महापारेषण

MAHARASHTRA STATE ELECTRICITY TRANSMISSION COMPANY LIMITED
(CIN NO U40109MH2005SGC153646)

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MSETCL/CO/STU/Sys/MTC/ No - 8091 **Date:** 22 NOV 2023

To,
As per mailing list

Sub: Minutes of 8th Maharashtra Transmission Committee (MTC) meeting held on 19 Oct, 2023.

Please find enclosed herewith minutes of the 8th Maharashtra Transmission Committee (MTC) meeting on held on held on 19 Oct, 2023 at 11:00 Hrs. at Adani Electricity Management Institute, 220 kV Aarey EHV Substation.

It is to be noted that the minutes of above meeting is also available on website www.mahatransco.in in STU section.

Thanking you.

Yours faithfully,

Chairperson – MTC And
Chief Engineer (STU)

Copy s.w.r. to:

1) The Director (Operations), CO, MSETCL, Mumbai

List of MTC Members

Sr. No.	Name of Organization	Name of Nominee & Designation	Committee position	Email ID
1	State Transmission Utility (STU)	Chief Engineer-STU	Chairperson	CESTU@mahatransco.in
2	State Transmission Utility (STU)	Superintending Engineer - STU	Member Convener	sesys@mahatransco.in
3	SLDC	Chief Engineer-SLDC	Member	cesldc@mahatransco.in
4*	MSETCL	Superintending Engineer (Project Scheme-I)	Member	SE1prj@mahatransco.in CEOM@mahatransco.in
5	MSEDCL	Chief Engineer (Distribution), CO, Mumbai	Member	cedist@mahadiscom.in
6	MSPGCL	Rahul Sohani (Superintending Engineer)	Member	cegw@mahagenco.in, seest1@mahagenco.in
7	Maharashtra eastern grid Power Transmission co ltd	Atul Sadaria	Member	atulj.sadaria@adani.com
8	Adani Electricity Mumbai Ltd. (Transmission Business)	Rakesh Raj (Head Planning – AEML Transmission)	Member	rakesh.raj2@adani.com nilesh.wankhede@adani.com
9	Tata Power Co. Ltd.- Mumbai- Transmission	Sh. Kiran Desale (Head-Transmission)	Member	desaleky@tatapower.com gstawre@tatapower.com
10	Central Railway	S.S.Parihar (Chief Electrical Engineer/Electrical Energy Management/CR)	Member	dyceetrdcrly@gmail.com
11	M/s Tata Power Company Ltd. (Distribution)	V T Narayanan	Member	vtnarayanan@tatapower.com
12	Adani Electricity Mumbai Ltd. (Distribution Business)	Abaji Naralkar (Asst. Vice President)	Member	abaji.naralkar@adani.com
13	BEST Undertaking	Smt. Manisha Krupanand Daware.Divisional Engineer (Project)	Member	depro@bestundertaking.com

Minutes of the 8th Maharashtra Transmission Committee (MTC) Meeting held on 19 Oct, 2023 at Adani Electricity Management Institute, 220 kV Aarey EHV Substation.

The 7th Maharashtra Transmission Committee (MTC) was held on 19 Oct, 2023 at Adani Electricity Management Institute, 220 kV Aarey EHV Substation. Chief Engineer (STU) presided over the meeting.

Superintending Engineer (STU), Member secretary of MTC, Welcomed all the MTC members & other participants in the 8th MTC meeting. After brief introduction of the participants, SE (STU) Member Secretary of MTC, requested members to conform 7th MTC Meeting MOM.

Agenda Point No. 1:

Procurement of 4 Nos. of van mounted underground EHV cable fault locator system to detect & locate the fault in underground cable in MSETCL upto 400KV level.

MSETCL representative placed before MTC a proposal for Procurement of 4 Nos. of van mounted underground EHV cable fault locator system to detect & locate the fault in underground cable in MSETCL upto 400KV level

He stated that majorly the power transmission is carried out by overhead transmission lines conventionally however during the last few years power transmission through underground cables is being adopted owing to the practical constraints of overhead lines in urban areas due to ROW issues. It was also informed that MSETCL has already laid the underground cables of various voltage levels (220kV, 132kV) at multiple locations across Maharashtra which are expected to further increase in the future. These underground cables are not affected by any adverse weather conditions like pollution, heavy rainfall, snow and storm etc. which in turn reduces the weather related outages & provides more reliable power supply. However when a breakdown occurs in cable it is very difficult to identify the type of fault & exact location of the fault .Recently, after a breakdown on 132 kV Under Ground 5KM Cable (Magarpatta-Rastapeth) in Pune the identification of the fault consumed about 2.5 months.

The procedure for fault finding in underground cables is a specialized one and is time consuming. This Van Mounted under Ground EHV Cable Fault Locator System is used to detect & locate the faults in underground cables in MSETCL upto 400 kV level in minimum time & will avoid large duration interruptions in cable network.

The Van Mounted under Ground EHV Cable Fault Locator System can detect & locate all types of faults i.e. Short circuit, Open Circuit & Resistive Faults in underground cable up to 400 kV level. It can also detect & locate the faults in wet/submerged condition when underground. The utilization of Van Mounted under Ground EHV Cable Fault Locator System fault expedite the fault finding & restoration work thereby enhancing system reliability & stability.

The committee discussed the proposal and acknowledged the need such Cable fault locators considering the downtime after breakdown of cable & the increasing population of EHV cables in MSETCL transmission network. Presently TPC & Adani Transmission are also utilizing these fault locators for fault detection and maintenance of Mumbai transmission network. Chairman, MTC suggested that activities related to EHV Cable being expertise in nature, MSETCL should also carry out skill development of a dedicated team for commissioning/maintenance/fault detection of EHV cables and better utilization of the Cable fault locators.

After detailed deliberation and discussion, the committee recommended the said proposals of Procurement of 4 Nos. of van mounted underground EHV cable fault locator system to detect & locate the fault in underground cable in MSETCL upto 400kV level for submission to GCC for approval.

Agenda Point No. 2:

Scheme of Augmentation by providing additional 3x500MVA, 765/400/33kV ICT with HV and IV bays along with 400kV Interconnection line between ICT-III IV side to 400kV Bus at 765kV R.S. Ektuni in Aurangabad zone

MSETCL representative placed before the MTC a proposal for Scheme of Augmentation by providing additional 3x500MVA, 765/400/33kV ICT with HV and IV bays along with 400kV Interconnection line between ICT-III IV side to 400kV Bus at 765kV R.S. Ektuni in Aurangabad zone

MSETCL representative explained that 765kV R.S Ektuni Commissioned in March 2016. At present, 2 nos. of 3X500 MVA, 765/400/33 ICTs are commissioned. Peak load on both ICTs are more than 70%. During outage/Breakdown of either of the ICT, the load cannot be catered i.e. not satisfying N-1 criteria. To mitigate the constraint presently LTS is also commissioned for the ICTs.

Hence considering the present loading condition, outage constraints, to satisfy N-1 criteria additional ICT is proposed at 765kV Ektuni S/S.

Further, as per the MOM of 2nd meeting of WRPC transmission planning held on 04th Sept 2020, CEA advised MSETCL to look out for various alternatives to relieve overloading of ICTs at 765/400 kV Ektuni S/s, 400/220 kV Akola S/s and 400 kV Tiroda S/s.

After detailed deliberation and discussion, the committee recommended the said proposals of Scheme of Augmentation by providing additional 3x500MVA, 765/400/33kV ICT with HV and IV bays along with 400kV Interconnection line between ICT-III IV side to 400kV Bus at 765kV R.S. Ektuni in Aurangabad zone for submission to GCC for approval.

