



MAHARASHTRA STATE ELECTRICITY TRANSMISSION COMPANY LIMITED  
(CIN NO U40109MH2005SGC153646)

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MSETCL/CO/STU/Sys/MTC/

Date:

No - 38 7. 3

26 MAY 2022

To,  
As per mailing list

**Sub:** Minutes of 3<sup>rd</sup> Maharashtra Transmission Committee (MTC) meeting held on 18<sup>th</sup> May, 2022.


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Please find enclosed herewith minutes of the 3<sup>rd</sup> Maharashtra Transmission Committee (MTC) meeting held on 18<sup>th</sup> May, 2022 at 14:00 Hrs. through video Conferencing (VC).

It is to be noted that the minutes of above meeting is also available on website [www.mahatransco.in](http://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	<a href="mailto:CESTU@mahatransco.in">CESTU@mahatransco.in</a>
2	State Transmission Utility (STU)	Superintending Engineer - STU	Member Convener	<a href="mailto:sesys@mahatransco.in">sesys@mahatransco.in</a>
3	SLDC	Chief Engineer-SLDC	Member	<a href="mailto:cesldc@mahatransco.in">cesldc@mahatransco.in</a>
4*	MSETCL	Jagannath G. Chude-Superintending Engineer (Project Scheme-I)	Member	<a href="mailto:SE1pri@mahatransco.in">SE1pri@mahatransco.in</a>
5	MSEDCL	Chief Engineer (Distribution), CO, Mumbai	Member	<a href="mailto:cedist@mahadiscom.in">cedist@mahadiscom.in</a>
6	MSPGCL	Rahul Sohani (Dy.Chief Engineer)	Member	<a href="mailto:cegwmahagenco.in">cegwmahagenco.in</a> , <a href="mailto:seest1@mahagenco.in">seest1@mahagenco.in</a>
7	Maharashtra eastern grid Power Transmission co ltd	Atul Sadaria	Member	<a href="mailto:atulj.sadaria@adani.com">atulj.sadaria@adani.com</a>
8	Adani Electricity Mumbai Ltd. (Transmission Business)	Rakesh Raj (Head Planning – AEML Transmission)	Member	<a href="mailto:rakesh.raj2@adani.com">rakesh.raj2@adani.com</a>
9	Tata Power Co. Ltd.-Mumbai- Transmission	Sh. Kiran Desale (Head-Transmission)	Member	<a href="mailto:desalekv@tatapower.com">desalekv@tatapower.com</a> <a href="mailto:gstawre@tatapower.com">gstawre@tatapower.com</a>
10	Central Railway	S.S.Parihar (Chief Electrical Engineer/Electrical Energy Management/CR)	Member	<a href="mailto:dyceetrdcrly@gmail.com">dyceetrdcrly@gmail.com</a>
11	M/s Tata Power Company Ltd. (Distribution)	V T Narayanan	Member	<a href="mailto:vtnarayanan@tatapower.com">vtnarayanan@tatapower.com</a>
12	Adani Electricity Mumbai Ltd. (Distribution Business)	Abaji Naralkar (Asst. Vice President)	Member	<a href="mailto:abaji.naralkar@adani.com">abaji.naralkar@adani.com</a>
13	BEST Undertaking	Ajay Ramchandra Talegaonkar. Divisional Engineer (Project)	Member	<a href="mailto:depro@bestundertaking.com">depro@bestundertaking.com</a>

**Minutes of the 3<sup>rd</sup> Maharashtra Transmission Committee (MTC) Meeting held on 18th May, 2022 at 14:00 Hrs. through Video Conferencing**

The 3<sup>rd</sup> Maharashtra Transmission Committee (MTC) was held on 18<sup>th</sup> May, 2022 at 14:00 Hrs. through Video Conferencing. Chief Engineer (STU) presided over the meeting. The list of members/participants is enclosed as **annexure-I**.

SE (STU) Member Secretary of MTC, Welcomed all the MTC members & other participants in the 3<sup>rd</sup> MTC meeting. After brief introduction of the participants, agenda items were taken up for discussion

**Agenda Point No. 1:**

**Establishment of 400 kV Velgaon (Boisar) GIS s/s, Dist. Palghar.**

SE (Schemes), MSETCL placed before the MTC a proposal for Establishment of 400 kV Velgaon (Boisar) GIS s/s, Dist. Palghar.

SE (Schemes), MSETCL explained the present status & emphasized the necessity for Establishment of 400 kV Velgaon (Boisar) GIS s/s, Dist. Palghar.

Presently, MMR is fed from Dahanu Power station and TPC Trombay generation. The PPA of Dahanu Thermal Power Generation is upto 2023. There will be shortfall of 500 MW in MMR after expiry of PPA and considering the future load growth of the Mumbai & Thane district. Hence, this 400 kV substation is proposed in this area.

After withdrawal of Dahanu generation, 400 kV Velgaon sub station will be source to Northern Mumbai region. The scheme is proposed to bring bulk power to MMR network with reliability of power supply during contingencies.

He further explained the following benefits for Establishment of 400 kV Velgaon (Boisar) GIS s/s, Dist. Palghar.

- 400/220 kV Velgaon substation creates a source for 220 kV Ghodbandar (AEML), 220 kV Versova, 220 kV Boisar & 220 kV Borivali MSETCL substation.
- This substation will strengthen the transmission system in MMR
- As per STU, after the establishment of this substation there will be saving in system loss of 18 MW.
- Dependency on embedded generation will be reduced
- This will increase the import TTC/ ATC of the Maharashtra state
- This will facilitate to reduce loading on 400kv Kalwa-Padgha and 400 kV Talegaon –Kalwa / Kharghar corridor.

TPC-Distribution representative asked that is it really required spare ICT to keep it as standby. MSETCL Representative elaborated that it is not a spare ICT, it's a spare single phase unit.

**After detailed deliberation and discussion, the committee recommended the said proposals of Establishment of 400 kV Velgaon (Boisar) GIS s/s, Dist. Palghar for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda point no. 2:**

**Establishment of 132/33 kV s/s at Ida, Tal.- Bhoom, Dist.-Osmanabad.**

SE (Schemes), MSETCL Proposed & presented the proposal for Establishment of 132/33 kV s/s at Ida, Tal.- Bhoom, Dist.-Osmanabad.

SE (Schemes), MSETCL explained that presently, load of Bhoom taluka in Osmanabad District is fed from 132 kV Bhoom and 220 kV Paranda s/stns. As there are multiple nos of 33/11 KV substation on single feeder, any interruption may lead to power failure for large area & large nos. of consumers get affected.

Establishment of proposed s/s will help in strengthening the network and avoiding the breakdowns & overloading of the system. The low voltage problems will be resolved and the consumers will get reliable and quality supply.

There are two substations in the vicinity. Their installed capacity and maximum load are as follows:-

Name of the S/S	Installed capacity	Max load
132 kV Bhoom s/s	2x50MVA, 132/33 kV	55 MW
	2x100MVA, 220/132 kV ICT	177 MW
	2x50MVA, 220/33 kV	62 MW

The formation of new EHV s/s at Ida will help in strengthening the network and avoiding the breakdowns & overloading of the system. The low voltage problems will be resolved and the consumers will get reliable and quality supply.

**After detailed deliberation and discussion by members, the committee recommended the above proposal of Establishment of 132/33 kV s/s at Ida, Tal.- Bhoom, Dist.-Osmanabad for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda Point No. 3:**

**Establishment of 132/33 kV sub-station at Samudral, Tal.- Lohara, Dist.-Osmanabad.**

SE (Schemes), MSETCL elucidated the necessity for Establishment of 132/33 kV sub-station at Samudral, Tal.- Lohara, Dist.-Osmanabad.

SE (Schemes), MSETCL explained that Presently, Lohara taluka is fed from 220/132/33 kV Narangwadi s/s. There are 04 nos. of 33 kV feeders emanating from this EHV s/s which are feeding 06 nos. of 33/11 kV s/s & 01 no. HTC.

33 kV Sastur feeder is emanating from 220 kV Narangwadi s/s is a lengthy feeder and hence high voltage regulation is experienced. By diverting 33 kV Sastur feeder on proposed 132/33 kV Samudral s/s there will be improvement in the voltage profile at DISCOM interface.

The list of 33 kV substations to be diverted on proposed 132/33 kV Samudral s/s from existing 220 kV Narangwadi s/s is as follows:

S.no.	Name of 33kV feeders	MVA capacity	Length of feeder in km		% voltage Reg.	
			Before	After	Before	After
1	Twashigad + Sastur	20	22.60	12.60	11.98	5.35
2	BBSSK	0.50	19	0.50	4.23	0.01
3	Salegaon	5	-	15	-	1.59
4	Khed	5	-	22	-	2.33

The total load to be shifted on proposed 132 kV sub-station is 30.50 MVA. From above table it is clear that after establishment of proposed 132/33 kV Samudral s/s there will be improvement in the voltage profile at DISCOM interface.

**After detailed deliberation and discussion, the committee recommended the above proposal of Establishment of 132/33 kV sub-station at Samudral, Tal.- Lohara, Dist.-Osmanabad for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 4:**

##### **Establishment of 220/33kV Deosane substation, Tal. Dindori, Dist. Nashik.**

SE (Schemes), MSETCL placed before the MTC a proposal for Establishment of 220/33kV Deosane substation, Tal. Dindori, Dist. Nashik

At present, the Dindori, Surgana & Peth Talukas are fed from 2 nos. of EHV substation i.e.132/33 kV Dndori & 132/33 kV Mhasrul substation.

The installed capacity of 132/33 kV Dindori substation is 150 MVA (3x50MVA) and the maximum demand reached of the substation is 124.31 MVA which is 82.87% of installed capacity.

The length of the 33kV Surgana feeder emanating from 132/33kV Dindori substation is 76 Kms. (approximately). VR of this feeder is 57.21% due to which fag end consumers facing low voltage problem.

The installed capacity of 132/33 kV Mhasrul substation is 100 MVA (2x50MVA) and the maximum demand reached of the substation is 62.53 MVA which is 62.53% of installed capacity.

The length of 33 kV Nanashi feeder emanating from 132/33 kV Mhasrul Substation is 70 Kms and VR of longest feeder is 60.76% due to which fag end consumers are facing low voltage problem.

66.30MVA load from 132kV Dindori & 132kV Mhasrul substation will be diverted on proposed 220 kV Deosane substation.

AEML representative asked that are we basically addressing the voltage issue & what will be the maximum load on this s/s. MSETCL Representative said that in village pockets the feeders are very lengthy hence we experience this voltage issue. 63MVA will be the load on this s/s.

**After detailed deliberation and discussion, the committee recommended the above proposal of Establishment of 220/33kV Deosane substation, Tal. Dindori, Dist. Nashik for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 5:**

#### **Installation of 3rd Transformer 220/22kV 50MVA at proposed 220kV Chikhaldongri GIS s/s, Dist-Palghar**

SE (Schemes), MSETCL further stated that Virar is a fast growing & developing town & is a major part of Vasai-Virar Municipal Corporation. Vasai-Virar town is well connected by western & central railway. All local, express & passengers trains halt or depart from Virar. Proposed bullet train is having station at Virar.

There is tremendous population growth & load growth in Vasai-Virar region. Various residential & industrial projects are coming in Virar. In Vasai-Virar region only two nos of 220kV (220kV Vasai & 220kV Nalasopara) & one no of 100kV Vasai S/s of MSETCL exist.

The past five year maximum S/s load details (in MW) of above S/s are as follows.

