation modalities for the scheme, in the 34<sup>th</sup> meeting of WRPC, it was agreed for independent funding and work to be executed by PGCIL.
- 4.3. In the 42<sup>nd</sup> meeting of SCPSPWR held on 17.11.2017, it was agreed to refer the scheme to WRPC for further deliberations / clarifications on the issue of independent funding for its implementation by POWERGRID
- 4.4. The matter was discussed in the 35<sup>th</sup> WRPC meeting held on 20<sup>th</sup> Dec, 2017 wherein members agreed that the work of installation of ICT and associated bays at CGPL Complex shall be carried out by PGCIL and the cost of the same shall be recovered through POC mechanism.
- 4.5. Members may deliberate on the rating of 315MVA or 500MVA 400/220kV ICT to be installed at CGPL switchyard. GETCO may furnish the details of the availability of downstream CGPL Mundra – Nanikhakhar 220kV S/c line & associated 220kV bay at Nanikhakhar, switching arrangement as well as its availability in matching time-frame of the 400/220kV ICT at CGPL switchyard.

**5. LILO of Balaghat – Dhamdha – Donagarh 132 kV DCDS at Kiranapur 400/132 kV S/s**

- 5.1. In 38<sup>th</sup> meeting of SCPSPWR, the scheme of establishment of 2X100 MVA, 400/132kV Kiranapur (Distt-Balaghat) substation by LILO of 400kV S/c line between Bhilai and Seoni at Kiranapur by MPPTCL as a part of intrastate system strengthening was noted by members.
- 5.2. Now, MPPTCL vide its letter no. 04-02/N-171/983 dated 04.05.2018 has intimated that it has completed the Kiranapur 400/132 kV S/s works. Further request made by SLDC for shut down of for establishing LILO of Balaghat (MP) – Dhamdha (CG) – Donagarh 132 kV D/C at Kiranapur 400/132 kV S/s, Chattishgarh SLDC has denied the shut down for want of approval of Standing Committee on Power System Planning of Western Region.

- 5.3. Accordingly, MPPTCL has sought the approval for LILO of Balaghat (MP) – Dhamdha (CG) – Donagarh 132 kV D/C at Kirnapur 400/132 kV S/s.

MPPTCL may present the power flow details for the proposal.

- 5.4. Members may deliberate on this.

## **6. Constitution of Western Region Committee on Transmission ( WRSCT)**

- 6.1. Ministry of Power vide its order no. 15/3/2017 – Trans dated 13.04.2018 (enclosed as Annexure -1) has constituted the “Western Region Standing Committee on Transmission” along with its ToR (Terms of Reference) and frequency of meeting. The composition of the Committee is as given below:

1	Member (PS), CEA	Chairperson
2	COO, CTU (PGCIL)	Member
3	Director (System Operation), POSOCO	Member
4	Heads of State Transmission Utilities of Gajarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Goa, DD, and DNH (STUs shall coordinate with their respective DISCOMs)	Member
5	Member Secretary of WRPC	Member
6	CE, Power System Wing, CEA	Member Secretary

- 6.2. The ToR (Terms of Reference) of the committee is as given below:

- i) Evolve and finalize System Strengthening Schemes for removal of operational constraints and transfer of surplus power through inter-Regional corridors.
- ii) Examine the proposals for transmission System for Access/ Connectivity Applications.
- iii) Examine the Associated Transmission System with Electricity Generators.
- iv) Review the up-stream and down-stream network associated with Transmission schemes.
- v) Examine and evaluate the intra-State transmission proposals.

- 6.3. This is for kind information of the members.

## **7. Operational feedback of NLDC for Jan’2018 – Mar’2018**

- 7.1. Transmission Line Constraints

S. No	Corridor	Constraints	Remedial Actions
1.	<p>400kV Padghe – Kudus – Kala D/c corridor</p> <p><b>Antecedent Conditions</b> With high Maharashtra Demand of the order of 18500-22000 MW during morning peak and low generation at Parli, RGPPL, Jaigad and nil generation at SSP</p>	<p>400 kV Padghe – Kudus – Kala corridors carrying more than 500 MW in each ckt. The corridor is N-1 non-compliant.</p> <p>The loading of the line in Jan' 2018 – Mar' 2018 is as shown in the figure 1.</p>	<p>With the commissioning of 400kV Aurangabad-Boisar D/C in Oct'17 and 765kV Aurangabad-Padghe D/C, 400kV Padghe-Kudus-Kala D/C in Dec'17 the loading of 400kV Bableshwar-Padghe is relieved. But only one ckt of 765kV Aurangabad-Padghe is kept in service to control the loading on this corridor. At present 2x500MVA 400/220kV Kudus ICTs are idle charged in the absence of 220kV outlets.</p> <p>Commissioning of 400 kV Bableshwar - Kudus D/C and 220kV outlets from Kudus to be expedited by MSETCL In transmission review meeting held on 09.10.17 at WRPC, MSETCL informed that 400 kV Bableshwar – Kudus D/C will be commissioned in Dec'18.</p> <p>MSETCL to intimate the completion schedule of 220 kV outlets from Kudus.</p>
2.	<p>400kV Padghe – Kalwa D/c</p> <p><b>Antecedent Conditions</b> High loading is observed in general during High demand in Mumbai system.</p>	<p>Facilitating outage in this corridor in normal days is difficult. Outages are being planned only on Saturday/Sundays with planned load shedding.</p> <p>The loading of the line in Jan' 2018 – Mar' 2018 is as shown in the figure 2.</p>	<p>Commissioning of 400kV Ghatkopar S/S and Padghe (GIS) – Khargar, Padghe – Navi Mumbai – Ghatkopar and Khargar – Ghatkopar would give additional infeed to Mumbai.</p>
3.	<p>765/400 kV ICT at Tirora and 765/400 kV ICT at Akola II</p> <p><b>Antecedent Conditions</b> When generation at APML Tirora is above 2400 MW and Rattan India (5 X 270 MW) is in service.</p>	<p>With Single ICT at Tiroda and Akola, the system is not N-1 compliant for any trippings at 765kV Ektuni. At present tripping of Akola and Tiroda ICT is managed by SPS actions.</p>	<p><b>42<sup>nd</sup> SCM Discussion:</b> In the meeting, MSETCL stated that they have reviewed the provision of 2nd 1x1500 MVA ICT at Tirora &amp; Akola II as the existing 1500 MVA ICTs have 3 single phase units of 500 MVA each with a spare unit. CEA stated that 2nd 1500 MVA ICTs are required at Tirora &amp; Akola II to make the system N-1 compliant.</p>



5.	<p>220 kV Boisar – Boisar T/C</p> <p><b>Antecedent Conditions</b> With high demand of Mumbai and less generation at 220kV Tarapur, Trombay and Dahanu</p>	<p>The ckts are loaded above 200MW each and managed with load trimming scheme implemented by MSETCL. With the commissioning of 400kV Aurangabad-Boisar D/C and less internal generation in Mumbai, the loading has further increased. One ckt of 400kV Aurangabad-Boisar D/C is kept open to control the loading on 220kV Boisar – Boisar ckts.</p>	<p>As informed in 501 OCC Additional ckt of Boisar – Boisar is scheduled for Mar'18. MSETCL to update the status.</p>
6	<p>220kV Pune PG-Talegaon D/c</p> <p><b>Antecedent Conditions</b> High Loading</p>	<p>The lines are loaded above 250MW always and N-1 non-compliant. One ICT at Pune PG kept out to control the line loading.</p>	<p><b>42<sup>nd</sup> SCM:</b> MSETCL intimated that Pune - Hingewadi 220 kV D/C is under implementation, however, due to urbanization it has severe RoW constraints and this line is expected to get commissioned by Dec, 2018. Further, it was stated that Talegaon - Chinchwad 200 kV D/C is under implementation &amp; expected to get commissioned by March, 2018. <b>Not yet commissioned.</b></p> <p>Bays are already charged at Pune (PG). MSETCL may update the status of 220kV outlets from Pune PG.</p>
7.	<p>400 kV Chandrapur – Chandrapur (II) D/C</p> <p><b>Antecedent Conditions</b> When generation at Chandrapur is less and Chandrapur (II) is high</p>	<p>Skew dispatch at Chandrapur leading in critical loading on these lines resulted in restriction of flow on Chandrapur-Padghe HVDC to ensure N-1 of lines, which in resulted in less reliability and low voltages at Parli, Lonikhand, Padghe in the month of March. The loading of the line in Jan' 2018 – Mar' 2018 is as shown in the figure 3.</p>	<p>Additional inter-connection between Chandrapur (II) - Chandrapur may be planned.</p>

8.	<p>400 kV Bina-Sujalpur D/c</p> <p><b>Antecedent Conditions</b> N-1 insecure operation of Bina – Sujalpur D/C after commissioning of Shujalpur – RAPS D/C coupled with high Demand in MP of above 11000 MW.</p>	<p>High loading observed above 600 MW/ckt on most of the time in Q3 (17-18). Although MP demand was less in Q4(17-18), power flow on these ckts was above 550MW /ckt for 20% of the time as APL Mundra generation in Gujarat area is very less.</p>	<p><b>Present Status:</b> With the commissioning of Bipole of Champa – Kurukshetra, loading on Bina-Shujalpur D/C has reduced slightly. MP has met highest demand till date is 12462 on 20<sup>th</sup> Dec’17.</p> <p>Commissioning of RAPS 7 &amp; 8 generation would relieve the loading.</p>
9.	<p>220 kV Gwalior - Malanpur D/c &amp; 220 kV Gwalior PG – Mahalgaon D/c</p> <p><b>Antecedent Conditions</b> High loading is observed in general during Rabi season MP when demand is more than 8500 MW.</p>	<p>The system is N-1 insecure. Presently system is being managed by load trimming scheme by MPPTCL for overloading of 220kV Gwalior-Malanpur D/C and overloading of 220/132kV Mahalgaon ICTs. 220kV Gwalior-Mahalgaon D/C is loaded more than 250MW for 70% of the time.</p>	<p>Commissioning of 400/220kV Morena S/S,400kV Gwalior-Morena D/C , LILO of one circuit of Malanpur – Mehgaon 220 kV line at 400/220 kV Morena S/s and LILO of one circuit of 400/220kV Morena- Sabalgarh (220kV line) at 220kV Morena S/s of MPPTCL would help to relieve the loading on 220kV lines.</p> <p><b>42<sup>nd</sup> SCM:</b> 400/220 kV Morena S/s expected in May’18.</p> <p><b>Present status:</b> 400/220 kV Morena S/S and 400kV Gwalior-Morena D/C by M/s CWRTL and LILO of one circuit of 220kV Malanpur – Mehgaon at Morena by MPPTCL. Expected in Apr18.</p>
10.	<p>400 kV Bhachau –Versana D/c</p> <p><b>Antecedent Conditions</b> With skewed dispatch in Gujarat system with almost nil generation at APL Mundra, Vadinar and full generation at CGPL</p>	<p>High loading of 400kV Bhachau-Versana D/C (short lines-10km each) are observed due to reverse power flow to APL from Versana with very less generation at APL. 400kV Versana – Hadala or Versana – Zerda lines are opened to control the Bachhau – Versana loading to 575 MW/ckt to ensure N-1 compliance. Tripping of the D/C would critically overload Bhachau ICTs.</p>	<p>Reverse power flow on HVDC Mundra – Mahendragarh Bi-pole would relieve the constraint to great extent.</p> <p>Also, additional ICT at Bhachau may be planned so that system will be N-2 compliant for 400kV Bhachau-Versana D/C. The loading of the line in Jan’ 2018 – Mar’ 2018 is as shown in the figure 4.</p>

11.	<p>220 kV Navsari (PG) – Navsari (GETCO) D/c</p> <p><b>Antecedent Conditions</b> With High generation Ukai, Kawas Jhanor.</p>	<p>High loading observed more than 220 MW and N – 1 non-compliant</p>	<p>Commissioning of 400kV Vav (II) S/s planned by Gujarat by making LILO of 400kV Jhanor-Navsari one ckt &amp; Ukai-Kosamba one ckt would relieve loading on 220kV Navsari (PG) – Navsari ckt.</p> <p>220kV Navsari- Bhesthan (Popada) D/C was to be implemented by DGENTPL under TBCB.</p> <p><b>42<sup>nd</sup> SCM Discussion:</b> M/s DGENTPL has intimated that they are not developing the scheme. The scheme need to be cancelled and the line may be implemented separately. In a meeting held on 23.01.2018 among CTU,GETCO &amp; NLDC, it was decided that CTU &amp; GETCO may explore the transmission scheme to reduce the over loading of Vav – Popadiya, Vav – Navsari, Navsari – Navsari (PG). GETCO / CTU may update the status.</p>
12.	<p>220 kV Jhanor (NTPC) – Haldarwa D/c</p> <p><b>Antecedent Conditions</b> High loading is observed in general when more than three machines are in service at Jhanor NTPC</p>	<p>The 220kV Jhanor-Haldarwa D/C lines (short lines-13 kms) are highly loaded and not N-1 compliant. Many reliability measures like bus split at Jhanor has to be taken to facilitate the shutdown of one line.</p>	<p>220kV Haldarwa-Jagadia S/C line LILO at Jhanor would relieve the loading. The LILO has been agreed in 36<sup>th</sup> SCM of WR.</p> <p><b>35<sup>th</sup> WRPC &amp; TCC discussions:</b> GETCO informed that no clearance is pending from NTPC, civil tender is finalised and electrical tender is to be retendered and two feeders would be commissioned by <b>Sept'18</b>. (Line work is already completed).</p>
13.	<p>220kV Amreli - Sawarkundla D/c</p> <p><b>Antecedent Conditions</b> High loading during Rabi season and when generation at Padva BECL and GPPC is not available in Gujarat system.</p>	<p>For 50% of the time, lines were loaded more than 250 MW (total) and N-1 non-compliant.</p>	<p>Gujarat to plan another infeed to Sawarkundla.</p> <p>GETCO may intimate the augmentation plan.</p>
14.	<p>220kV Ukai - Mota D/c</p>	<p>The lines are loaded above 250MW (total) for 50% of</p>	<p>Commissioning of 400kV Vav (II) S/s planned by Gujarat by making LILO of</p>