Agenda point no. 3:

Scheme of Augmentation by providing Additional 1x100MVA, 220/132kV ICT along with HV & LV bays and allied civil works at 220kV Malkapur (Dharangaon) S/s under EHV O&M division, Buldhana in Amravati Zone

MSETCL representative Proposed & presented the proposal for Scheme of Augmentation by providing Additional 1x100MVA, 220/132kV ICT along with HV & LV bays and allied civil works at 220kV Malkapur (Dharangaon) S/s under EHV O&M division, Buldhana in Amravati Zone.

MSETCL representative stated that 220kV Malkapur (Dharangaon) S/s is commissioned on 10.01.2020. At present, 2 nos. of 100MVA, 220/132kV ICTs are installed. Peak load on both ICTs are more than 70%.

STU section has carried out the load flow studies by considering the Grid Connectivity of following RE Generation developers.

No.	Wind/Solar/Co Gen	Name of Developer	Generation MW	Voltage Level kV
1	Solar	M/s. Energevo Lights LPP	200	220
2	Solar	M/s. FPEL Solvin (P) Ltd.	150	220
3	Solar	M/s. Kalpak Power Ltd.	30	33

After load flow studies of above three developers, STU section has concluded that proposed solar project are not feasible due to overloading of 1X 100MVA, 220/132kV ICT at Malkapur (Dharangaon) under N-1 contingency. Hence to provide evacuate the upcoming RE generation in the region STU has recommended the additional 1X100MVA, 220/132kV ICT at 220kV Malkapur S/s (Dharangaon).

During outage/Breakdown of either of the ICT, the load cannot be managed on other ICT i.e. the substation does not satisfy N-1 criteria.

Hence considering the present loading condition, outage constraints, future demand of RE developers and to satisfy N-1 criteria, additional 1x100MVA, 220/132kV ICT is proposed at 220kV Malkapur (Dharangaon).

After detailed deliberation and discussion by members, the committee recommended the above proposal of Scheme of Augmentation by providing Additional 1x100MVA, 220/132kV ICT along with HV & LV bays and allied civil works at 220kV Malkapur (Dharangaon) S/s under EHV O&M division, Buldhana in Amravati Zone for submission to GCC for approval.

Agenda Point No. 4:

Scheme of Augmentation by providing Additional 1x25MVA, 132/33kV T/F along with HV & LV bays and 33kV PT bay at 132kV Arni S/s under EHV O&M division, Yavatmal in Amravati Zone

MSETCL representative explained 132kV Arni S/S, commissioned in the year 2016. Existing solar projects connected to 132kV Arni S/S is as follows:

Sr. No.	Wind/Solar/CoGen	Name of Developer	Generation MW	Voltage Level kV
1	Solar	M/s Juniper Green Field Pvt. Ltd	80	132
2	Solar	Shri Sai Purnanand Green Energy Pvt. Ltd	20	33

As per the load flow study carried out by STU for solar projects to be connected under MSKVY 2.0 to the MSEDCL network, it is observed that during N-1 contingency i.e. tripping of 1 X 25 MVA transformer, the load cannot be managed on other 1x25 MVA transformer when 80% of generation injection is considered towards the EHV ss.

132kV Arni S/S is identified by STU in Cluster-14 of "Mukhyamantri Saur Krishi Vahini Yojana 2.0" (MSKVY 2.0). Chairman,MTC suggested as the project is of top most priority being a transmission constrain for MSKVY 2.0 scheme spare 25MVA unit having balance life & taken out of service during augmentation schemes of 25-50MVA may be explored for utilization at 132Kv Arni S/S to expedite the work.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of Augmentation by providing Additional 1x25MVA, 132/33kV T/F along with HV & LV bays and 33kV PT bay at 132kV Arni S/s under EHV O&M division, Yavatmal in Amravati Zone for submission to GCC for approval.

Agenda Point No. 5:

Scheme of Augmentation by providing Additional 1x50MVA, 220/33kV T/F along with HV & LV bays at 220kV Kekatnimbhora S/s under Bhusawal Circle in Nashik Zone

MSETCL representative placed before the MTC a proposal for Scheme of Augmentation by providing Additional 1x50MVA, 220/33kV T/F along with HV & LV bays at 220kV Kekatnimbhora S/s under Bhusawal Circle in Nashik Zone.

MSETCL representative explained 220kV Kekatnimbhora S/S, commissioned in June 2019. 50 MW solar generation is connected at 33 kV level of 220 kV Kekatnimbhora S/S.

220kV Kekatnimbhora S/S is identified by STU in Cluster-8 (Jalgaon 02) of "Mukhyamantri Saur Krishi Vahini Yojana 2.0" (MSKVY 2.0). As per the load flow study carried out by STU for solar projects to be connected under MSKVY 2.0 to the MSEDCL network, it is observed that during N-1 contingency i.e. tripping of 1 X 50 MVA transformer, the other 1 X 50 MVA transformer will reach up to 92 % of its rated capacity 80% of generation injection is considered towards the EHV ss.

Hence, additional 1x50MVA, 220/33kV T/F capacity will ensure supply reliability, increase in system voltage per unit, and reduction in transmission losses.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of Augmentation by providing Additional 1x50MVA, 220/33kV T/F along with HV & LV bays at 220kV Kekatnimbhora S/s under Bhusawal Circle in Nashik Zone for submission to GCC for approval.

Agenda Point No. 6:

Scheme of Augmentation by providing Additional 1x50MVA, 220/33kV T/F along with HV & LV bays at 220kV Satana S/s under Nashik Circle in Nashik Zone

MSETCL representative placed before the MTC a proposal for Scheme of Augmentation by providing Additional 1x50MVA, 220/33kV T/F along with HV & LV bays at 220kV Satana S/s under Nashik Circle in Nashik Zone.

MSETCL representative explained 220kV Satana Substation commissioned on 20.03.1990. 220kV Satana Substation caters the load of Satana & Deola Taluka under Nashik District.

220kV Satana S/S is identified by STU in Cluster-3/cluster 4 (Nashik 02/Nashik 03) of "Mukhyamantri Saur Krishi Vahini Yojana 2.0" (MSKVY 2.0). As per the load flow study carried out by STU for solar projects to be connected under MSKVY 2.0 to the MSEDCL network, it is observed that during N-1 contingency i.e. tripping of 1 X 50 MVA transformer, the load cannot be managed on other 1x50 MVA transformer when 80% of generation injection is considered towards the EHV ss.

220kV Satana Substation fulfills the augmentation criteria hence to satisfy (N-1) criteria & also to meet the future load demand, additional 1X50MVA, 132/33kV TF along with HV & LV Bays is proposed at 220kV Satana Substation.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of Augmentation by providing Additional 1x50MVA, 220/33kV T/F along with HV & LV bays at 220kV Satana S/s under Nashik Circle in Nashik Zone for submission to GCC for approval.

Agenda Point No. 7:

Scheme of Augmentation by addition of 3X167 MVA, 400/220/33kV ICT-4 with extension of RRS upto existing 167MVA, 400/220/33kV Spare ICT-2 at 400kV R.S. Dhule under Nashik zone.

MSETCL representative stated that 400kV R.S. Dhule substation is commissioned in the year 1995. It is a very vital and important Inter-state connected substation (i.e. connected to Gujarat through 400kV SSNNL Line and Madhya Pradesh through 400kV Khandwa Line and 765/400kV BDTCL Substation through 400kV Songir Line).

The Total installed capacity of 400kV R.S. Dhule is 1315 MVA (i.e. 2 Nos. of 3X167MVA, 400/220/33kV ICTs and 3X105 MVA, 400/220/33kV ICT) and considering the installed capacity of spare ICT unit the total installed capacity will be 1587 MVA.