Name of S/stn	2017-18	2018-19	2019-20	2020-21	2021-22
220kV Nalasopara	193 MW	207 MW	205 MW	193 MW	191 MW
220kV Vasai	No 220/22kV T/Fs			85 MW	86 MW
100kV Vasai	180 MW	185 MW	182 MW	135 MW	135

Installation of 3rd Transformer 220/22kV 50MVA at proposed 220kV Chikhaldongri GIS s/s will help in Catering load growth of Vasai-Virar area, Saving in transmission system loss-0.6 MW.

AEML representative asked that considering the load density MSETCL can propose higher capacity instead of 50MVA. MSETCL Representative elaborated that this is this is at 22KV level. 220/22KV 100MVA T/F is not available in market.

**After detailed deliberation and discussion, the committee recommended the above proposal of Installation of 3rd Transformer 220/22kV 50MVA at proposed 220kV Chikhaldongri GIS s/s, Dist-Palghar for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda Point No. 6:**

**Establishment of 132/33 kV sub-station at Navapur, Dist.-Nandurbar.**

SE (Schemes), MSETCL proposed a proposal for Establishment of 132/33 kV sub-station at Navapur, Dist.-Nandurbar

SE (Schemes), MSETCL further explain that Presently load of Navapur area is catered from 132 kV Visarwadi s/s. the distance of Navapur city is 20 km from 132 kV Visarwadi s/s. 132 kV Visarwadi s/s is having source from 132 kV Nandurbar s/s through DC line.

There are 7 nos of 33 kV feeders emanating from 132/33 kV Visarwadi s/s on which 9 nos of 33/11 kV s/stns having connected load 115 MVA and max demand reached is 74.80 MVA are connected. Also, 33 kV feeders are lengthy. The MIDC is located at Navapur. Also, load demand of HT consumers & agriculture load is increasing.

Details of the proposed load on 132kv navapur s/s are as follows:-

Name of EHV s/s from where feeders are diverted	33/11 kV s/s to be diverted	Load to be connected (MVA)	Distance from existing source (km)	Distance from proposed 132 kV Navapur s/s (km)	% VR before	% VR after
	MIDC	15	19	1	10.69	0.56
	Raipur	10	30	8	11.26	3
	Navapur	25	21	3	19.70	2.81
	Bandharfall	10	38	16	14.26	6
Total load diverted to prop. Navapur s/s ----->				60 MVA		

TPC-Distribution representative asked whether MSETCL will be diverting existing substation load on this proposed s/s or there is an additional load requirement. MSETCL Representative elaborated & made it clear that as of now the existing load of Visarwadi s/s is getting diverted to proposed Navapur s/s. it will also cater the additional load in future if there is additional demand in the vicinity.

TPC-Distribution representative said that 33KV line is too lengthy. What is the reduction in length of line by shifting the 33KV feeders. MSEDCL representative replied that there are two 33KV feeders, one is 21km & another one is 38km. currently Voltage regulation is about 20%. After shifting of these feeders to proposed Navapur s/s, VR will be about 2.8%. Proposed Navapur s/s

will help in improving the Voltage regulation & strengthening of the network. Also textile cluster will be developing in near future, so it will also help in catering that loads.

**After detailed deliberation and discussion, the committee recommended the above proposal of Establishment of 132/33 kV sub-station at Navapur, Dist.-Nandurbar for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

### **Agenda Point No. 7:**

**Replacement of existing 0.4 ASCR Zebra Conductor by HTLS conductor along with necessary hardwares of 220kV Talangade-Tilwani ckt I & II under EHV O & M Division, Kolhapur**

MSETCL representative explain in depth the necessity for Replacement of existing 0.4 ASCR Zebra Conductor by HTLS conductor.

220kV Talandage-Tilawani CKT-I & II lines (DCDC) were commissioned on 26.08.2003. 0.4 ACSR ZEBRA conductor is used for the line having current capacity of 739 A at 75°C.

On 14.02.2021 at 14:03 Hrs, 220kV Talandage -Tilawani CKT II tripped on distance protection at both ends due to burning of sugarcane in between tower Loc. 17 & 18.

The load on this line got shifted on 220kV Talandage-Tilawani Ckt-1, suddenly this 220kV Talandage-Tilawani Ckt-1 also tripped on backup overload protection at 14:04 Hrs at 400kV Talandage S/s end. Max current of 880 Amp was recorded on this line before tripping on overload protection.

Load of 220kV Tilawani S/s and 220kV Miraj S/s got shifted on 400/220kV Alkud S/s. Hence 220kV Alkud-Miraj line got overloaded and tripped on O/C protection and 220kV Alkud-Vita line feeding to 220kV Miraj S/s via 220kV Mhaishal got overloaded and tripped on O/C. The 220kV Miraj S/s which was also fed from Kadegaon & Vita tripped on O/C at Kadegaon & Vita S/s end

In N-1 contingency situation, the load on other line increases substantially which results in tripping of in-service line due to overload causing interruption of supply. Thus the said corridor is not N-1 Compliant.

Further, outage on one Ckt is not feasible without curtailment of the load. Therefore, proper regular & maintenance works cannot be carried out. Therefore, for capacity enhancement of the corridor, replacement of the conductor by HTLS conductor is proposed.

He further explained the following benefits for Replacement of existing 0.4 ASCR Zebra Conductor by HTLS conductor.

- The Capacity of the said corridor will be increased/doubled.
- Criteria of N-1 system compliance will be addressed.
- Load trimming due to tripping will be eliminated.
- Reduction in interruptions/tripping & occurrences.
- Reliability and availability of the system will be improved.



- Life enhancement of existing line.

TPC-Distribution representative asked that whether N-1 is for today's scenario or for the future. MSETCL representative replied that said corridor is not N-1 Compliant for today's scenario. In HTLS capacity will be increased to almost double. Hence it can also cater the future requirement.

**After detailed deliberation and discussion, the committee recommended the above proposal of Replacement of existing 0.4 ACSR Zebra Conductor by HTLS conductor along with necessary hardwares of 220kV Talangade-Tilwani ckt I & II under EHV O & M Division, Kolhapur for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

### **Agenda Point No. 8**

**Scheme of replacement of existing 0.35 ACSR Sheep Conductor by equivalent HTLS conductor and replacement of existing suspension tower by 30° Tension tower at Loc. No. 626 & 632, along with additional 1 No. of tower between. Loc. 638-639 for height rising & replacement of 2 Nos. of tower at Loc. No. 648 -649 of 220kV Apta - Talaja, 220kV Apta-Kalwa and 220kV Kalwa-Talaja Line under EHV PC O&M Zone Vashi**

MSETCL Representative proposed the above proposal before the MTC. He further informed that Recently, the work of replacement of existing 0.35 ACSR Sheep Conductor by 0.4 ACSR Zebra conductor along with Insulators and hardware and replacement of existing suspension towers by 30° Tension towers of 220kV Apta -Talaja – Pachanand - Kalwa and 220kV Apta - Kalwa lines under EHV O&M Circle, Panvel was put up to the Board of Directors in 150<sup>th</sup> Board meeting held on 12.10.2021.

The Board of Directors vide B.R. No. 150/12 dt. 12.10.2021 has directed that Director (Operations) and Director (Projects) to examine the possibility of suitable HTLS conductor instead of 0.4 ACSR Zebra conductor for replacement considering the various aspect and LILO of 220 kV Apta-Kalwa lines at 400/200 kV New Panvel GIS of PGCIL.

Accordingly, the proposal has been reviewed considering various aspects and discussion with officials of Vashi Zone & STU Department.

The matter was referred to STU to carry out necessary System Studies and confirm the requirement of HTLS conversion in the said corridor.

Accordingly, STU has carried the load flow studies considering the proposed LILO of these lines at 400kV Navi-Mumbai S/s. STU has further considered the requirement of proposed substations at Print House and Estella while carrying out the load flow studies for this purpose.

The STU has recommended to uprate following existing lines to HTLS:

1. 220kV Apta –Kalwa line.

2. 220kV Apta-Taloja-Panchanand –Kalwa line.
3. 220kV Temghar –Kalwa line.

Considering the above report of STU, it is decided to convert the said corridor i.e. 220kV Apta –Kalwa and 220kV Apta-Taloja-Panchanand –Kalwa lines to HTLS.

Further, it is seen that the LILO portion of 220kV Panchanand GIS substation is constructed by cable of 1200A capacity.

Whereas, after conversion of the proposed corridor by HTLS, the capacity of the corridor will be uprated to @1600A. Hence, till the entire capacity of LILO portion 220kV Panchanand S/s along with the substation equipments of GIS to be uprated to 1600A capacity, the said LILO needs to be converted and operated as Tap line.

Further, STU has already uprated the capacity of proposed LILO of these 220kV lines to 400kV Navi Mumbai PG S/s by modifying the connectivity to HTLS. Also, the connectivity for proposed 220kV Estella S/s and 220kV Print House needs to be uprated to 1600 A capacity.

Above scheme will provide the following benefits:-

- The current carrying capacity of the corridor will be increased (doubled).
- Enhanced capacity of the corridor will serve to cater additional load in future.
- Reliability & Availability of the system will be increased.
- Reduction in interruptions/trippings.

**After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of replacement of existing 0.35 ACSR Sheep Conductor by equivalent HTLS conductor and replacement of existing suspension tower by 30° Tension tower at Loc. No. 626 & 632, along with additional 1 No. of tower between. Loc. 638-639 for height raising & replacement of 2 Nos. of tower at Loc. No. 648 -649 of 220kV Apta - Taloja, 220kV Apta-Kalwa and 220kV Kalwa-Taloja Line under EHV PC O&M Zone Vashi for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 9:**

**Replacement of existing old 0.4 ACSR by HTLS for 220kV Padghe-Pal , Padghe-Jambhul, Jambhul-Anandnagar line under EHV O & M Circle, Panvel.**

MSETCL representative placed before the MTC a proposal for Replacement of existing old 0.4 ACSR by HTLS for 220kV Padghe-Pal , Padghe-Jambhul, Jambhul-Anandnagar line under EHV O & M Circle, Panvel.

He explained that 220kV Padghe-Pal, 220kV Padghe-Jambhul & 220kV Jambhul - Anandnagar lines were commissioned way back in the year 1994 (27 Years old). The maximum load reached on 220kV Padghe -Jambhul Circuit I & II together was 342 MW in the month of March 2019.

In N-1 contingency situation during peak hours, the load on other line increases substantially which results in tripping of in-service line due to overload causing interruption of supply and approximately 300MW load gets affected(Jambhul SS, Anandnagar SS, Pal-Dombivali SS & 100kV Dombivali SS)

Thus the said corridor is not N-1 Compliant. Further, outage on one Ckt is not feasible without curtailment of the load. Therefore, proper regular & maintenance works cannot be carried out. Therefore, for capacity enhancement of the corridor, replacement of the conductor by HTLS conductor is proposed.

Above scheme will provide the following benefits:-

- Increased current carrying capacity of the existing corridor using same RoW.
- Complying N-1 Criteria for grid operation as per grid code.
- Increase in the reliability & availability of power supply in the area.
- Reduction in the downtime of the lines thereby reductions in interruption of power supply in the area.
- Strengthening of the transmission network in Mumbai Metropolitan Region (MMR).