	<p><b>Antecedent Conditions</b> When Ukai generation is high at 220kV side.</p>	<p>time and N-1 non-compliant.</p>	<p>400kV Jhanor-Navsari one ckt &amp; Ukai-Kosamba one ckt would help in relieving the constraint.</p> <p>GETCO may intimate the schedule of commissioning.</p>
15.	<p>220kV DSPM – Korba (E)</p> <p><b>Antecedent Conditions</b> With full generation in DSPM and less generation in Korba East and Budhipadar</p>	<p>DSPM (2X250 MW) generation was planned with LILO of existing 220 kV Korba West-Korba East one ckt and 220kV Suhela-Banari line. No additional evacuation was planned for DSPM evacuation. This has resulted in overloading of 220kV DSPM-Korba East line when the power flow is towards Budhipadar end. SLDC CSPTCL raised concerns of forced backing down at DSPM even when they were overdrawing from the grid</p> <p>The loading of the line in Jan' 2018 – Mar' 2018 is as shown in the figure 5.</p>	<p>Additional 220 kV lines to be planned for DSPM generation and strengthen the interconnection between Korba (E) and DSPM.</p> <p>CSPTCL may intimate the augmentation plan.</p>
16.	<p>220kV Raigarh-Raigarh D/C</p> <p><b>Antecedent Conditions</b> All time</p>	<p>The lines are loaded above 200MW always and N-1 non-compliant.</p>	<p>Only 220kV Raigarh-Raigarh D/c commissioned, Two more outlets are planned but not yet commissioned. However bays are charged at Raigarh PG</p>