The load in and around Dhule, Nandurbar, Jalgaon (partly) and Babhaleshwar (partly) districts is catered by 400/220kV ICTs at 400kV R.S. Dhule through 400kV Babhaleshwar, 220kV Malegaon, 220kV Dhule, 220kV Chalisgaon, 220kV Amalner and 220kV Dondaicha lines.

In case of tripping or outage on any of the ICT, it is difficult to manage load on the other ICTs i.e. substation does not fulfils (N-1) criteria.

Hence, to satisfy (N-1) criteria & also to meet the future load demand additional 3X167MVA, 400/220/33kV ICT is proposed at 400kV Dhule S/stn.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of Augmentation by addition of 3X167 MVA, 400/220/33kV ICT-4 with extension of RRS upto existing 167MVA, 400/220/33kV Spare ICT-2 at 400kV R.S. Dhule under Nashik zone. for submission to GCC for approval.

Agenda Point No. 8:

Scheme for Augmentation by providing additional 50 MVA, 132/33 kV T/F along with HV & LV Bays with 33kV Bus extension at 132 kV Mohol substation under EHV (O&M) Division, Solapur in Pune zone.

MSETCL representative placed before the MTC a proposal for Scheme for Augmentation by providing additional 50 MVA, 132/33 kV T/F along with HV & LV Bays with 33kV Bus extension at 132 kV Mohol substation under EHV (O&M) Division, Solapur in Pune zone.

132/33kV, Mohol S/stn commissioned on 02.07.1993 and having installed capacity of 2x50 MVA 132/33kV, i.e. 100 MVA. At 33kV Bus, maximum load recorded on existing 2x50MVA T/F LV Side is 83.46 MVA on 02.05.2022 (including Vishwaj Solar generation).Feasibility report has been given to 20 MW Surolite solar and 25MW B.R.Dalve-Patil solar.

132kV Mohol S/S is identified by STU in Cluster-5 (Solapur) of "Mukhyamantri Saur Krishi Vahini Yojana 2.0" (MSKVY 2.0). As per the load flow study carried out by STU for solar projects to be connected under MSKVY 2.0 to the MSEDCL network, it is observed that during N-1 contingency i.e. tripping of 1 X 50 MVA transformer, the load cannot be managed on other 1x50 MVA transformer when 80% of generation injection is considered towards the EHV ss.

Hence, to satisfy (N-1) criteria & also to meet the future load demand, additional 50MVA, 132/33kV T/F along with HV & LV with 33kV Bus extension Bays is proposed at 132kV Mohol substation.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme for Augmentation by providing additional 50 MVA, 132/33 kV T/F along with HV & LV Bays with 33kV Bus extension at 132 kV Mohol substation under EHV (O&M) Division, Solapur in Pune zone. for submission to GCC for approval.

Agenda Point No. 9

Scheme of Augmentation by providing additional 3X167MVA, 400/220/33kV ICT-IV along with spare ICT unit and HV & LV Bays at 400kV Kharghar S/s under Panvel Circle in Vashi Zone

MSETCL representative placed before the MTC a proposal for Scheme of Augmentation by providing additional 3X167MVA, 400/220/33kV ICT-IV along with spare ICT unit and HV & LV Bays at 400kV Kharghar S/s under Panvel Circle in Vashi Zone

400/220/33kV R.S. Kharghar is one of the important grid substation in Navi Mumbai. 400kV Kharghar S/s is fed by 400kV lines from 400kV Talegaon PG & 400kV Kalwa S/s. This substation is transmitting power to Navi Mumbai & Mumbai sub urban area (Urban-100%) through 03 Nos. of 315 MVA, 400/220kV ICTs and 03 Nos. of 50 MVA, 220/33kV Power Transformers.

Considering the development plan of CIDCO along with new Airport & allied development activities thereupon, the power demand of this region is going to enhance. In case of outage / tripping of any of the ICT, the load cannot be managed on other ICTs. i.e. not satisfying (N-1) criteria.

Hence, to satisfy (N-1) criteria & also to meet the future load demand additional 3X167MVA, 400/220kV ICT-IV along with spare unit, HV & LV Bays is proposed at 400kV Kharghar S/s.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of Augmentation by providing additional 3X167MVA, 400/220/33kV ICT-IV along with spare ICT unit and HV & LV Bays at 400kV Kharghar S/s under Panvel Circle in Vashi Zone for submission to GCC for approval.

Agenda Point No. 10:

Scheme of Second Circuit Stringing on a) 132kV Gangapur-Vaijapur, b) 132kV Jalna(old)-Partur, c) 132kV Jalkot - Udgir, d) 132kV Nilanga - Omerga, e) 132kV Georai(220kV s/s) - Mahakala, f) 132kV Bhokar - Tamsa & g) 132kV Bhokar - Himayatnagar SCDC lines along with construction of associated end bays under Aurangabad zone

MSETCL representative placed before the MTC a proposal for scheme of Second Circuit Stringing on a) 132kV Gangapur-Vaijapur, b) 132kV Jalna(old)-Partur, c) 132kV Jalkot - Udgir, d) 132kV Nilanga - Omerga, e) 132kV Georai(220kV s/s) - Mahakala, f) 132kV Bhokar - Tamsa & g) 132kV Bhokar - Himayatnagar SCDC lines along with construction of associated end bays under Aurangabad zone

a) 132kV Gangapur-Vaijapur:

132kV Vaijapur substation is fed by two source lines i.e. one from 220kV Kopargaon substation via Kopargaon TSS (LILO) & other from 220kV Deogaon Rangari S/s via 132kV Gangapur substation. Apart from this, Rotegaon TSS (4.8MW) is connected at 132kV Vaijapur bus & Kopargaon TSS is made LILO on 132kV Kopargaon-Vaijapur line.

Most of the load of 132kV Vijapur substation is fed from 220kV Deogaon Rangari substation via Gangapur line as 220kV Kopargaon substation is a weak source. Thus, the only strong source to 132kV Vaijapur substation is from 132kV Gangapur substation. The maximum load on 132kV Gangapur - Vaijapur SCDC line was reached up to 90MW on 01.03.2023.

Considering this, there is necessity of an alternate source to 132kV Vaijapur Substation. As such, second circuit stringing on existing 132kV Gangapur - Vaijapur SCDC line is required.

b) 132kV Jalna(old)-Partur:

At present, 220/132/33kV Partur substation and vicinity area has following generations connected or proposed for connection:

Sr. No.	Wind/ Solar/ Co Gen	Name of Developer	Existing/ Sanctioned/ Application	Generation MW	Voltage Level
1	Solar	Tata Solar	Existing	100	132kV Partur (220kV)
2	Co-Gen	Bageshwari Sugars	Existing	12	
3	Solar	Ajanta Solar	Sanctioned	5.1	33kV Partur
4	Solar	Ujaas Energy Ltd.	Existing	30	33kV Mantha
5	Solar	Repal Renewables Pvt. Ltd.	Sanctioned	20	
6	Solar	ADICCA Energy Pvt. Ltd.	Sanctioned	50	
7	Solar	Solenco Renewables Pvt. Ltd.	Existing	70	132kV Ghanasawangi
8	Solar	Azure Power Fifty Six Pvt. Ltd.	Application	100	132kV Ambad

At 220 kV Partur substation, M/s. Tata Solar Power is connected with 100MW generation capacity. To facilitate the evacuation of these existing and proposed RE generations, conversion of existing 132kV Partur(220kV)-132kV Partur DC line conductor to HTLS conductor has already been proposed in STU plan (2022-23 to 2026-27).