**After detailed deliberation and discussion, the committee recommended the above proposal of Replacement of existing old 0.4 ACSR by HTLS for 220kV Padghe-Pal , Padghe-Jambhul, Jambhul-Anandnagar line under EHV O & M Circle, Panvel for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 10:**

**Scheme for replacement of old existing 0.2 ACSR Panther conductor by equivalent CCC HTLS conductor along with suitable hardware, accessories and porcelain long rod insulator for 132kV Eklahare OCR-Satpur line (ckt Kms= 20.941.kms) under EHV O & M Division, Nashik under EHV O & M Circle, Nashik.**

MSETCL representative stated that 132 kV Nashik Ring Main network is mainly feeding power to the Nashik City and the adjoining MIDC area such as Ambad MIDC, Satpur MIDC, Gonde MIDC etc.

132KV Source lines for the ring main network are as below-

- 132kV Eklahare GCR – Ambad line, 132kV Eklahare OCR-Takali line, 132kV Raymond – Ambad line & 132kV Eklahare OCR – Satpur line

The said corridor is not N-1 Compliant. Further, outage on one Ckt is not feasible without curtailment of the load. Therefore, proper regular & maintenance works cannot be carried out.

Hence, for capacity enhancement of the corridor, replacement of the conductor by HTLS conductor is proposed.

Above scheme will provide the following benefits:-

- Increased current carrying capacity of the existing corridor using same RoW.
- Complying N-1 Criteria for grid operation as per grid code.
- Increase in the reliability & availability of power supply in the area.
- Reduction in the downtime of the lines thereby reductions in interruption of power supply in the area.
- Strengthening of the transmission network in Nashik City and Satpur MIDC area

**After detailed deliberation and discussion, the committee recommended the above proposal of Scheme for replacement of old existing 0.2 ACSR Panther conductor by equivalent CCC HTLS conductor along with suitable hardware, accessories and porcelain long rod insulator for 132kV Eklahare OCR-Satpur line (ckt Kms= 20.941.kms) under EHV O & M Division, Nashik under EHV O & M Circle, Nashik. for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 11:**

**Replacement of old 0.4 ACSR Deer ACSR Conductor by equivalent CCC HTLS conductor along with suitable hardware, accessories and porcelain long rod insulator for 220kV Dhule-Malegaon line (Ckt km = 80.5 kms) under EHV O & M Division, Nashik.**

MSETCL representative informed that presently, 220kV Dhule-Malegaon line and 220kV Dhule-Chalisgaon- Sayane-Malegaon line are the two main sources of power supply feeding power to 220kV Malegaon sub-station from 400kV Dhule Sub-station.

Recently, 132kV Manmad sub-station is upgraded to 220kV sub-station which is fed from 220kV Malegaon sub-station. Hence the total load fed by 220kV Dhule-Malegaon line to Nashik Division i.e Eastern Part of Nashik District is as below:

220kV Manmad sub-station, 220kV Kalwan sub-station, 220kV Sayane sub-station, 220kV Satana sub-stations, 132kV Malegaon sub-station, 132kV Lasalgaon sub-station, 132kV Pimperkhed sub-station, 132kV Yeola sub-station, 132kV Dindori sub-station, 132kV Kalwan sub-station, 132kV Chandwad sub-station, 132kV Nampur sub-station, 132kV Taharabad sub-station.

In order to have the redundancy for Northern-east load of Nashik District, the additional 220kV Dhule-Malegaon D/C line was sanctioned vide BR No. 32/04 in year 2008. However due to severe ROW & Forest NOC involved, the said line was dropped.

Presently, the current carrying capacity of 0.4 Deer conductor of 220kV Dhule-Malegaon line is 800A. But most of the time the load goes up to 750A to 790A. Hence re-conductoring of the 220kV Dhule-Malegaon is required to be done.

In case of N-1 contingencies, the loading of the corridor cannot be managed on other line. Additional load of 30MVA is anticipated in this area as per the rate of load growth of 10% per year in the next three years.

DISCOM authority is implementing the scheme viz. "HVDS, DDUGJY", Infra-II and DDIGY-1 and IPDS schemes in the jurisdiction of Nashik Rural Circle.

Above scheme will provide the following benefits:-

- Increased current carrying capacity (double) of the existing corridor using same RoW.
- Load trimming due to overloading of line will be avoided.
- Reduction in interruptions/tripping & occurrences.
- Increase in the reliability & availability of power supply in the area.
- Strengthening of the transmission network in Nashik Region.

**After detailed deliberation and discussion, the committee recommended the above proposal of Replacement of old 0.4 ASCR Deer ACSR Conductor by equivalent CCC HTLS conductor along with suitable hardware, accessories and porcelain long rod insulator for 220kV Dhule-Malegaon line (Ckt km = 80.5 kms) under EHV O & M Division, Nashik for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 12:**

**Replacement of existing 0.4 Deer/Zebra ACSR Conductor by new CCC type HTLS conductor and allied work for 220kV Parvati-Phursungi EHV line and required bay strengthening work at respective EHV SS under EHV O & M Division-I, Pune**

MSETCL representative explained that the 220kV Phursungi - Parvati line is one of the important line of 220 kV Pune Ring Main Network. This line is a part of old 220kV Chinchwad - Theur line which was commissioned on 16.08.1988. This line has completed useful life of 33 years.

The 220kV Phursungi - Parvati line has following sections:

- 1) From 220kV Parvati Substation to Parvati Substation LILO point i.e. from (LN18) to LN 01 (LN 73 of old line) --- D/C line commissioned on 16.08.1988.
- 2) From 220kV Parvati Substation LILO point to 220kV Phursungi Substation LILO point i.e. from LN 01 (LN 73) to LN 106 ---- Old 220kV D/C Chinchwad - Theur line, commissioned in the year 1978.
- 3) From 220kV Phursungi Substation LILO point to 220kV Phursungi Substation i.e. from LN 106 (old line) (LN 01) to (LN 23) ---- M/C line commissioned on 08.07.2004.

220kV Phursungi Substation is one of major & critical substation in Pune Ring Main. It has transformation capacity of 600 MVA & connects two major 400kV substation viz. 400kV Lonikand -I & 400kV Jejuri Substation. Source to 220kV Phursungi Substation is from 220 kV

Theur -I & II circuits & 220kV Jejuri-I & II Circuits from both 400kV substations. 220kV Phursungi Substation feeds supply to 220kV Parvati, 220kV Serum, 132kV Kothrud, 132kV Phursungi, 132kV Kamthadi & nearby area of Phursungi Substation via 2 no's of 220/22 kV 100 MVA Transformers.

Further, 220kV Parvati Substation feeds the core area of Pune city especially the Parvati Water Works which is the main water works of Pune city. Also, 220kV Parvati Substation is the main source to 132kV GIS Rastapeth which feeds cream area of Pune City including important hospitals, Defense area etc. Also, in future the load of 132kV Kothrud Substation as well as the load of proposed Metro RSS will also be fed by 220kV Parvati Substation.

Considering the present total load of 220kV Parvati Substation (553Amp), proposed load of 132kV Metro RSS at Kothrud (77 Amp) & proposed load of 132kV Kothrud Substation (40 Amp) i.e. after laying 132 kV Parvati-Kothrud cable, the load of the 220kV Phursungi - Parvati line will reach @ 670Amp against the current carrying capacity of 747 Amp.

Under such situation & in view of overall load of 220kV Parvati Substation including future proposed load and avoid sagging of conductor due to overloading and the life span, it is very much necessary to increase the current carrying capacity of 220kV Phursungi - Parvati line by replacement of existing old 0.4 ACSR DEER & Zebra conductor by HTLS conductor.

In addition to above, the Disc Insulators / Conductor Hardware are also very old & are in service since more than 33 years. To avoid multiple breakdown due to aging of insulator/red hot due to overloading, it is necessary to change these items also along with the conductor. There is no need to replace the Earth wire i.e. OPGW which is installed in Feb 2016. Thus the total line will be renovated and upgraded after replacement of conductor & insulators.

Above scheme will provide the following benefits:-

- The transmission capacity of the existing corridor will be enhanced/doubled.
- Transmission network in this corridor will become N-1 compliant.
- Load trimming/ Distressed Load Shedding in this area due to overloading of the lines will be eliminated.
- Reliability and Availability of transmission network will be enhanced.

TPC-Distribution representative asked that in HTLS conversion whether bays conversion/bay replacement is also required. MSETCL representative elaborated that in all HTLS conversion bays replacement is must because of the increased capacity. In some HTLS proposals bays conversion/bay replacement is a part of the proposals or sometimes bays conversion/bay replacement is done separately based on the requirement.

TPC-Distribution representative also asked that whether MSETCL will be reusing the replaced conductors/CT/PT/Isolators. MSETCL representative answered that replaced conductors/CT/PT/isolators are utilized for other works. MSETCL has a scrapping policy. All replaced materials are tested, if they are healthy, they are utilized or otherwise scrapped.

**After detailed deliberation and discussion, the committee recommended the above proposal of Replacement of existing 0.4 Deer/Zebra ACSR Conductor by new CCC type HTLS conductor and allied work for 220kV Parvati-Phursungi EHV line and required bay strengthening work at respective EHV SS under EHV O & M Division-I, Pune for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda Point No. 13:**

**Replacement of existing 0.4 ACSR Zebra Conductor by High Ampacity CCC Type conductor of 220kV PG- Nalasopara & 220kV Padghe-Nalasopara lines under Vashi zone.**

MSETCL representative explained that the existing 220/132/33kV Boisar-II sub-station commissioned in the year 1994 was fed by 220kV Padghe- Boisar D/C line. After commissioning of the 400/220kV Boisar(PGCIL) sub-station at Boisar, 220/132/33kV Boisar-II sub-station is fully fed from Boisar(PGCIL) sub-station through 220kV Boisar-Boisar(PG)-1, Boisar-Boisar(PG)-2 and Boisar- Boisar(PG)-3.

The existing 220kV Padghe-Boisar line is converted as 220kV Boisar – Nalasopara in the year 1999 after commissioning of 220/22 kV Nalasopara sub-station in the year 1999, the Boisar – Nalasopara line converted to Boisar(PGCIL)-Nalasopara line.

**220 kV Boisar(PGCIL))- Nalasopara line** has rendered the service of about 27 years (Originally 220kV Boisar-Padghe line commissioned in 1994) & have 0.4 ACSR Zebra conductor with current carrying capacity of 737A and thermal capacity of 827Amp. It is necessary to replace the existing conductor by high Ampacity HTLS conductor due to following reasons.

The maximum load reached on 220kV BOISAR (BOISAR (PGCIL))- NALASOPARA line is about 651Amp /240MW.

The details of the upcoming sub-stations is as below

1. DFCCIL -220kV Panchali Substation-60 MVA (LILO on Boisar(PG)- Vasai line)
2. MSETCL-220KV Chikhaldongri Substation-(2x50 MVA) (LILO on Boisar(PG)- Vasai line)
3. MSETCL-220/132kV Palghar Substation-(2x100 MVA) (LILO on Boisar(PG)- Nalasopara line)
4. NHSRCL-220kV Saphale TSS-12.4 MW(LILO on Boisar(PG)- Nalasopara line).
5. MRVCL-220kV Saphale TSS- 18.03 MW (LILO on Boisar(PG)- Vasai/Nalasopara line)

Therefore, the additional loading of these upcoming sub-stations will be about 350MW.

**220kV Padghe- Nalasopara** was previously Padghe-Boisar line and commissioned in the year 1994 then converted to 220KV PADGHE- NALASOPARA in the year 2002. This Line has also completed 27 years of service life & it is necessary to replace the existing conductor by high Ampacity HTLS conductor due to following reasons:-

The maximum load reached on 220KV Padghe-Nalsopara Line is 428Amp/158MW.