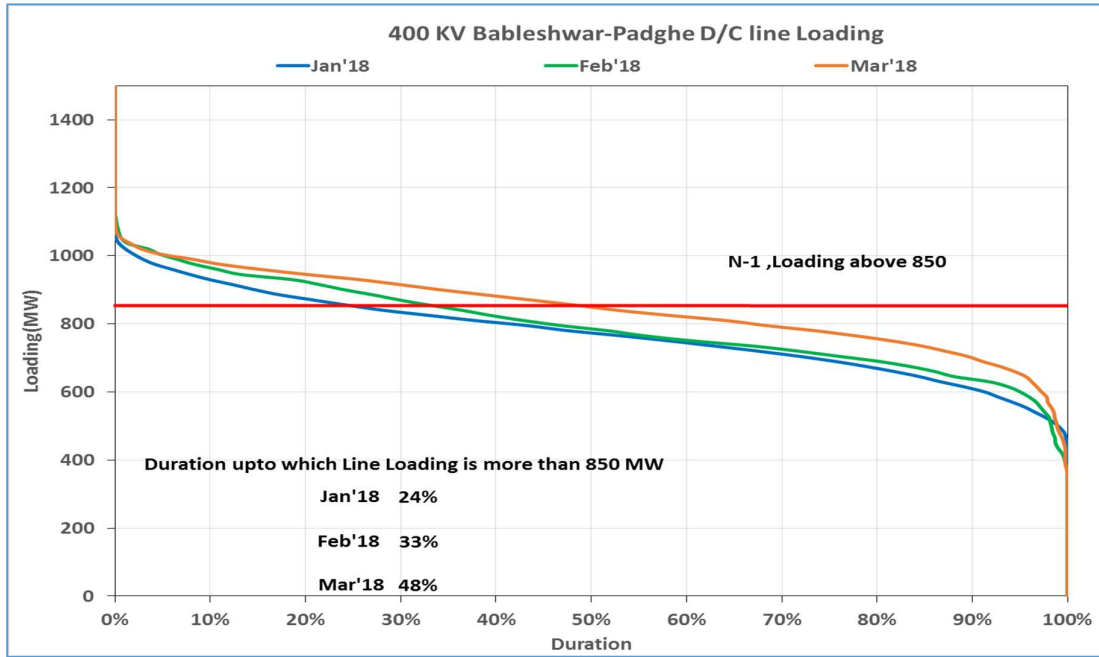


Figure 1

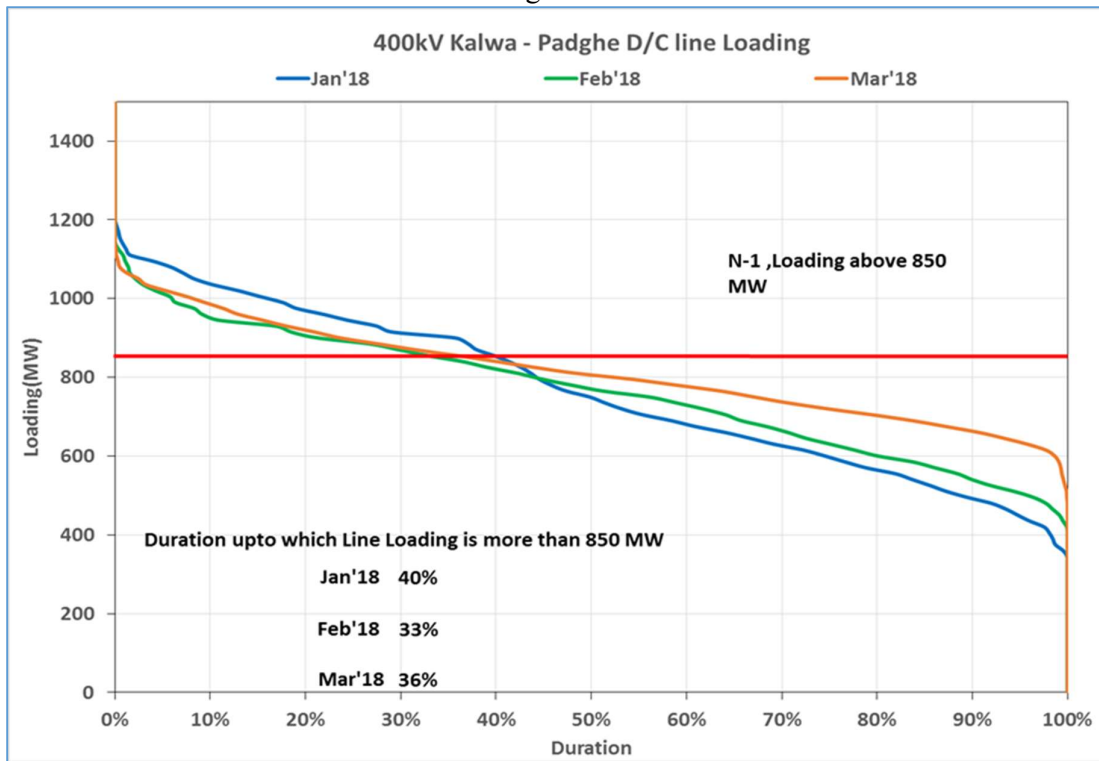


Figure 2

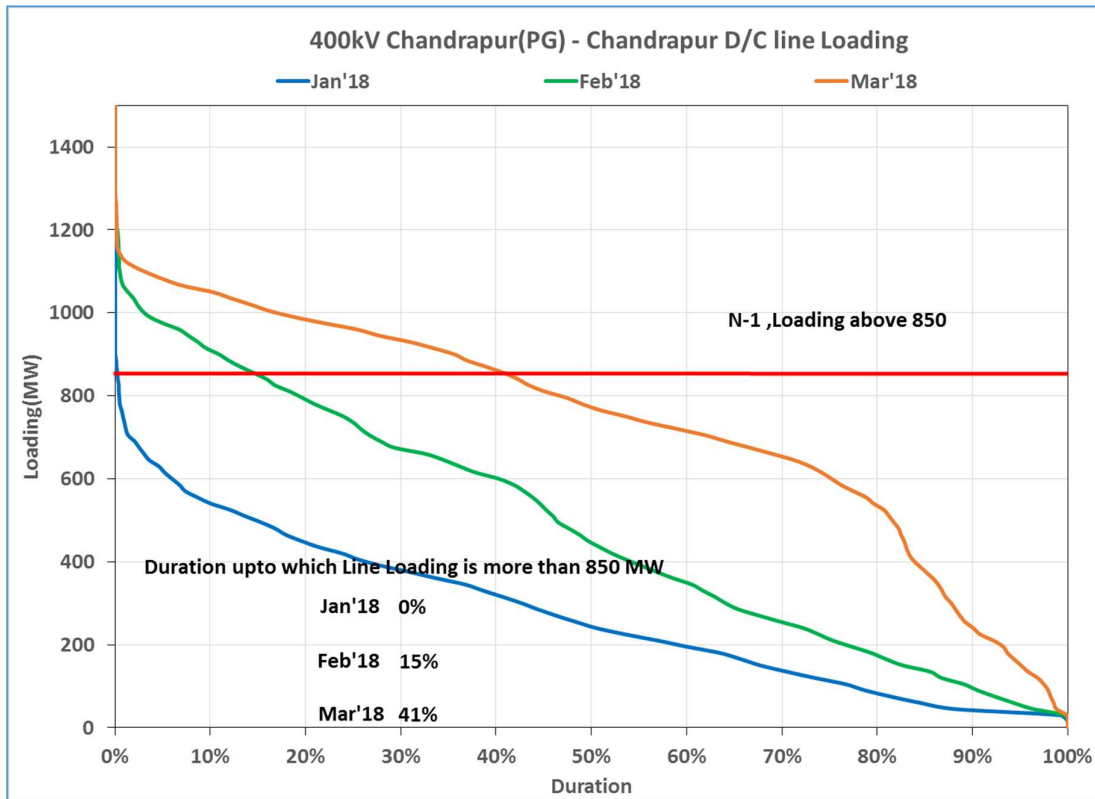


Figure 3

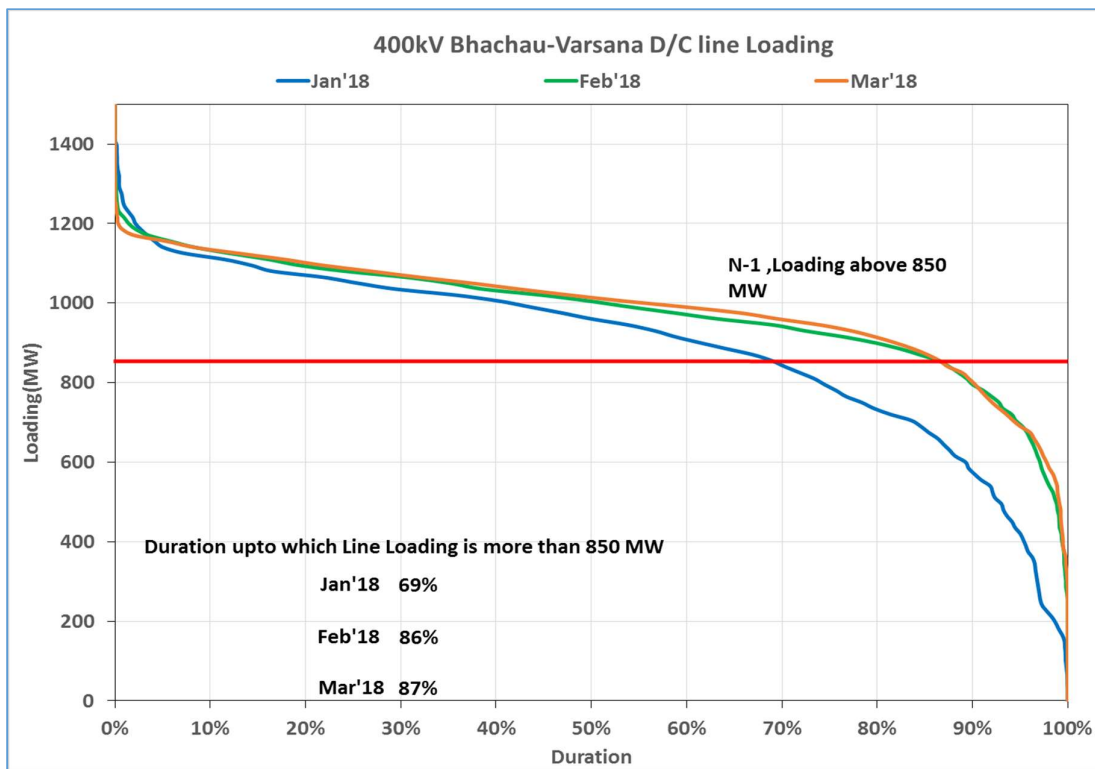


Figure 4

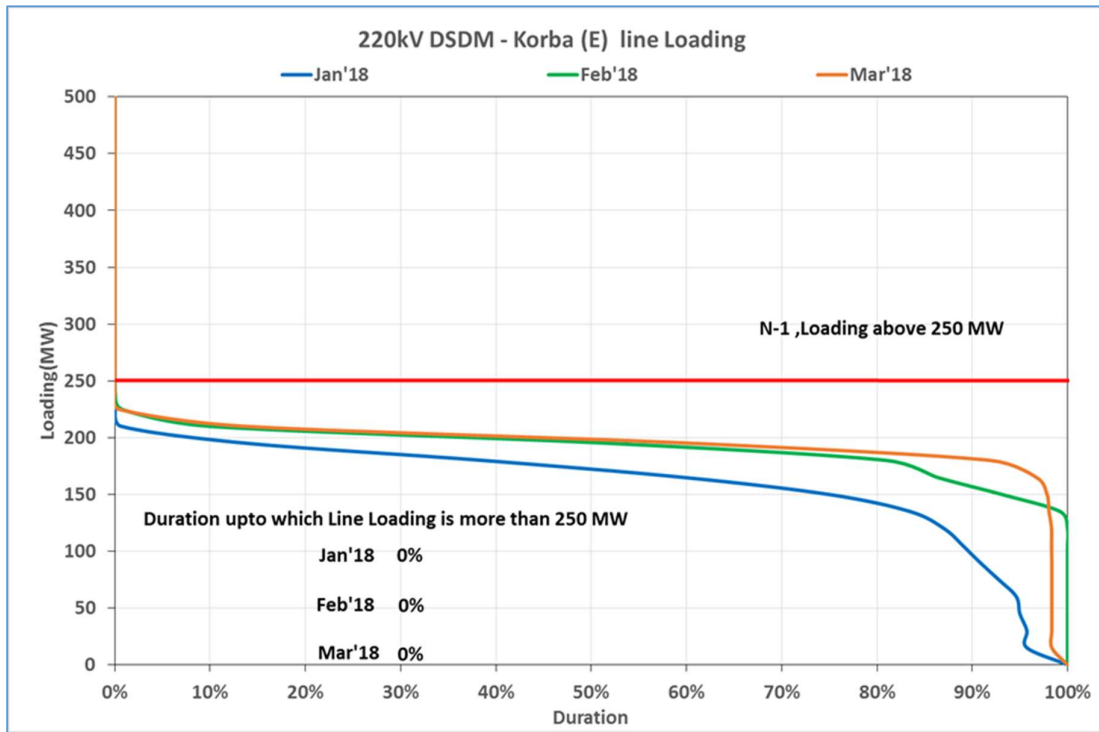


Figure 5

## 7.2. ICT Constraints

S. No	ICT	Constraints	Remedial measures
1	2 X 315 MVA 400/220 kV Chakan ICTs  <b>Antecedent Conditions</b> All time	It is observed that the loading on ICTs at Chakan (2 x 315 MVA) are above 200 MW and additional ICT has to be proposed.  MSETCL has implemented load trimming scheme to take care of overloading.	<b>42<sup>nd</sup> SCM:</b> MSETCL intimated that additional 315 MVA ICT has been approved and is under tendering process. The same is expected to be commissioned by March, 2019.
2	(2x315 + 1x500 MVA) 400/220 kV Parli (MS) ICTs  <b>Antecedent Conditions</b> With High Demand in Maharashtra and low Parli generation	It is observed that loading on these ICTs are high and N-1 non-compliant.  MSETCL has implemented load trimming scheme to take care of overloading.	Nanded Sub-station with 2x500MVA 400/220 kV ICTs and 220 kV lines commissioned in Mar16 and Parli ICTs are relieved to some extent.  <b>42<sup>nd</sup> SCM Discussion:</b> ICTs and bays at Parli (PG) are under implementation by POWERGRID and are expected to be commissioned by Jun/July'18. The LILO of 220 kV Parli - Harngul S/c and LILO of Osmanabad (MS) – Parli 220 kV S/c at Parli PG are expected to be commissioned by Dec – 2018.
3	2 X 315 + 500 MVA 400/220 kV Kolhapur (MS) ICTs and 3 X 315 MVA 400/220 kV Karad ICTs  <b>Antecedent Conditions</b> With High Demand in Maharashtra and Low Wind generation in Southern Maharashtra	It is observed that loading on these ICTs are N-1 non-compliant when wind generation is very low in Southern Maharashtra.  In April 2017, two blackouts have occurred at Karad and Kolhapur S/s causing load loss of more than 1800 MW.  MSETCL thereafter planned and implemented load trimming scheme.  The loading of the ICT at Karad in Jan' 2018 – Mar' 2018 is as shown in the figure 6.	Additional ICTs to be planned for Kolhapur S/s. Load has to be shifted to 400/220 kV Alkud and Sholapur PG S/s with augmentation of 220 kV lines. Constraints in Karad ICTs not observed in this quarter.  <b>42<sup>nd</sup> SCM Discussion:</b> Additional ICT is planned for Kolhapur S/s. MSETCL representative intimated that with the commissioning of 220 kV network at Alkud and Kolhapur S/S, ICT at Karad would be relieved.  Later on MSETCL informed that one 315 MVA ICT at Kolhapur would be replaced by 500MVA.  MSETCL to expedite the 220kV outlets from Alkud.



S. No	ICT	Constraints	Remedial measures
4	<p>2 X 500 MVA 400/220 kV Sholapur (MS) ICTs</p> <p><b>Antecedent Conditions</b> With High Demand in Maharashtra system above 18500 MW</p>	<p>It is observed that loading on these ICTs are high and N-1 non-compliant.</p> <p>MSETCL has implemented load trimming scheme to take care of overloading.</p>	<p>To control overloading, load has to be shifted from Lamboti ICTs to Sholapur (PG) ICTs which are underutilised. As an interim arrangement 400kV Solapur PG-Karad S/c line is being used as 220kV Solapur PG-Jeur S/c line which relieved the loading on Solapur MS ICT's.</p> <p><b>42nd SCM of WR:</b> MSETCL intimated that 1x500 MVA 400/220 kV ICT is proposed at Solapur (MS) which is expected to be commissioned by March 2019.</p>
5.	<p>2 X 315 MVA 400/220 kV Wardha (PG) ICTs</p> <p><b>Antecedent Conditions</b> With Commissioning of Koardi Units 3x660 MW.</p>	<p>The ICTs are loaded above 200 MW most of the time with the commissioning of Koradi stage 2.</p> <p>The loading of the ICT at Karad in Jan' 2018 – Mar' 2018 is as shown in the figure 7.</p>	<p>Earlier there were 2 X 315 MVA +1 X 500 MVA 400/220 kV ICTs at Wardha S/s. On request of Maharashtra one ICT (500 MVA) was shifted to Solapur PG. As there are many generators connected at near by network of 220 kV Wardha PG, Maharashtra was not drawing power from these ICTs. However, now due to less generation at 220 kV Wardha, Maharashtra has started drawing large quantum of power from the remaining two ICTs causing their overloading.</p> <p>2 X 500 MVA 400/220 ICTs of Koardi 2 are lightly loaded. Network augmentation and load distribution to be done so that loads of Wardha should be shifted to Koradi ICT's.</p> <p><b>As per 42<sup>nd</sup> SCM:</b> MSETCL intimated that redistribution of loads is not feasible in the area and requested augmentation of Wardha (PG) by 400/220 kV 1x500 MVA ICT.</p>

S. No	ICT	Constraints	Remedial measures
6.	2 X 500 MVA + 1 X 600 MVA 400/220 kV Kalwa ICTs  <b>Antecedent Conditions</b> With high demand in Maharashtra	With increased demand and low network augmentation in the area, the system is not N-1 compliant.	ICT – 3 of 500 MVA is commissioned on 25.10.17 with Load trimming scheme in operation.  The Navi Mumbai substation need to be utilized with 220 kV network augmentation.  <b>As per 42<sup>nd</sup> SCM:</b> MSETCL intimated that 4 <sup>th</sup> 400/220 kV 500 MVA ICT at Kalwa S/S is expected to be commissioned by March 2018.  MSETCL to update the status.
7	2 X 315 MVA + 1X 500 MVA 400/220 kV Boisar ICTs  <b>Antecedent Conditions</b> With low Generation at Tarapur – 1 & 2, Dahanu and high Mumbai demand	High loading is observed on these ICTs. One ckt of 400kV Aurangabad – Boisar D/C is kept out to control loading on ICTs.  The loading of the ICT at Karad in Jan’ 2018 – Mar’ 2018 is as shown in the figure 8.	Load trimming schemes to be implemented by MSLDC / MSETCL for contingency of 500 MVA ICT.  <b>41<sup>st</sup> SCM Decision:</b> 4 <sup>th</sup> ICT of 500MVA is planned and expected in Mar’19.
8	3 X 315 MVA 400/220 kV Bina ICTs  <b>Antecedent Conditions</b> High Demand in MP	400/220kV Bina ICT-1 is out of service from 15 <sup>th</sup> jan’18 and ICT-2 is out of service from 14 <sup>th</sup> Feb’18. Now there is only one ICT at Bina (MP) and to manage its loading, load is transferred to Gwalior ICTs causing its overloading.	Intra-state OCC of MP: ICT1 is being replaced by new ICT and is scheduled for May’18.  ICT-2 to be restored as soon as possible. MPPTCL may intimate the augmentation plan.
9	3 X 315 MVA 400/220 kV Gwalior PG ICTs  <b>Antecedent Conditions</b> High Demand in Gwalior and nearby area. and low generation in Auraiya	The ICTs are N-1 non-compliant. With the absence of 2 ICTs at Bina, the loading on Gwalior ICTs are further increased. Facilitating outage of Gwalior ICTs requires load shedding by MP in the present system operation.	SPS has to be implemented by MP SLDC in coordination with /PGCIL for N-1 compliance of these ICTs.  400/220 kV Morena S/s and ICTs at Morena with LILO of one circuit of Malanpur – Mehgaon 220 kV line at 400/220 kV Morena S/s is expected in Apr’ 18 and would relieve Gwalior ICTs.  LILO of one circuit of Malanpur – Mehgaon 220 kV line at 400/220 kV Morena S/s was completed in Feb, 2018

S. No	ICT	Constraints	Remedial measures
10	3 X 315 MVA 400/220 kV Bhopal ICTs  <b>Antecedent Conditions</b> Madhya Pradesh meeting high demand of above 9000 MW	It is observed that the loading on ICTs at Bhopal (3 x 315MVA) are above 200 MW and additional ICT is already proposed.	220 kV Bhopal – Shujalpur D/c lines are kept open by SLDC MP to control the ICT's loading.  <b>42<sup>nd</sup> SCM discussion:</b> 1 X 315 MVA, 400/220 kV ICT (4 <sup>th</sup> ) at Bhopal is under implementation by MPPTCL. Award has been placed on 04.04.2016 and is expected to be completed by Mar'18.
11	315 MVA + 500 MVA 400/220 kV Itarsi ICT  <b>Antecedent Conditions</b> Madhya Pradesh meeting high demand of above 9000 MW	System is not N-1 compliant for tripping of 500 MVA ICT.	Load trimming scheme to be planned by SLDC, MP/MPPTCL for contingency of 500 MVA ICT. Load may be shifted to Betul (GIS)  <b>42<sup>nd</sup> SCM decision:</b> Replacement of 315 MVA, 400/220kV transformer at Itarsi (PG) S/s by 500MVA ICT and Shifting the 315 MVA ICT thus freed to Gwalior as 4 <sup>th</sup> 400/220 kV ICT.
12	2 X 315 MVA 400/220 kV Dehgam ICTs  <b>Antecedent Conditions</b> High demand in Gujarat and less generation at Wanakbori.	It is observed that the loading on ICTs at Dehgam (2 x 315 MVA) are above 180 MW and additional ICT has to be proposed.  The loading of the ICT at Karad in Jan' 2018 – Mar' 2018 is as shown in the figure 9.	<b>42<sup>nd</sup> SCM discussion:</b> 1 X 500 MVA, 400/220 kV ICT at Dehgam is schedule by PGCIL in March 2019.
13	2 X 315 MVA 400/220 kV Kala ICTs  <b>Antecedent Conditions</b> With commissioning of 765 kV Aurangabad PG – Padghe D/c, 400 kV Padghe – Kala – Kudus D/c corridor and increased load of DNH	It is observed that ICTs are loaded above 250 MW n-1 non-compliant. One ckt of 765 kV Aurangabad-Padghe is opened to control Kala ICT loading.	<b>41<sup>st</sup> SCM Decision:</b> 3 <sup>rd</sup> ICT of 500 MVA is planned and expected in Mar'19.

