



MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO.LTD.

CIN NO. U40109MH2005SGC153646

	<p>Office of the Executive Director, Maharashtra State Load Dispatch Centre, Thane-Belapur Road, P.O. Airoli, Navi Mumbai. Pin – 400 708. Tele :91-22-27601765/1766/1931/2937 Fax :91-22-2659 0808 Email: edmsehholding@gmail.com Website : http://www.mahasldc.in</p>
---	--

Ref. No. CE/MSLDC/OP/OCC/ No 0 2 0 8 0

Date: 29 NOV 2023

To,
Members of the OCC as per mailing list.

Sub: Minutes of the 6th Operation Co-ordination Committee (OCC) meeting held on 18.08.2023 at 11:30 hrs. through physical & video conferencing mode at Khopoli HPS and Additional OCC meeting held on 31.08.2023 through VC.

Ref.: 1. MOM Circulated vide MSLDC/TECH/Op/OCC/822 Dated. 18.05.2023
2. E-mail dtd. 19.06.2023 for agenda request.
3. E-mail dtd. 29.08.2023 for meeting intimation.

Dear Sir/Madam,

In reference to the above subject, the 6th Operation Co-ordination Committee (OCC) meeting was held on 18.08.2023 at 11:30 hrs. through physical & video conferencing mode at Khopoli HPS and Additional OCC meeting held on 31.08.2023 through VC.

The Minutes of the said meeting are attached herewith.

Encl: As above.

Yours sincerely,

(Girish Pantoji)

Superintending Engineer, SLDC
(Member Convener of OCC)

Copy s.w.rs. to:

The Director (Operations), MSETCL, Prakashganga, Mumbai.

Sub: Minutes of the 6th Operation Co-ordination Committee (OCC) meeting held on 18.08.2023 at 11:30 hrs and Additional OCC meeting held on 31.08.2023.

**To,
All OCC members as per list**

Sr.No.	Name of Organization	Name of Nominee	Designation	Committee constituent	Contact No.	E-mail ID
1	SLDC	Shri Shashank Jewalikar	ED, MSLDC (I/c)	Chairperson	022-27301931	edmsebholding@gmail.com
2	MSETCL	Shri. Rohidas Mhaske	ED, Tr O&M MSETCL	Member	7447441000	edtrans@mahatransco.in
3	SLDC	Shri. Mahesh Bhagwat	CE, MSLDC	Member	9920499062	cesldc@mahasldc.in
4	STU/MSETCL	Shri. Peeyush Sharma	CE, STU	Member	9769213865	cestu@mahatransco.in
5	MSEDCL	Shri Pravin Annachatre	S.E (LM), MSEDCL	Member	9833980238	selmkalwa@gmail.com
6	MSPGCL	Shri E. S. Moze	Dy.CE (Works) MSPGCL	Member	8879770737	cegw@mahagenco.in
7	TPCL	Shri Kiran Desale	Head Transmission TPCL	Member	9223553342	desalekv@tatapower.com
		Shri Milind Gole	Head (PSCC), TPCL	Member	9820868264	pscct@tatapower.com
8	AEML	Shri Shrikant Yeole	Head O&M AEML Transmission	Member	9323552945	shrikant.yeole@adani.com
9	AEML	Shri Abaji Naralkar	AVP, AEML Distribution	Member	9324817526	abaji.naralkar@adani.com
10	ATIL	Shri Abhishek Kukreja	Associate Manager-O&M	Member	6359956492	Abjishek.Kukreja@adani.com
11	MEGPTCL	Shri Rakesh Bhalerao	Associate Manager-Business Development	Member	7045953823	rakesh.bhalerao@adani.com
12	JPTL	Shri Vaibhav D Sansare	Associate Manager-Transmission	Member	9552577122	Vaibhav.sansare@jsw.in
13	APTCL	Shri Rajiv Nimje	AGM, APTCL	Member	9422308883	Rajiv.nimje@rattanindia.com
14	VIPL	VIPL Representative		Member		
15	JSWEL	Shri Harshal Joshi	Manager (OSTS Dept,JSW)	Member	9552577131	harshal.joshi@jsw.in

Sub: Minutes of the 6th Operation Co-ordination Committee (OCC) meeting held on 18.08.2023 at 11:30 hrs and Additional OCC meeting held on 31.08.2023.

16	ADTPS	Shri Vijay Dalli	VP- Operations ADTPS	Member	9325119741	Vijay.Dali@adani.com
17	RIPL	Shri Amit Panchalwar	DGM, RIPL	Member	9503229333	amit.panchalwar@rattanindia.com
18	APML, Tiroda	Shri Manoj Taunk	Associate VP- Protection & Metering	Member	9099005517	Manoj.Taunk@adani.com
		Shri Akshay Mathur		Member	9870663062	Akkshayv.Mathur@adani.com
19	SWPGL Wardha.	Shri Dinesh B Mewade	DGM, SWPGL	Member	7387007010	Dinesh.m@saiwardha.com
		Shri Prabhjit Singh Samra	GM (BDG – Operations), SWPGL	Member	9177025554	Dbg_operatios@saiwardha.com
20	M/S. AVAADA Maharashtra Pvt. Ltd.	Mr. Dhiren Bhatt		Member (Solar)	9978922979	dhiren.bhatt@avaada.com
21	M/s RENEW Power Pvt. Ltd.	Mr. Jobin Abraham		Member (Wind)	9158202754	Jobin.abraham@renewpower.in
22	SLDC	Shri Girish Pantoji	SE(OP), MSLDC	Member- Convener	9822414154	seoperationmsldc@gmail.com

Minutes of the 6th Operation Co-ordination Committee (OCC) meeting held on 18th August 2023 at 11:30 Hrs. through physical & video conferencing mode and the additional OCC meeting scheduled on 31.08.2023.

In accordance with the provisions of the MEGC, 2020, the Grid Co-ordination Committee (GCC) in its 2nd meeting held on dated 08.01.2021 has constituted the Operational Co-ordination Committee (OCC). Accordingly, meetings including additional meeting of OCC have been convened as per requirement and schedule.

The 6th meeting of the OCC, was convened on 18.08.2023 at 11:30 hrs through physical and video conferencing mode and the Additional OCC meeting on 31.08.2023 through VC.

At the outset, The Superintending Engineer (OP-MSLDC) & Member Convener of OCC, welcomed all the members and participants.

The Executive Director (MSLDC) & the Chairman of the OCC, welcomed all the members and in his introductory note, elaborated the various achievements of OCC meetings viz. development of various procedures entrusted under MEGC, 2020, resolving Operational issues etc. He further stated that all the operational issues will be discussed in the OCC forum so that issues can be resolved for smooth & secure grid operations.

The list of participants in the meeting is attached herewith as **ANNEXURE – A**.

The detailed Point-wise Discussions held during the meeting are as follows:

PART A : OCCM on dt. 18.08.2023

1. Item No. 1: Confirmation of Minutes of Meeting of the 5th OCC Meeting convened on 21.03.2023:

- The Member Convenor informed that on dated 18.05.2023, the MoM of the 5th OCC Meeting have been shared with all the members and requested to offer any comments on the same so as to confirm the MoM.

Item No. 6.1 in MoM: High Reactive Power flow from Dahanu TPS units:

The Vice President, ADTPS, informed that the high reactive power requirement in Boisar area is impacting high reactive power injection from ADTPS units thereby reducing the active power generation. During the meeting held on 08.06.2022, the Executive Director (MSLDC), has directed STU, AEML, MSEDCL to jointly study the reactive power requirement in Boisar area. He further

requested the Chief Engineer, Kalyan, MSEDCL to check the power factor of all the major loads in Boisar area and correct the issue.

The Chief Engineer (MSLDC), informed that as per the Capability Curve of ADTPS units, the reactive power injection is within limits. Hence, reduction of active power for injecting high reactive power should not be required. In this respect, the VP, ADTPS, informed that as per the suggestions of OEM, to avoid vibrations in the turbine, it is necessary to reduce reactive power. Further, the OEM has suggested revision in the Capability curve.

The Chairman on OCC opined that if the reactive power injection is within capability curve, then there should not be any issue of reduction in active power. However, study of reactive power requirement needs to be assessed. Further, the ADTPS is requested to submit the communication made by the OEM for reducing the capability curve and thus reactive power injection/absorption limits.

The Chairman on OCC requested the Chief Engineer (STU) to carry out joint study with STU, MSEDCL, MSETCL, AEML & MSLDC for reactive power requirement in Boisar area.

Changes suggested by ADTPS in MoM Item no. 6.1 as below;

The Chief Engineer (MSLDC), informed that as per the Capability Curve of ADTPS units, the reactive power injection is within limits. Hence, reduction of active power for injecting high reactive power should not be required. In this respect, the VP, ADTPS, informed that higher rotor vibrations are observed in case of higher MVAR injection at full load, this was brought to the notice of OEM during the annual overhaul. Considering the past failure history, they have advised maintaining vibrations within limit by appropriately adjusting active/reactive power output.

The Chairman of OCC opined that if the reactive power injection is within capability curve, then there should not be any issue of reduction in active power. However, ADTPS will have to submit the relevant statements & correspondences from OEM to MSLDC at earliest in this regard.)

With above changes, OCC confirmed the MoM of the 5th meeting.

2. Item No. 4: Agenda points from MSLDC:

Item No. 4.1: Compliance of clause no 17.18 of Hon MERC order in case no. 1/SM/2022 dtd 29.07.2022 regarding Co-gen and Bio mass registration with MSLDC:

As per clause no 17.18 of Hon'ble MERC Order no 1/SM/2022, all RE generators (Except wind and solar), co-gen and biomass plants having installed capacity below 25 MW are also need to get register with MSLDC for the purpose of scheduling.

Further it is directed to MSEDCL to withhold 50% amount of non-registered plants monthly bill towards supply of RE power at generic tariff and said withheld amount to be paid without any interest once such generator registers himself with MSLDC.

MSLDC presented the status of registration of Co-gen plants in DSM software. Around 43 identified co-gen plants are yet not registered in the DSM registration software. Correspondence is made by MSLDC vide L.no. CE/MSLDC/Airoli/862 dtd 25.05.2023 and CE/MSLDC/Airoli/1158 dtd 06.07.2023 with CE (RE), MSEDCL regarding details of non-registered Co-Gen plants.

The Chief Engineer (RE), MSEDCL informed that 78 nos. of Co-gen and Bio mass are registered having capacity of 1762 MW and 43 nos. are yet to be registered with MSLDC. The 50% amount which is to be withheld of non-registered plants monthly bill towards supply of RE power at generic tariff is not yet withheld.

The Chairman of OCC expressed his displeasure towards non-registration of co-gen plant inspite of continuous reminders from MSLDC. He instructed to issue notices irrespective of whether the crushing season has started or not. He also insisted that MERC order in this regard must be followed by MSEDCL. (refer the order 110 of 2020). Further, the detailed list of defaulters will be shared by MSLDC.

OCC took note of the same.

Item No. 4.2: RTDA bills raised by WRPC and payment thereof:

As per CERC (Sharing of Inter-State Transmission Charges and losses) Regulations, 2020, the STU, Distribution companies come under the definition of designated ISTS customers (DICs). Therefore, the regional transmission deviation accounts shall be issued by the Member Secretary, WRPC to DICs only.

The said matter was taken up by MSEDCL in the 84th, 85th,86th and 88th CCM conducted by WRPC insisting to raise the RTDA bills to MSLDC. In the 88th CCM, it has been proposed by MSLDC that MSEDCL should take up the issue for resolution in the State OCC.

The representative of MSEDCL has briefed the issue regarding raising of RTDA bills. He stated that WRPC raises RTDA bills to MSEDCL only. During FBSM regime, the RTDA bills were forwarded to MSLDC and MSLDC distributed the same among all distribution licensees on the

proportionate basis. This is because, the other discoms have their interstate purchases/ power exchange transactions which are also involved in the regional schedule & drawl of the Maharashtra State.