220kV Padghe-Nalasopara is second source to 220/22kV Nalasopara sub-station. In case of any tripping or breakdown on 220kV Boisar(PGCIL)- Nalasopara line, the entire load of 220/22 kV Nalasopara sub-station is fed by 220KV Padghe-Nalasopara line. In this situation, 0.4 ACSR Zebra conductor cannot carry the entire load of Nalasopara sub-station and ultimately this line will also trip and the Nalasopara sub-station will be in dark for a long duration which is not desirable in the view of supplying reliable and uninterrupted supply to the consumers.

Also, as most part of these two lines i.e 220 kV Boisar(PGCIL)- Nalasopara line & 220kV Padghe-Nalasopara passes through the creek area & due to presence of saline weather all hardware of these line has rusted heavily and are prone to breakage & may cause frequent breakdown on the line in coming year.

Above scheme will provide the following benefits:-

- Increased current carrying capacity (double) of the existing corridor using same RoW.
- Reduction in interruptions/tripping & occurrences.
- Increase in the reliability & availability of power supply in the area.
- Strengthening of the transmission network in MMR.

**After detailed deliberation and discussion, the committee recommended the above proposal of Replacement of existing 0.4 ACSR Zebra Conductor by High Ampacity CCC Type conductor of 220kV PG- Nalasopara & 220kV Padghe-Nalasopara lines under Vashi zone for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 14:**

**Scheme for replacement of old 0.2 ACSR Panther conductor by CCC type HTLS conductor along with all required hardwares, accessories of 132kV Dhule- Sakri line and 132kV Sakri-Shivajinagar ckt-I & II along with replacement of EHV equipments (compatible to HTLS conductor) at corresponding 132kV end bay at 132kV Sakri, 220kV Shivajinagar and 220kV Dhule substation under EHV O&M Circle, Dhule.**

MSETCL representative explained that 132kV Sakri Substation is one of the generation attached Substation with 06 numbers of 33kV wind generation feeders i.e. 33kV KP-1 & II, 33kV Suzlon-I & I and 33kV Micon-I & II are evacuating power to the grid. Now, against 88 MW of sanctioned provision 61.71 MW (approx) power is evacuated from these feeders.

Presently, 132kV Sakri is radial substation with single source from 132kV Shivajinagar Substation through 132kV Shivajinagar-Sakri Line; however, the LILO work of 132kV Dhule-Shivajinagar Line at 132kV Sakri Substation (sanctioned against MBR no. CMD/3076 Dtd. 19.09.2019) is under process by Project Division, Jalgaon. After LILO work lines will be as below:

1. 132kV Dhule-Sakri Line (SCSC)
2. 132kV Shivajinagar- Sakri Ckt - I & II (DCDC).



220kV Shivajinagar Substation is also one of the important Grid connected Substation attached with the 230 MW Generation (i.e. 130MW power is evacuated from 5X33 kV solar generation feeders of MAHAGENCO and 01 no of 33kV Variac Feeder and 100MW from 02 X132kV Greenraj solar generation)

Recently, three Solar Power Generation Projects proposed of M/s. Hauban Pt Ltd, M/s. Juniper Green Field Pvt Ltd and M/s. Soleco solar of 70MW, 70MW and 50MW respectively (feasibility informed by Project Wing) are envisaged as LILO on existing 132kV Dhule Shivajinagar (S/C) line. Also 70MW generation is proposed by MAHAGENCO.

Further, there were certain instances of overloading and over current tripping on 220kV and 132kV lines due to which 220kV Shivajinagar and subsequently 132kV Sakri Substation went in dark.

As per the System Study report, STU has suggested to convert the lines to HTLS after making LILO on 132kV Shivajinagar-Dhule Line at 132kV Saki Substation i.e. 132kV Dhule-Sakri Line and 132kV Shivajinagar-Sakri Line (After LILO arrangement).

Above scheme will provide the following benefits:-

- Increased current carrying capacity (double) of the existing corridor using same RoW.
- Reduction in interruptions/tripping & occurrences.
- Increase in the reliability & availability of power supply in the area.
- Strengthening of the transmission network for evacuation of RE generation.

**After detailed deliberation and discussion, the committee recommended the above proposal of Scheme for replacement of old 0.2 ACSR Panther conductor by CCC type HTLS conductor along with all required hardwares, accessories of 132kV Dhule- Sakri line and 132kV Sakri- Shivajinagar ckt-I & II along with replacement of EHV equipments (compatible to HTLS conductor) at corresponding 132kV end bay at 132kV Sakri, 220kV Shivajinagar and 220kV Dhule substation under EHV O&M Circle, Dhule for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 15:**

**Scheme of replacement of existing 0.2 ACSR Conductor along with Hardware by High Ampacity Conductor in respect of 132kV Jalna - Jalna MIDC (via Rajur Circuit II) and 132kV Nagewadi –Jalna MIDC lines under EHV O & M Division, Jalna.**

MSETCL representative explained that 132kV Jalna - Jalna MIDC (via Rajur Circuit II) was commissioned on 20.05.2010 and 132kV Nagewadi –Jalna MIDC lines was commissioned on 30.10.2003. The maximum load reached on 132kV Jalna - Jalna MIDC (via Rajur Circuit II) and 132kV Nagewadi –Jalna MIDC lines were 73.84 MW & 124 MW respectively.

Further at 132kV Jalna MIDC Substation on dtd. 01.03.2021, total bus loading reached to 123.58MW / 552A. Following technical feasibilities for load enhancement on 33kV and 132kV level to HT consumers are already issued from 132kV Jalna MIDC substation-

1. M/s NRB Bearing on 33kV Kalika feeder for 0.97 MW load enhancement.
2. M/s Jalna Siddhivinayak on 33kV Siddhivinayak feeder for 14 MW load enhancement.
3. M/s Saptashruni on 33kV Saptashruni feeder for 8 MW load enhancement
4. M/s Kalika Steel on 132kV Kalika feeder for load enhancement of 27 MW.

Total Load Enhancement issued= 49.97 MW.

132kV Jalna MIDC Substation feeds power supply to continuous process steel industry, EHV / HT consumers of Jalna MIDC area and part of Jalna urban area. Any type of interruption to these continuous process industries causes loss of production to these industries resulting into unrest. Further industrial load demand is increasing day by day.

However due to limitations of loadings of both 132kV Jalna (220kV)-132kV Jalna MIDC line (via Rajur Ckt-II) and 132kV Nagewadi (220kV)- 132kV Jalna MIDC lines , it is not possible to meet extra power demand of industrial consumers.

In n - 1 contingency situation, the loading on other line increases substantially which results in tripping of in-service line due to overloading. This may affect the power supply position in Jalna MIDC Region. Hence enhancement of the capacity of this corridor is necessary.

Above scheme will provide the following benefits:-

- Enhancement of transmission capacity of the existing corridor.
- Transmission network will become N-1 compliant.
- Ensuring Reliability and quality of power supply to prime industrial consumers i.e. Steel Industries of Jalna MIDC.
- Availability of transmission network will be enhanced.

**After detailed deliberation and discussion, the committee recommended the above proposal of Scheme of replacement of existing 0.2 ACSR Conductor along with Hardware by High Ampacity Conductor in respect of 132kV Jalna - Jalna MIDC (via Rajur Circuit II) and 132kV Nagewadi –Jalna MIDC lines under EHV O & M Division, Jalna for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 16:**

##### **Replacement of 110 kV and 22 kV AIS bays with GIS bays at 110 kV Parel RSS**

TPC-T representative explained before the MTC above proposals of Replacement of 110 kV and 22 kV AIS bays with GIS bays at 110 kV Parel RSS. He requested the committee to consider the above cable replacement proposals and further emphasized the necessity of scheme as below:

- High-rise residential towers have been constructed adjacent to the compound wall of the 110 kV outdoor switchyard of Parel RSS by private developers. There are instances when objects like bedsheets, towels, cardboard, saree, football, water bottles, windowpane etc. have fallen

from this building on 110 kV switchyard. In one of the cases, it had triggered Bus fault causing shut down of power supply to the consumers.

- Existing 110 kV AIS switchyard has outlived its useful life. Various defects like hot spots, isolators open /close problems are observed on equipment.
- Existing AIS has become congested and there is no scope for future expansion if required.

**After detailed deliberation and discussion, the committee recommended the above proposals cited under agenda no. 16 for Replacement of 110 kV and 22 kV AIS bays with GIS bays at 110 kV Parel RSS for consideration by GCC for inclusion in upcoming five year STU plan and DPR approval thereof.**

#### **Agenda Point No. 17:**

##### **Interconnection between 220 kV TPC-T Waghivali Station and 220 kV MSETCL Waghivali Station**

TPC-T representative placed before the committee necessity of implementation of the scheme as below:

- 220 kV TPC-T Waghivali Station and 220 kV MSETCL Waghivali Station are adjacent to each other and connectivity between two stations are feasible. This interconnection will strengthen and stabilize the Mumbai Transmission Network.
- HCL has recommended for additional interconnections to improve Transmission capability. (Recommendation 6.4)
- To facilitate bring additional power from Maharashtra Network into the city of Mumbai through Tata Power Network. It will also cater to part of future load growth of Mumbai.

**After detailed deliberation and discussion, the committee recommended the above proposals cited under agenda no. 17 for Interconnection between 220 kV TPC-T Waghivali Station and 220 kV MSETCL Waghivali Station for consideration by GCC for inclusion in upcoming five year STU plan and DPR approval thereof.**

#### **Agenda Point No. 18:**

##### **MV AIS switchgear replacement by GIS at Salsette, Chembur, Saki, Ambernath, Borivali.**

TPC-T presented the need of MV AIS switchgear replacement by GIS at Salsette, Chembur, Saki, Ambernath, Borivali as below:

- OEM support is not there due to obsolete technology.
- Various defects are observed on equipment.
- To enhance reliability and ensure continuity of power supply to DISCOMs.
- Existing AIS switchgear has outlived its useful life.
- No space for future expansion if required.

**After detailed deliberation and discussion, the committee recommended the above proposals cited under agenda no. 18 for MV AIS switchgear replacement by GIS at Salsette, Chembur, Saki, Ambernath, Borivali. for consideration by GCC for inclusion in upcoming five year STU plan and DPR approval thereof.**

**Agenda Point No. 19:**

**Replacement of 220KV Trombay-Carnac-5 & 6 oil filled cable with XLPE cable.**

TPC-T representative presented to consider the proposal as below:

- These cables have served useful life and showing signs of deterioration.
- OEM has stopped manufacturing of oil filled cables and OEM support for oil filled cables and associated accessories is not easily available.
- The failure of these cables will require prolonged outage of 20 to 25 days for repairs since spares are not easily available, and this will have an impact on N-2 (considering south Mumbai) contingency and reliability of 220 kV Carnac Receiving Station which feeds loads of political and commercial importance.

**After detailed deliberation and discussion, the committee recommended the above proposal cited under agenda no. 19 for consideration by GCC for inclusion in upcoming five year STU plan and DPR approval thereof.**

**Agenda Point No. 20:**

**Replacement of 110KV Trombay Parel 3 & Trombay Carnac 3 oil filled cable with XLPE cable.**

- These cables have served useful life and showing signs of deterioration.
- OEM has stopped manufacturing of oil filled cables and OEM support for oil filled cables and associated accessories is not easily available.
- The scheme is envisaged with common cable route of proposed 220 kV Salsette Backbay cable so execution of both schemes simultaneously will result in approximate saving of Rs. 100 Crs.
- To strengthen Transmission Network.