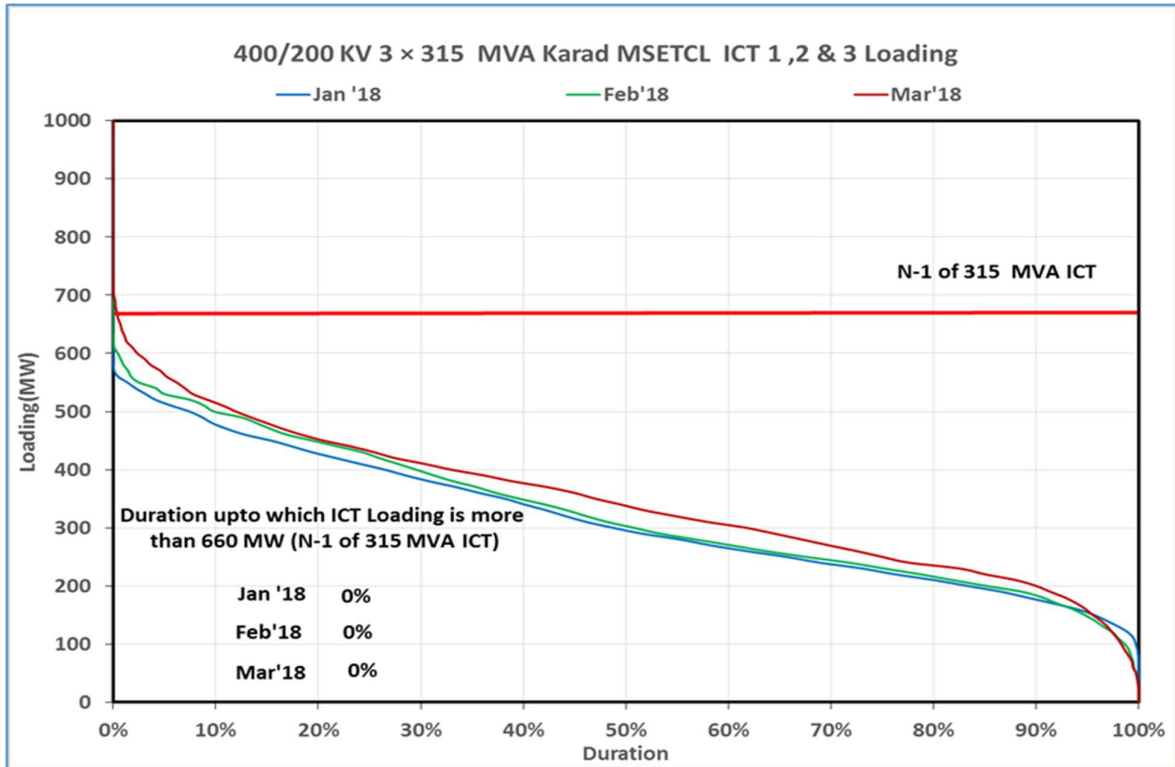


Figure 6

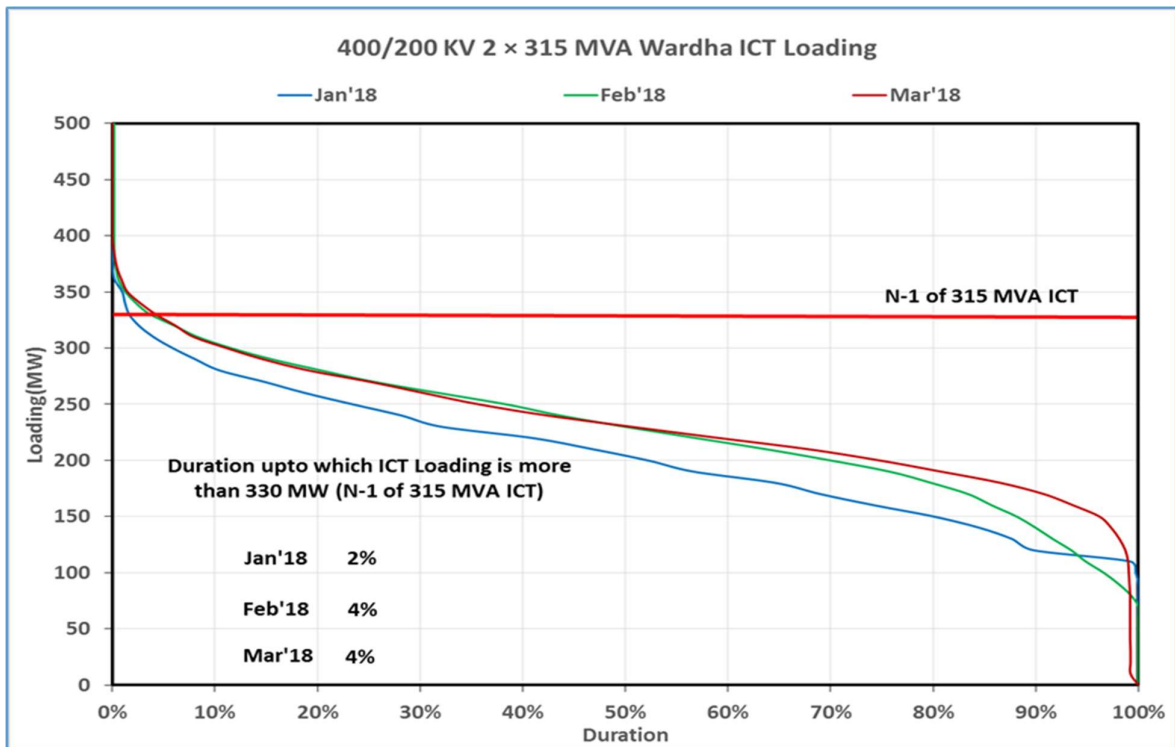


Figure 7

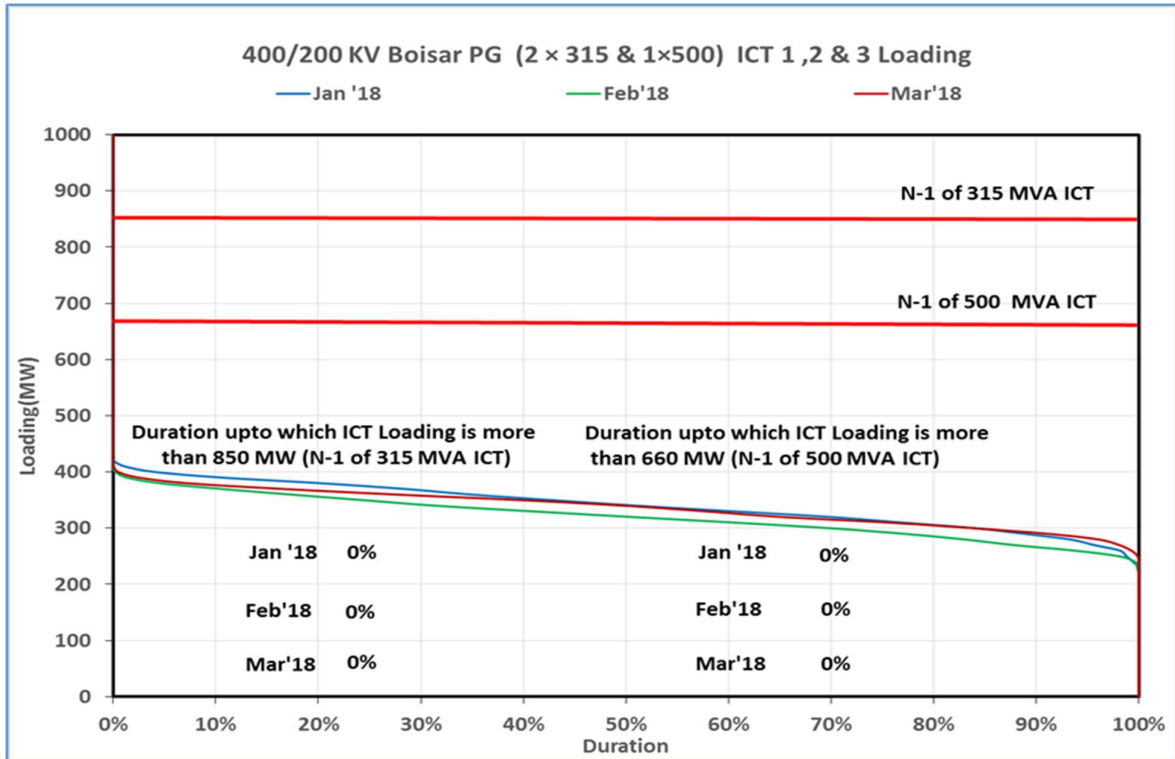


Figure 8

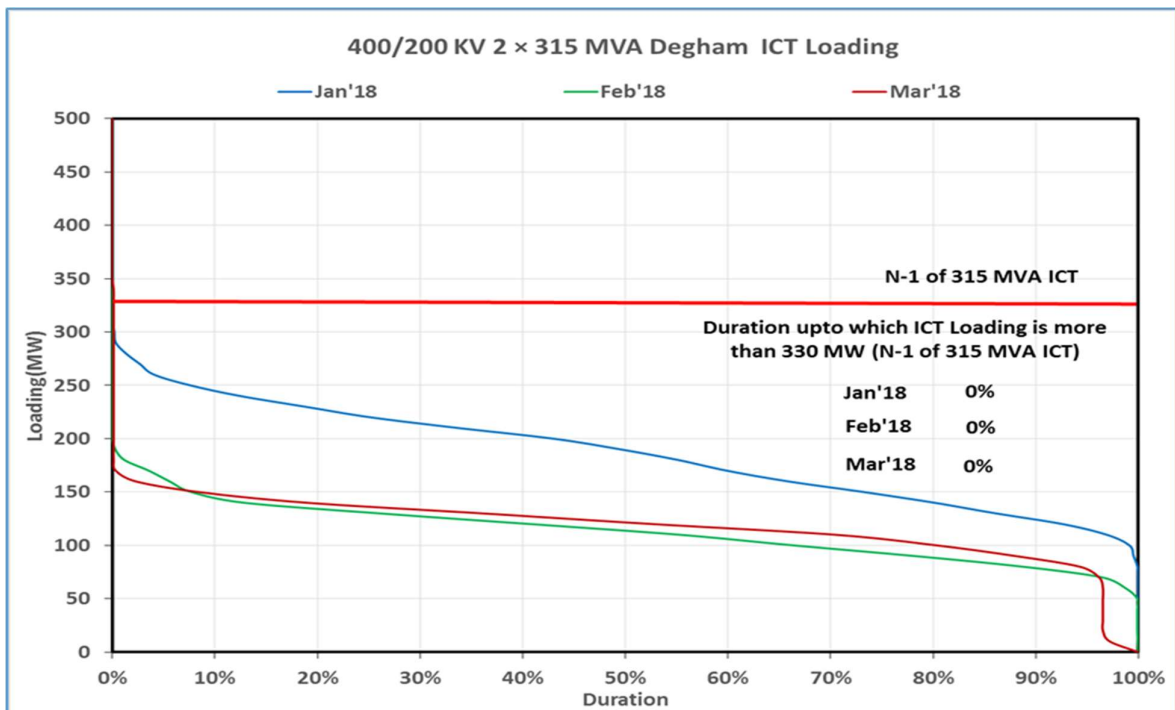


Figure 9

7.3. **Nodes experiencing high voltage at 400 kV level:** Kalwa, Aurangabad (MS), Chandrapur, Dhule, Karad, Mapusa, Rajgarh, Khandwa (PG), Wardha (PG), Raigarh (PG), Solapur(PG), Solapur (MS), Dehgam, Seoni, Sami and GPEC.

7.4. Lines / ICTs opened to control overloading

Sl. No	Transmission Element (s) opened	Overloaded corridor	Remarks
1.	400/220 kV Pune(PG) one ICT	To control loading in 220 kV Pune (PG) – Talegaon D/C lines	Additional 220 kV outlets from Pune (PG) to be expedited by MSETCL. <b>42<sup>nd</sup> SCM:</b> MSETCL intimated that Pune - Hingewadi 220 kV D/C is under implementation, however, due to urbanization it has severe RoW constraints and this line is expected to get commissioned by Dec, 2018. Further, it was stated that Talegaon - Chinchwad 200 kV D/C is under implementation & expected to get commissioned by March, 2018. There are constraints beyond Urse only.
2	400/220 kV, (2 x 315 + 1 X 500) MVA Solapur(PG) ICTs	2 X 500 MVA Sholapur (MS) ICTs loading will reduce if loads are shifted to Sholapur PG ICTs	South Solapur has been connected which is around 100 MW. Further 2x500MVA Sholapur (MS) ICTS are heavily loaded. Therefore, loads from Solapur (MS) need to be transferred to Sholapur (PG) for reducing ICT loading at Solapur (MS) and better utilization of ICTS at Sholapur (PG). <b>Present:</b> Load connected is in tune of 200-250 MW. 220 kV Sholapur (PG)-Jeur line has been made as an interim arrangement by reconfiguration of 400 kV Karad-Solapur (PG) Circuit.  <b>42<sup>nd</sup> SCM :</b> 220kV Solapur PG-Bale D/c lines expected by Jun'18. MSETCL may <b>expedite the commissioning of these ckts. Restoration of 400kV Solapur PG-Karad is essential as generation has started at Solapur NTPC.</b>
3.	400/220 kV 1 X 500 MVA Alkud ICT	Idle charged in the absence of 220kV downstream network.	The Loading on these ICTs will help in reducing the loading on Kolhapur (MS), Karad and Solapur (MS) ICTs. However, 220 kV System is not yet ready.  <b>42<sup>nd</sup> SCM:</b> MSETCL intimated that the LILO of 220kV Vita-Miraj line at Alkud is expected to be commissioned by Sep 2018.
4	400/220 kV 2 X 500 MVA ICTs at Vadodara GIS	Idle charged in the absence of 220kV downstream network.	Powerflow on these ICTs will help in reducing loading on Jambua and other nearby ICTs. <b>42<sup>nd</sup> SCM:</b> GETCO has informed that 220 kV Venkatpura-Vadodara D/C Line is expected by Jan'18 and 220 kV Jambua – Vadodara D/C Line by Mar'19.  GETCO may update the status.

Sl. No	Transmission Element (s) opened	Overloaded corridor	Remarks
6	400/220 kV 2 X 315 MVA ICTs at Betul GIS	Under utilized ICT's and over loading of Itarsi PG ICT's. Less loading on 220kV Betul-Betul GIS D/c lines.	High loading observed in the ICT's at Itarsi PG. Shifting of load on these ICT's would relieve the loading of Itarsi ICT's. <b>42<sup>nd</sup> SCM:</b> LILO of Sarni - Pandhurna 220 kV line at Betul GIS by Dec'18.
7.	400/220kV, 2X500 MVA ICT at Kudus MSETCL	Idle charged in the absence of 220kV downstream network.	400/220kV 2X 500 MVA ICT-1&2 are charged idle from 400kV side at Kudus MSETCL in Dec'17 and Mar'18 respectively. <b>Transmission planning report of Maharashtra STU (2016-21):</b> 220kV Padghe-Wada and Wada-Kolset planned to be LILO'ed at Kudus and shall be commissioned by Mar'18. Not yet commissioned. MSETCL may expedite the commissioning.
8.	400kV Raita-Jagdalpur one Ckt and 400/220kV ICT (1X315 MVA) at Jagadalpur CSPTCL	Idle charged in the absence of 220kV downstream network.	400/220kV ICT-1 at Jagdalpur idle charged in Sept'17. Further in TRM held on 09.10.2017 CSTPCL has informed that 220kV Barsoor-Jagadalpur D/c lines expected by Jun'18.
9.	DGEN (400/220kV, 3X315 MVA) ICT's	Idle charged in the absence of 220kV downstream network.	Presently all three ICT's are under idle charged condition.
10.	400kV Essar Vadinar-Bhachau D/c lines	Lines are idle charged from Bhachu PG.	Lines are idle charged From Bhachau end only. No connection at Vadinar end.

7.5. Delay in transmission lines affecting grid operation adversely

S. No.	Transmission Corridor	Scheduled Commissioning Date	Actual/ Likely Commissioning Date	Transmission Constraint Caused
1.	400 kV Essar Vadinar-Amreli D/C	July'13	Mar'19	<p>Would complete Vadinar evacuation and relieve Hadala-Chorania S/C. However, interim arrangement with completed portion of Amreli-Vadinar one ckt terminated at Jetpur and one ckt at Hadala relieved loading of Chorania –Kasor.</p> <p><b>CEA transmission line progress report as on 28.2.18-</b> Progress affected due to contractual issue with M/s Jyoti and contract has been terminated.LOA is issued on 05.03.2018. Likely to be commissioned by Mar'19.</p>
2.	400 kV Amreli – Kasor D/C	June'13	Dec'18	<p>Would relieve Chorania-Kasor S/C. However, interim arrangement with completed portion of Amreli-Vadinar D/C, one ckt terminated at Jetpur and one ckt at Hadala has relieved the loading of Chorania –Kasor.</p> <p><b>CEA transmission line progress report as on 28.2.18:</b> Gujarat has informed that severe RoW problem in construction however same is expected by Dec'18.</p>
3.	400 kV Essar Mahan-Bilaspur Pooling Station D/C	Mar13	June'18	<p>This would complete transmission system planned for evacuation of Essar Mahan (2 X 600 MW) which is at present connected with LILO of 400 kV Korba-V'chal-1. Bilaspur pooling station is commissioned in Mar'12 and dedicated lines from Essar Mahan to Bilaspur are delayed indefinitely by developer causing constraints in the transmission system from Korba.</p> <p>This interim connectivity has also resulted in poor maintenance of line and bay equipment as several time outages are being cancelled as generator.</p>
4.	400kV Bableshwar-Kudus D/C and associated 220 kV system	Mar'16	May'19	<p>Delay in commissioning of 400 kV Bableshwar – Kudus D/C, has resulted in high loading on 400 kV Padghe-Kudus-Kala D/C.</p> <p>Kudus S/s is commissioned in Dec'17.</p> <p><b>CEA transmission line progress report as on 28.2.18:</b> Delayed due to severe ROW problem. NOC for diverted route from GMRT awaited.</p>
5.	400 kV KSK-Champa 2 X D/C	2015	Aug'18	<p><b>Present Status:</b> 400 kV KSK-Champa PS ckts 3 &amp; 4 were charged on Oct'16.</p>



S. No.	Transmission Corridor	Scheduled Commissioning Date	Actual/ Likely Commissioning Date	Transmission Constraint Caused
				Presently 3 <sup>rd</sup> Unit (Unit-2) at KSK (600 MW) has declared COD on 28 <sup>th</sup> Feb' 18.  <b>CEA transmission line progress report as on 28.2.18:</b> One ckt of 400kV KSK-Champa 2X D/C is likely to be commissioned in Aug' 18

7.6. Delay in Generation affecting grid operation adversely

SI . No	Generating Unit	Area/ State	Proposed Commissioning Date	Actual/ Likely Commissioning Date	Operational Constraint Caused
1	Kakrapar 3&4 (2X700MW)	South Gujarat	2015	2019	400kV Kakrapar-Vapi D/C and Kakrapar-Navsari D/C are commissioned and with no generation at 400kV KAPP(3&4) , only loop flows are observed. These lines are under utilized and KAPP(3&4) generation would help in feeding Vapi and Navsari areas.