He also presented the RTDA bill raised to MSEDCL during the FBSM regime. He requested to continue the same practice of apportioning the RTDA bills to the responsible state constituents as was done till September 2012.

The representative of AEML informed that this matter was already deliberated & discussed in the MSPC meetings (FBSM) & further MSPC was also approached to Commission during removal of difficulties raised in FBSM mechanism. He also stated that there is no mechanism for RTDA at State level. As no Procedure is in place to apportion the RTDA charges, regulatory support may be needed in this regard.

However, all OCC members informed that any such resolution is yet to receive from Commission.

Further, MSEDCL raised the urgency to take specific action immediately as more than Rupees 50 crore amount of RTDA bill is pending for payment as on date.

The Chairman of OCC suggested as follows:

1. A separate call shall be taken up with STU about whether WRPC shall raise the bills to STU or SLDC.
2. SLDC shall prepare a procedure for apportionment of RTDA bill amongst state entities. The procedure will be put up for acceptance in upcoming MSPC meeting.

With due deliberations, OCC accepted the suggestion of the Chairman of OCC.

Item No. 4.3: Grant of Open Access for partial capacity of a WTG:

In accordance with the directives of Hon'ble MERC, MSLDC is maintaining Common Registry of all the RE Generators in the State. In the said registry, commercial data is being maintained. This information is updated by all the Discoms in the State on monthly basis & as and when required.

Recently, it has been observed that Open Access permission is granted by MSEDCL for a partial capacity of a WTG. i.e. in case WTG capacity is 1 MW, then Open Access permission is granted for 0.858 MW, thus, 0.142 MW capacity remains uncontracted. In such a case, the contracted capacity is considered for scheduling, however, the generation will be from the total installed capacity i.e. 1 MW capacity.

Further, such type of partial permissions is posing difficulties in maintaining Common Registry as non-contracted capacity needs to be shown in a separate row.

As per MERC approved procedure, the non-contracted capacity should be disconnected from the grid to prevent unscheduled injection of the power. Under such conditions, how non-contracted capacity (0.142MW) will be disconnected by the distribution licenses from a single WTG?

Such type of issues will increase further as the limit for Open Access has been now reduced to 100 kW. Hence, there should be certain procedure for addressing such issues.

The representative of MSEDCL informed that the Open Access regulation does not restrict to the partial Open Access. Open access is given for the quantum applied by the consumer irrespective of the capacity of the turbine. The settlement between buyer & seller is carried out based on GCN which has capping of the approved Open Access capacity. He informed that such turbines having partial OA/PPA are not disconnected. In this respect EE(Op), MSLDC opined that in such case, the unscheduled injection of power will be considered in the deviation accounting of the PSS.

The Chairman of OCC directed MSLDC EA Team to confirm the de-pooling methodology adopted by QCA in accordance with the regulation No. 16 of MERC F&S and Deviation accounting for Wind & Solar regulation, 2018. Further, the issue should be communicated to Hon. MERC for resolution.

Further, MSLDC REMC representative highlighted that in case of partial open access permission, whether AvC should be considered as full turbine capacity or the approved contracted capacity. In this respect OCC members opined that under such cases, the AvC should be considered as turbine capacity and not the partial approved capacity.

With due deliberations, OCC took a note of the same.

Item No. 4.4: Load Shedding incidences in Pune region due to severe Low Voltages in Grid during April to June-2023:

The Superintending Engineer (Operation), MSLDC, informed that low voltages are observed mainly at 400 kV Lonikand-1, 400 kV Lonikand-II, 400 kV Talegaon (PG), 400 kV Chakan & 400 kV Jejuri and allied 220kV network. Due to these low voltages, around 9.37 Mus load loss is observed in three months. Similar issues have been observed in Nashik & Vashi zone. In this regard STU has carried out the study for installation of capacitors for reactive compensation.

STU representatives presented the study and recommendations for installation of capacitor banks at suggested locations.

The Chairman of OCC informed that Kharghar end also experiences low voltages up to 367kV. Hence UVLS at Kharghar end is necessary & he proposed requirement of UVLS scheme in front of OCC forum.

With due deliberations, OCC agreed on the study reports submitted by STU and proposal of UVLS at 400kV Kharghar. Considering the prevailing voltage scenarios in high demand seasons; the OCC strongly recommended that a fast-track execution of this needs to be taken up by MSETCL.

Item No. 4.5: Transmission constraints in the system:

The Superintending Engineer (Operation), MSLDC, informed that during real time grid operations, constraints on following transmission lines have been observed:

- 220kV Nashik – Babhaleshwar ckt 1,2
- 220 KV Urse - Chinchwad S/C
- 400 kV Talegaon PG – Chakan S/C
- 220 kV Lonand- Jejuri S/C

Accordingly, STU representative presented the action plan (enclosed as **Annexure II**) for resolution of the said constraints.

The Chairman of the OCC opined that the solution for removal of constraints on 400kV Talegaon - Chakan line needs to be explored before ensuing summer season.

With due deliberations, OCC took a note of opinion of the Chairman of OCC.

Item No. 4.6: Non-Payment of RE-DSM Charges by QCAs:

In accordance with the provisions of the MERC (Forecasting, Scheduling & Deviation Settlement for Solar & Wind Generation) Regulations, 2018, MSLDC is publishing weekly RE-DSM bills on four-weekly basis.

It is the responsibility of the QCAs to make payment of the said charges to SLDC within stipulated time frame. However, it has been observed that most of the QCAs have paid RE-DSM charges partially stating the reason that RE Generators are not making payment.

The Regulations No. 13.1 is reproduced below:

“The QCA shall pay the amount of Deviation Charges to the SLDC, and collect it from the concerned Generators in proportion to their actual generation: Provided that the onus of

ensuring the payment of the Deviation Charges to the SLDC by the QCA shall remain that of the concerned Generators.”

Further, as per the clause No. 4.9 of the MERC amended F&S Procedure dated 19.12.2019, it is the responsibility of the QCA to intimate the details of Generators which are not complying the provisions of the Regulations & procedure to MSLDC and the same will be intimated to Distribution Licensees for initiation of action.

In this respect, MSLDC has requested all the QCAs to intimate the list of RE Generators which have not paid RE-DSM charges for intimation to all the Discoms for initiation of action against such generators. Accordingly, SLDC has sought the list of defaulting RE generators from the QCAs. The said list has been submitted to CE(PP) MSEDCL vide Letter No. MSLDC/TECH/EA/REMC/MSEDCL/1453 dated 23.08.2023 with a request to stop the energy charges payments to the defaulting RE generators to the extent of outstanding REDSM payments and the same process shall be followed herein after.

In this respect, MSEDCL representative informed that MSEDCL has made communication with the defaulting generators towards stoppage of payment. Further, MSEDCL assured that same process will be followed up on receipt of list of such defaulting RE Generators from MSLDC.

With due deliberations, OCC took a note of assurance provided by MSEDCL.

3. Item No. 5: Agenda points from MSPGCL:

Item No. 5.1: Zig Zag Schedule:

MSPGCL Units are receiving Bidirectional changes in Schedule Generation frequently issued by SLDC. There are instances where the Schedule Generation is changed and reflected in the next immediate block.

Due to such instantaneous changes before 3rd block in the Schedule Generation, it is very difficult to maintain Generation as per Schedule Generation leading to deviation in DSM and attracts DSM Charges (payable).

For Example: CSTPS Chandrapur: Bidirectional Changes in the Schedule Generation in respect to Unit 3 to 9 (Copy attached as Annexure-I).

The Superintending Engineer (Operation), MSLDC, informed that the MoD operation for LGBR in each block and change in demand or RE generation effects the schedules to generators. MSPGCL agreed for the same. He further stated that, all intrastate generator's schedules are derived on the basis Load generation balance equation of Discom. Load generation balance equation considers demand, ISGS requisitions, Power purchases (exchanges/bilateral etc) and pre-decided ramp up/ ramp down/ tech min of all intrastate transactions.

Next block schedule changes are expected in case of SLDC actions related to transmission constraint or Centralized MOD operations only.

Further, CERC has issued guide lines for the generators to operate at faster ramp rates and reduction in operational technical minimums up to 40%. In view high RE integration into the grid, the role of thermal generators is more vital to fill up the gap between the generations and demands. With increasing RE penetration, more flexible operation from the thermal units will be expected.

After deliberation, the OCC concluded to have a discussion of flexibility needs and necessary support mechanisms for intrastate network in the next OCC meeting.

Item No. 5.2, 5.3: Nashik High MVAR/ Reactive power sharing/grid voltage issues:

Nashik Units are continuously sharing high MVAR to maintain grid voltage and thus results in increase of generator winding temperature and the load of generator is restricted causing loss in generation. Many times, the grid voltage drops below 205 KV as against 220KV. The sudden drop in Grid Voltage results in load reduction of @40-50 MW for running unit causing severe financial loss to Mahagenco.

Due to low grid Voltage, NTPS unit needs to share more reactive power resulting into reduction in active power along with rise in rotor temperature up to 1150C. Excitation current has reached its maximum limit of 2600 Amperes resulting in huge stress on the insulation of Generator. Reduction in load (load sacrificed due to MVAR) results in reduction of MERC availability & as per the present regulations, there is no compensation provided for the reduction in MERC availability due to MVAR.

Solution on this issue is taken care and is addressed in reactive compensation study as in item no. 2.4

OCC took a note of the same.

Item No. 5.4: Chandrapur Unit 8 Grid Disturbance Event on dtd. 24-04-2023:

Heavy Load Jerk experienced on dtd. 24-04-2023 due to dip in bus voltage. Following alarms and indications appeared on electrical system;

Unit MW load fluctuated between 471 MW and 515 MW

a. Generator Protection Panel (GRP) : Alarm appeared - Under Impedance, Over Current.

b. Battery Changeover: 220 V DC Charger-2 FC DC Overvoltage alarm appeared. Same reset and charge were restored.

c. All HT Boards (6.6 kV and 11 kV) Line PT and Bus PT Under Voltage alarm appeared.

In view of above, incidences of zigzag schedule and Nashik high MVAR issues have caused considerable financial loss to MSPGCL. Further, an event of grid disturbance like that of

Chandrapur Unit-8 disturbs the operations of Unit which may lead to its tripping causing generation loss.

The Chairman of OCC informed that MSETCL should maintain healthiness of transmission network to avoid such incidences.

OCC took a note of the same.

4. Item No. 6: Agenda from APML

Item No. 6.1: AMR Meters Time Synchronization to be done in line with GPS time:

The MSETCL AMR meters of L&T Make showed a time drift of 4 to 5 minutes. The time drift was corrected by MSLDC - Kalwa through their DSM Server after requests and follow-ups from Adani to MSETCL - Bhandara office. However, the time drift was corrected in the range of 1 to 2 minutes, and it was communicated verbally that further time correction will be done in a later stage gradually in accordance with MSETCL requirements. The real time measurement sheet of AMR meters is also enclosed for your reference. The mismatch of time with GPS affects our real time decisions, request you to correct periodically.

Representatives of APML and JSW informed about the issues regarding MSETCL AMR meters of L&T Make which showed a time drift of 4 to 5 minutes. The Chairman of OCC informed that the issue of mismatch of time with that of GPS was already taken up with L&T and asked APML to check and revert.

OCC took a note of the same.

Item No. 6.2: AMR meters load survey data sharing for DSM verification:

MSETCL has implemented AMR system at APML, Tiroda Plant by installing of new L&T make ER300P ABT Meters along with Kalkitech DCU in new separate metering panels and sealed the panels. At present, the load survey data is being directly fetched by MSLDC for generation schedule management & issuing the DSM account, however we don't have access of real time MW flow & load survey data of these meters for taking any real time corrective action at Plant level, hence MSLDC – Kalwa is requested to share respective data of AMR meters for DSM account verification & maintaining the history data by Plant. This data is required for verification of DSM account and required for computation of Aux power consumption, which is required for processing monthly change in law bills to MSEDCL, these bills are required for computation of MOD rates.