Also, 132kV Utwad substation is planned by making LILO on existing 132kV Jalna Old-Partur line. Therefore, 2nd circuit stringing of 132kV Jalna Old-Partur line will be beneficial from system point of view for evacuation of RE generations in the area.

c) 132kV Jalkot – Udgir:

132kV Udgir substation is having two sources i.e. from 220kV Jalkot & 220kV Harangul substation. The maximum load reached on 132kV Jalkot – Udgir line is 91.8MW. This line feeds power to the whole Udgir, Deoni & part of Jalkot, Shirur Anantpal, Degloor Taluka and its surrounding area.

In case of tripping or outage on 132kV Jalkot - Udgir line, load of 132kV Udgir substation is fed from 220kV Harangul substation through 132kV S/C Harangul - Chakur - Jagruti - Udgir line.

As 132kV S/C Harangul - Chakur - Jagruti - Udgir line is single circuit & very old (commissioned on 15.03.1985) and having long route length, affects the voltage profile at 132kV Udgir substation end and more effect on end consumers connected to 132kV Udgir substation. Thus, second circuit stringing will help in reliability of power supply & enhancement of transmission capacity thereby making the system N-1 compliant.

d) 132kV Nilanga – Omerga:

132kV Nilanga substation is serving Urban as well as Rural load of Nilanga, part of Shirur Anantpal & part of Ausa Taluka, whereas 132kV Omerga substation is serving Urban as well as Rural load of Omerga Taluka & part of Lohara Taluka. 132kV Omerga substation is feeding through 132kV Narangwadi - Omerga 1 & 2 lines, from single source i.e. 220kV Narangwadi substation.

In case 220kV Narangwadi substation goes into dark, 132kV Omerga substation will also go into dark; as 220kV Narangwadi substation is the single source for 132kV Omerga substation. This Second circuit will provide second source to 132kV Omerga substation.

Second circuit will enhance the capacity to meet future increment in load. There are upcoming proposed RE Generators since Omerga & Lohara Taluka are having huge potential of Wind and Solar Energy. This second circuit stringing will be helpful for proposed RE evacuation.

e) 132kV Georai(220kV s/s) – Mahakala:

132/33kV Mahakala substation is fed by a single source line from 220/132kV Georai substation and has 2x25 MVA, 132/33kV transformers. If this supply fails, then there is no alternate arrangement for this substation.

Further, Samarth Sahakari Sakhar Karkhana (SSSK) Co-generation (18MW) is also connected at 132kV level of Mahakala substation via 132kV Mahakala-SSSK line. Hence, whenever there is breakdown of 132kV Mahakala-Georai line, the co-generation of Samarth Sahakari Sakhar Karkhana (SSSK) also gets affected.

Therefore, 132kV Mahakala substation is not N-1 compliant as it is radially connected so 2nd circuit stringing of 132kV Georai (220kV S/s)- Mahakala is required.

f) 132kV Bhokar – Tamsa:

220kV Bhokar substation serves urban as well as rural load of Bhokar, Ardhapur Taluka, whereas, 132kV Tamsa substation serves urban as well as rural load of Hadgaon Taluka. Most of the load fed from 220kV Bhokar & Tamsa substation is having agricultural load.

220kV Bhokar substation is having source from 400kV Kumbhargaon substation and generally exports power to 132kV Tamsa substation through existing 132kV Bhokar-Tamsa SCDC line.

132kV Tamsa substation is fed from 132kV Bhokar- Tamsa line and exports power to 220kV Waghala substation through 132kV Waghala-Tamsa (SCSC) line & that to 132kV Umarkhed substation through 132kV Tamsa-Umarkhed (SCDC) line.

The maximum load of 132kV Bhokar-Tamsa line was about 78MW in the year 2022-23 and maximum load of 132kV Waghala-Tamsa line & 132kV Tamsa-Umarkhed line is about 38MW & 48MW respectively in the year 2022-23.

In case of tripping/maintenance of 132kV Bhokar-Himayatnagar line/ operation of 132kV busbar of bus section-02 at 220kV Bhokar substation, the maximum load of 132kV Himayatnagar & 132kV Kinwat substation is fed from existing 132kV Bhokar-Tamsa line as 220kV Bhokar is strong source & line gets overloaded.

Therefore, 2nd circuit stringing of 132kV Bhokar- Tamsa line is required from system point of view. Also, it will help in creating margin in transmission network for evacuation of power from upcoming RE projects.

g) 132kV Bhokar – Himayatnagar:

220kV Bhokar substation serves urban as well as rural load of Bhokar & part of Ardhapur Talukas whereas, 132kV Himayatnagar substation serves urban as well as rural load of Himayatnagar & Kinwat Taluka. 220kV Bhokar & 132kV Himayatnagar substations are also having agricultural load.

220kV Bhokar substation is having source from 400kV Kumbhargaon substation and currently there is power exports to 132kV Himayatnagar substation through existing 132kV Bhokar-Himayatnagar SCDC line.

132kV Himayatnagar substation is feeding power to 132kV Kinwat substation (single source SS) through 132kV Himayatnagar-Kinwat (SCDC) line & 132kV Himayatnagar-Umarkhed line export/import to 132kV Umarkhed substation.

The maximum load of 132kV Bhokar-Himayatnagar line is about 57MW in the year 2022-23 and maximum load of 132kV Himayatnagar-Umarkhed line & 132kV Himayatnagar- Kinwat line is about 24MW & 40MW respectively in the year 2022-23.

Also, it is important and essential to make arrangement for evacuation of RE power connected & proposed to be connected to 132kV bus of Himayatnagar substation is as follows.

Sr. No.	Wind/ Solar/ Co-Gen	Name of Developer	Existing/ Sanctioned/ Application	Generation MW	Voltage Level
1	Solar	M/s. Shri. Sai Purnanand Green Energy Pvt. Ltd	Existing	10	33kV Himayatnagar
2	Solar	M/s. Lomond Solar P. Ltd.	Sanctioned	50	132kV Himayatnagar
3	Solar	M/s. Tata Power Renewable Energy Ltd.	Sanctioned	70	
4	Co-Gen	M/s. Shri. Subhash Sugar (P) Ltd.	Sanctioned	14.9	LILO on 132kV Tamsa-Himayatnagar

Therefore, to facilitate the evacuation of these existing and proposed RE generations, 2nd circuit stringing of 132kV Bhokar-Himayatnagar line is required from system point of view. Also, it will help in creating margin in transmission network for evacuation of power from these RE projects.

After detailed deliberation and discussion, the committee recommended the above scheme of Second Circuit Stringing on a) 132kV Gangapur-Vaijapur, b) 132kV Jalna(old)-Partur, c) 132kV Jalkot - Udgir, d) 132kV Nilanga - Omerga, e) 132kV Georai(220kV s/s) - Mahakala, f) 132kV Bhokar - Tamsa & g) 132kV Bhokar - Himayatnagar SCDC lines along with construction of associated end bays under Aurangabad zone for submission to GCC for approval.

Agenda Point No. 11:

Scheme for second circuit stringing on various EHV lines under Karad zone

1) 220kV Ghatnandre-waifale
2) 132kV Lonand-Phaltan
3) 110kV Mudshingi-Puikhadi

1) 220kV Ghatnandre-waifale:

220kV Ghatnandre Substation solely relies on a single source i.e. 220kV Vita substation, which is a wind generation (226MW) attached substation. If 220kV Vita-Ghatnandre line trips, generation evacuation will be hampered.

Similarly, 220kV Waifale substation has a single source from 220kV Vita substation, which is also a wind generation (50MW) attached substation. In the event of a tripping of 220kV Vita-Waifale line, generation will not be evacuated.