**8. Progress of downstream network whose terminating bays are under construction by PGCIL**

8.1. The 5.4. Proviso (iii) of Indian Electricity Grid Code (IEGC) (Fourth Amendment) Regulations, 2016, of CERC dated 06.04.2016 is as follows:

*“Where the transmission system executed by a transmission licensee is required to be connected to the transmission system executed by any other transmission licensee and both transmission systems are executed in a manner other than through tariff based competitive bidding, the transmission licensee shall endeavor to match the commissioning of its transmission system with the transmission system of the other licensee as far as practicable and shall ensure the same through an appropriate Implementation Agreement.”*

8.2. Accordingly, in order to match commissioning schedule of Inter-state transmission assets with the schedule of downstream and upstream network of STUs, utilities requested to furnish the following information:

**Status of unutilized 220kV line bays at Existing Substations in WR**

S. No.	ISTS Substation	Voltage ratio in use	Status of Bays		220kV Lines for unutilized bays	Status As per 42 <sup>nd</sup> SCM	Remarks
			Total	Unutilized			
1	Raipur (PG)	3x315 MVA, 400/220 kV	6	2 no of bays ready since 01.07.2011 (WRSS-6)	Raipur (PG) – Doma 220 kV D/c	Target to complete by 30.11.2017	CSPTCL may update the status Information is not provided to CEA for its monthly progress report
2	Mapusa (PG)	3x315 MVA, 400/220kV	4	2 no of bays ready since : 01.11.2013	Mapusa – Cuncolin 220 kV D/c	-	GED may update
3	Pirana	2x315 MVA, 400/220kV	4	2 no of bays ready since 19.03.15 (WRSS-6)	Pirana – Barjadi 220 kV D/c	March 2019	GETCO may update the status
4	Boisar	2x315 +500 MVA, 400/220 kV	6	1 Bay ready since 30.05.15	Boisar – Borivali 220 kV line S/c	March, 2018	MSETCL may update
5	Magarwada	2x315 MVA, 400/220 kV	4	2 no of bays ready since 03/11/14	Magarwada – Ringanwada 220 kV D/c	March, 2018	Commissioned
6	Wardha	2x315 MVA, 400/220 kV	6	2 no of bays ready since 01.02.2011	Wardha- Yavatmal 220 kV D/C line	Dec, 2018	MSETCL may update
				2 no of bays ready since 01.01.2012	Wardha – Bhugaon 220 kV S/c	Commissioned in August 2016	Commissioned
					Wardha – Pusad 220kV S/c	Commissioned in August 2016	Commissioned
7	Solapur	2x315 +1x500 MVA, 400/220 kV	6	2 no of bays ready since 01.04.2011	Solapur – Bhale (MS) 220kV D/c	June, 2018	MSETCL may update
				2 no of bays ready since 02.11.2015	Solapur – Narangwadi 220 kV D/c line	Narangwadi 220 kV S/s planned in 2019 – 20 timeframe.	MSETCL may update

8	Damoh	1 x 500 MVA 400/220 kV	6	2 no. of bays ready since Nov – 2016	LILO of 2nd 220 kV circuit of Damoh (MPPTCL) - Sagar 220kV line at Damoh (PGCIL) 400kV S/s. (1Km)	Commissioned on 28.08.2017	Commissioned
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**400 kV line bays:**

S. No.	ISTS Substation	Proposed Bays	Commissioning Schedule	Lines emanating from Substation	Remarks
1	Indore (PG)	2	Jul, 2018	Indore (PG) – Ujjain 400 kV D/c line	MPPTCL may update the status

**Status of Under Construction 220 kV line bays at New Substations / Substation Extensions in WR**

S. No.	ISTS Substation	Proposed Bays	Commissioning Schedule	220kV Lines emanating from Substation	Status of 220kV lines as per 42 <sup>nd</sup> SCM	Remarks
1	Betul GIS 2x315 MVA, 400/220 kV	4	Commissioned	(i) Betul (PG) - Betul D/C 220 kV line (3 Km)	Completed in July, 2017	Commissioned
				ii) LILO of Sarni - Pandhurna 220kV line at Betul GIS (PGCIL) 400 kV S/s (41 Km).	targeted to complete by Dec, 2018	Information is not provided to CEA for its monthly progress report
2	Morena (TBCB) 2 x 315, 400/220 kV	4	May'18 (Chhattisgarh & WR SS)	i) LILO of one circuit of Malanpur – Mehgaon 220kV line at Morena (TBCB) 400kV S/s (8Km from Loc. No.12).	targeted to complete by March 2018	Completed in Feb, 2018
				Morena (TBCB) 400 - Sabalgarh 220 kV DCDS line (92Km) with LILO of one circuit of Morena (TBCB) 400 - Sabalgarh 220 kV line at Morena 220 kV S/s of MPPTCL (0.5Km)	targeted to complete by March 2018	MPPTCL may update the status

S. No.	ISTS Substation	Proposed Bays	Commissioning Schedule	220kV Lines emanating from Substation	Status of 220kV lines as per 42 <sup>nd</sup> SCM	Remarks
3	Navi Mumbai 2 x 315, 400/220 kV	4	Bays ready since Mar'14 (WRSS-V)	LILO of Apta-Taloja and Apta-Kalwa section of the Apta-Taloja/Kalwa 220 kV D/c line at Navi Mumbai (PG)	TBCB	Severe RoW issues are involved
4	Indore (PG) 2x500 MVA, 400/220 kV	6	Jul'18 (WRSS-14)	LILO of both circuit of Indore-II (Jaitpura) - Ujjain 220 kV line at Indore (PGCIL) 765 kV S/s. (2X4Km)	Targeted to complete by Dec, 2018	
				(ii) Remaining 2 Nos. feeders from Indore(PGCIL) 765kV S/s shall be intimated at later stage	Yet to plan	
5	Itarsi (PG) 1x500 MVA, 400/220 kV	2	Commissioned in Jul'17. (WRSS-14)	LILO of 2nd 220kV circuit of Itarsi (MPPTCL) - Hoshangabad 220 kV line at Itarsi (PGCIL) 400kV S/s (Existing)	Completed on 09.08.2017	Information is not provided to CEA for its monthly progress report
6	Parli (PG) 2x500 MVA, 400/220 kV	4	Jul'18 (WRSS-16)	LILO of Parli - Harnkul 220 kV S/c	Dec, 2018	MSETCL may update the information
				LILO of Osmanabad (MS) - Parli 220 kV S/c	Dec, 2018	MSETCL may update the information
7	Mapusa (PG) 3X315 MVA, 400/220	2	Jul'18 (WRSS-16)	Mapusa - Tuem 220 kV D/c	UC	GED may update this.
8	Satna (PG) 1x500MVA, 400/220kV	2	Commissioned in Oct'17. (WRSS-16)	LILO of one circuit of Satna (MPPTCL) - Chhatarpur 220 kV line at Satna (PGCIL) 400 kV S/s (3Km)	Line completed (in Oct, 2017)	
9	Vadodara GIS 2 x 500 MVA, 400/220 kV	4	Commissioned	220 kV Venkatpura-Vadodara D/C Line	March, 2017	
				220 KV Jambua – Vadodara D/C Line	Dec, 2018	
10	Navsari 2x315MVA +	2	May'18	Navsari – Bhestan 220kV D/c line	Scheduled COD : May'18	DGENTPL has confirmed

S. No.	ISTS Substation	Proposed Bays	Commissioning Schedule	220kV Lines emanating from Substation	Status of 220kV lines as per 42 <sup>nd</sup> SCM	Remarks
	1x500MVA, 400/220kV					that they are not taking up implementation of the scheme
11	Rewa PS 3x500MVA, 400/220kV	6	Substation charged (ICT-I and II)	Rewa UMSP – Rewa PS 220kV 3xD/c line	UC by Rewa UMSP	Matching with Generation Project
12	Khandwa 1x500MVA, 400/220kV	2	Sep'19	Khandwa – Chamera 220kV D/c line	June, 2018	MPPTCL may update this. Information is not provided to CEA for its monthly progress report

8.3. Members may deliberate.

## 9. Connectivity application of 250 MW as Bulk Consumer for BALCO

- 9.1. M/s BALCO has been granted connectivity for 4x300 (1200) MW as IPP through BALCO – Dharamjaygarh 400 kV D/C (initially agreed as BALCO – Champa PS 400 kV D/C later modified as BALCO – Dharamjaygarh 400 kV D/C), which was later modified to 1335 MW (**4x300 + 2x67.5**) as Generator (IPP) vide intimation dated 29.05.2012. Subsequently, in addition to this, connectivity was granted to BALCO for 675 MW (**4x 135 + 2x67.5**) of Captive Generation through the above same line vide intimation dated 13.06.2013, thus the total connectivity granted to M/s BALCO through above 400 kV D/C was 2010 MW.
- 9.2. Subsequently, BALCO vide letter dated 21.10.2016 requested for a second 400 kV D/C line to improve the reliability, to meet RPO obligation etc., This was deliberated in 41<sup>st</sup> meeting of SCPSWR held on 21.1.2016, in which M/s BALCO intimated that it has proposed to segregate its plant as 600 MW IPP and 1410 MW CPP.
- 9.3. Subsequently, a meeting was held on 10.03.2017 among CTU, POSOCO, BALCO and CEA in which, the following was agreed:
- Existing Connectivity with ISTS through BALCO- Dharamjaygarh 400 kV D/C line, provided for injection of power from both CPP and IPP units of BALCO, is adequate. The existing regulations do not have provision for separate connectivity for CPP and IPP units connected with ISTS system at a single point. Further,

BALCO is not eligible to apply for additional connectivity for the same generation capacity for which connectivity has already been granted. In case, if BALCO still desires separate connectivity for CPP and IPP units connected with ISTS system at a single point, M/s BALCO may approach CERC for necessary direction in this regard.

- M/s BALCO is resorting to frequent change of status of its units from IPP to CPP and / or vice versa. M/s BALCO may therefore clearly identify the IPP units & CPP units and submit necessary documents to CEA, CTU and POSOCO in this regard.

9.4. Subsequently, M/s BALCO vide its letter dated 24.10.2017 informed that it has planned for new smelter with an additional load of around 750 MW. Out of the above 750 MW, it is proposed to meet around 600 MW through own generation and the remaining 150 MW through importing from grid. The 600 MW of own generation would be met through upgradation of existing 4 x 67.5 MW units of stage I (spare boiler of 67.5 MW is available) into 5 x 67.5 MW along with existing unit 2 of 300 MW (of IPP). Thus sought connectivity for 150 MW as a bulk consumer.

9.5. In this regards, a meeting held on 13.11.2017 in CEA among CTU, NLDC, BALCO & CEA, in which BALCO was suggested to apply for its connectivity in the capacity of bulk consumer. Subsequently, the matter was deliberated in the 42<sup>nd</sup> meeting of SCPSWR held on 17.11.2017, in which CTU was suggested that on submission of application by BALCO, CTU may process the application as per regulations of CERC.

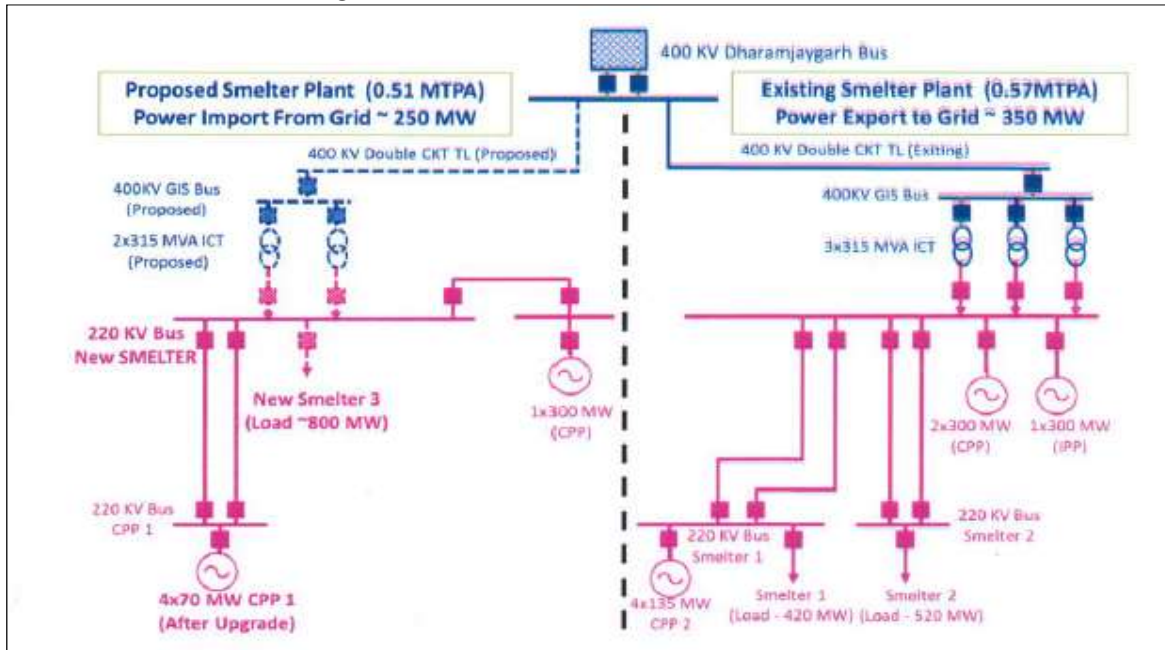
9.6. Now, CTU vide its email date 04.05.2018 intimated that M/s BALCO has submitted an online application for 250 MW connectivity as a bulk consumer with following arrangement wherein BALCO seeks to segregate units as under:

- 580 MW [1x300 MW (CPP) + 4x70MW (up gradation of 4x67.5MW) (CPP)] units on one bus with New Smelter Load of 800 MW] *for which BALCO now seeks connectivity to the tune of 250 MW for meeting the average demand of the smelter load*
- 1440 MW [1x300 (IPP) + 2x300MW (CPP) + 4x135MW (CPP)] units on the other bus with existing smelter load of 940 MW. Accordingly, the exportable capacity on this bus shall be about 500 MW against which LTA of 350 MW [200 (TN) + 95 (KSEB) + 55 (CSPTTrCL)] is already granted.
- Accordingly, M/S BALCO seeks to modify the status of its 3X300MW + 2X67.5MW units from IPP to CPP.

9.7. Considering all of above, the following is proposed:

- (i) The proposed arrangement would result in a change of connectivity of generators as stated above from IPP to CPP for which M/s BALCO needs to furnish intimation from CEA/SERC/CEI confirming the same. Upon confirmation, M/s BALCO would need to sign connection agreement in accordance with connectivity granted for the generators/Bulk Consumer.
- (ii) Connectivity for the Bulk consumer section may be provided through 400 kV Balco-Dharamjaygarh D/C. The line and associated bays may be constructed by M/S BALCO.