**After detailed deliberation and discussion, the committee recommended the above proposal cited under agenda no. 20 for Replacement of 110KV Trombay Parel 3 & Trombay Carnac 3 oil filled cable with XLPE cable for consideration by GCC for inclusion in upcoming five year STU plan and DPR approval thereof.**

**Agenda Point No. 21:**

**Establishing connectivity between 400KV north & south Mumbai. Phase -I: Installation of 400KV station at Dharavi.**

- As recommendation of HLC committee to avoid recurrence of major Mumbai grid failure on 12.10.2020 and on 27.02.2022, it is proposed to establish connectivity between 400 kV North and South Mumbai by establishing 400 kV Network among 400 kV Vikhroli – Dharavi – Mahalaxmi – Sewri – 400 kV Trombay – 400 kV Vikhroli to augment transmission network in Mumbai for improving the reliability power supply.
- As a part of First phase, it is proposed to establish 400/ 220 kV RSS at Dharavi with interconnection from 400 kV KVTPL Vikhroli for optimum evacuation of power from 400 kV Vikhroli RSS.
- Implementing this scheme will facilitate 400 kV power injection in South Mumbai available from upcoming 400 kV Vikhroli Station.
- Mumbai Internal Transmission will strengthen and will facilitate evacuation of additional power available from 400 kV Vikhroli Station. This will avoid recurrence of occurrences like 12th October 2020 and recent 27th February 2022 (which was a result of ,loss of connectivity between North and South Transmission Network), wherein power supply to critical loads was disrupted.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out assessment and entire study in line with the justification clarified by TPC-T for necessity of scheme and as such the agenda will be taken in next meeting. Accordingly the scheme will be processed based on STU's assessment.**

#### **Agenda Point No. 22:**

##### **Establishing 33KV voltage level at 220KV Karanjade station**

- MSEDCL has proposed 12 Nos of 33 kV outlets from 220 kV Karanjade Station for meeting the existing load growth and power demand of upcoming residential and commercial projects. Considering this requirement in Panvel and new Airport Area, addition of 33 kV GIS at Karanjade Switching station is most suitable option.
- It will facilitate proposed development at Panvel area with bulk load demand with using available infrastructure which will reduce the cost and burden on consumers.

**After detailed deliberation and discussion, the committee expressed that the proposal/requirement of MSEDCL for allotment of 33 kV feeders is not received to STU. Hence the scheme is deferred.**

#### **Agenda Point No. 23:**

##### **MV Switchgear replacement at 110KV Kalyan RSS with additional feeders for Discom.**

- Requirement of additional 06 separate Outlets with load requirement of about 41.5 MW is submitted by MSEDCL for their various upcoming switching stations. Existing 22 kV switchyard cannot be extended as it has road on one side and residential area on other side. Hence, it will not be possible to accommodate additional outlets in the available space for any future requirement.

- The existing 22 kV Outdoor Switchgears at Kalyan is difficult to maintain due to non-availability of spares. OEM have stopped manufacturing these types of breakers (ABB-OHB, Siemens-3AA3, 3AH3) and its spares.
- 22kV Switchyard at Kalyan is surrounded by Chemical factories. Due to polluted weather, there is problem of frequent rusting of switchyard equipment.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out assessment in line with the reasons mentioned above. Also STU is not received such proposal of outlet requirement of MSEDCL. Accordingly the scheme will be processed based on STU's assessment.**

#### **Agenda Point No. 24:**

**MV Switchgear replacement at 110KV Vikhroli station with segregation of back to back feeders.**

- OEM have stopped manufacturing these types of breakers and its spares. The poles of HPA24 Make Breakers are not available in the market as OEM had discontinued the product as well as support to old switchgear.
- There are back-to-back connected feeders at Vikhroli RS. It is unsafe to work on one feeder for maintenance / fault repairs while the other feeder is in service. It is proposed to segregate these back-to-back connected feeders in this switchgear replacement thereby enhancing safety.
- It will not be possible to accommodate additional outlets requirement of DISCOMs in the available space for any future requirement

**After detailed deliberation and discussion, the committee suggested that the STU to carry out assessment in line with the reasons mentioned above. Also STU is not received such proposal of outlet requirement of MSEDCL. Accordingly the scheme will be processed based on STU's assessment.**

#### **Agenda Point No. 25:**

**Replacement of 2x250MVA, 220KV/110KV/22KV ICT 1&2 at Salsette**

- Both these ICTs 1 & 2 were manufactured and installed in 1992 and are showing signs of deterioration (The results and analysis will be submitted with DPR). CGL make ICT 1 has failed on 10.10.2020 & is beyond repairs. Failure was due to ageing (bushing failure resulted into winding failure).
- OEM support and spares are not for accessories, because the ICTs are old with older versions of accessories.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out assessment study as above. DPR to be submitted to STU, the scheme will be processed based on STU's assessment.**

### **Agenda Point No. 26:**

#### **Replacement of 110KV AIS by GIS bays at Malad S/S**

- Malad RS is built on dumping ground and now there are issues of sinking in Main Control room Building and Switchyard. Due to this sinking, there are issues related alignment of all Switchyard equipment's and tilting of Panels in the Switchgear room. Since this Substation was built on a dumping ground, there is constant release of obnoxious gases which cause chemical reaction within copper and other materials. The Gas analysis study is submitted with DPR.
- Various defects like hot spots and corrosion (due to gasses from dumping ground)) are observed on equipment.
- The existing switchyard has become congested due to addition of bays for Western Railway and Metro Rail bays. Also, to meet additional load growth requirement (mainly Metro bays), the 110 kV bus was extended and additional 110 kV bays were introduced in switchyard at different location. This is causing operation constraints as it is not a standard arrangement.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out assessment study considering the location of substation, STU may visit the substation. The scheme will be processed based on STU's assessment.**

### **Agenda Point No. 27:**

#### **Installation of 1x125MVAR reactor at Borivali**

- Absorbing reactive power generated by EHV cables to mitigate the over voltage problem during off peak and non-availability of Trombay Unit # 5.
- The reactive power flow needs to be minimized to reduce losses (I<sup>2</sup>R) which affects active power flow in Transmission system.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out joint study alongwith TPC-T and AEML-T**

### **Agenda Point No. 28:**

#### **Replacement of 220KV Trombay-Dharavi 5, 6 oil filled underground section by XLPE cable.**

- OEM has stopped manufacturing of oil filled cables and OEM support for oil filled cables and associated accessories is not easily available.
- These cables have served useful life and showing signs of deterioration.

**After detailed deliberation and discussion, the committee suggested that the TPC-T to submit the DPR to STU.**

### **Agenda Point No. 29:**

#### **Installation of 220/33KV station at Goregaon.**

- To meet additional Load demand of 70 MVA in Goregaon area.
- TPC-T is in the process of land acquisition, once the STU approval is obtained then the land can procure.

**After detailed deliberation and discussion, the committee suggested that STU to do joint study considering the location of MSETCL's proposed 220/33 kV Goregaon filmcity substation for which land is available, but land is not available for substation proposed by TPC-T which is long pending issue. As such MSETCL (Project Scheme Section) to seek the requirement of 33 kV feeders from TPC-D and AEML-D so as to process the proposed 220/33 kV Goregaon filmcity S/S scheme through MTC/GCC.**

### **Agenda Point No. 30:**

#### **Installation of 2x250 MVA 220/110KV ICT at Waghivali (new).**

- To improve network reliability by bringing additional power to Mumbai at 110 kV level through 220 kV interconnection at Waghivali.
- This will facilitate to bring power from MSETCL network to 110 kV TPC-T Network in case of non-availability of Hydro Power.

**After detailed deliberation and discussion, the committee suggested that STU to do assessment study. Accordingly the scheme will be processed based on STU's assessment.**

### **Agenda Point No. 31 & 32:**

#### **220KV Salsette-Borivali 1&2 HTLS upgradation (new).**

For strengthening power evacuation to North Mumbai after establishment of 400 kV Vikhroli

#### **220KV Waghivali Dharavi 7&8 HTLS upgradation (new)**

To cater source requirement of South Mumbai after interconnection with MSETCL Waghivali.

**After detailed deliberation and discussion, the committee suggested that STU to do assessment study considering the present line loadings and considering the ongoing projects.**

### **Agenda Point No. 33:**

#### **33 kV level creation at Malad (Transformer replacement with 110kV/22kV/33kV (Additional level).**

To create 33 kV level as requested by DISCOMs to support up gradation of Distribution network.



After detailed deliberation and discussion, the committee suggested that TPC-T to submit the holistic load requirement coming in Malad area alongwith outlet requirement. The scheme is deferred.

#### **Agenda Point No. 34:**

**New 110KV/33KV BKC S/S (New scheme).**

To meet additional Load demand in the BKC area

After detailed deliberation and discussion, the committee suggested that 220 kV BKC substation is already proposed by AEML-T in BKC area and which is approved by Hon'ble MERC. Hence this new substation is not required at this stage.

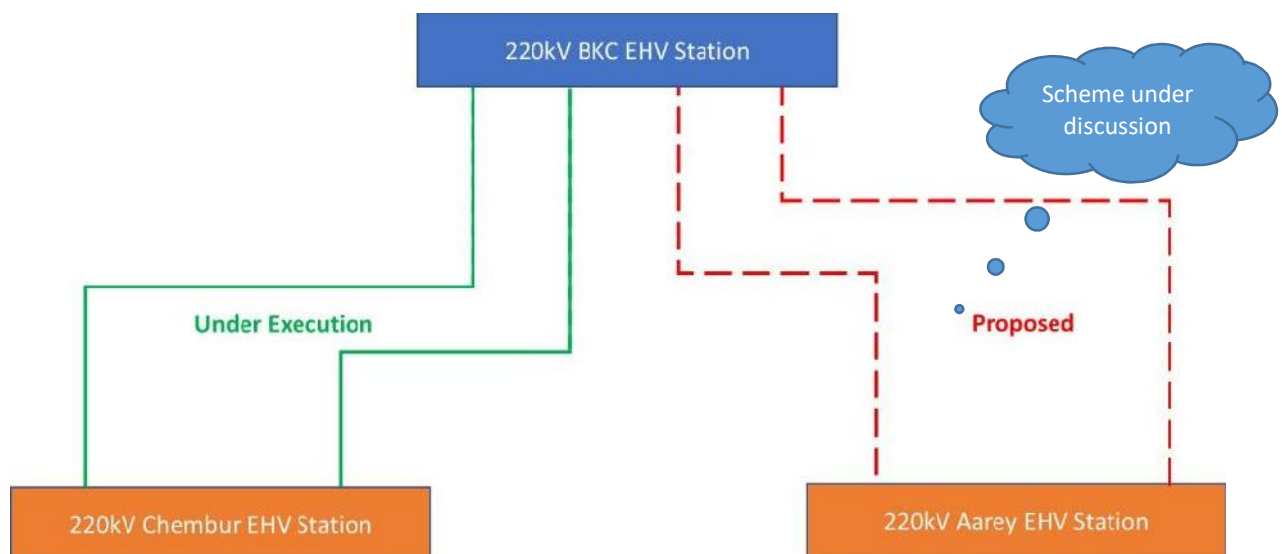
#### **Agenda Point No. 35:**

**220kV Connectivity between AEML-BKC S/s and AEML-Aarey S/s.**

- For North-East system connectivity in Mumbai power system Chembur -BKC – Aarey and 2nd feed to upcoming BKC EHV S/s.