To address these issues, providing an alternate source to 220kV Ghatnandre & 220kV Waifale substation is necessary. This can be achieved by converting 220kV Ghatnandre-Waifale SCDC line to DCDC line through second circuit stringing (17km) and constructing 220kV Line end bays at 220kV Ghatnandre and 220kV Waifale substations, which will provide a dual source to 220kV Ghatnandre and 220kV Waifale substations.

This will form a Ring-Main system between 220kV Vita-Ghatnandre-Waifale S/s.

2) **132kV Lonand-Phaltan:**

132kV Phaltan substation is fed by two source lines: 132kV Lonand- Phaltan Ckt-I SCSC line (Date of commissioning 29.10.1972) & 132kV Lonand-Phaltan Ckt-II SCDC line (Date of commissioning 08.03.1988). These lines also feed power to 132kV Dahiwadi & 132kV Aundh substation.
Also, generation at 132kV Mograle, 132kV Dahiwadi & 132kV Aundh substation is evacuated through these lines. The total loading on both lines exceeds 660A/150MW. If any one of the circuit trips, it may overload/trip the remaining circuit. Since, both lines are crucial for meeting the load requirement, it becomes challenging to schedule necessary outages for maintenance without disrupting the power supply.

To address these issues, providing another source to 132kV Phaltan substation through the second circuit stringing of 132kV Lonand-Phaltan SCDC line is necessary. Implementation of the second source will enable the system to cope up with upcoming future load demands.

3) 110kV Mudshingi-Puikhadi:

110kV Mudshingi-Kale line was made LILO at 110kV Puikhadi substation on 31.05.1995 during commissioning of 110kV Puikhadi substation.

110kV Puikhadi substation is connected to two lines i.e. 110 kV Mudshingi- Puikhadi & 110 kV Kumbhi-Puikhadi Line.

Most of the times, 110kV Mudshingi- Puikhadi line act as a source to 110kV Puikhadi & 110kV Kale substation. In the event of an outage on 110kV Mudshingi- Puikhadi line, the load of Puikhadi substation is transferred to 110kV Kumbhi-Puikhadi line.

The maximum load reached on 110kV Mudshingi- Puikhadi Ckt-I during year 2022-23 and 2023-24 is 441 Amp/80.18 MW. To ensure N- 1 contingency with such heavy loading conditions, it is essential to provide a second source to 110kV Puikhadi substation from 220kV Mudshingi substation.

The implementation of the second source will contribute to maintaining the stability of the 110kV Grid network connecting to 110kV Puikhadi, Kumbhi, Kale, Asurle Porte, and Chambukhadi in Kolhapur District.

After detailed deliberation and discussion, the committee recommended the above Scheme for second circuit stringing on 220kV Ghatnandre-waifale, 132kV Lonand-Phaltan, 110kV Mudshingi-Puikhadi EHV lines under Karad zone for submission to GCC for approval.

Agenda Point No. 12:

Scheme for work of LILO arrangement of 132kV Deepnagar-Muktainagar line along with 132kV bays at Varangaon substation under EHV O&M Dn. Jalgaon under EHV O&M Circle, Bhusawal.

MSETCL representative placed before the MTC a proposal for Scheme for work of LILO arrangement of 132kV Deepnagar-Muktainagar line along with 132kV bays at Varangaon substation under EHV O&M Dn. Jalgaon under EHV O&M Circle, Bhusawal.

132kV Varangaon is one of the important substation which feeds power supply to nearby Central Government Ordnance Factory under Jalgaon District. The installed capacity of 132kV Varangaon substation is 41MVA (1×25MVA + 1x16MVA, 132/11kV Transformer). 132/11kV Varangaon substation is having source through Tap arrangement on following 132kV Lines:

132kV Deepnagar - Muktainagar S/C line
132kV Khadka - Juniper (Solar) S/C line (132kV Khadka - Juniper (Solar) - Malkapur line)

Existing source to 132/11kV Varangaon substation is through TAP arrangement on 132kV Deepnagar - Muktainagar S/C line and there is no any protection provided on this line at 132kV Varangaon substation end. Such arrangements are hampering the reliability and availability of network & supply as a whole.
During outage on line or any line work between 132kV Deepnagar to Muktainagar substation or any breakdown, the sub-station In-charge has to open jumps at 132kV Varangaon substation.

Technical benefits of the Scheme:
Increased reliability & availability of power supply in the area.
Removing TAP arrangement, the line protection related issues will be resolved.
Reduction in interruption period.
Operational flexibility during outages will be achieved due to redundancy.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme for work of LILO arrangement of 132kV Deepnagar-Muktainagar line along with 132kV bays at Varangaon substation under EHV O&M Dn. Jalgaon under EHV O&M Circle, Bhusawal for submission to GCC for approval.

Agenda Point No. 13:

Second circuit stringing along with end bays in r/o o (i) 132 kV Bambhori-Erondol Line - 26.77 ckm. (ii) 132 kV Alephata-Ghargaon -30.82 ckm. (iii) 132 kV Dondaicha-Shirpur line- 53ckm. (iv) 220 kV Gangapur-Valve line 12 ckm. under EHV PC O&M Zone Nashik.

1) 132 kV Bambhori- Erondol SCDC line in to DCDC line (26.77 Ckm):
At present, there is only one 132kV source for 132kV Erondol substation i.e. from 220 kV Bambhori s/s. As the line is radial one, interruption on the line affects the Erondol Taluka.

This line is identified as a Transmission constrain by STU in Cluster-7 (Jalgaon 01) of "Mukhyamantri Saur Krishi Vahini Yojana 2.0" (MSKVY 2.0). As per the load flow study carried out by STU for solar projects to be connected under MSKVY 2.0 to the MSEDCL network, it is observed that during N-1 contingency when 80% of generation injection is considered towards the EHV ss there are evacuation constrains. To maintain redundancy and uninterrupted power supply and in order to achieve N-1 compliance, the 2nd circuit stringing of said line is very essential.

2) 132 kV Alephata-Ghargaon SCDC Line into DCDC line (30.82Ckm):
132KV Ghargaon s/s is radial, having only one source from 132kV Alephata s/s connected through SCDC line. Hence, in order to achieve N-1 compliance & to cater the future load demand of the forthcoming Nashik-Pune Railway, the second circuit stringing on existing SCDC line is proposed.

3) 132 kV Dondaicha-Shirpur SCDC line in to DCDC line (53Ckm):
132 kV Dondaicha-Shirpur line feeds most part of the Shindkheda & Shirpur Taluka (Urban, Rural and MIDC area). Considering the future load growth and to maintain redundancy and uninterrupted power supply, the 2nd circuit stringing of this line is very essential.

4) 220 kV Gangapur-Valve SCDC in to DCDC line (12Ckm):

This line is connected on both side, to the generating substations i.e. 220kV Valve s/s & 220kV Gangapur s/s. Said line evacuates the generation of 220kV Valve s/s (167MW) towards Malegaon and Satana area (Dist. Nashik) through 220kV Gangapur s/s.

From 21.02.2021 to 03.03.2021, outage was taken on 220kV Jamade – Valve line, for replacement of bent towers. During the outage period, low voltage issue was faced within 220kV Shivajinagar pocket, which resulted into tripping of M/s. Greenco Solar Power Generation on low voltage. To overcome the low voltage issue, second circuit stringing of 220kV Jamade – Valve line was established on 12.04.2021. Now, in the existing grid network (220kV Jamde - Valve – Dondaicha – Shivajinagar) only 220kV Gangapur - Valve line is single circuit. Hence, in order to achieve N-1 compliance, second circuit stringing is proposed.