As per APML, this issue is sorted out.

5. Item No. 7: Agenda from TPCL

Item No. 7.1: Zero schedule for Trombay Unit-8:

TPC-D has asked MSLDC for zero schedule for Trombay Unit-8 on 28th June 2023 considering following reasons,

- *Demand drop of @ 800 – 1000 MW at Mumbai level with corresponding demand drop of 100-150 MW for TPC-D compared to summer load.*
- *Increased contracted wind generation by @ 100-120 MW.*
- *Hydro generation is required to be scheduled in heavy rains for any flood control*
- *On the same note BEST has also requested zero scheduling of Trombay Unit-8 on 30th June 2023.*
- *Contracted DISCOMs are trying to manage its load generation balance and to optimize on Power Purchase cost hence any denial of zero scheduling by SLDC, would result in serious commercial implications for DISCOMs.*

Hence SLDC is requested to consider zero schedule requirement of TPC D by considering readiness of Islanding, network security check and other generation availability.

The representative of TPC-D requested MSLDC for zero schedule for Trombay Unit-8 on 28th June 2023 considering demand drop of @ 800 – 1000 MW at Mumbai level, increased contracted wind generation by @ 100-120 MW, scheduled Hydro generation due to heavy rains to control flood. On the same note BEST has also requested zero scheduling of Trombay Unit-8 on 30th June 2023. He explained that denial of zero scheduling by SLDC, would result in serious commercial implications for DISCOMs.

In this regard, SE(Op), MSLDC explained that presently, all 400 kV incomer lines which are transferring power to both MMR and Mumbai regions are already loaded up to its capacity in considering the available embedded generation on bar. Further any loss of embedded generation or tripping of any major 400 kV line affects the stability of Mumbai grid and it leads to curtailment of load in the prime areas of Mumbai & MMR regions to maintain grid stability. In view of this Trombay U-8 is essential to be kept on bar. Economization is allowed up to the technical minimum of that unit as per the real time system condition.

OCC took a note of the same.

Item No. 7.2: Non consideration of TPC D contracted wind generation embedded in MSEDCL for DSM Bills:

About 20 MW of such contracted wind generation of TPC-D is not being considered by MSLDC in DSM Bills for which MSLDC has issued NOC. TPC-D request to consider the same to avoid discrepancies and multiple revisions in DSM Bills.

The MSLDC (EA) representative stated that RE (Wind & Solar) and other RE having inter DISCOM wheeling shall only be considered for DSM billing and the same has been communicated to software vendor for necessary modification in the software.

OCC took a note of the same.

Item No. 7.3: Issuing monthly Bills for energy generated at TPC-Hydro under VSE.

No bills have been issued by MSLDC of energy generated under VSE from TPC-Hydro since last year. Request for issuance of the bills at the earliest.

The MSLDC (EA) representative stated that Hydro VSE bills are being issued on regular basis from 27.07.2023 onwards.

OCC took a note of the same.

Item No. 7.4: Voltage fluctuations due to tripping of lines in Grid

Important and critical consumers in Mumbai like Refineries, RCF and Data centres are experiencing voltage fluctuations on account of Grid related tripping.

The TPCL representative informed that Important and critical consumers in Mumbai like Refineries, RCF and Data centres are experiencing voltage fluctuations on account of Grid related tripping.

The Chairman of OCC informed that a study group was formed to investigate and studies for corrective actions required to reduce the fault level, reasons for high magnitude voltages dips and minimize the impact of these dips on the system network, accordingly bus splitting was done at 400KV Kalwa, 220KV Mulund and 220KV Temghar. All OCC members opined that Voltage dips upto 160ms time delay is to be sustained by consumers & accordingly revision in machine settings to be carried out at their end. The Chairman of OCC also directed OCC members to provide the event list of occurrences above 200ms voltage dip & that shall be discussed in PCC meeting.

OCC took a note of the same.

6. Item No. 8: Agenda from MSEDCL

Item No. 8.1: <https://dsm-scheduling.mahasldc.in/> software needs validation formulas:-

Many times MSEDCL has requested validation for unloadable fields like Demand, small hydro, Co-gen-, embedded solar, embedded wind, etc.

Presently this validation is made available in the scheduling software and entry to the DSM scheduling software as per the inputs received from stakeholders.

OCC took a note of the same.

Item no. 8.2: MSEDCL's demand rejection event of 18-06-2023;

<https://dsm-scheduling.mahasldc.in/> software has rejected MSEDCL's demand which was neither noticed by SLDC shift engineers nor LM cell shift engineers. APML shift engineers informed LM cell about back-down in the first block then the issue was traced out. Telephonically requested generators not to back down and then the demand issue was resolved. There should be some alert mechanism to inform the concerned beneficiaries and SLDC shift engineers so that corrective action can be taken well in time.

The MSLDC(Op) representative stated that, the day ahead schedules are issued and published through scheduling software well in advance as per decentralized MOD operations i.e at 11:00 hrs., 15:00hrs., 18:00hrs and 23:00 hrs.

Further, in the DSM regime, the energy payments are based on the schedules available in the DSM software. So, all the state entities should monitor and verify their respective schedules regularly and timely. During the monitoring of schedules by state entities, if any issue observed, it should report SLDC in timely manner.

OCC took a note of the same.

Item no. 8.3: REMC curtailment of AEML;

Many times inter - REMC curtailment reflects in a shortfall to AEML but SLDC does not implement any load curtailment in the AEML whereas uses MSEDCL's resources to meet the shortfall. Sometimes during shortfall, AEML sold power in RTM also.

The chairman OCC opined that, Mumbai load cannot be curtailed for any resource shortfall being the financial capital of India and further directed all Discoms to arrange power in such cases and meet the shortfall.

OCC took a note of the same.

Item no. 8.4: To control OD or Underdrawal

To control OD or Underdrawal different Shift Engineers take different steps. There should be uniformity in a sequence of operations.

The MSEDCL representative stated that to control overdrawl or underdrawal different Shift Engineers take different steps. There should be uniformity in a sequence of operations.

The MSLDC (Op) representative informed that SLDC shift engineers respond to the state periphery drawl as per the real time grid conditions & the trend observed at the particular point of time. So, the actions by grid operators may vary as per variations in different grid parameters.

Further, the centralized MOD operation, action for controlling overdrawl/underdrawl will be as per the Procedure prepared by MSLDC in accordance with the MEGC-2020.

OCC took a note of the same.

Item no. 8.5: DSM software and abnormal loads of supply points:

The supply point mapped for T<>D points of MSEDCL records abnormal data and the same reflects in the DSM bill. for example, data of 132 kV Nimboni (Hybrid) for the date 11-06-2023 recorded more than 3000MW. To avoid such issues before the issue of the DSM bill there should be a checking system at SLDC.

The MSLDC (EA) representative stated that the abnormal value for 33KV Precision Cam Shaft at 132kV Nimboni was observed in the week of 05 to 11 June-2023. The issue has been resolved and the DSM bill is revised accordingly.

OCC took a note of the same.

Item no. 8.6: Sharing of AMR data in real-time:

To increase accuracy during intra-day working, sharing of AMR data was requested by MSEDCL. Hon CMD, MSEDCL has written a letter Hon CMD, MSETCL dated 3-Oct-2022.

The Superintending Engineer (LM Cell), MSEDCL informed that to increase accuracy during intra-day working, sharing of AMR data was requested by MSEDCL. Hon'ble CMD, MSEDCL has written letter Hon'ble CMD, MSETCL on dated 03.10.2022.

The Chairman of OCC informed that this matter is already discussed during DSM meetings and replied at different forums & can be taken up in MSPC for further discussion if needed.

OCC took a note of the same.

PART B: Minutes of Additional OCCM

- 1) Operation of VSE mechanism for facilitation of outages required for execution of ORC works:

During major outages for ORC (Outright Contract) works in Mumbai/MMR & Pune area, due to any system constraints, the costlier Mumbai embedded generation, Nasik generation & Koyna hydro is required to be picked up as per requirement to maintain system 'N-1' compliant and to resolve the system constraints. This causes additional burden on the DSM pool. In this respect, MSLDC enquired with such stake holders whether such additional burden needs to be shared by the agency carrying out such ORC works. This scenario is similar to the charges levied by Indian Railways to transmission/distribution licensees for granting power/ traffic blocks.

In view of the opinion of different stakeholders, the chairman of OCC directed SLDC to prepare procedure for levy of such charges to the entity carrying ORC works. The procedure be circulated to all the members.

The OCC agreed the directives of the Chairman of OCC.

The meeting concluded with vote of thanks.

---X---

ANNEXURE - A.



**THE TATA POWER COMPANY LTD
TRAINING CENTRE - KHOPOLI
TRAINING PROGRAMME PARTICULARS**

COURSE TITLE : Maharashtra state 6th OCC meeting

ORGANISED BY : SLDC / Tata Power Khopoli DEPT : _____

DATE : 18.08.23 DURATION : 1130 - 1700hrs VENUE : Khopoli Generating Station

FACULTY : _____ SIGNATURE : _____

LIST OF PARTICIPANTS

No.	Name (BLOCK LETTERS)	Emp. No.	Designation	Grade	Department	Signature
1	MILIND GOLE	-	Head-PSCC		Tata Power	<i>[Signature]</i>
2	Shashank Jewalkar		ED, SLDC		SLDC, MSETCL	<i>[Signature]</i>
3	M. B. Bhagwal	-	CE SLDC		MSETCL	<i>[Signature]</i>
4.	G. S. Pantoi		SE (OP&MC)		MSETCL	<i>[Signature]</i>
5.	Dipak Veer	-	Head grid operation		Tata Power	<i>[Signature]</i>
6.	Anirach. Dhawade	-	SLDC			<i>[Signature]</i>
7.	Shrikant Teole		V.P		AEML	<i>[Signature]</i>
8	Abaji Naralkar		AVP.		AEML	<i>[Signature]</i>
9	Gopichand Ghadke		EE		MSEDC	<i>[Signature]</i>
10	Eknathi Mose		CE (works)		MSPSCL	<i>[Signature]</i>
11	Ranjeet Sawadekar		ASSI V.P		AEML	<i>[Signature]</i>
12	V. V. Rane		Head - PP		Tata Power	<i>[Signature]</i>
13.	Gaudam Kamble		A-E-E STU		MSETCL	<i>[Signature]</i>
14	VINAY KHEDEKAR		EE (STU)		MSETCL	<i>[Signature]</i>
15	Sachin Pakhede		EE (MSLDC)			<i>[Signature]</i>
16	Madhav Pande		EE (MSLDC)		SLDC	<i>[Signature]</i>



Task Force
Reactive Power Compensation
Study of Pune & Nashik Zone
along with Vashi Zone

STATE TRANSMISSION UTILITY

Task Force for Reactive Power Compensation :

- Vide circular No. CMD/MSETCL/No.T-734 dated 16th June 2023 constituted Task Force for study in Pune & Nashik Zone Transmission system & suggesting necessity and methodology for reactive power compensation to address the EHV under voltage issues observed in peak load season.

- **Members of Task Force:**
 - a) Executive Director (MSLDC) – Coordinator
 - b) Chief Engineer (STU) – Member
 - c) Superintending Engineer (PAC Circle, Nashik) – Member
 - d) Superintending Engineer (PAC Circle, Pune) - Member

- **Objective:**

Assess sufficiency of approved reactive power compensation schemes in this area and make suggestions for required additional compensation.