AEML-T representative explained before the MTC above proposal of establishment of 220kV Connectivity between AEML-BKC S/s and AEML-Aarey S/s. He requested the committee to consider the above proposal and further emphasized the necessity of scheme as below:

- 220 kV BKC - Aarey (North of Mumbai) link shall establish connectivity between North & South via Borivali – Aarey – BKC – Chembur – Trombay linkages.
- Initially 220 kV EHV station at BKC shall be operating in radial mode, having only connectivity from existing Chembur EHV Station. Any contingency at Chembur S/s or BKC – Chembur link may result in loss of load from BKC EHV Sub-Station



**STU's Observation:**

AEML-T to submit the proposal to STU for scheme assessment.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out assessment for necessity of the scheme and its benefits. The scheme will be processed based on STU's assessment.**

**Agenda Point No. 36 & 37****Agenda Point No. 36: 33kV Reactors at AEML EHV Substations**

- ) To address voltage fluctuations in and around interconnected substations within MMR
- ) During off peak season, the system voltage on 33 kV side increases to higher level. Despite of the voltage control measures such as load shifting, tap changing and switching off all capacitors system, voltage remains high, causing over-voltages in the system. Which increase the dielectric stress in the power equipment, also lead to cable faults, making system vulnerable to faults, reducing the system availability
- ) To ensure quality power to Discom customers and to maintain 33kV Bus voltage level at 33kV

**Agenda Point No. 37: 220kV Reactor at AEML-Chembur EHV S/s**

- Issues with respect to Voltage dips in and around interconnected Sub-Stations of the 400/220/100 kV Kalwa S/s. by various utilities viz. M/s. HPCL, M/s. TATA, M/s. AEML & Other consumers/ TSUs
- Under the Chairmanship of Director (Operations) MSETCL working group was constituted to look into the issue to explore the reason for frequent high magnitude Voltage dips & to suggest remedial actions in this regard.
- To offset the capacitive effect of 220 kV cable system, to ensure desired level of voltage limits and reactive power management in MMR power system, schemes to install Reactors in system is proposed.

**STU's Observation:**

STU to conduct the joint study with AEML-T and TPC-T to finalise the reactor requirement within MMR region. The joint study is scheduled on 24/05/2022.

**After detailed deliberation and discussion, the committee suggested that the STU to carry out the joint study with AEML-T and TPC-T to finalise the reactor requirement within MMR region. The scheme will be processed based on STU's assessment.**

## Agenda Point No. 38:

### 220kV Uttan EHV scheme

AEML representative presented to consider the proposal of establishment of 220 kV Uttan EHV scheme. The scope of scheme includes:

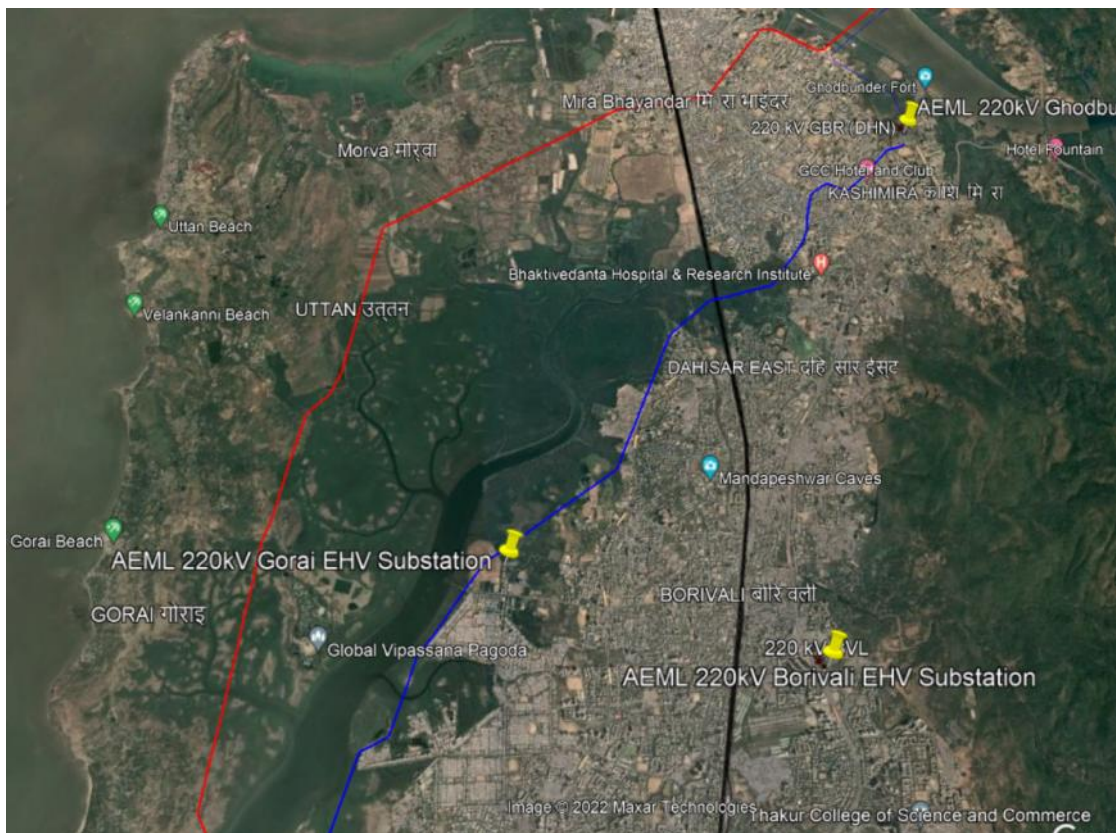
Substation Scope:

- 220 kV GIS Based EHV Substation (2x125 MVA Transformers) Cable Connectivity.
- Connectivity between 220kV OH line (Boisar-Versova) and proposed 220kV Uttan EHV S/s
- Associated Civil Work

Load requirement **91 MW**, Load requirement - 115 MW, Outlet Requirement -10 nos. (AEML-D), Land Location- Land options identified.

He further explained the need for implementation of scheme as below:

- ) No Transmission S/s in/around Bhayander-West/Uttan/Gorai/Manori area.
- ) Growing power demand further causes stress on existing 11kV / 33kV distribution network, affecting quality and reliability of power supply in the region
- ) As load grows, for feeding reliable quality power supply in/around Uttan,



**After detailed deliberation and discussion, the committee suggested that the AEML-T to submit the proposal to STU considering exact load requirement, spare transmission capacity available nearby EHV substations, to explore 33 kV feeder installation from existing nearby EHV substations to meet the load requirement.**

**Agenda Point No. 39:**

**Appropriate Transmission scheme at 220kV level for reactive power management around DTPTS / Boisar.**

AEML representative presented the proposal as below:

- J Adani Dahanu Thermal Power Station (ADTPS) 2 X 250MW, an embedded generation of Mumbai Power System.
- J AEML takes care of reactive power compensation with the provision of Capacitor banks at 220 KV EHV stn.
- J ADTPS connects at 220KV with MSETCL- Boiser through Dahanu-Boiser Line, later line is LILO at MSETCL Viraj.
- J After commissioning of Viraj Substation and changes in power flow patterns resulted into excess loading of Mvar on ADTPS Units
- J At ADTPS, the High MVar Constraint is being experienced due to increase in MVar on Dahanu-Viraj line as the voltage level at 220 KV MSETCL Boiser substation is maintaining on lower side (in the range of ~ 208-212KV).
- J MVar Export on Viraj Line increases significantly during morning Peak hours and continued up to 1700 Hrs(Excluding 1300 Hr to 1400 Hrs period).
- J Active power generation at ADTPS has to be reduced due to excess loading of MVar required by Boiser/Viraj substation to support the network voltage.
- J During this MVar constraint period ADTPS units may not be able to increase generation up to full DC in case of grid contingency, impacting Mumbai Power system.
- J Request – It is understood that MSETCL is exploring schemes at 220kV, 132kV. Appropriate Reactive power mgmt. scheme around DTPTS/Boisar may be taken up on priority.

**After detailed deliberation and discussion, the committee suggested that the AEML-T to submit the proposal consists of existing problems and remedial solution thereof to STU for preliminary discussion to understand the idea of scheme.**

**Agenda point no. 40:**

**Providing additional 1X25 MVA, 132/33 kV T/F along with HV & LV Bays at 132kV Nardana S/s under E HV (O&M) Circle, Bhusawal**

MSETCL representative explained that 132kV Nardana Substation is vital substation and supplying the Urban & MIDC load of Nardana village & Shindkheda Taluka. The Maximum load on the substation has reached more than 80% of its capacity.

MSEDCL has also proposed 5MVA T/F at Babhale MIDC & the load of the same is to be catered by 33kV Babhale feeder emanating from 132kV Nardana S/s.

It is difficult to manage load in case of outage/tripping of any one transformer i.e. the substation does not satisfy the N-1 criteria. The proposed substation fulfills the P-I criteria of augmentation scheme.

**After detailed deliberation and discussion by members, the committee recommended the above proposal of Providing additional 1X25 MVA, 132/33 kV T/F along with HV & LV Bays at 132kV Nardana S/s under E HV (O&M) Circle, Bhusawal for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda point no. 41:**

**Providing additional 1X50 MVA, 132/33 kV T/F along with HV & LV Bays at 132kV Khandke S/s under EHV (O&M) Circle, Nashik.**

MSETCL representative explained that at Present, 2X50MVA, 132/33kV T/Fs are in service at 132kV Khandke S/s. 108MW capacity Wind Generation is attached to this substation on 33kV level. During Peak windy season i.e. June to December, both 50MVA T/Fs run above 85% rated capacity.

During peak season, it is difficult to manage load in case of Outage/tripping on any one transformer i.e. the substation does not satisfy the N-1 criteria. The proposed substation fulfills the P-I criteria of augmentation scheme

**After detailed deliberation and discussion by members, the committee recommended the above proposal of Providing additional 1X50 MVA, 132/33 kV T/F along with HV & LV Bays at 132kV Khandke S/s under EHV (O&M) Circle, Nashik for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 42:**

**Providing additional 1X50 MVA, 132/33 kV T/F along with HV & LV Bays at 132kV Ghodegaon S/s EHV (O&M) Circle, Nashik. under Nasik Zone.**

MSETCL representative informed that 132kV Ghodegaon S/s was commissioned on 06.02.2015 with 2x50MVA, 132/33kV T/Fs against sanctioned BR No.52/16 dt.23.4.2010. However, even after two years from commissioning of S/s, MSEDCL did not avail load from this S/s. Hence, the

S/s was under loaded. At the same time 2 Nos. of 50MVA, 132/33kV T/Fs were urgently required one at 132kV Sinnar MIDC S/s & another at 220kV Dondaicha S/s. Both 50MVA T/Fs were dismantled and transferred to 132kV Sinnar MIDC S/s & 220kV Dondaicha S/s as per the directives of the higher authority.

Repaired 2X25MVA transformers were erected against 2X50MVA transformers on 09.11.2017 & 07.02.2018 respectively. At present 132kV Ghodegaon S/s supplying power to Agriculture, Industrial & Residential load of some part of Newasa Taluka. Total maximum load has reached about 40MVA against installed capacity of 50MVA.