After detailed deliberation and discussion, the committee recommended the above proposal of Second circuit stringing along with end bays in r/o o (i) 132 kV Bambhori-Erondol Line - 26.77 ckm. (ii) 132 kV Alephata-Ghargaon -30.82 ckm (iii) 132 kV Dondaicha-Shirpur line-53ckm (iv) 220 kV Gangapur-Valve line 12 ckm under EHV PC O&M Zone Nashik for submission to GCC for approval.

Agenda Point No. 14:

Second circuit stringing in r/o (i) 132 KV Katol – Warud line (42.2KM) along with end bays & PT bay under EHV O&M Division, Nagpur. (ii) 132kV Ashti – Alapalli line (63.7KM) along with end bays under EHV O&M Division, Ballarshah.

1) Second circuit stringing of 132 KV Katol – Warud line (42.2KM):

There is more push due to generation in the Nagpur region on 132 KV Kalmeshwar – Katol line. During shutdown on 132 KV Kalmeshwar-Katol ckt, the supply is extended to 132 KV Katol sub-station from 132 KV Bharsingi sub-station via 132 KV Warud sub-station. During shutdown, it is several times observed that, the voltage at 132 KV Katol sub-station gets dropped considerably. This situation results in low voltage supply to Central Railway (TSS) from 132 KV Katol sub-station. This results in low voltages at Fag end at 33 KV Bus of substation and further resulting to the low voltage to DISCOM S/s & then to the consumers. Also there are complaints from railway authorities regarding low voltages.

132 KV Katol and 132 KV Bharsingi sub stations are situated in agriculture dominated area, this reduced low voltage supply further reduced due to inductive agriculture pump load which results in complaints about low voltage at 33 KV Level . Even though capacitor banks are installed at 132 KV Katol s/s (10 MVAR) & 132 KV Bharsingi s/s (5 MVAR).

These loading conditions are with 60 MW solar generation in service on 33 KV level at 132 KV Katol substation. In case when solar generation is not available, then there are chances of over loading on 132 KV Kalmeshwar- Katol line. Also, there is proposed solar generation of 75 MW by M/s Elio Energy Pvt Ltd.

In order to improve the line loading & voltage profile in the region, the 2nd circuit stringing 132 KV Katol – Warud line along with end bays is essential.

2) Second circuit stringing of 132kV Ashti – Alapalli line (63.7KM) :

At Present, 132kV Ashti S/stn and 132kV Alapalli S/stn are connected through SCDC line and are fed from 220/132/33kV Virur S/stn. The power supply to the part of Gadchiroli district, Alapalli region up to Sironcha was erstwhile supplied through 66kV network which covers the various substation i.e. 132kV Alapalli (erstwhile 66kV Alapalli), 66kV Etapalli, 66 kV Jimalgatta and 66kV Sironcha. These substations continuously feed the supply to Gadchiroli district. This area is having heavy rainfall and containing dense forest. Earlier, the old 66kV Ashti – Alapalli was the only incoming source to feed this part of Gadchiroli district.

At present, the 132 kV Ashti-Alapalli ckt-1, is the only reliable source for 132kV Alapalli substation and further 66kV network. As this line passes through dense/reserve forest area which helps for maintaining continuous power supply. The existing alternate source to the area is 66kV Ashti –Alapalli incoming line which passes through dense forest and wild life area and hence not reliable. Also, the 66kV network is under elimination. Therefore the second alternative source i.e. 132 kV Ashti-Alapalli ckt-2 is necessary to maintain continuous and reliable supply to this region of Gadchiroli district.

Considering the above facts and importance of substations, 2nd circuit stringing of 132 KV Ashti – Alapalli line is essential.

After detailed deliberation and discussion, the committee recommended the above proposal of Second circuit stringing in r/o (i) 132 KV Katol – Warud line (42.2KM) along with end bays & PT bay under EHV O&M Division, Nagpur (ii) 132kV Ashti – Alapalli line (63.7KM) along with end bays under EHV O&M Division, Ballarshah. for submission to GCC for approval.

Agenda Point No. 15:

The scheme of Design, Supply, Installation, Testing and Commissioning of Capacitor banks of voltage ratings of 11kV, 22kV, 33kV, 100kV, 132kV & 220kV at various EHV substations under Nashik, Pune and Vashi Zone under Phase-VI.

MSETCL representative placed before the MTC a proposal "The scheme of Design, Supply, Installation, Testing and Commissioning of Capacitor banks of voltage ratings of 11kV, 22kV,

33kV, 100kV, 132kV & 220kV at various EHV substations under Nashik, Pune and Vashi Zone under Phase-VI".

The Nashik, Pune & Vashi Zone comprises of Industrial, urban area and green belt of agriculture land. The agriculture demand over the year is substantial because of availability of good irrigation facilities. It is noticed that large amount of reactive power is being drawn at HV level due to agricultural load during the agricultural season.

In May 2023, it is observed that the voltages at important Buses viz. 400 kV Kharghar, 400 kV Lonikand & 400 kV Jejuri drops upto 370kV, which in turn leads to operation of Under voltage and Load trimming scheme and substantial quantum of load shedding takes place.

In order to address the said issues in Pune, Nashik and Vashi Zone, Hon.CMD had constituted a Task Force vide circular No.CMD/MSETCL/No. T-734 dated 16th June 2023 headed by ED (MSLDC).

The task Force constituted to identify the location and quantum of Reactive compensation to be provided. The task force has identified the locations and quantum for Reactive power compensation to be provided in these three Zones so as to improve the Voltage profile to the required level.

400kV Voltage details observed during the study Before & After consideration of Phase-6 Capacitor Banks for Pune, Nashik & Vashi Zone

				Before	After	Before	After
Area Name	Bus Number	Bus Name	Base kV	Voltage (pu)	Voltage (pu)	Voltage (kV)	Voltage (kV)
PUNE	484	CHAKAN	400	0.9248	0.991	370	396
	34	LONIKAND-I	400	0.9257	0.9947	370	398
	114	LONIKAND-II	400	0.9257	0.9947	370	398
	64	JEJURI	400	0.9274	0.9974	371	399
	504	SOLAPUR-MS	400	1.0081	1.028	403	411
	334042	PUNE-PG	400	0.9372	0.9945	374	398
NASHIK	8824	KARJAT_400	400	0.9491	1.0026	380	401
	474	BABLESHWAR	400	0.9826	1.0124	393	405
	194	DEEPNAGAR	400	1.002	1.0139	401	406
	434	BHUSAWAL	400	1.0022	1.0148	401	406
	404	DHULE	400	1.009	1.0244	404	410
VASHI	224	KHARGHAR	400	0.9418	0.9923	377	397
	344	KALWA	400	0.9454	0.9949	378	398
	254	PADGHE	400	0.9575	1.0054	383	402
	414	NAGOTHANE	400	0.9689	1.0011	388	400
	12794	KUDUS-MSETCL	400	1.0048	1.0274	402	411

The Task force also assessed the sufficiency of approved reactive power compensation schemes in Nashik, Pune & Vashi Zone area and made suggestions for required additional compensation after system study by STU.
As such, scheme for providing Reactive Power Compensation of about 2495 MVAR in Nashik, Pune & Vashi Zone is proposed herewith as follows:

Zone	No. of Substations	MVAr	Total cost Rs. In Crore
Nashik	05	160	11.39
Pune	82	1595	125.63
Vashi	26	740	124.01
Total	**113**	**2495**	**261.03**

After detailed deliberation and discussion, the committee recommended the above proposal of "The scheme of Design, Supply, Installation, Testing and Commissioning of Capacitor banks of voltage ratings of 11kV, 22kV, 33kV, 100kV, 132kV & 220kV at various EHV substations under Nashik, Pune and Vashi Zone under Phase-VI". for submission to GCC for approval.