9.8. The schematic regarding proposed connectivity arrangement sought for 250 MW as Bulk Consumer are given below:



<b>Installed capacity</b>	-	<b>580 MW</b>
Aux. Consumption	-	45 MW
(Considering approx.8%)		
Ex- bus capacity	-	535 MW
Load	-	800 MW
<b>Deficit</b>	-	<b>265 MW</b>

<b>Installed capacity</b>	-	<b>1440 MW</b>
Aux. Consumption	-	115 MW
(Considering approx. 8%)		
Ex- bus capacity	-	1325 MW
Load	-	940 MW
<b>Exportable Capacity</b>	-	<b>385 MW</b>

Members may discuss.

**10. Proposal for extension of 220 kV main bus bars for replacement of old 220/33 kV, 25 MVA transformers at 220 kV switchyard of TAPS – 1&2 – Agenda by BARC**

10.1. BARC vide its letter no. BARC/NRB/2018/89752 dated 04.05.2018 (enclosed as Annexure-2) intimated that BARC has specific allocation of 10 MW from unallocated power of TAPS 3 & 4 and BARC has been registered as regional entity of WRLDC.

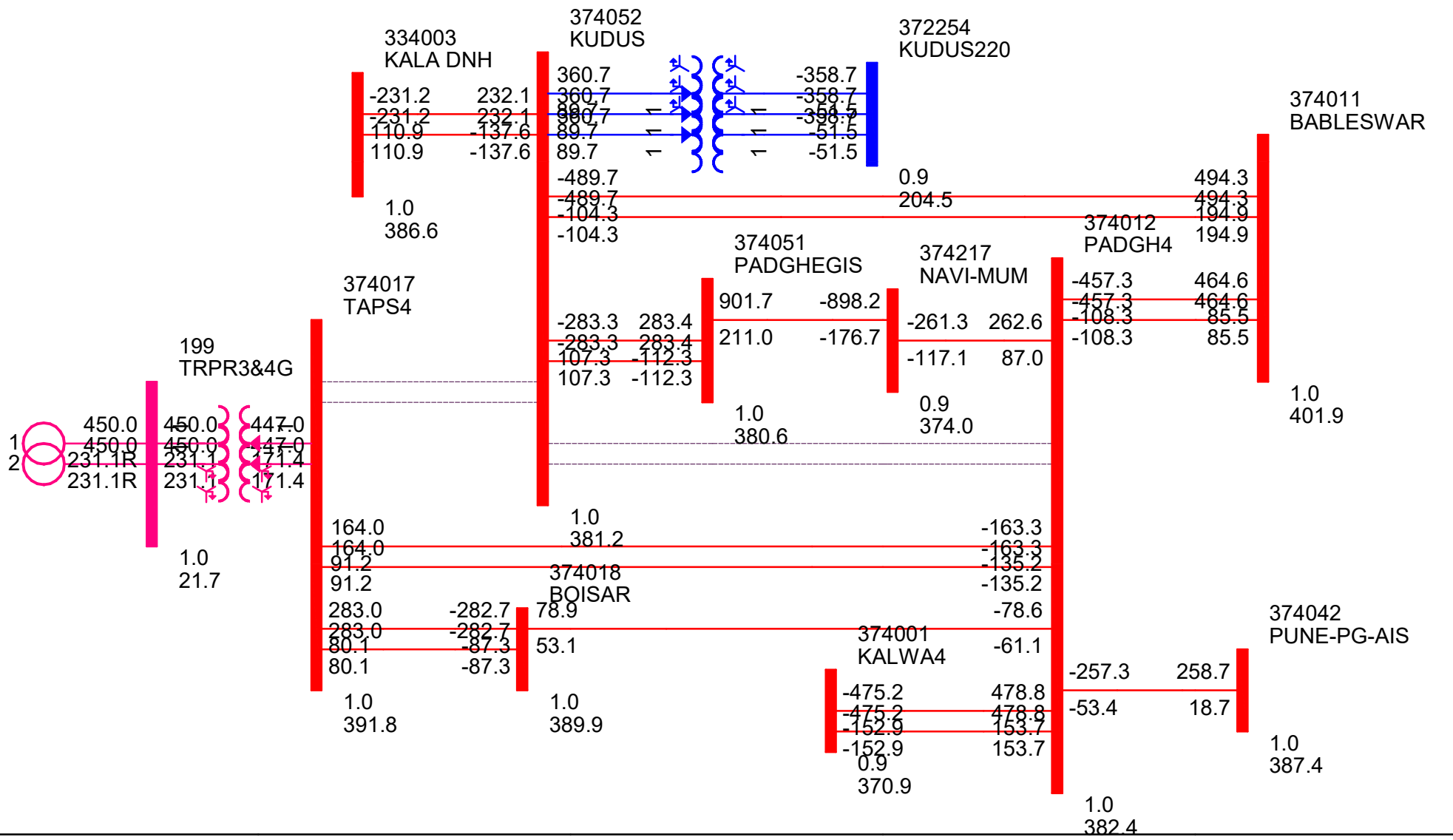
10.2. Presently, this 10 MW of TAPS 3 & 4, is supplied through 220/33 kV, 2 x 25 MVA transformers of 220 kV switchyard of TAPS 1 & 2, which were installed in 1975. Therefore, the same need to be replaced at the earliest along with the water sprinkler and oil soak pits. However, due to space constraints the same can't be implemented.

- 10.3. In view of the above, BARC proposes to construct 2 no. of 220 kV additional bays by extension of 220 kV switchyard of TAPS 1 & 2 and power would be supplied to BARC through 220/33 kV 2x 50 MVA ICTs, which would meet the future requirements of BARC. The existing metering scheme would be utilized and telemetering would be reconfigured as per requirement. The existing 220 kV bays would be kept as spare.
- 10.4. Members may deliberate.

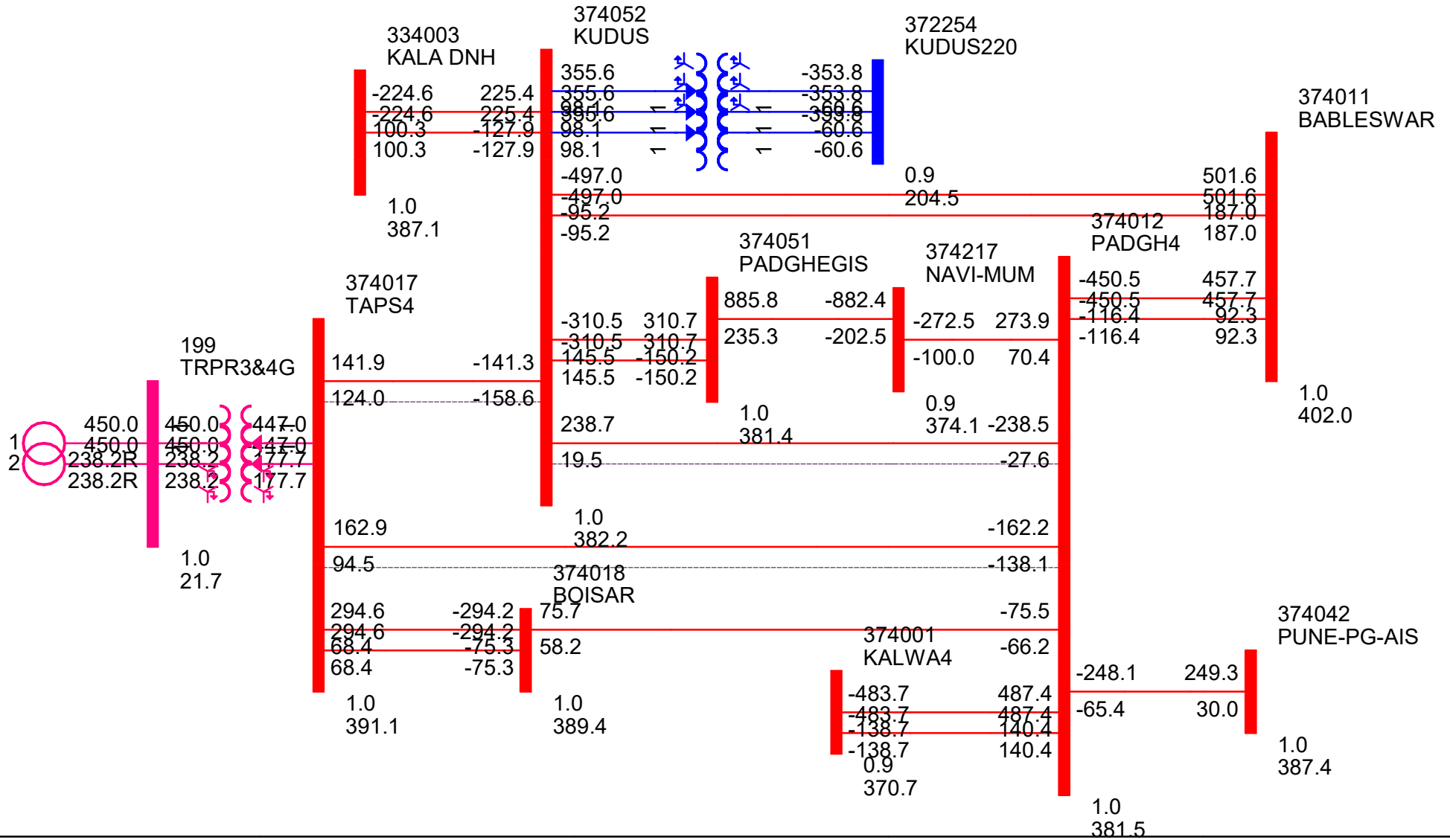


## **Exhibits**

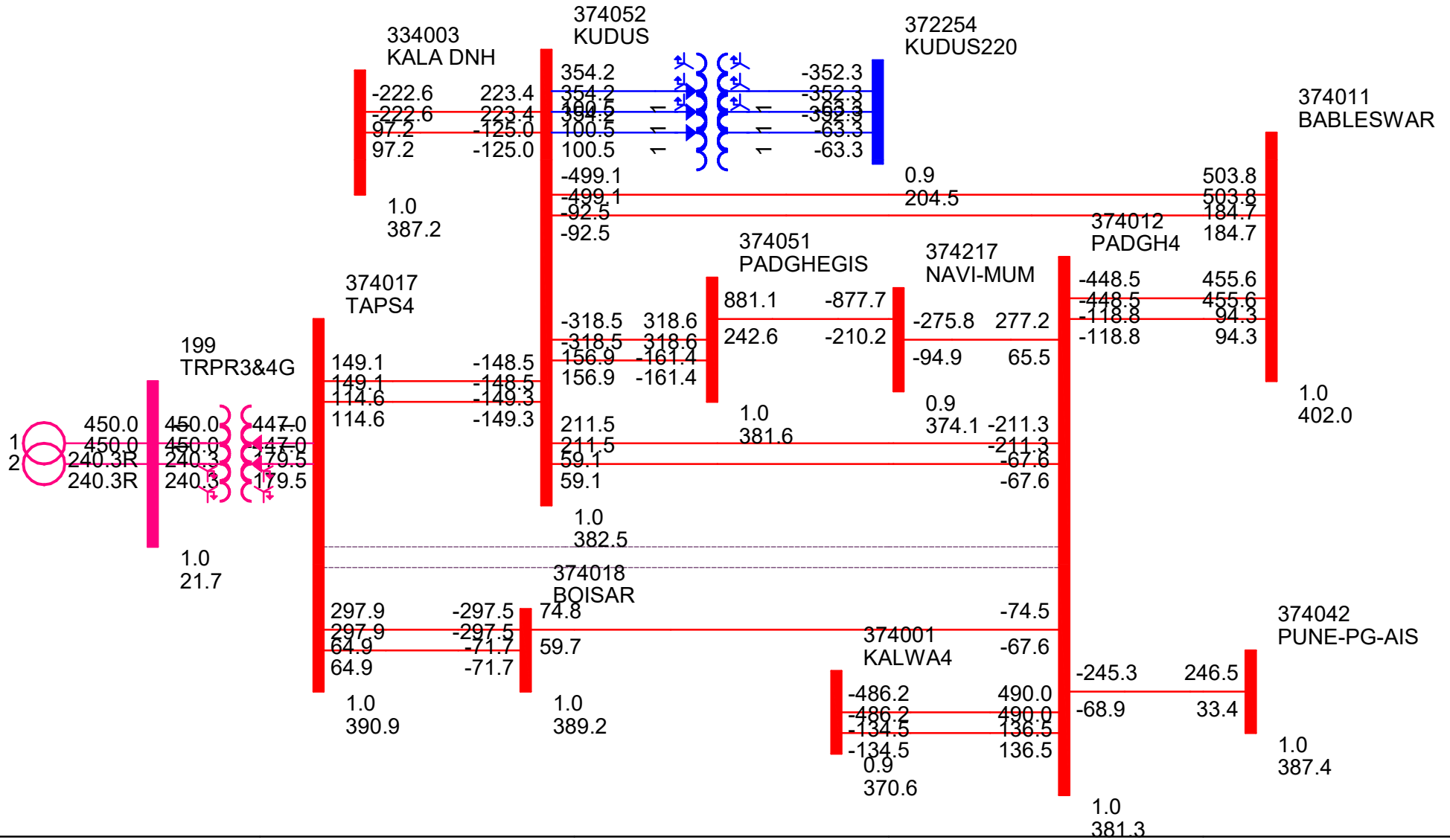
Without LILO of TAPS - Padghe 400 kV D/c line at Kudus 400 kV S/s