CONTENT

Task Force for Reactive Power Compensation :

- 1) Pune
- 2) Nashik Zone
- 3) Vashi Zone

- System Modeling & approach
- Voltage Limits for various Voltage level as per CEA's Manual on Transmission Planning Criteria
- Existing & Proposed Capacitor Banks (Pre-Phase + Phase 1 to 5)
- 400kV Buses Voltage Scenario (Before & After)
- Proposed Capacitor Banks Phase-6 (Pune, Vashi & Nashik Zone)
- Losses Comparison (Pune, Vashi, Nashik Zone & State)

- System simulated for Peak demand of 29000 MW for Maharashtra with operational network.
- Unavailability of Trombay Gas generation 7A-120 MW and 7B-60 MW and Minimum Uran generation (Pgen-190 MW) is considered.
- Full embedded generation in Mumbai is also considered with (Trombay Unit 5-500 MW ,Unit 8-250 MW, TPC Hydro and Dahanu Generation in-service).
- Unavailability of Koyna Generation, Hydro Generation and Co-Generation is considered
- Availability of 6373 MVAR Capacitor Banks is considered:
Pre-Phase (1848 MVAR)+ Phase-1 to 4 (3570 MVAR) + Phase-5 (955 MVAR proposed)

Voltage Limits for various Voltage level as per CEA's Manual on Transmission Planning Criteria 2023

4.3 Voltage limits

a) The steady-state voltage limits are given below. However, at the planning stage a margin as specified at Paragraph: 3.10 may be kept in the voltage limits.

Nominal	Voltages (kV _{rms})			
	Normal rating		Emergency rating	
	Maximum	Minimum	Maximum	Minimum
765 (1 pu)	800 (1.05 pu)	728 (0.95 pu)	800 (1.05 pu)	713 (0.93 pu)
400 (1 pu)	420 (1.05 pu)	380 (0.95 pu)	420 (1.05 pu)	372 (0.93 pu)
230 (1 pu)	245 (1.07 pu)	207 (0.90 pu)	245 (1.07 pu)	202 (0.88 pu)
220 (1 pu)	245 (1.11 pu)	198 (0.90 pu)	245 (1.11 pu)	194 (0.88 pu)
132 (1 pu)	145 (1.10 pu)	122 (0.92 pu)	145 (1.10 pu)	119 (0.90 pu)
110 (1 pu)	123 (1.12 pu)	99 (0.90 pu)	123 (1.12 pu)	97 (0.88 pu)
66 (1 pu)	72.5 (1.10 pu)	60 (0.91 pu)	72.5 (1.10 pu)	59 (0.89 pu)

Pg. no. 24

3.10.4 At the planning stage, a margin of about $\pm 2\%$ may be kept in the voltage limits and thus the voltages under load flow studies (for 'N-0' and 'N-1' steady-state conditions only) may be maintained within the limits given below:

Voltage (kV _{rms}) (after planning margins)		
Nominal	Maximum	Minimum
765	785 (1.03 pu)	745 (0.97 pu)
400	412 (1.03 pu)	388 (0.97 pu)
230	240 (1.04 pu)	212 (0.92 pu)
220	240 (1.09 pu)	203 (0.92 pu)
132	142 (1.08 pu)	125 (0.95 pu)
110	119 (1.08 pu)	102 (0.93 pu)
66	70 (1.06 pu)	62 (0.94 pu)

Pg. no. 13

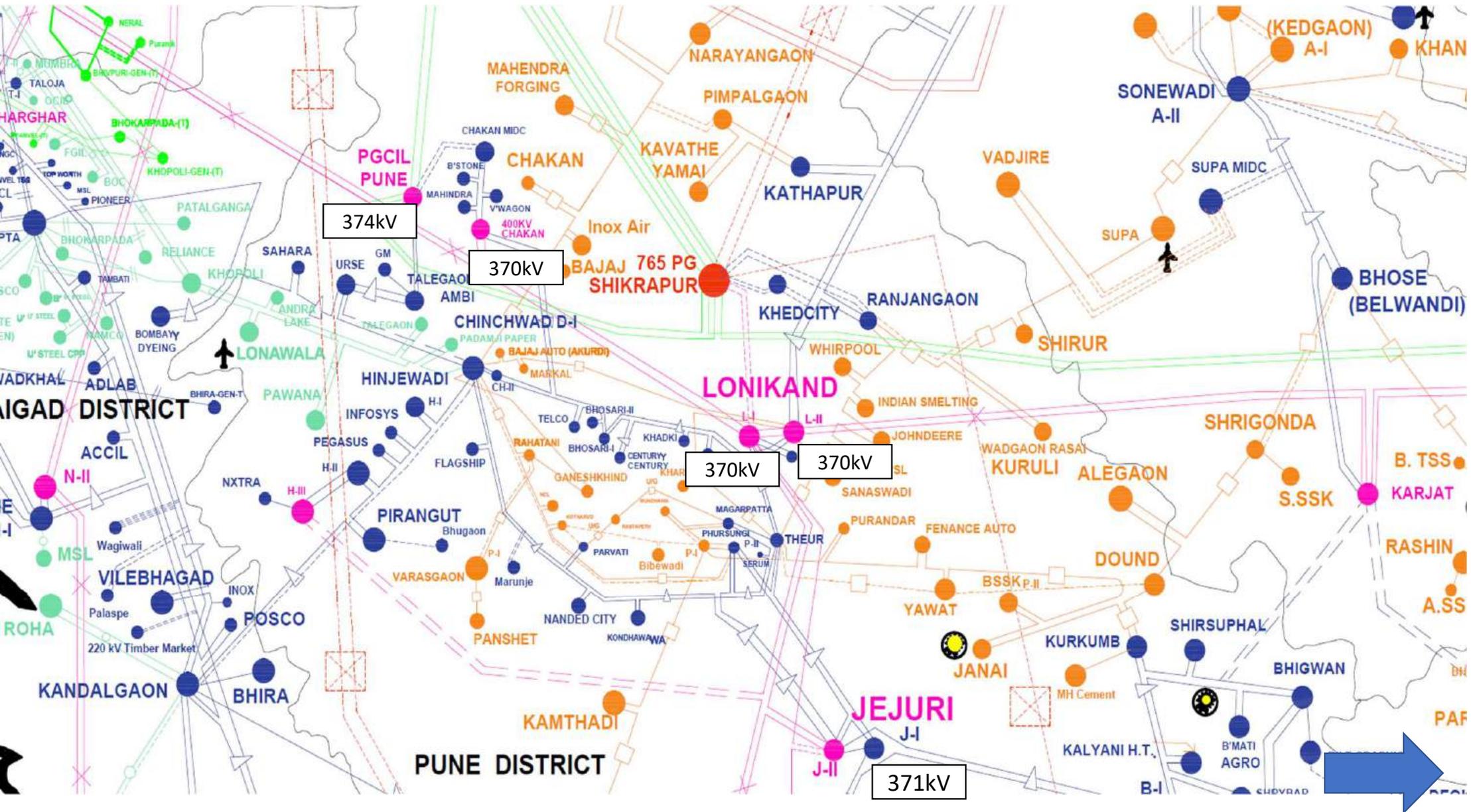
400kV Voltage Scenario (Nashik, Pune & Vashi Zone)

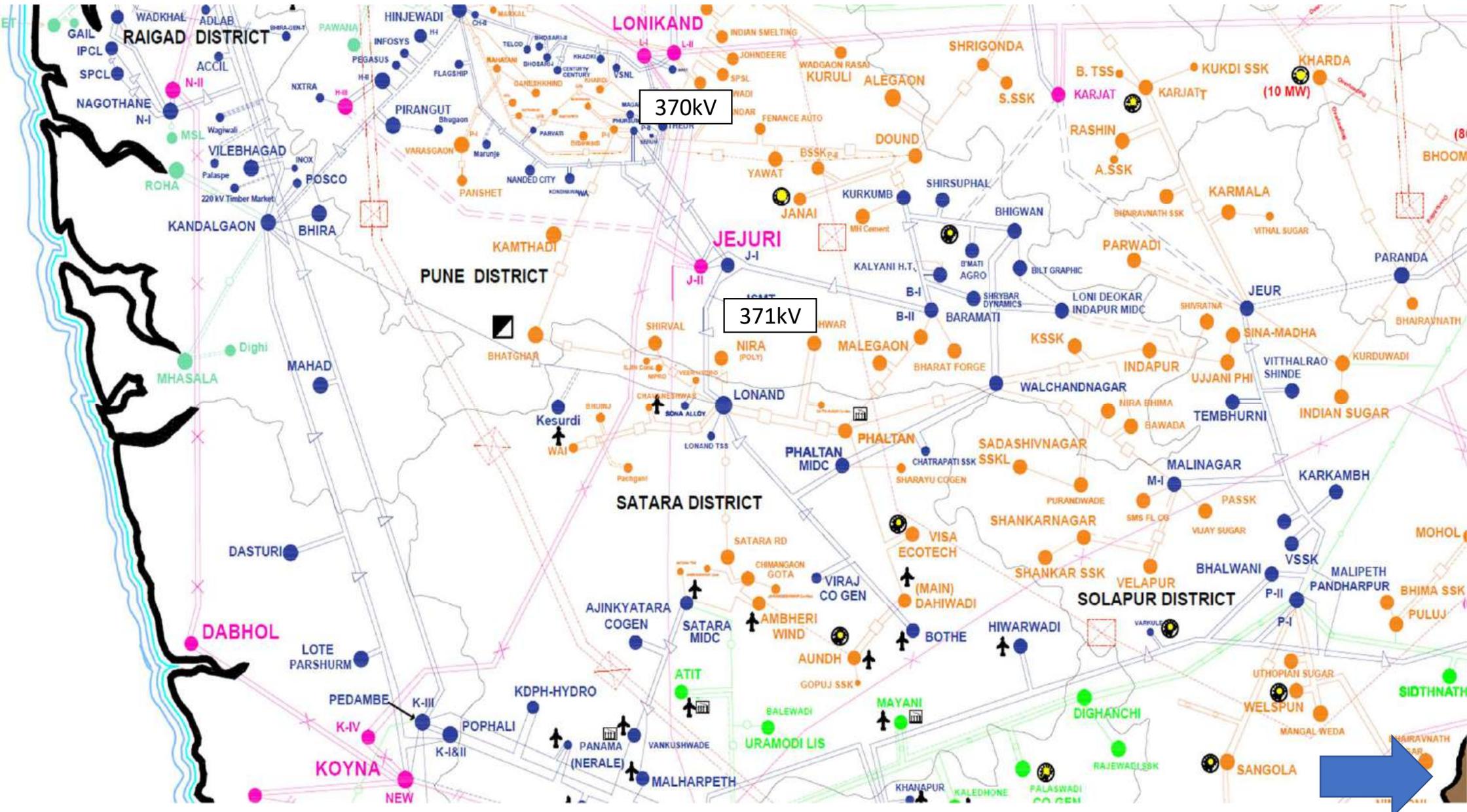
400kV Voltage details observed during the study

Before & After consideration of Phase-6 Capacitor Banks for Pune, Nashik & Vashi Zone

Area Name	Bus Number	Bus Name	Base kV	Before Voltage (pu)	After Voltage (pu)	Before Voltage (kV)	After Voltage (kV)
PUNE	484	CHAKAN	400	0.9219	0.9924	370	397
	34	LONIKAND-I	400	0.9218	0.9932	368	397
	114	LONIKAND-II	400	0.9217	0.9945	368	397
	64	JEJURI	400	0.9221	0.999	371	396
	504	SOLAPUR-	400	0.9889	1.019	395	407
	334042	PUNE-PG	400	0.9350	0.994	374	397
NASHIK	8824	KARJAT_400	400	0.9491	1.005	380	402
	474	BABLESHWAR	400	0.9826	1.014	393	405
	194	DEEPNAGAR	400	1.002	1.0146	401	406
	434	BHUSAWAL	400	1.0022	1.0155	401	406
	404	DHULE	400	1.009	1.0253	404	410
WASHI	224	KHARGAR	400	0.940	0.9932	376	397
	344	KALWA	400	0.9440	0.9957	377.6	398
	254	PADGHE	400	0.9560	1.006	382.6	402
	414	NAGOTHANE	400	0.9670	1.0014	386.8	401
	12794	KUDUS-MSETCL	400	1.004	1.027	401.7	410