MSEDCL has proposed to shift 33kV Sonai feeder (15MVA) from 132kV Rahuri S/s & 33kV Jeur feeder(15MVA) from 132kV Kedgaon S/s to 132kV Ghodegaon S/s in order to reduce 33kV feeder line length. After shifting these feeders, projected load at 132kV Ghodegaon S/s will be 70MVA. It is difficult to manage the load in case of outage/tripping of any one transformer i.e. the substation does not fulfil the N-1 criteria.

**After detailed deliberation and discussion, the committee recommended the above proposal of providing additional 1X50MVA, 132/33kV T/F along with HV & LV bays, for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 43:**

**Providing additional 25 MVA, 220/33 kV T/F along with HV & LV Bays at 220kV Raymond S/s under EHV (O&M) Circle, Nashik.**

MSETCL representative informed that 220/132kV Raymond S/s was commissioned in 1994. As per the scope of approved BR No.72/11 dtd.5.5.2012, 2x50MVA, 220/33KV transformers along with 08Nos. of 33kV feeder bays were to be erected. Whereas, practically and as per STU consent only one 50MVA T/F on priority was commissioned and out of 08 Nos. only 04 Nos. of 33kV feeder bays were constructed. The scheme was short closed after commissioning of one 50MVA transformer. This 50MVA, 220kV T/F was shifted at overloaded 220 Sayane S/s on 23.09.2018 and against which 25MVA, transformer was installed.

220kV Raymond S/s is supplying power to Urban & MIDC load of Igatpuri & Nashik Taluka. The maximum load has reached almost 70% of its capacity. 220kV Raymond S/s is critical S/s in Nashik Ring main as it is supplying power to Nashik ring main through 132kV line. In case of tripping/outage/interruption of existing 01 No. of 25MVA T/F, load on all 33kV feeders get affected i.e. the Substation does not meet the (N-1) criteria.

**After detailed deliberation and discussion, the committee recommended the above proposal of providing additional 25 MVA, 220/33 kV T/F along with HV & LV Bays at 220kV Raymond S/s under EHV (O&M) Circle, Nashik for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 44:**

**Replacement of 3X50MVA, 220/22kV T/Fs by 3X80MVA, 220/22kV T/Fs alongwith 3nos. of LV incomer bay equipment at 220kV Telco S/s under Pune zone.**

MSETCL representative explained that 220kV Telco S/s is geographically located in the heart of Pimpri Chinchwad and supplying the power to MIDC and fast growing Urban load. Space is not available for additional T/F. All the three T/Fs are very old (repaired) and loaded more than 70%. It is difficult to manage the load in case of tripping/outage of any one of the transformer i.e. **the substation does not fulfils N-1 criteria.** The proposed scheme fulfills P-1 criteria of augmentation scheme. At present, load is managed by diverting the load on other nearby substation i.e. 220kV Bhosari-1 S/s, 220kV Bhosari-2 S/s & 220kV Chinchwad-1 S/s.

In view of above, it is proposed to replace 2X50MVA, 220/22kV T/Fs by 2X100MVA, 220/22kV T/Fs at 220kV Telco S/s.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of 3X50MVA, 220/22kV T/Fs by 3X80MVA, 220/22kV T/Fs alongwith 3nos. of LV incomer bay equipment at 220kV Telco S/s for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 45:**

**Addition of 1X50MVA, 132/33kV T/F along with HV & LV bays at 132kV Sanaswadi S/s. under Pune zone.**

MSETCL representative explained that at 132kV Sanaswadi S/S presently 1X50MVA, 132/22kV T/F and 1X50 MVA, 132/33kV T/F are in service and the work of addition of 1X50 MVA, 132/22kV T/F is in progress. Both 22kV & 33kV levels have single T/F which runs independently. As such, there is no redundancy for both the T/Fs.

The Maximum Load reached on 50 MVA, 132/33kV T/F is 35.11 MVA (i.e. 70.22%) in the year 2020-21. It is difficult to manage the 33kV load in case of tripping/outage on 50MVA, 132/33kV transformer i.e. **the substation does not fulfils N-1 criteria.**

In view of above, it is proposed for addition of 1X50MVA, 132/33kV T/F at 132kV Sanaswadi S/s.

**After detailed deliberation and discussion, the committee recommended the above proposal of addition of 1X50MVA, 132/33kV T/F along with HV & LV bays at 132kV Sanaswadi S/s. under Pune zone for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 46:**

**Replacement of 2X25MVA, 220/33kV T/Fs by 2X50MVA, 220/33kV T/Fs at 220kV Vairag S/s. under Pune zone.**

MSETCL representative informed that 220kV Vairag S/S has installed capacity of 50MVA which includes 2X25 MVA, 220/33kV T/Fs and feeds most of the load of Barshi, Madha & North Solapur Taluka. The average load on both the T/Fs has reached about 85% of its capacity. LIS load of 5 MW is proposed by irrigation department at Darfal and 33/11kV Substation is proposed under INFRA –II Plan in the vicinity of 220kV Vairag Substation. It is difficult to manage the load in case of tripping/outage of any one of the transformer i.e. **the substation does not fulfils N-1 criteria.**

In view of above, it is proposed for replacement of 2X25MVA, 220/33 kV T/Fs by 2X50MVA, 220/33 kV T/Fs at 220kV Vairag S/S.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of 2X25MVA, 220/33kV T/Fs by 2X50MVA, 220/33kV T/Fs at 220kV Vairag S/s. under Pune zone for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 47:**

**Replacement of 1X25MVA, 220/33kV T/F by 1X50MVA, 220/33kV T/F at 220kV Bhigwan S/s under Pune zone.**

MSETCL representative informed that 220kV Bhigwan S/S has installed capacity of 75MVA which includes 1X50MVA, 220/33 kV T/F and 1X25MVA, 220/33 kV T/F. This substation is supplying load of part of Indapur & Daund Taluka of Pune District. Maximum load reached on 50MVA T/F is 37.20MVA (74.40%) and on 25MVA T/F is 20.09MVA (80.34%) in the year 2019-20. In case of tripping/outage on 50MVA T/F, the load can't be managed on 25MVA T/F. i.e. **the substation does not fulfils N-1 criteria.** Also, it is not possible to divert the load on nearby EHV S/s or on MSEDCL S/s. Also space is not available for installation of additional transformer.

In view of above, it is proposed for replacement of 1X25MVA, 220/33 KV T/F by 1X50MVA, 220/33 KV T/F at 220kV Bhigwan S/S.

**After detailed deliberation and discussion, the committee recommended the above proposal of Replacement of 1X25MVA, 220/33kV T/F by 1X50MVA, 220/33kV T/F at 220kV Bhigwan S/s under Pune zone for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**



#### **Agenda Point No. 48:**

##### **Replacement of 1X100MVA 220/132kV ICT by 1X200MVA 220/132kV ICT at 220kV Jeur S/s under Pune Zone.**

MSETCL representative informed that this substation is supplying power to 70% Agricultural and 30 % rural of Karmala, Madha & Karjat Taluka. The peak load of the S/s has reached 70% of its capacity in the FY 2019-20 and have average peak loading more than 50%. It is difficult to manage the load in case of tripping/ou tage of any one of the transformer i.e. substation does not fulfils N-1 criteria.

Traction S/s has been commissioned at 132KV Parewadi S/s & 132kV Kurduwadi S/s on 19.08.2020 & 02.03.2021 respectively which are being fed from 220KV Jeur S/s. In view of above, replacement of existing 1X100MVA, 220/132kV ICT by 1X200MVA, 220/132kV ICT is proposed at 220kV Jeur S/s.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of 1X100MVA 220/132kV ICT by 1X200MVA 220/132kV ICT at 220kV Jeur S/s under Pune Zone for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 49:**

##### **Replacement of existing 0.5 ACSR conductor with suitable HTLS conductor of 400KV Chandrapur GCR-I Chandrapur-II Ckt I&II under HVDC TL O&M Division Chandrapur.**

MSETCL representative informed that proposal for LILO arrangement of 400kV GCR - Bhadrawati Ckt III & IV (PGCIL) at 400kV Chandrapur 2 substation is approved by Corporate Office. The said work of LILO arrangement might take considerable time as the work can be carried out only after the receipt of approval from PGCIL and it was asked to explore the possibility for converting the existing twin conductor line into quad conductor.

However, converting existing twin conductor lines into quad conductor line will increase overall weight of conductor and existing towers may not be able to bear said increased conductor weight. Hence replacing the existing twin 0.5ACSR Moose conductor with twin HTLS conductor seems to be best suitable.

As per directives of CMD PGCIL, the meeting between CTU, STU & CEA was held at CEA office on 04.02.2022 to carry out joint studies for the interim arrangement for 400kV Wardha PG Bypass.

As per the said MOM, in the interim case suggested by CTU, one single circuit of 400kV Warora(PG) & 400KV Warora MSETCL line was terminated from 400kV Wardha(PG) to form 400KV Warora(G) to Warora MSETCL line. In the interim case the 400kV Chandrapur-I, to Chandrapur-II line flows are reaching the critical limits and any contingency on these lines May not satisfy the N-1 contingency / reliability criteria. Further, CEA has suggested that 400kV Chandrapur-I - Chandrapur-II lines being short distance lines, the up gradation of these lines to HTLS conversion can be taken up by MSETCL.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of existing 0.5 ACSR conductor with suitable HTLS conductor of 400KV Chandrapur GCR-I Chandrapur-II Ckt I&II under HVDC TL O&M Division Chandrapur for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda Point No. 50:**

**Scheme for strengthening of 220kV GIS Bhandup-Mulund, 220kV GIS Bhandup-Borivali line bays and Bus coupler bay & providing one additional 220kV spare bay at 220kV GIS Bhandup Substation under EHV(O&M) Dn., Bhandup under jurisdiction of EHV(O&M) Circle, Kalwa.**

MSETCL representative informed that the 220kV GIS Bhandup substation was commissioned on 30.11.2011. The substation is having 02 nos. of 220kV Lines i.e. Bhandup – Mulund line & Bhandup - Borivali line and 04 nos. of 50MVA 220/22kV Transformer. The 220kV Gas Insulated Switchyard is manufactured by M/s PINGGAO GROUP HIGH VOLTAGE SWITCHGEAR CO. LTD P. R. CHINA. This GIS Bhandup S/Stn is supplying the power to major Mumbai central suburban areas. The original 220kV Kalwa Borivali Line has been made LILO at Mulund and GIS Bhandup substation. The LILO part for 220kV Bhandup GIS S/s is constructed using cable. The entire corridor from 220kV Kalwa to 220kV Borivali is already converted to higher capacity by using 520 Sq, mm AAAC twin conductor **except this LILO part of Cable.**

Now the bay strengthening part at GIS Bhandup end Bays (Mulund & Borivali Line) and Cable portion is required to be completed so that the entire corridor can be utilized to higher capacity (i.e. 1600A per circuit)

After completion of this scheme, the cable part of LILO portion of 220kV GIS Bhandup Substation will be proposed for strengthening to 1600Amp in another scheme.

Further, Dir(Finance) has already given the directives regarding completion of both these works in coordinated & time bound manner to avoid idling of asset.