# With LILO of one ckt of TAPS - Padghe 400 kV D/c line at Kudus 400 kV S/s

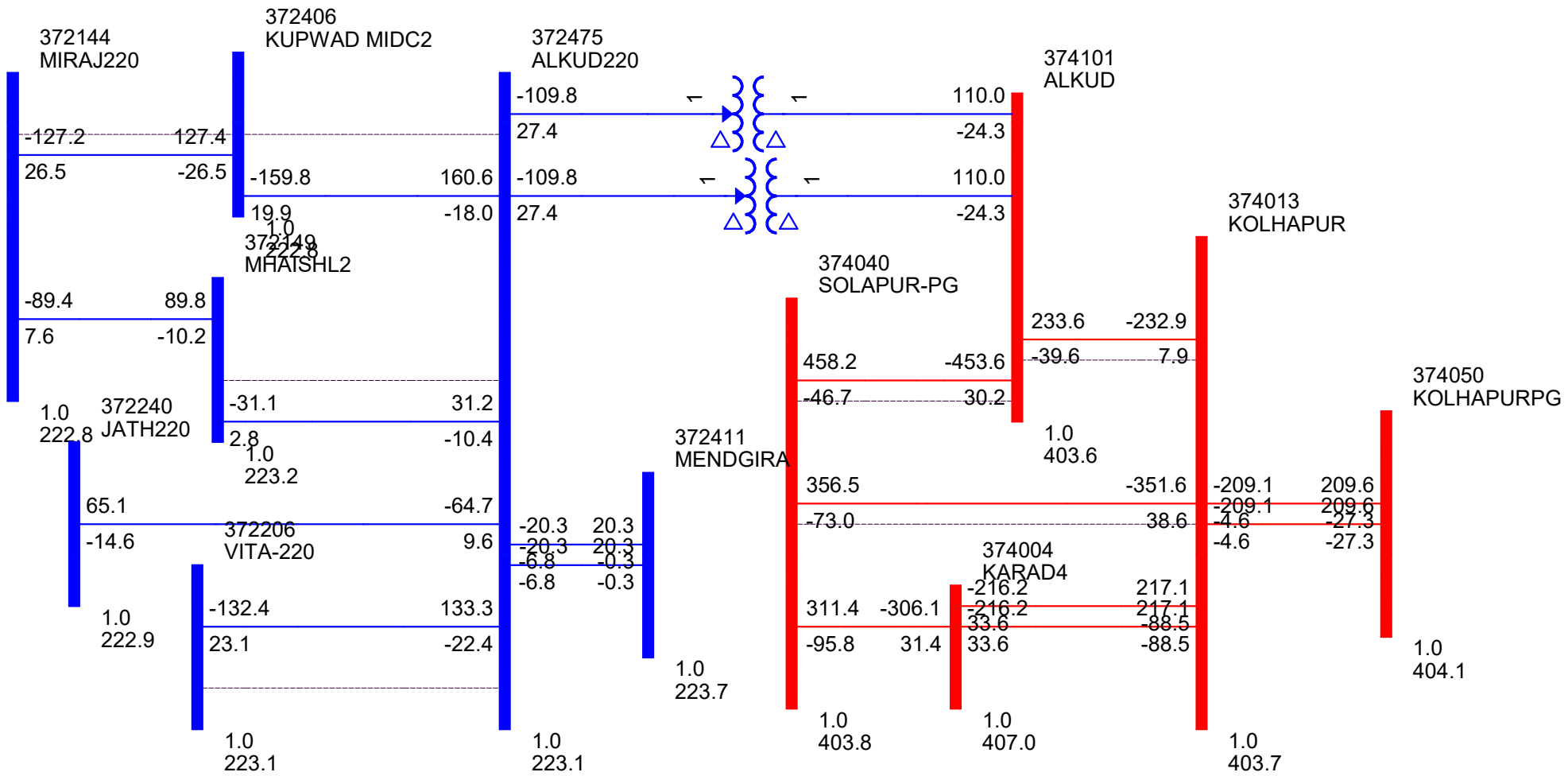


# With LILO of both ckts of TAPS - Padghe 400 kV D/c line at Kudus 400 kV S/s

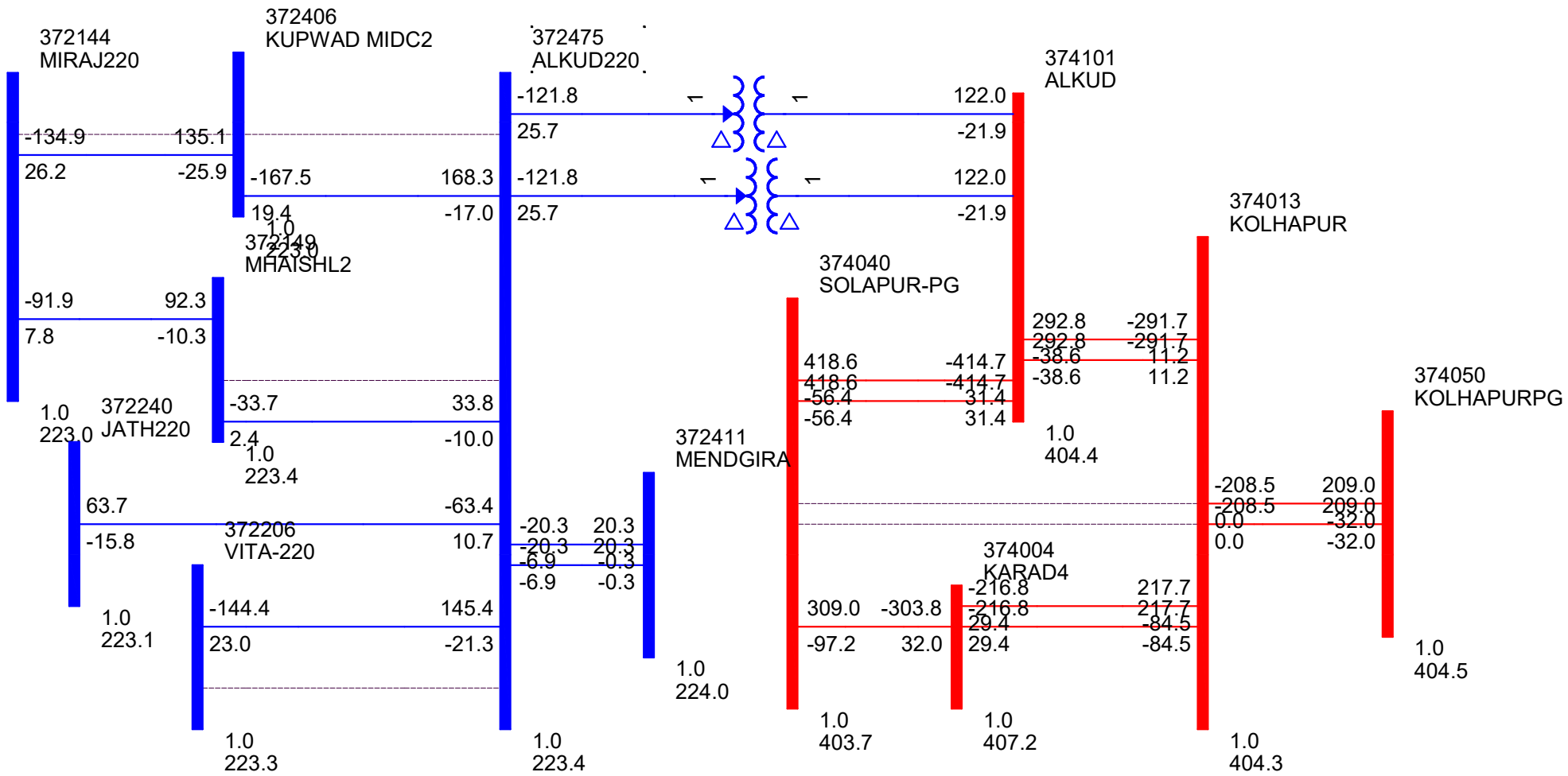


# Without LILO of 2nd Ckt of South Solapur - Kolhapur D/C at Alkud 400 kV S/s

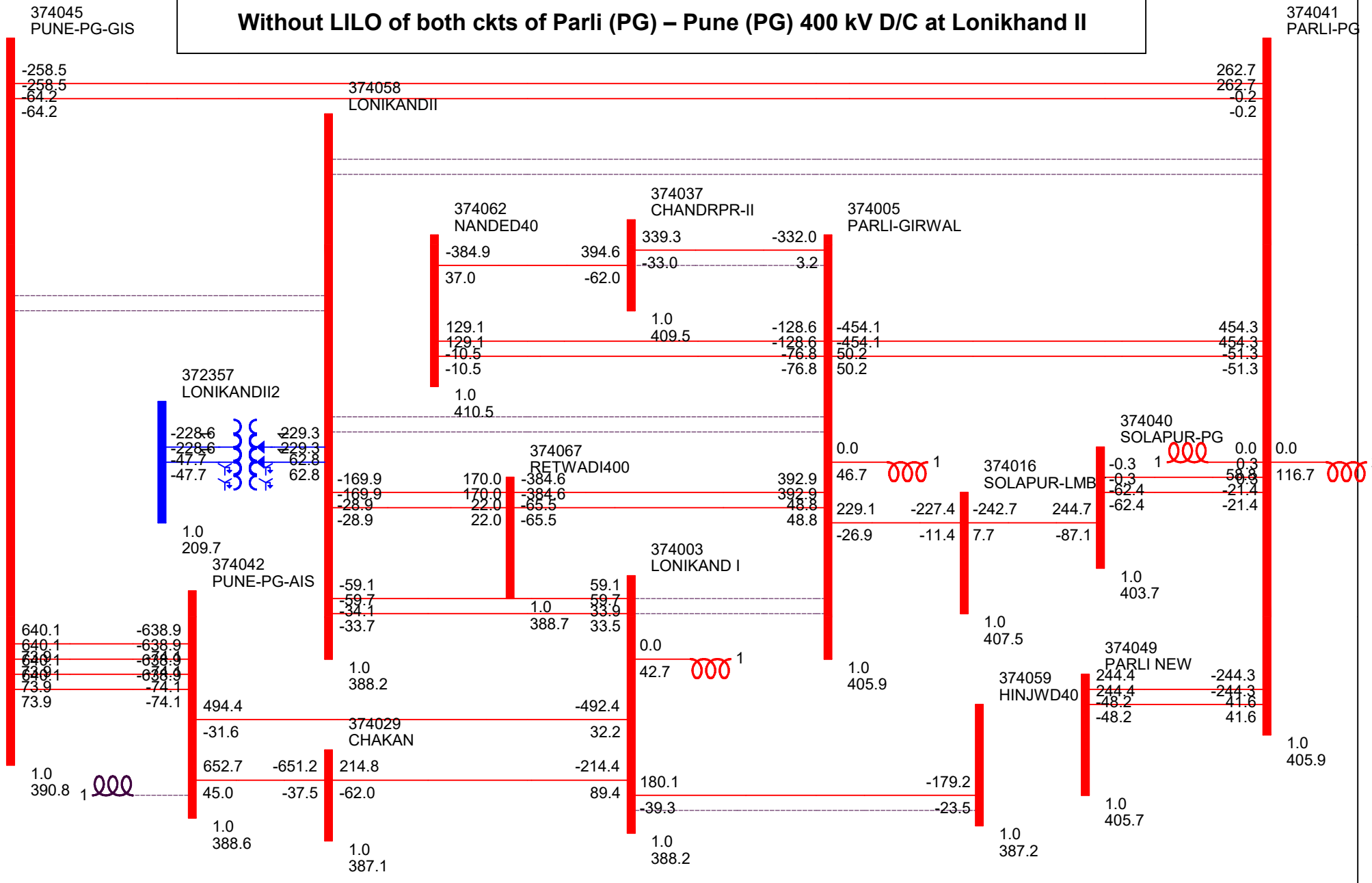
Exhibit - 1(B)



# With LILO of 2nd Ckt of South Solapur - Kolhapur D/C at Alkud 400 kV S/s



**Without LILO of both ckts of Parli (PG) – Pune (PG) 400 kV D/C at Lonikhand II**



374045  
PUNE-PG-GIS

**Without LILO of both ckts of Parli (PG) – Pune (PG) 400 kV D/C at Lonikhand II**

374041  
PARLI-PG

374058  
LONIKANDII

-315.4  
-315.4  
-54.3  
-54.3

321.7  
321.7  
14.7  
14.7

374062  
NANDED40

374037  
CHANDRPR-II

374005  
PARLI-GIRWAL

-382.7  
36.3

392.3  
-62.2

337.0  
-33.3

-329.7  
2.3

336.1  
336.1  
8.9  
8.9

-335.4  
-335.4  
66.7  
66.7

372357  
LONIKANDII2

-259.7  
-259.7  
-46.7  
-46.7  
-46.7  
65.9

260.6  
260.6  
65.9

127.2  
127.2  
-9.9  
-9.9

1.0  
409.5

-126.7  
-126.7  
-77.5  
-77.5

-395.5  
-395.5  
62.4  
62.4

395.7  
395.7  
-64.0  
-64.0

1.0  
410.5

374067  
RETWADI400

-92.6  
-92.6  
-43.1  
-43.1

92.6  
92.6  
35.6  
35.6

-328.3  
-328.3  
-80.7  
-80.7

334.4  
334.4  
38.4  
38.4

46.7  
223.4  
-28.0

0.0  
-221.7  
-11.2

374016  
SOLAPUR-LMB

4.3  
4.3  
-62.2  
-62.2

0.0  
0.0  
-21.5  
-21.5

0.0  
0.0  
116.7  
116.7

1.0  
209.8

374042  
PUNE-PG-AIS

481.6  
483.9  
-32.6  
-37.7

-481.6  
-483.9  
32.6  
37.7

374003  
LONIKAND I

0.0  
42.8

1.0  
405.9

1.0  
407.6

1.0  
403.7

399.3  
399.3  
44.1  
44.1

-398.8  
-398.8  
-56.7  
-56.7

9.1  
-51.4

1.0  
388.7

1.0  
389.4

0.0  
-9.0

1.0  
405.9

1.0  
407.6

1.0  
403.7

1.0  
403.7

1.0  
405.8

1.0  
388.8

278.2  
22.4

-278.0  
-28.6  
-65.5

126.1  
90.6

233.6  
-36.0

-232.1  
-20.1

1.0  
387.2

1.0  
405.6

1.0  
405.8

1.0  
386.6

1.0  
388.7

1.0  
387.2



## **Annexure 1**

Dated, the 13<sup>th</sup> April, 2018

**OFFICE ORDER**

Subject: - Constitution of the "Western Region Standing Committee on Transmission" (WR SCT) for planning of Transmission System in the Region: regarding.

The undersigned is directed to state that "Western Region Standing Committee on Transmission" (WR SCT) has been constituted having following composition:

1	Member(Power System), Central Electricity Authority (CEA)	Chairperson
2	Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
3	Director(System Operation), Power System Operation Corporation Ltd.	Member
4	Heads of State Transmission Utilities (STUs) of Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Goa, Daman & Diu, Dadra & Nagar Haveli #	Member
5	Member Secretary of Western Region Power Committee	Member
6	Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

# STUs to coordinate with their respective Distribution Companies (DISCOMs).

\* To be nominated by the Central Electricity Authority.

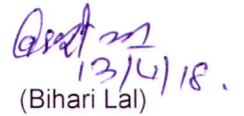
2. Terms of Reference (ToR) of the Committee are to:

- (i) Evolve and finalize System Strengthening Schemes for removal of operational constraints and transfer of surplus power through inter-Regional corridors.
- (ii) Examine the proposals for transmission System for Access/ Connectivity Applications.
- (iii) Examine the Associated Transmission System with Electricity Generators.
- (iv) Review the up-stream and down-stream network associated with Transmission schemes.
- (v) Examine and evaluate the intra-State transmission proposals.

3. The WR SCT shall meet at least once in three months.

4. Accordingly, the Guidelines for Encouraging Competition in Development of Transmission Projects shall be amended through Gazette Notification and shall be communicated separately.

5. This issues with the approval of the Minister of State (Independent Charge) for Power and New & Renewable Energy.

  
13/4/18.