- Minimum Voltage observed is 368kV which is in Pune Zone
- Need of reactive power compensation by Capacitor Banks is observed during Before case.
- After implementation of Phase-6 Capacitor Banks the improvement in Voltage is observed





Existing & Proposed Capacitor Banks in MSETCL Network



Capacitor Banks Pre-Phase + Phase-1 to 4 (Installed/commissioned) Total **5418** MVAR Existing Capacitor Bank

- 1) Nashik Zone : 1845 MVAR
- 2) Pune Zone : Pune District 240 MVAR + Solapur District -575 MVAR
- 3) Vashi Zone : 20 MVAR

Phase-wise Capacitor Banks in MSETCL Network

Phase Capacitor	Amravati	Aurangabad	Karad	Nagpur	Nashik	Pune	Vashi	Grand Total
Pre-Phase Capacitor banks	100	489	-	-	675	584	-	1848
Phase-1 (Commissioned)	200	340	5	25	130	150	20	870
Phase-2 (Commissioned)	175	190	80	65	360	50	-	920
Phase-3 (Commissioned)	130	70	125	40	320	30	-	715
Phase-4 (Commissioned)	270	315	-	-	360	120	-	1065
Existing Total Capacitor Banks (Pre-Phase + Phase-1 to 4)	875	1404	210	130	1845	934	20	5418
Phase-5 (Proposed)	95	175	170	140	255	120	-	955
Grand Total	970	1579	380	270	2130	1054	20	6373

Buses below 0.9 PU Voltage in MSETCL Network



Voltage scenario in Pune, Nashik & Vashi Zone for Voltage below 0.9 PU

Sr. No.	Voltage Level (kV)	Pune Zone			Nashik Zone			Vashi Zone		
		Bus Voltage Less than 0.92 (Pu) (Location/Bus)	Proposed @ Locations	Proposed Capacitor Banks Phase-6 (MVar)	Bus Voltage Less than 0.92 (Pu) (Location/Bus)	Proposed @ Locations	Proposed Capacitor Banks Phase-6 (MVar)	Bus Voltage Less than 0.92 (Pu) (Location/Bus)	Proposed @ Locations	Proposed Capacitor Banks Phase-6 (MVar)
1	11	11	8	50	3	-	-	-	-	-
2	22	48	43	515	-	-	-	34	7	85
3	33	52	42	645	9	3	70	4	4	100
4	100				-	-	-	3	3	85
5	110				-	-	-	-	-	-
6	132	77	9	255	6	3	90	1	3	-
7	220	54	2	120	-	-	-	13	13	480
	Total	225	104	1485	18	6	160	72	25	750
Grand Total Capacitor Banks (MVar)		2395								

After implementation of envisaged Phase-6 Capacitor Banks all Bus are having 0.9 PU & above

Nashik Zone Reactive Power Compensation Phase-6

Voltage scenario in Nashik Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Nashik Zone							
Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVar)	Before_Voltage (PU)	After_Voltage (PU)
1	Nasik	Nasik	132kV Ambad	33	30	0.8602	0.974
2	Nasik	Nasik	132kV Satpur - MIDC	33	10	0.8594	0.970
3	Nasik	Nasik	132kV Takali	33	30	0.8838	0.9816
4	Nasik	Nasik	132kV Mhasarul	132	30	0.886	0.981
5	Nasik	Nasik	132kV SATPUR MIDC	132	30	0.8746	0.9697
6	Nasik	Nasik	132kV Satpur	132	30	0.9008	0.9764
			Total MVar		160		

Pune Zone Reactive Power Compensation Phase-6



Voltage scenario in Pune Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVar)	Before_Voltage (PU)	After_Voltage (PU)
1	Pune	Pune	132kV Ganeshkhind	11	5	0.7997	0.9488
2	Pune	Pune	132kV Kothrud	11	5	0.824	0.9743
3	Pune	Pune	132kV Mundhwa	11	5	0.8345	0.9841
4	Pune	Pune	132kV Narayangaon	11	5	0.8656	1.0159
5	Pune	Pune	132kV NCL	11	5	0.8117	0.9631
6	Pune	Pune	220kV Bhosari-1	22	30	0.8619	0.9825
7	Pune	Pune	132kV Chakan-1 22	22	10	0.8214	0.9654
8	Pune	Pune	220kV Chinchwad 22	22	20	0.8697	0.9727
9	Pune	Pune	132kV Ganeshkhind	22	10	0.8086	0.9559
10	Pune	Pune	220kV Hinjewadi-1 22	22	10	0.849	0.9462
11	Pune	Pune	220kV Khadaki	22	15	0.8575	0.9758
12	Pune	Pune	132kV Kharadi	22	20	0.8197	0.9896
13	Pune	Pune	100kV Lonavala	22	10	0.8825	0.9611
14	Pune	Pune	400kV Lonikand-1	22	30	0.8239	0.9458
15	Pune	Pune	132kV Mundhwa	22	10	0.8401	0.9842
16	Pune	Pune	132kV NCL	22	15	0.8224	0.971
17	Pune	Pune	220kV Parvati	22	20	0.8404	0.9812
18	Pune	Pune	220kV Phursungi-1	22	10	0.8495	1.0025
19	Pune	Pune	132kV Phursungi-2	22	10	0.8601	0.9968
20	Pune	Pune	132kV Phursungi-2	22	10	0.8601	0.9968
21	Pune	Pune	100kV Talegaon-1	22	15	0.8837	0.9637
22	Pune	Pune	220kV Theur	22	20	0.8507	0.991
23	Pune	Pune	132kV Varasgaon	22	5	0.8223	0.9721

Pune Zone Reactive Power Compensation Phase-6



Voltage scenario in Pune Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVar)	Before_Voltage (PU)	After_Voltage (PU)
24	Pune	Pune	132kV Markal 22	22	15	0.8318	0.9912
25	Pune	Pune	132kV Rahatani 22	22	10	0.8168	0.963
26	Pune	Pune	132kV Kamthadi	22	10	0.8386	1.0218
27	Pune	Pune	220kV Hinjewadi-2	22	10	0.8688	0.9694
28	Pune	Pune	220kV Urse	22	10	0.8808	0.9762
29	Pune	Pune	400kV Chakan	22	20	0.9219	0.9671
30	Pune	Pune	220kV Pirangut	22	10	0.8528	0.9539
31	Pune	Pune	220kV Flagship	22	10	0.8573	0.973
32	Pune	Pune	220kV Bhosari-2	22	10	0.8577	0.9718
33	Pune	Pune	220kV VSNL 22	22	10	0.8475	0.9706
34	Pune	Pune	220kV Serum	22	5	0.8396	0.9802
35	Pune	Pune	132kV Kuruli	22	5	0.8222	0.9753
36	Pune	Pune	132kV Sanaswadi	22	10	0.8233	0.9867
37	Pune	Pune	220kV Nandedcity	22	15	0.8313	0.9849
38	Pune	Pune	220kV Talegaon-2	22	10	0.8903	0.9809
39	Pune	Pune	220kV Maragpatta	22	15	0.8408	0.9817
40	Pune	Pune	132kV Chakan-2	22	10	0.8474	0.9626
41	Pune	Pune	220kV Kondhwa-G	22	10	0.8474	0.9874
42	Pune	Pune	220kV Pigasis	22	5	0.8777	0.9835
43	Pune	Pune	132kV SPSL	22	5	0.8294	0.9792
44	Pune	Pune	132kV Bhatghar	22	10	0.8308	1.0286
45	Pune	Pune	220kV Bridgestone	22	10	0.8423	0.9727

Contd..

Pune Zone Reactive Power Compensation Phase-6



Voltage scenario in Pune Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVar)	Before_Voltage (PU)	After_Voltage (PU)
46	Pune	Pune	220kV Alephata	33	30	0.8666	1.0104
47	Pune	Pune	132kV Markal 33	33	20	0.8258	0.9948
48	Pune	Pune	132kV Narayangaon	33	5	0.8644	0.9999
49	Pune	Pune	220kV Pargaon/ Kathapur	33	20	0.8472	1.0036
50	Pune	Pune	132kV Sanaswadi	33	10	0.8414	1.0068
51	Pune	Pune	132kV Kamthadi	33	10	0.8594	1.0476
52	Pune	Pune	132kV Chakan-1	33	15	0.8102	0.9566
53	Pune	Pune	132kV Pimpalgaon	33	10	0.8648	1.0266
54	Pune	Pune	132kV Kawathe Yemai	33	10	0.8616	1.035
55	Pune	Pune	132kV Narayangaon	132	30	0.8766	1.0104
56	Pune	Pune	132kV Ranjangaon	132	30	0.8645	0.9884
57	Pune	Pune	132kV Theur	132	15	0.8605	1.0061
58	Pune	Pune	132kV Kuruli	132	30	0.8342	0.9726
59	Pune	Pune	132kV Kamthadi	132	30	0.851	1.0114
60	Pune	Pune	132kV Pargaon/ Kathapur	132	30	0.8818	1.0252
61	Pune	Pune	400kV Lonikand-2	132	30	0.8988	0.9945
62	Pune	Pune	400kV Lonikand-1	220	60	0.9218	0.9932
63	Pune	Pune	400kV Jejuri-II	220	60	0.8929	0.9999
64	Pune	Solapur	132/33/11kV Indapur	11	10	0.8414	1.0278
65	Pune	Solapur	132/22kV Baramati-1	22	5	0.8602	0.996
66	Pune	Solapur	132//33/22kV Yawat	22	10	0.7737	0.9978

Contd..

Pune Zone Reactive Power Compensation Phase-6



Voltage scenario in Pune Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVar)	Before_Voltage (PU)	After_Voltage (PU)
67	Pune	Solapur	132/22kV Alegaon	22	5	0.7989	1.0064
68	Pune	Solapur	132/33kV Janai	33	10	0.7745	0.9798
69	Pune	Solapur	220/132/33kV Baramati-2	33	10	0.8251	0.9837
70	Pune	Solapur	220/33kV Bhigwan	33	10	0.8126	0.9972
71	Pune	Solapur	132/33/22kV Daund	33	10	0.7811	1
72	Pune	Solapur	220/33kV Jejuri-1	33	20	0.7923	1.0129
73	Pune	Solapur	220/132/33kV Kurkumbh	33	20	0.7927	0.9928
74	Pune	Solapur	132/33/22 Walchandnagar-1	33	20	0.8068	0.9967
75	Pune	Solapur	132//33/22kV Yawat	33	10	0.759	0.9954
76	Pune	Solapur	132/33kV Purandawade	33	20	0.8097	1.0209
77	Pune	Solapur	220/132/33kV Pandharpur	33	10	0.9001	0.996
78	Pune	Solapur	110-100/33/11kV Pandharpur	33	30	0.9545	1.0194
79	Pune	Solapur	132/33kV Somshwar	33	10	0.8356	0.9791
80	Pune	Solapur	220/132/33kV Lonideokar	33	10	0.8399	1.0342
81	Pune	Solapur	132//33/22kV Yawat	132	30	0.7874	0.996
82	Pune	Solapur	220/132/33kV Lonideokar	132	30	0.8582	1.0357
83	Pune	Solapur	220kV Jeur	33	20	0.8915	1.0023
84	Pune	Solapur	220kV Tembhorni	33	15	0.8676	0.9699
85	Pune	Solapur	220kV Malinagar	33	10	0.9056	1.0132

Contd..