Agenda Point No. 16:

Scheme of procurement of 03 Nos. of Power Transformers and 02 Nos of ICTs as emergency/critical spares for Vashi Zone by keeping aside the spare policy in view of criticality of Vashi Zone.

MSETCL representative explained that Spares of transmission system assets, which include substation equipment are essential to meet any exigency and reduce the downtime of the equipment/system. Availability of spares at the time of need plays an important role in bringing normalcy back to the system. Availability of adequate spares for transmission assets helps in faster restoration of power supply.

It avoids delay in tendering process, transportation of new/repaired transmission assets from manufacturer's works to site, and minimization of financial loss to the affected utility by reducing the down time significantly and alleviate the inconvenience to the consumers, in general.

The Vashi zone is catering load to MMR region as well as Thane, Palghar and Raigad Districts. Substations under Vashi zone are feeding 24x7 power supply to Industrial, Commercial and Residential loads.It includes Important & critical establishments like Major Industries, EHV Consumers, Data Centers, Hospitals, important Govt. and private establishments, Corporate Sectors, Railway Network, Port, Airport etc.

Being MMR region most of the PTRs & ICTs are heavily loaded and are non N-1 compliant. In such case undesired failure of Power Transformer or ICTs creates distress load shedding which in turn creates public unrest.

NECESSITY: At present Vashi zone has total 229 nos. of Power Transformers and ICTs having transformation capacity of 20,090 MVA. Many of these are repaired and no spare is available.

Out of these, the details of such 155 Nos of PTRs & ICTs along with availability and requirement are given as below:

Sr. No.	Transformer /ICT details	In-service	Repaired	Required spare	Spare provision as per policy	Available	Required spare	Under Procure ment	Net require ment
A	B	C	D	E	F	G	H	I	J
01	100/22kV, 50MVA	55	22	02	01	Nil	02	01	01
02	220/22kV, 80MVA*	06	06	01	00	Nil	01	00	01*
03	220/22kV, 50MVA	58	23	01	02	Nil	01	01	00
04	220/22kV, 25MVA	07	03	01	00	Nil	01	00	01
05	220/100kV, 100MVA	08	02	01	00	Nil	01	00	01
06	220/100kV, 200MVA	21	10	01	01	Nil	01	00	01
07	**Total**	**155**	**66**	**07**	**04**	**Nil**	**07**	**02****	**05**

Note: *As 80MVA, 220/22kV is not standard rating. Hence 100MVA, 220/22-22kV (Dual LV ratio) Power Transformer is proposed.
** CPA has recently placed LoA for procurement of 02 Nos of PTRs as mentioned in column No. I above vide BR No.161/23 DT:15.05.2023.
Spare Policy

Benefits of the scheme:

Interruptions and incidents of distressed load shedding due to overloading can be avoided.
It will help in improvement in reliability of the MMR Transmission SysteM.Avoid undesirable operation of overload tripping due to failure of adjacent one ICT and PTR.Ensuring reliability of supply. The project is the part of the system improvement, as per technical study carried out by MSETCL.

The committee deliberated the issue & suggested MSETCL that such critical & high value spares should be commissioned on receipt against the units who are nearer to their life cycle and these removed units should be kept as spare. This will enable to avoid exhausting the warranty of the newly procured units by keeping it idle as spare and utilizing only at the time of failure of old units. It was also suggested that MSETCL may modify it's spare policy accordingly for such highly critical zones.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of procurement of 03 Nos of Power Transformers and 02 Nos of ICTs as emergency/critical spares for Vashi Zone by keeping aside the spare policy in view of criticality of Vashi Zone for submission to GCC for approval.

Agenda Point No. 17:

Scheme of Supply, Installation, Testing & Commissioning of new 400kV, 125MVAr Bus Reactor at 400kV R S New Koyna S/s.

MSETCL representative placed before the MTC a proposal for Scheme of Supply, Installation, Testing & Commissioning of new 400kV, 125MVAr Bus Reactor at 400kV R S New Koyna S/s.

400 KV R.S. New Koyna Sub station is commissioned in 1998. It is an important grid substation in Western Maharashtra under MSETCL network & feeds power to Ratnagiri, Satara, Pune and Kolhapur district. The present installed capacity of this sub-station is 3X315 MVA, 400/220 kV ICT, 2X25 MVA, 220/33 kV T/F. Total MVA capacity of substation is 995 MVA.

Presently, Reactors are available only at 400 KV Karad SS end only & no reactors are provided at 400 kV New Koyna substation, 400 kV Dabhol, 400 kV Nagothane & 400 kV Jaigad Sub stations.

Presently, the reactive power compensation at 400 kV New Koyna SS is provided by 3*250MW Stage-IV generators i.e. by running these generators in condenser mode. Now a days, due to increase in load demand, with the system requirement of active power from stage-IV the reactive power is not available from 400 kV Stage-IV.

Since the generation from Thermal, Hydro or Gas is connected to 400 kV New Koyna Sub-Stn, the over voltage problems particularly during Off peak period are being faced. To control this overvoltage, 400 kV lines are being hand tripped; which ultimately depletes the reliability of the 400 kV Network & availability of line.

400kV New Koyna S/s is very important Substation in the grid. As per MERC Grid Code-2020, Part-C (Operating Code), Sr. No 37.13, the prescribed limits for maintaining bus voltage at 400kV bus is ±5% i.e., 380kV to 420kV. As per the overvoltage data of last 03 years, the over voltage duration (i.e. voltage above 420 KV) is more than 50 % of total duration during year.

Also, due to persistent high voltage stresses, the insulation level of the equipment, insulator strings etc. gets deteriorated; which may lead to failure of the equipment. Further, the STU has carried out system studies & analyzed 400kV Voltage profiles and assessed the need of new Reactors along with load flow study.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of Supply, Installation, Testing & Commissioning of new 400kV, 125MVAr Bus Reactor at 400kV R S New Koyna S/s. for submission to GCC for approval.

Agenda Point No. 18:

Scheme for procurement of 4 nos. of Van Mounted under Ground EHV Cable Fault Locator System to detect & locate the faults in underground cables in MSETCL upto 400 kV level.

Repeated. (Same with Sr. nNo.1)

Agenda Point No. 19:

Scheme of procurement of 12 Nos of 25MVA, 132/11kV & 02 nos. of 25MVA, 110/11kV EHV Power Transformers having 11kV Secondary voltage as emergency /critical spares for all zones of MSETCL.

MSETCL representative placed before the MTC a proposal for Scheme of procurement of 12 Nos of 25MVA, 132/11kV & 02 nos. of 25MVA, 110/11kV EHV Power Transformers having 11kV Secondary voltage as emergency /critical spares for all zones of MSETCL.

MSETCL in coordination with MSEDCL has decided to eliminate 11kV level at EHV ss being a sub transmission level and as such

i) These spares are not included under MSETCL spare policy.
ii) No new PTRs with 11kV secondary voltage are not being purchased in MSETCL.
iii) Regular follow up for elimination of 11kV level is being taken with MSEDCL during Coordination meetings at different levels.

However the 11Kv level has not been completely eliminated yet. Presently the population of 11kV PTRs is 202 in MSETCL. Existing in service PTRs are age old or repaired several time in its service life.

Repaired 11kV Transformers	Power Transformers above 35 years age
46	44

Due to this, failures have been taking place every year due to aging or some other reason. In such case, PTRs are relocated from other S/s to meet the urgency.The load management becomes very critical in the event of failure of any Power Transformer, as no such spare Transformers are available due to non-procurement of 11kV Power Transformers in past years.