(Bihari Lal)

Under Secretary to the Govt. of India

Telefax: 23325242

Email: transdesk-mop@nic.in

To

1. All members of the WR SCT.
2. Chairperson, CEA, New Delhi.
3. CMDs of all CPSUs under the Ministry of Power, Govt. of India.
4. Heads of all autonomous bodies under the Ministry of Power, Govt. of India.
5. Finance/ Budget Section, Ministry of Power.
6. Power/ Energy Secretaries of all States/UTs.
7. Chief Executives of all State Transmission Utilities (STUs).

Copy to: PS to MoSP(IC)/ PPS to Secretary(Power)/ all Joint Secretaries/ Directors/ Dy. Secretaries, Ministry of Power.

**Annexure 2**



TELEPHONE: 91-22-25597900  
FAX:91-22-25555118  
NRB OFFICE, NEAR HBNI,  
ANUSHAKTINAGAR, MUMBAI-94.

**Government of India  
Bhabha Atomic Research Centre  
Nuclear Recycle Board**

**Ref.: BARC/NRB/2018/ 89752**

**May 4, 2018**

To,

Chief Engineer,  
Power System Planning – I,  
Central Electricity Authority,  
302, North, Sewa Bhawan,  
R.K. Puram, New Delhi – 110066.

**Sub.: Proposal for extension of 220KV Main Bus Bars for replacement of old 220KV/33KV, 25MVA transformers at 220KV Switchyard [Zone-3] of TAPS-1&2.**

**Ref.: WRPC/Comml-I/6/alloc/2014/7872 dated 22.08.2014.**

Dear Sir,

BARC facilities at Tarapur has received specific allocation of 10 MW power from the un-allocated power of TAPS-3&4 vide MoP letter No. 3/44/2014-OM dated 20.08.2014 and BARC facility Tarapur has been registered with WRLDC as a regional entity as per the resolution of 30<sup>th</sup> WRPC meeting held on 24.11.15 at Bhubaneswar. Accordingly, WRLDC has been scheduling power to BARC facilities w.e.f. 14.12.2015.

Power supply to BARC facilities at Tarapur is provided from TAPS-1&2, 220 kV switchyard [Zone-3] using 2 numbers 220KV/ 33KV transformers of 25 MVA capacity. These transformers are in service since the year 1975 and have served for 42 years. These transformers have lived their service life and need to be replaced at the earliest. Also the new transformers are required to be provided with water sprinkler system and oil soak pits as per the Industry Practices to meet the statutory requirements.

The new transformers will be difficult to commission at the present location due to space limitations and scope of civil works to be carried out. Also the outage of the transformers is to be minimized to ensure the reliability of power supply for the vital installations.

In view of the above, it is planned to construct 2 numbers additional 220KV bays in 220KV switchyard of TAPS-1&2 in the space available adjacent to the existing 220KV bays. The 220KV main bus will be extended to supply the new transformers and the present 220KV bays feeding the old 25MVA transformers will be kept as spare. The new transformers will be of 50MVA capacities keeping in mind the power requirement of BARC and R&D facilities in future.

The existing metering scheme at 220KV will remain the same and the telemetry scheme will be suitably reconfigured before commissioning of the new bays and 33KV switchgear panels.

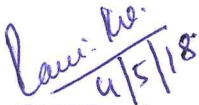
The layout of existing and proposed 220KV/ 33KV bays and SLD is attached as annexure 1 & 2 respectively.

Above proposal is submitted for approval of CEA.

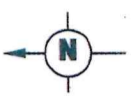
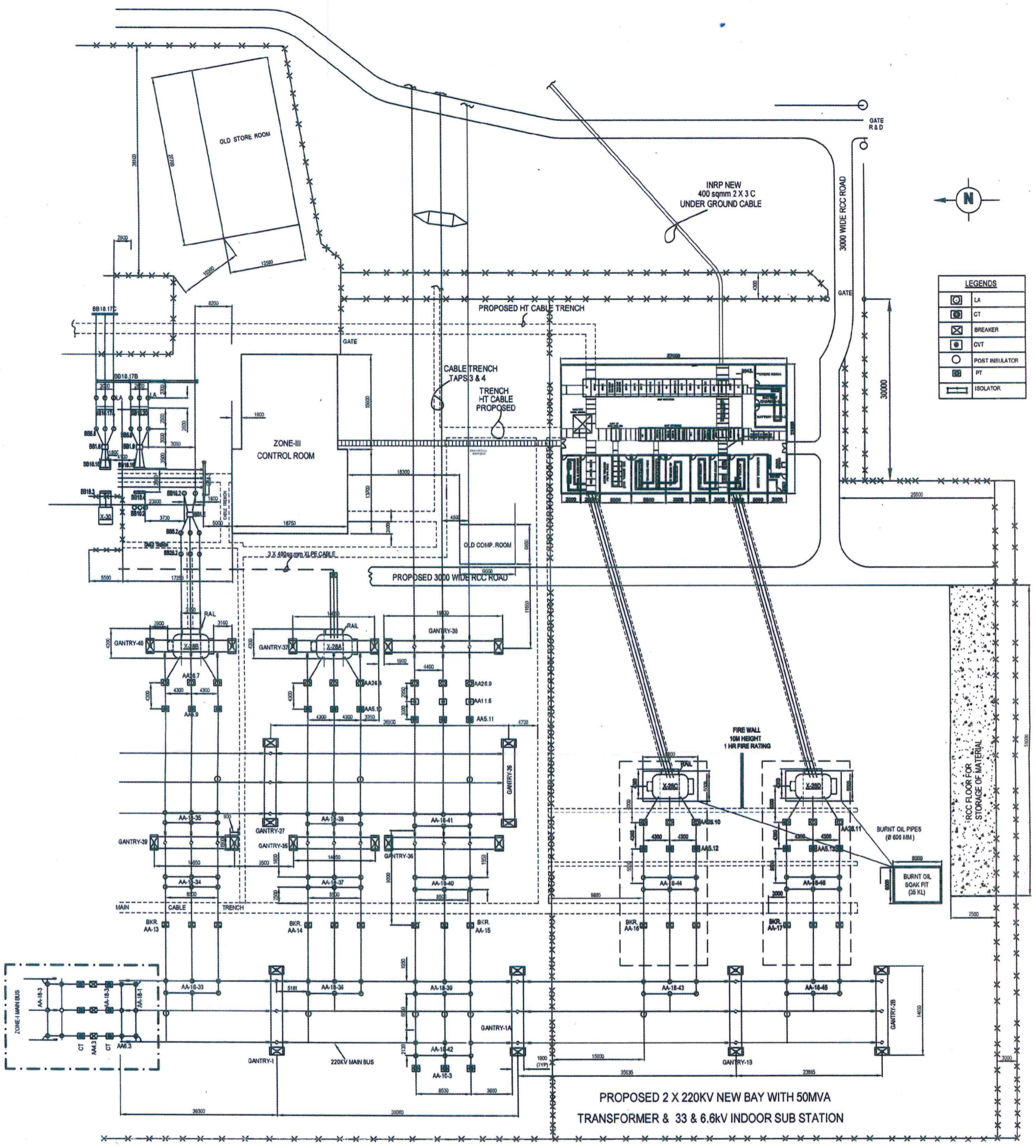
Thanking you.

Yours faithfully,

Encl.: Annexure 1 & 2.

  
(K.V.Ravi)  
Chief Executive, NRB

# ANNEXURE-1



LEGENDS	
	LA
	CT
	BREAKER
	CVT
	POST INSULATOR
	PT
	ISOLATOR

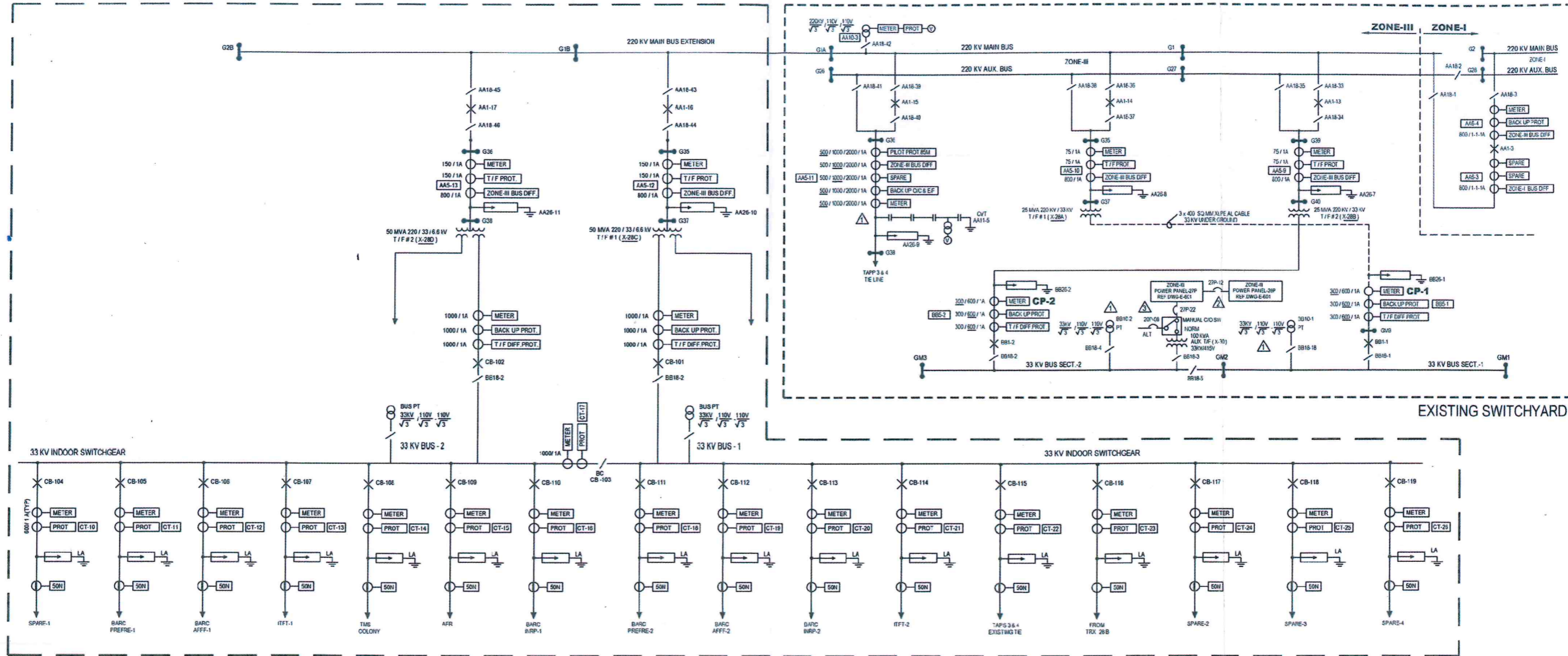
एच. पी. गुप्ता (अ.प्र.)  
 सहायक प्रमुख अभियंता  
 S.P.G.U.  
 Chief Engg.  
 (TRD)

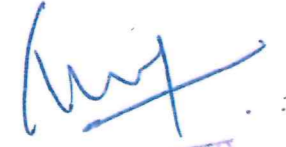
**NOTES:**  
 1. ALL DIMENSIONS ARE IN MM.  
 2. FIRE PROTECTION SYSTEM FOR NEW 50MVA TRANSFORMER IS NOTE SHOWN

REV	DATE	REVISION DESCRIPTION	DSND.	CHKD.	APPD.
0	11.11.17				

	<b>NUCLEAR POWER CORPORATION OF INDIA LIMITED</b> (A GOVERNMENT OF INDIA ENTERPRISE)	
	<b>TARAPUR ATOMIC POWER STATION 1&amp;2</b>	
PROJECT:	<b>AUGMENTATION OF 220/33/6.6kV SWITCHYARD</b> INSTALLATION OF NEW TRANSFORMER AND 33&6.6KV INDOOR SWITCHGEAR IN ZONE-III	
DESIGNED	TITLE: 220/33, ZONE-III SWITCHYARD LAYOUT	
CHECKED	SCALE :	
APPROVED	DRG. CATEGORY :	TENDER PURPOSE
DATE	DRG. No.	SHEET
		REV
		0


# ANNEXURE-2



  
**एस. पी. गुप्ता**  
**अपर मुख्य अभियंता (टी.डी.)**  
**S. P. GUPTA**  
**Addl. Chief Engineer (TD)**

## TAPS 1 & 2, 220/33kV, ZONE-III SWITCHYARD AUGMENTATION

SYMBOL	DESCRIPTION
	GANTRY
	CIRCUIT BREAKER
	ISOLATOR
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	LIGHTING ARRESTOR

REV. No.	DESCRIPTION	DATE	APP'D.
DRAWING ISSUED FOR			
 <b>NUCLEAR POWER CORPORATION OF INDIA LIMITED</b> ( A GOVERNMENT OF INDIA ENTERPRISE )			

DO NOT SCALE THE DRAWING.

UNLESS OTHERWISE STATED :-  
 ALL DIMENSIONS ARE IN mm.  
 MACHINE ALL OVER.  
 SURFACE FINISH TO BE 3/32 OR BETTER.  
 REMOVE ALL BURRS.  
 REMOVE ALL EXTERNAL SHARP CORNERS  
 AND EDGES BY CHAMFERING TO 0.15 x 45°  
 ROUND ALL INTERNAL CORNERS AND EDGES TO R 0.40.  
 TOLERANCES ON RADI AND CHAMFERS ( IS : 2102 )

RADI AND CHAMFERS	0.5-3	3-6	6-30
TOLERANCES	: 0.2	: 0.5	: 1.0

TOLERANCES ON LINEAR DIMENSIONS (IS:2102)			
DIMENSIONS	TOL.	DIMENSIONS	TOL.
UP TO 6	: 0.1	315 - 1000	: 0.8
6 - 30	: 0.2	1000 - 2000	: 1.2
30 - 120	: 0.3	2000 - 4000	: 2.0
120 - 315	: 0.5	4000 - 8000	: 3.0

TOLERANCES ON LINEAR DIMENSIONS	
SPECIFIED DIMENSIONS	TOLERANCE
XX	±
XX.X	±
XX.XX	±

TOLERANCES ON ANGULAR DIMENSIONS : ± 0-30'

TAPS 1 & 2, ZONE -III, 220KV SWITCHYARD AUGMENTATION		
DES'D.	DR'N.	REV'D.
DES. CHK'D.	DRG. CHK'D.	APP'D.
PROJECT TAPS- 1 & 2.		
SCALE - NTS		
PROJECTION		
DRG. No.	NPCIL/50000/0551/GA	
FILE NAME		
REV. No.		

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DRG. No. NPCIL/50000/0551/GA

REFERENCE DRAWINGS	DRAWING No.	REFERENCE DRAWINGS	DRAWING No.	REVISIONS	DR'N.	DES'D.	DES. CHK'D.	REV'D.	APP'D.