Pune Zone Reactive Power Compensation Phase-6



Voltage scenario in Pune Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVAR)	Before_Voltage (PU)	After_Voltage (PU)
86	Pune	Solapur	132kV Bawda	33	10	0.9056	1.0191
87	Pune	Solapur	132kV Parewadi	33	18	0.8859	1.0382
88	Pune	Solapur	132kV Kurduwadi	33	18	0.9205	1.0168
89	Pune	Solapur	132kV Velapur	33	18	0.9171	1.0349
90	Pune	Solapur	132kV Nimboni	33	8	0.8842	1.027
91	Pune	Solapur	132kV Mangalvedha	33	25	0.8524	1.0047
92	Pune	Solapur	132kV Manegaon	33	13	0.866	1.002
93	Pune	Solapur	220kV Bhalwani	33	14	0.8722	1.0076
94	Pune	Solapur	220kV Barshi	33	15	0.9093	0.9689
95	Pune	Solapur	220kV Vairag	33	17	0.9242	1.0264
96	Pune	Solapur	132kV Degaon	11	10	0.9449	1.0135
97	Pune	Solapur	132kV Soregaon	33	5	0.9528	1.0042
98	Pune	Solapur	132kV Mohol	33	28	0.8817	0.9618
99	Pune	Solapur	132kV Chincholekathi	33	7	0.901	0.967
100	Pune	Solapur	132kV Pulum	33	24	0.8468	0.945
101	Pune	Solapur	132kV Solapur MIDC	33	20	0.9288	0.9885
				11	5	0.9367	0.9885
102	Pune	Solapur	132kV Karajgi	33	15	0.9583	1.0213
103	Pune	Solapur	132kV Akkalkot	33	25	0.9692	1.0097
Total MVAR					1585		

Vashi Zone Reactive Power Compensation Phase-6



Voltage scenario in Vashi Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

Sr. No.	Zone	Circle	Name of Sub station	Base kV	Proposed (MVAR)	Before_Voltage (PU)	After_Voltage (PU)
1	Vashi	Kalwa	220kV KOLSHET	220	40	0.8684	0.969
2	Vashi	Kalwa	220kV VASAI	220	40	0.8332	0.9660
3	Vashi	Kalwa	220kV BHAVEGHAR	220	20	0.8755	0.976
4	Vashi	Kalwa	220kV WADA	220	40	0.8774	0.9761
5	Vashi	Kalwa	220kV KAMBA	220	40	0.8843	0.973
6	Vashi	Panvel	220kV DOMBIVALI -PAL	220	40	0.8918	0.9741
7	Vashi	Panvel	220kV ANANDNAGAR	220	40	0.8934	0.9784
8	Vashi	Panvel	220kV JAMBHUL	220	40	0.8963	0.9799
9	Vashi	Kalwa	220kV NALASOPARA	220	40	0.8981	0.9735
10	Vashi	Kalwa	220kV KNOWLEDGE-PARK	220	40	0.8993	0.9681
11	Vashi	Panvel	220kV TALOJA	220	20	0.9037	0.9679
	Vashi	Panvel	100kV TALOJA	100	15	0.8807	0.959
12	Vashi	Kalwa	220kV TEMGHAR	220	40	0.9066	0.9779
13	Vashi	Kalwa	220kV COLORCHEM	220	40	0.9244	0.9857
14	Vashi	Kalwa	100kV BHIVANDI	100	30	0.8301	0.9535
15	Vashi	Kalwa	100kV VASAI	100	40	0.8332	0.9557
16	Vashi	Panvel	220kV AMBARNATH	22	20	0.799	0.9364
17	Vashi	Panvel	100kV MOHANE	22	20	0.8019	0.9381
18	Vashi	Panvel	100kV MURBAD	22	20	0.8357	0.9781
19	Vashi	Panvel	100kV TALOJA-I	33	20	0.8462	0.9456
20	Vashi	Kalwa	132kV DAHANU	33	20	0.8649	0.9689
21	Vashi	Kalwa	132kV BOISAR-MIDC	33	30	0.8679	0.9716
22	Vashi	Kalwa	132kV PALGHAR	33	30	0.8858	0.9799
22	Vashi	Panvel	220kV Mahad	22	5	0.9123	0.964
22	Vashi	Panvel	100kV Roha	22	5	0.8784	0.949
22	Vashi	Panvel	220kV Vilebhagad	22	10	0.928	1.011
22	Vashi	Panvel	220kV Kandalgaon	22	5	0.9188	0.984
Total MVAR					750		

Losses Comparison (Pune, Nashik & Vashi Zone & State)

Comparison of Losses for Pune Zone, Nashik Zone, Vashi Zone & State

Sr. No.	Zone	Before Capacitor (Phase-6) Losses (MW)	After Capacitor (Phase-6) Losses (MW)	Difference in Losses (MW)
1	Pune	188.1	144.76	43.34
2	Nashik	289.22	261.55	27.67
3	Vashi	191.15	160.9	30.25
4	State Losses	1233.7	1085.61	148

- After considering proposed Phase-6 Capacitor Banks envisaged in Pune, Nashik & Vashi Zone overall 10% Saving in Losses is observed with overall improvement of Voltage in the System.

Conclusion

- The requirement of Capacitor bank near load end is important which inherently improves the source end Voltage.
- When Capacitor banks were introduced at EHV level, the Voltage improvement is observed but the combination of both shows better results.
- The Capacitor at EHV level & HV level both needs to be existing simultaneously for overall improvement of the Voltage profile.
- It will provide flexibility of MVAR addressal as and when required basis throughout the year to improve the voltage profile depending upon the load/voltage scenario.
- Also the previously proposed Phase-5 should be invariably be present / needed

THANK YOU...

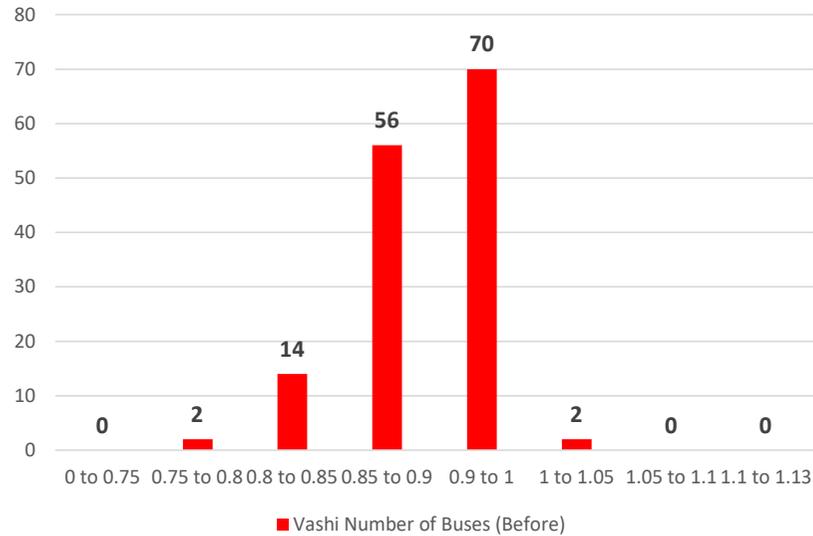
Voltage in MSETCL Network



Voltage scenario in Vashi Zone (Before & After Phase-6 Capacitor Banks)

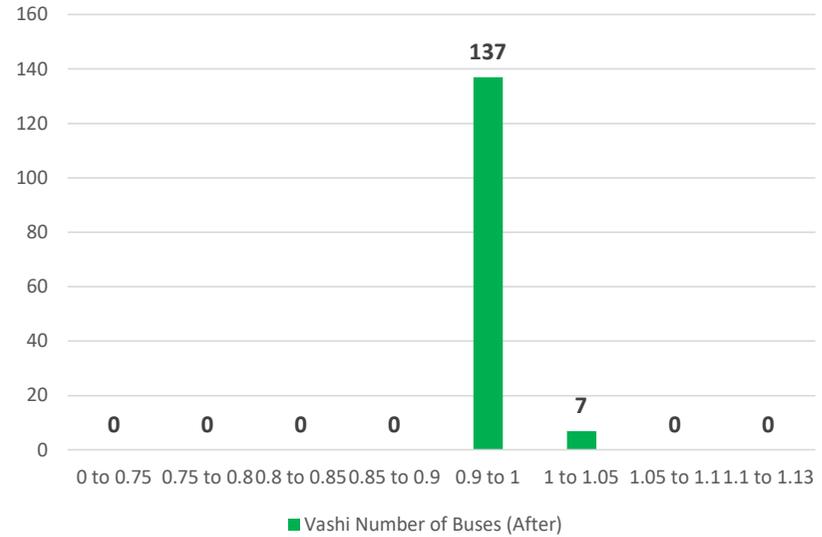
Total
144 bus

Vashi Voltage Range **Before** Phase-6



Voltage Range 0.7811 (pu) to 1.0048 (pu)

Vashi Voltage Range **After** Phase-6

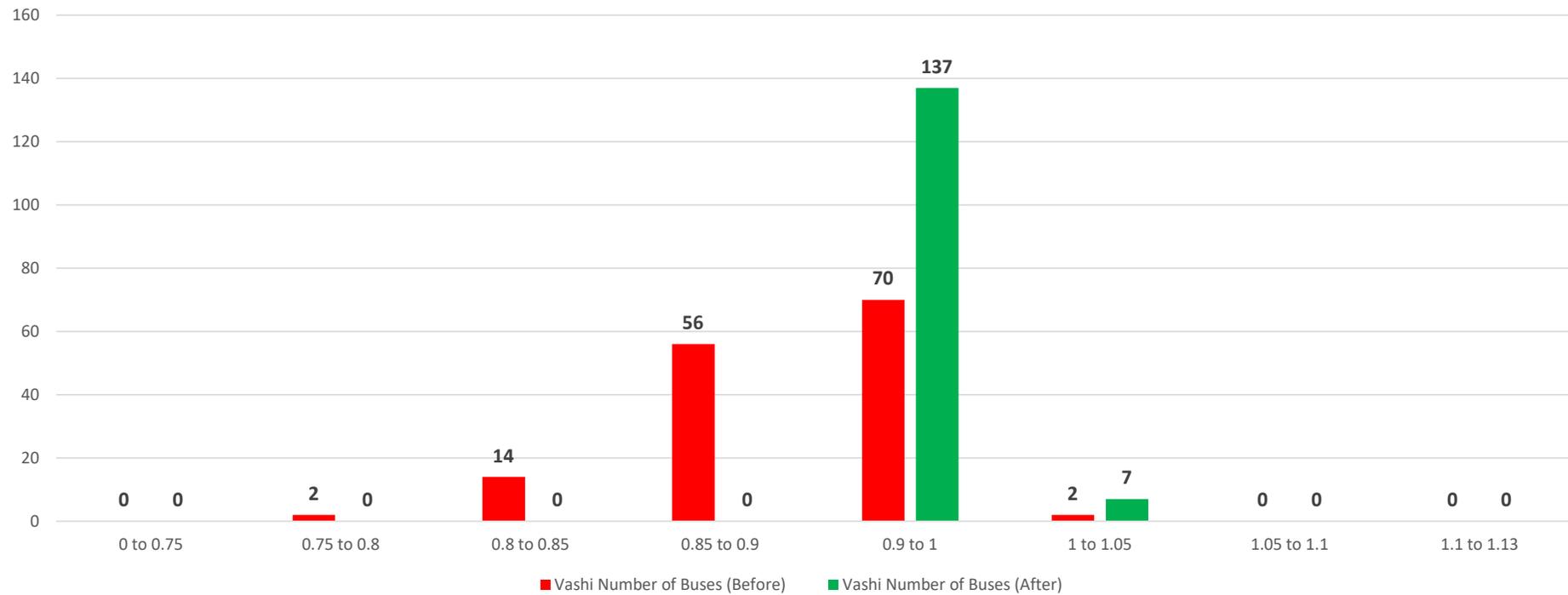


Voltage Range 0.9004 (pu) to 1.0285 (pu)

Voltage in MSETCL Network

Voltage scenario in Vashi Zone (Before & After Phase-6 Capacitor Banks)

Vashi Voltage Range **Before** & **After** Phase-6



Vashi Zone Reactive Power Compensation Phase-6

Voltage scenario in Vashi Zone Before & After Phase-6 Capacitor Banks in MSETCL Network