Recently, in May 2023 in Nagpur area at 132kV Besa Sub station, 25MVA 132/11kV PTR failed affecting 20MW load for 03 days.

i) Restoration took 03 days because of non-availability of spare 11kV PTR.

ii) The incidence had caused large public unrest and became public issue and maligned the image of MSETCL.

Availability of spare 11kV Power Transformers will ensure,

i. Early restoration of system.
ii. Increased reliability and availability.

iii. Revenue loss can be minimized.
iv. Least Public unrest.

Further MSETCL has adopted policy to utilize spares within 25% of its guarantee/warrantee period and put to use these spare 11kV Power Transformer against the old and sick power Transformer.Hence, the performance of these procured Power Transformers can be ascertained during guarantee period. Also, MERC does not allow the capitalization until it is put to use. System interruptions due to failure of old/sick power transformer will be minimized.

The committee deliberated the issue & suggested that instead of procurement of 12 Nos of 25MVA, 132/11kV & 02 nos. of 25MVA, 110/11kV EHV Power Transformers having 11kV Secondary voltage seperatly, dual ratio transformers viz 132-110/11kV 25MVA Transformer may be explored for optimization of spares.

After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of procurement of 12 Nos of 25MVA, 132/11kV & 02 nos. of 25MVA, 110/11kV EHV Power Transformers having 11kV Secondary voltage as emergency /critical spares for all zones of MSETCL. for submission to GCC for approval.

Agenda Point No. 20:

Establishment of 132/33kV substation at Fulsawangi, Dist: Yavatmal under EHV O&M circle Amaravati.

MSETCL representative placed before the MTC a proposal for Establishment of 132/33kV substation at Fulsawangi, Dist: Yavatmal under EHV O&M circle Amaravati.

Presently, the power supply to Mahagaon taluka in Yavatmal district is fed from 132kV Gunj S/Stn and 132kV Umarkhed S/Stn & Mahagaon taluka is not having any EHV substation. Existing 132kV Gunj S/S and 132KV Umarkhed S/S are having lengthy 33kV feeders. Due to this the consumers at the far end are facing low voltage problems..

132 kV substation is located Gunj area, whereas increase in load growth is at the farthest end i.e. 33kV Bhawani s/s and onwards(52 km). Bhawani s/s is with %VR as 20.71%. At 132kV Umarkhed s/s, 33 kV Bitargaon s/s is at farthest end i.e. 28 km away from 132 kV Umarkhed with %VR as 10.57 %.

After establishment of 132/33 KV Fulsawangi s/s, the voltage regulation of 33kV Mahagaon feeder from 132kV Gunj s/s will improve from 20.71% to 4.61%.

Voltage regulation of 33kV Mahagaon feeder from 132 kV Gunj s/s will improve from 23.39% to 17.74% and that of 33 kV Dhanki feeder from Umarkhed s/s will be completely shifted to 132

kV Fulsawangi s/s. Establishment of this substation will facilitate evacuation of future RE generations.

After detailed deliberation and discussion, the committee recommended the above proposal of Establishment of 132/33kV substation at Fulsawangi, Dist: Yavatmal under EHV O&M circle Amaravati for submission to GCC for approval.

Agenda Point No. 21:

Establishment of 400 / 220 kV Nandagaon Peth Substation and associated Lines, District Amravati under EHV O&M Circle Amravati.

MSETCL representative placed before the MTC a proposal for Establishment of 400 / 220 kV Nandagaon Peth Substation and associated Lines, District Amravati under EHV O&M Circle Amravati.

Amravati District is RE rich area. There are 615 MW Solar IPPs are connected to the grid. There are 905 MW Solar IPPs are under construction. Also there are applications for grid connectivity for 1675 MW, which are received to STU

The maximum load of about 582MW of Amravati district is mainly fed from 220 kV Amravati Substation. Main source line is 220 kV Ambazari- Amravati SCSC line, which is 40 year old line.The second source line is 220 kV Deoli (PGCIL) - Badnera SCDC line, which is frequently hand tripped. The source for 220 kV Nandagaon Peth Substation is made by LILO on 220 kV Badnera – Amravati D/C line. Situation, further become difficult in the event of failure / outage of Paras generation, the flow towards Akola from Amravati & Badnera Substations increases. At present, power supply demand of about 582 MW of Amravati District is mainly fed from 220 kV Amravati Substation, however the main source lines of 220 kV Amravati Substation from 220 are overloaded.

There is requirement of power evacuation from 615 MW Solar IPPs immediately and 905 MW upcoming, which will increase in near future in this area. System strengthening of this area is required to avoid the dependability on Paras generation. STU section carried out System Study and Load Flow Study and recommended for the establishment of 400 kV Nandgaon Peth S/s.

In view of above, it is proposed to establish 400/220//33 kV EHV Substation which will help to avoid the major load shedding of Amravati District area and evacuation of RE power and upcoming load of RE Power.

After detailed deliberation and discussion, the committee recommended the above proposal of Establishment of 400 / 220 kV Nandagaon Peth Substation and associated Lines, District Amravati under EHV O&M Circle Amravati for submission to GCC for approval.

Agenda Point No. 22:

Upgradation of 110 kV Powai R/S to 220 kV level.

In continuation to the discussions in the last MTC meeting TPC-T representative informed that they are in receipt of demand requirement for upcoming load of Metro at 110 kV (Metro) to the tune of 53 MW and for 33 kV (TPC-D) consumers of 70-80 MW for which applications are already submitted to STU.STU emphasized that the proposal will be validated on the basis of feasibility report submitted by TPC-T for the above-mentioned applications. A joint Load flow study to be carried out by TPC-T with STU for the same. Based on the results of joint study further DPR to be submitted.

Agenda Point No. 23 & Agenda Point No. 24:

Installation of New 220/33 kV s/s at Vile Parle & 220kV Khardanda EHV scheme DPR

TPC-T & AEML-T informed as per the joint committee report submitted earlier, considering the upcoming load growth in the area both the substations which are in close vicinity are essential. Chairman-MTC stated that as per deliberations in the earlier MTC, it was requested to TPC-T & AEML-T to submit the timelines for the load realization and the time horizon for the same. This would enable to prioritize the establishment of the two substations in stages. TPC-T & AEML-T agreed to submit the same and further decision shall be taken based on the above submission.

Agenda Point No. 25:

2nd feed to 220 kV Chandivali substation from 220 kV Aarey substation

In continuation to the discussions in the earlier MTC meetings, STU presented Load flows results for 2nd feed to 220 kV Chandivali substation from 220 kV Aarey substation based on the upcoming Amazon load. It was observed that during N-1 contingency of 220 kV Aarey –Saki (AEML-T) Line, 2nd circuit of 220 kV Aarey-Chandivali is still loaded above its rated thermal capacity.Thus an alternate option, with 220 kV Aarey –Chandivali S/c Line and 220 kV Aarey – Saki (TPC) S/c Line, the loading on 220 kV Aarey –Saki (AEML-T) Line during N-1 contingency is reduced by 30-40MW & line is loaded below the rated thermal capacity. As the increase in loading from 220 kV Kalwa-Salsette 3xS/C is negligible in this case it was suggested that the alternate option as above is more feasible than 220 kV Aarey-Chandivali D/c Line.

From the above study outcome, the committee deliberated that the additional source to the Chandivali substation is in principal required however the exact solution of the same either through 220 kV Aarey-Chandivali D/c Line or 220 kV Aarey –Saki (TPC) S/c will be processed further based on the joint study by AEML-T with STU considering all options.

SE (STU), Member Secretary offered the vote of thanks to all the MTC members and other participants.

Chairperson - MTC
Chief Engineer (STU)