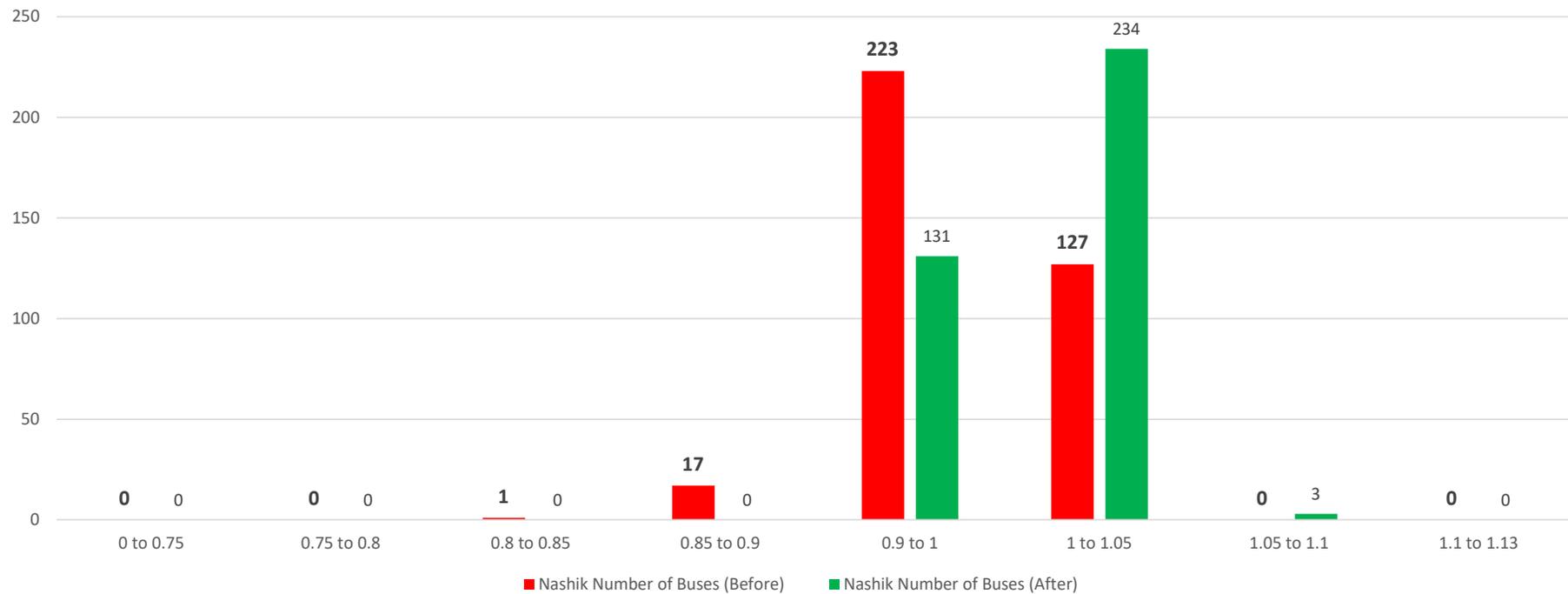
- 220/132/100 kV Bus voltages are as below (column A).
- Following nodes are chosen for reactive compensation which are close to 0.9 PU
- Capacitive compensation at nodes are indicated in (column B) and Improvement in voltages (PU) are indicated in (Column C)

Sr No	Bus Name	Base kV	A	B	C
			Voltage (PU) Before Compensation	Capacitor Bank (Mvar)	Voltage (PU) After Compensation
1	BHIVND100	100	0.8317	2x20 (100kV)	0.9451
2	VASAI10	100	0.8347	2x20 (100kV)	0.9476
3	AMBNATH-MS	100	0.8006	20 (22kV)	0.9324
4	MOHANE100	100	0.8035	20 (22kV)	0.9341
5	MURBAD100	100	0.8373	10 (22kV)	0.9555
6	TALOJA-I	100	0.8481	20 (22kV)	0.9476
7	DAHANU13	132	0.8656	20 (33kV)	0.9607
8	BOISR1-M	132	0.8686	20 (33kV)	0.9524
9	PALGHAR13	132	0.8865	20 (33kV)	0.9629

Voltage in MSETCL Network

Voltage scenario in Nashik Zone (Before & After Phase-6 Capacitor Banks)

Nashik Voltage Range **Before** & **After** Phase-6



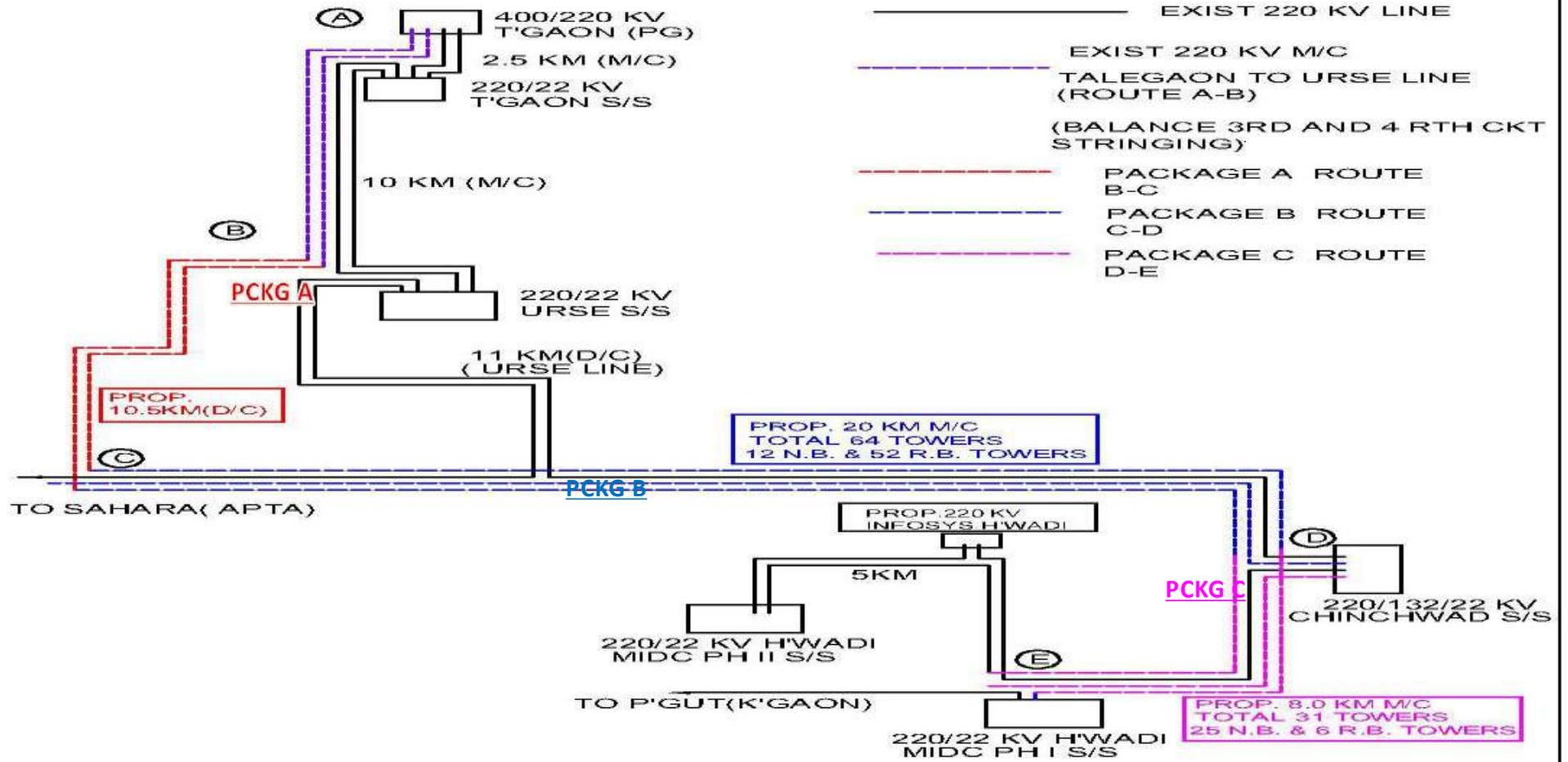


7.5 Transmission constraints in the system:

Present Intra-state transmission constraints for which remedial measures are to be taken by (MSETCL)

Sl.	Issue	Actions planned by STU	Latest status
1	N-1 non-compliance of 220 kV Babhleshwar-Nashik-D/c lines	400/220kV Pimpalgaon S/s is being implemented by MSETCL by Dec'24 a) 220 kV DC line to existing 220 kV Pimpalgaon Interconnection b) Reorientation of existing 220 kV D/C Nasik (GCR) – Pimpalgaon S/S at existing 400 kV Pimpalgaon S/S c) LILO of 132 kV Ozhar – Chandwad at 132 kV Ranwad 2nd Ckt stinging of Pipalgaon Ranwad line.	400/220kV Pimpalgaon S/s is being implemented by MSETCL by Dec-24 The scheme is sanctioned by Board of MSETCL. The scheme is included in STU 5-year plan during the year 2023-24. Tenderisation under process. Award expected by Dec-2023. Expected completion 36 months after tender award.

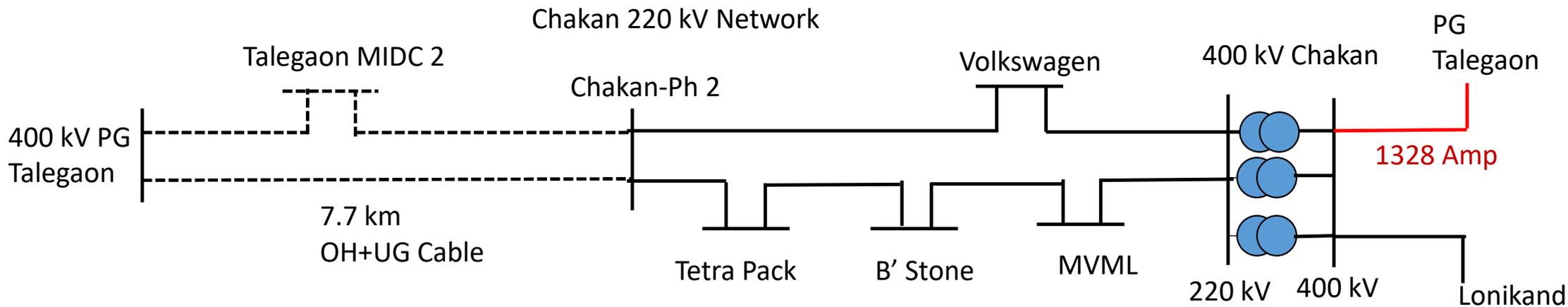
Sr. No	Issue	Actions planned by STU	Remark	Latest status
2	<p>Overloading of 220kV Chinchwad-Urse S/C line</p> <p>STU Plan Year 2023-24</p>	<p>Conversion of 220kV Urse-Chinchwad SC to MC Corridor under Pakage A, B & C LILO on 220kV Chinchwad-Apta line for 400/220kV Talegaon PG S/S upto pt. near Urse S/S (PKG A)</p>	<ol style="list-style-type: none"> 1. The work order awarded to M/s MahaActive Engineers is Short closed vide 1134 dt. 30.01.18 as the work involved in Pkg A was not possible to execute due to severe ROW problems. 2. Now, estimates of construction of 220kV M/C line from point near Urse substation to Loc. No. 37 of 220kV Chinchwad-Urse line by using monopole of route length is submitted to CO dtd 12.12.2022. 	<p>Project Stuck up . Scheme to be revised.</p>
	<p>Conversion of existing S/C Chinchwad-Apta line into M/C for portion between Chinchwad S/S to proposed 220 kV PGCIL (T) line LILO at Loc No.51 (PKG B)</p>	<ol style="list-style-type: none"> 1. The work order awarded to M/S MahaActive Engineers. 2. Status of work:- F- 57/61 Nos, E- 27/61 Nos, S- 7.49 km (29.96 ckm) / 19.06 km (76.32 ckm) 3. Work stopped since 23.03.2016. 4. Short closure proposal sent to C.O. vide ltr. CE/2197 dt.05.12.2019 & Compliance submitted by zone office vide ltr. CE/1885 dt. 10.12.2021. 5. Balance work estimates for amount of Rs.26.70 Cr submitted to CO on dtd 12.12.2022 6. Committee formed for study of short closure. Decision awaited. 		



220 KV LINE FROM 400 KV T'GAON (PG) TO 220 / 22 KV H'WADI MIDC PH I & II S/S

Sr. No	Issue	Actions planned by STU	Remark
7	400kV TalegaonPG-Chakan line; Due to high import at 400kV Talegaon PG from Pune PG and Aurangabad PG, loading of this line is increase	220kV TalegaonPG-Chakan Phase II DC line	Scheme to be submitted to Hon. MERC
		Conversion of 220kV Urse-Chinchwad SC to MC Corridor under Package A, B & C	Completion of Package A,B&C as briefed in point no.1
		Revised scheme for 400kV DC Quad Shikrapur-Lonikand-II & Jejuri (with Lonikand to Jejuri HTLS)	Estimates will be submitted after STU study
		Commissioning of 500MVA additional ICT at 400kV Bhabaleshwar.	Work is in progress, needs to be expedited

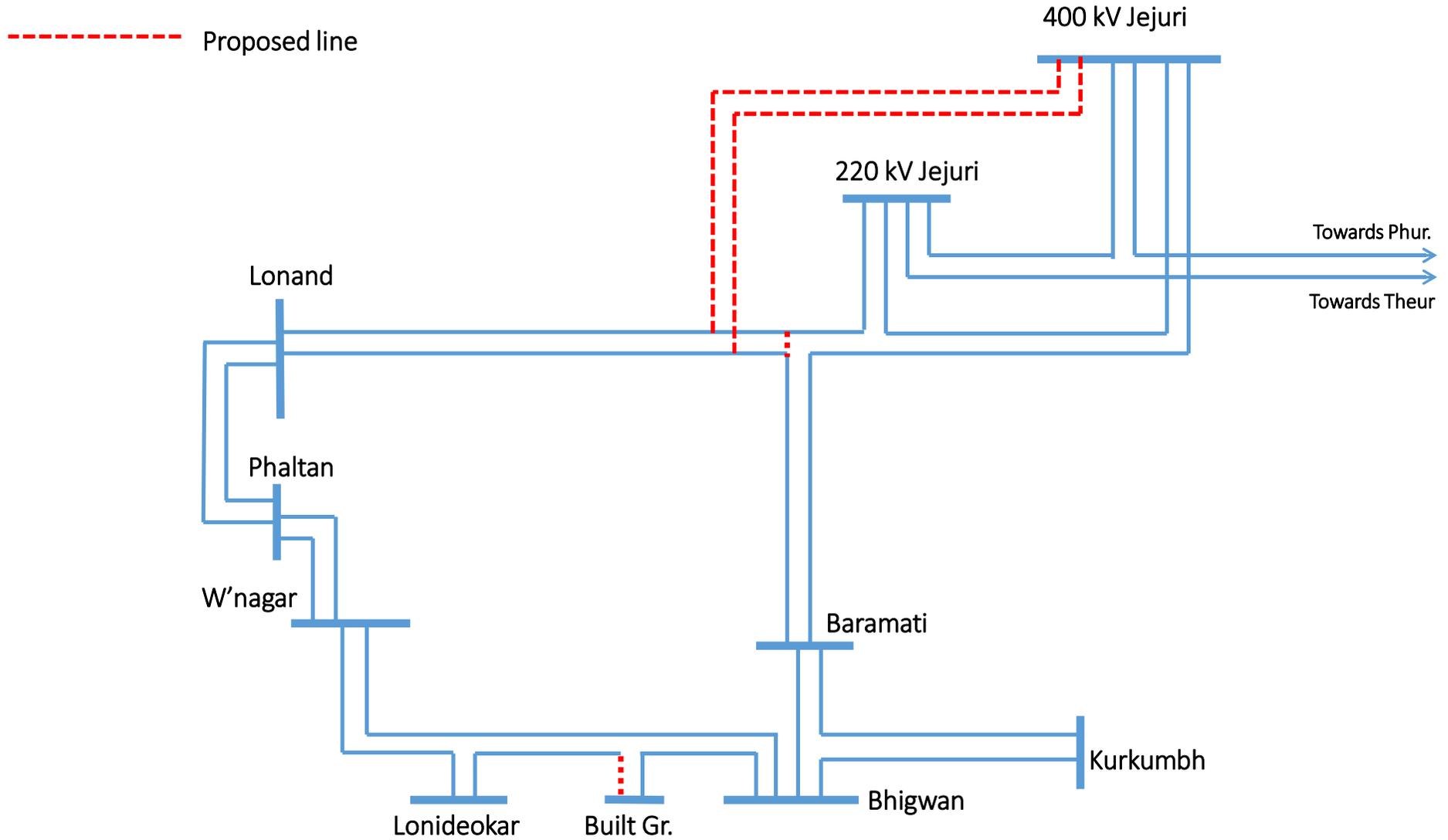
Proposed 220 kV PG Talegaon-Chakan Ph-II DC circuit.



- This connection will support 220 kV bus of 400 kV Chakan and thereby relieve the loading of 400 kV PG-Chakan line & 220kV Urse- Chinchwad line.
- This circuit passes through MIDC area and will present no ROW issues.

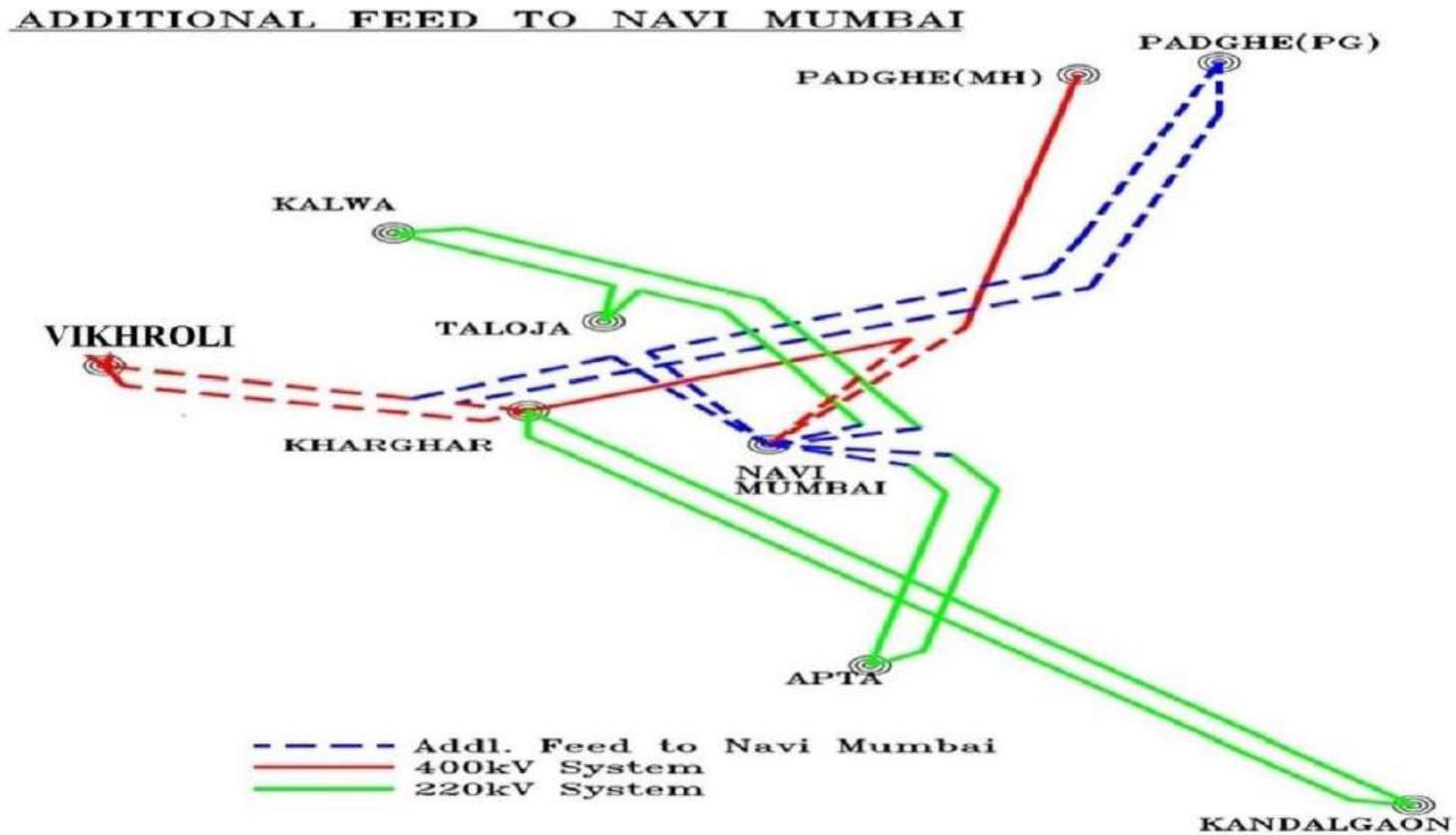
Sr. No	Issue	Actions planned by STU	Latest Status
3	220kV Jejuri-Lonand line	<p>Source separation for 220kV Lonand & Baramati from 400kV Jejuri by construction of 220kV DC line.</p> <p>STU Plan 2022-23</p>	<ol style="list-style-type: none"> 1. Loading of 220 kV Jejuri-Lonand line crosses 800 A in summer season. 2. This line caters load of 220 kV Lonand, Phaltan, Walchandnagar, Bhigwan etc. 3. LTS has been installed on the line at 220 kV Jejuri s/s. 4. Also 220 kV Jejuri- Baramati line also operates near full capacity. LTS is in place for this line also. 5. The work of DC connection from 400 kV Jejuri to 220 kV Lonand line to existing Lonand/Baramati line at Loc No.28 is under progress. 6. This will create two circuits each for Lonand and Baramati. 7. The work was awarded to M/s Anand electricals vide LOA no.4378 dt. 26.10.2020 8. F- 20/24, E-17/24 and S- 0/14.28 ckm

220kV Jejuri-Lonand line



Sr.No	Constraint Point as per MSLDC (Load dispatch enter)	Planning to relieve congestion by MSETCL/STU	Remark
4	<p>Requirement of Multi-Source to 400 kV Sub-Stations: 5 Nos. of 400 kV Sub-Stations viz. Jejuri, Kharghar, Chakan, Alkud & Lamboti are fed through only two sources. In case of tripping of outage on any one 400 kV line, the other line is overloaded. Also, 'N – 1' criterion is not fulfilled, and voltage profile is degraded. In view of the same, it is necessary provide additional Source for these 400kV Sub-Stations on priority.</p>	<p>Padghe (PG) – Kharghar 400kV D/c (quad) line to be terminated into one ckt. of Kharghar – Vikhroli 400kV D/c (quad) line (thus forming Padghe (PG) – Kharghar 400kV S/c (quad) line, Padghe (PG) –Vikhroli 400kV S/c (quad) line)- 70km ·</p>	<p>Length: 140 ckm · Locations: 187 nos. · Foundation completed: 98 nos. (WIP 19 nos.) · Tower erected: 70 nos (WIP 5 nos.) · Stringing completed: 0 ckm · SCOD (as per TSA): 22-12-2023 · Revised SCOD (as per CEA meeting dtd. 03.11.2020): 31.07.2023# · Anticipated COD: 22.06.2024</p>
		<p>220kV TalegaonPG-Chakan Phase II DC line STU Plan 2023-24</p>	<p>Scheme to be submitted to MERC</p>
		<p>LILO on 400kV Lonikand-Karad SC line at Jejuri S/S STU Plan 2021-22</p>	<p>Work completed on dtd 04.11.2022</p>

Proposed Padghe (PG) – Kharghar 400kV D/c (quad) line



THANK YOU