**After detailed deliberation and discussion, the committee recommended the above proposal of Scheme for strengthening of 220kV GIS Bhandup-Mulund, 220kV GIS Bhandup-Borivali line bays and Bus coupler bay & providing one additional 220kV spare bay at 220kV GIS Bhandup Substation under EHV(O&M) Dn., Bhandup under jurisdiction of EHV(O&M) Circle, Kalwa for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda Point No. 51:**

**Replacement of old 0.35 ACSR Sheep Conductor with new 0.4 ACSR Zebra conductor and existing suspension tower with 30° Cut point towers of 220kV Kandurgaon-ONGC-Vilebhagad- Topworth D/C line under jurisdiction of EHV (O&M) Panvel & Mahad**

**divisions and Height raising by new D/C narrow base tower from Loc.No. 637 to 647 in Vichumbe & New Panvel area of 220kV Kandurgaon-ONGC-Vilebhagad - Topworth D/C line under jurisdiction of EHV (O&M) Division Panvel under EHV (O&M) Circle, Panvel.**

MSETCL representative informed that 220KV ONGC – Kandurgaon – Topworth – Vilebhagad - Kharghar D/C Lines are commissioned way back in the year 1962 and thus in service for more than 59 years. These lines are passing through heavy industrial pollution zone, Heavy Rainfall area of Konkan & Raighad District, creek area having high corrosive and deteriorated effect.

However now due to ageing effect they are vulnerable to frequent breakdowns & need heavy attention and maintenance. The tower members and foundation these lines have already rendered the services more than 50 years.

As per IS-13311 Part 1 & 2, IS-456:2000 & IS-516-1959 the strength evaluation survey (Structural Stability) of existing foundation & tower member is recently carried out. Accordingly, evaluation survey (NDT) reports the Rebound Hammer test in “Poor” & Ultrasonic Pulse Velocity test is “Doubtful, which means that the strength of the concrete is less than desired strength of M-20 i.e. 20 N/sqmm.

Further the testing of existing 0.35 ACSR sheep conductor was carried out on 02.12.2016. The results of DC resistance, breaking load for single strands, torsion & galvanizing tests were not found satisfactory. Hence it was recommended to replace the existing conductor of these lines.

It was observed that the No. of cut point towers in total line is very less. Cut points are erected after 15 to 20 suspension towers. After aging of nearly 55 years, it is very risky to work on such highly loaded cut point towers.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of old 0.35 ACSR Sheep Conductor with new 0.4 ACSR Zebra conductor and existing suspension tower with 30° Cut point towers of 220kV Kandurgaon-ONGC-Vilebhagad- Topworth D/C line under jurisdiction of EHV (O&M) Panvel & Mahad divisions and Height raising by new D/C narrow base tower from Loc.No. 637 to 647 in Vichumbe & New Panvel area of 220kV Kandurgaon-ONGC-Vilebhagad - Topworth D/C line under jurisdiction of EHV (O&M) Division Panvel under EHV (O&M) Circle, Panvel for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No.52:**

**Replacement of existing 0.2 ACSR Panther conductor by equivalent CCC type HTLS conductor along with necessary hardwares of 132 kV Malinagar - Bawada Trunk Line under EHV O&M Division, Baramati under Pune zone.**

MSETCL representative informed that earlier, the scheme for replacement of existing 0.2 ACSR Panther conductor by HTLS conductor along with necessary hardware of 132 kV Malinagar - Bawada line was referred to STU in the year 2018. STU had suggested to carry out the following works on top priority so as to relieve the loading on 132kV Malinagar-Bawada line:

- a) Bay work at 400k V Jejuri S/s so as to take 3x167 MVA. 400/220kV ICT in service.
- b) Tap to LILO conversion a Purandwade S/s and using Split Bus Arrangement.
- c) LILO of 132kV Indapur - Uiani line at 220k V Loni Deokar S/s.
- d) 132 kV link line from 220k V Walchandnagar to Bawada.

As per the present scenario, the load of Bawada, Indapur Ujani backwater and partly load of Malshiras Taluka is fed by 132 kV Bawada substation. At Ambient temperature 45 degree the maximum permissible load handled by this conductor is 398 Amp. Due to development, the load of these area is increasing. The load on line normally crosses 445-450 Amps. Further at 132 kV Walchandnagar substation, Circuit Breaker of 132 kV Nira Bhima bay is normally kept open. Also, the total load of 132 kV Bawada s/s (having 2X25 MVA 132/22 kV T/Fs upgradation to 50 MVA of both transformer making 100 MVA capacity was proposed in the year 2017-18) is fed from 132 kV Malinagar-Bawada-Nira Bhima-Purundawade line radially.

Hence, after up gradation of transformers at 132kV Bawada substation, the total load cannot be catered by the existing 132 kV Malinagar- Bawada line. Since from last few years the line is getting overloaded frequently. On dt. 07.04.2021 & 08.04.2021 the Load trimming scheme (LTS) was also operated.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of existing 0.2 ACSR Panther conductor by equivalent CCC type HTLS conductor along with necessary hardware of 132 kV Malinagar - Bawada Trunk Line under EHV O&M Division, Baramati under Pune zone for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No. 53:**

**Replacement of existing 0.2 ACSR Panther conductor by new CCC type HTLS conductor & allied work thereof for 132kV Magarpatta-Mundhwa EHV lines & required bay strengthening work thereof at respective EHV S/s under EHV O&M Division-I, Pune.**

MSETCL representative informed that the 220 kV Magarpatta ss is the only main source feeding 132 kV Mundhawa ss. 132 kV Mundhawa ss feeds EHV Consumer M/s Bharat Forge & Kalyani Carpenter ( M/S Sarloha) and Industrial feeder of 22 kV.

The capacity of both the Ckts between 220/132 k V Magarpatta ss to 132 kV Mundhawass is not sufficient to sustain the load in case of any tripping of any one of the Ckts because of any reason such as breaking of jumper/ breaking of conductor/ cyclone situation or otherwise, which results in failure of supply to M/S Bharat Forge, Kalyani etc.. , due to overloading. On 09.06.2019, the load on 132 kV Magarpatta- Mundhawa Ckt-I & Ckt-II was reached up to 395 A & 417 A respectively. Total load on both the circuits was around 812 A.

Hence the same could not be managed on one circuit. Also due to the same N-1 criteria does not get fulfilled. Further, during fault on 25.12.2020, due to tripping on Ckt II, the Ckt -I was also tripped on overload.Hence it is necessary to replace existing conductor of line between 220/132 kV Magarpatta ss to 132 kV Mundhawa ss ckt I & II by HTLS conductor.

**After detailed deliberation and discussion, the committee recommended the above proposal of replacement of existing 0.2 ACSR Panther conductor by new CCC type HTLS conductor & allied work thereof for 132kV Magarpatta-Mundhwa EHV lines & required bay strengthening work thereof at respective EHV S/s under EHV O&M Division-I, Pune for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

**Agenda Point No. 54:**

**Replacement of existing 0.2 ACSR Panther Conductor with 273.6 sq. mm CCC HTLS Casablanca conductor of 100kV Pal Dombivali line no 1&2 under EHV (O&M) Division, Dombivali, EHV (O&M) Circle Panvel.**

MSETCL representative informed that 100kV Pal Dombivali 1 and 2 lines are rendering supply to important residential and industrial areas of Dombivali, Kalyan. The peak load on this line is more than 80 % of the rated capacity of 0.2 ACSR Panther conductor.

100kV Pal- Dombivali line no 1 & 2 were commissioned in the year 1988. These lines are in service since last 34 years. These lines are passing through heavy industrial pollution Zone of MIDC, which are having high corrosive effect. Moreover, due to humid atmosphere of Dombivali, Kalyan area these lines are getting deteriorated day by day.

These lines also don't satisfy the N-1 criteria of load sharing i.e., in case of tripping of one line, may cause tripping of the other line due to over load. In case of tripping of one-line major load gets affected at 100KV Dombivali S/s.

**After detailed deliberation and discussion, the committee recommended the above proposal for replacement of existing 0.2 ACSR Panther Conductor with 273.6 sq. mm CCC HTLS Casablanca conductor of 100kV Pal Dombivali line no 1&2 under EHV (O&M) Division, Dombivali, EHV (O&M) Circle Panvel for further discussion & their recommendations.**

**Agenda Point No. 55:**

**Establishment of 220 kV Yenwa s/s Dist-Nagpur.**

SE (Schemes), MSETCL placed before the MTC a proposal for establishment of 220 kV Yenwa s/s Dist-Nagpur.

Scope of work includes:

- 1) 220 kV DC line by making LILO on 220 kV Kalmeshwar-Warud line at 220 kV proposed Yenwa s/s – 0.5 km
- 2) 50 MVA, 220/33 kV Transformer with bays-2 nos.
- 3) 220 kV line bay – 02 nos.(at prop.220 kV Yenwa S/s)
- 4) 33 kV outlet – 08 nos

5) 33 kV, 5 MVAR Capacitor bank- 02 nos.

SE (Schemes), MSETCL explained that presently the Katol Taluka is fed from 132/33 kV Katol SS & 132/33 kV Bharsingi ss. At present, the area in the vicinity of Yenwa fed from 33 kV Sawargaon feeder originating from 132 kV Katol S/stn having installed capacity of 132/33 kV 3x25 MVA power T/fs i.e. 75 MVA. Some of the 33 kV feeders are lengthy & there is low voltage problem. To resolve low voltage problem, 220/33 kV Yenwa S/stn is proposed.

After establishment of 220/33 kV Yenwa s/stn the length of 33 kV feeders will reduce leading to improvement in voltage regulation.

**After detailed deliberation and discussion, the committee recommended the above proposal of establishment of 220 kV Yenwa s/s Dist-Nagpur for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

### **Agenda Point No. 56:**

#### **Establishment of 132 kV Karajgaon s/s Dist-Amravati.**

SE (Schemes), MSETCL placed before the MTC a proposal for **establishment of 1320 kV Karajgaon s/s Dist-Amravati.**

Scope of work includes:

- 1) Construction of 132 kV DC line by making LILO on 132 kV Chandur bazar- Achalpur line – 18.1 kms
- 2) 25 MVA, 132/33 kV transformer with bays – 02 nos.
- 3) 132 kV line bay – 02 nos.
- 4) 33 kV outlet – 6 nos. (Outlets to be constructed as per requirement of MSEDCL)
- 5) 132kV, 15 MVAR capacitor bank – 1 no.

SE (Schemes), MSETCL explained deeply that presently, the power supply of Chandur Bazar taluka is fed from 02 nos. of EHV substations viz. namely 132kV Chandur bazar s/s & 132 kV Achalpur s/s

➤ Details are given below

<b>Name of EHV s/s</b>	<b>Installed capacity in MVA</b>	<b>Max. load in MVA</b>	<b>No. of 33 kV s/stns connected</b>	<b>Installed capacity of 33kV s/stns in MVA</b>
132kV Chandur bazar	2x25 MVA	45.8	Existing -12 nos & Proposed -3 nos	Existing- 126.30 Proposed- 15
132 kV Achalpur	3x25MVA	51.5	Existing -10 nos & Proposed -5 nos	Existing- 108.15 Proposed- 5

Existing capacity of 132 kV Chandur Bazar s/s is insufficient to meet the current and future demand. Also, it is not geographically and technically viable to make connectivity of 33/11 kV substations under Chandur Bazar taluka area to adjacent EHV substation.

The length of 33 kV Narsary (Kharpi) feeder emanating from 132/33 kV Achalpur s/s is 24 kms and voltage regulation on this lengthy feeder is 36.42 %.

Voltage regulation of 33 kV Sarfapur is 54%. Also, the length of 33 kV Jawala (Tondgaon) feeder emanating from 132kV Chandur bazar s/s is 24 kms and voltage regulation on this lengthy feeder is 32.95 %. Due to this, the consumers at the far end are facing very low voltage problems.

He stated that establishment of **132 kV Karajgaon s/s** will provide following benefits:

- The length of 33kV feeders will be reduced leading to improvement of voltage regulation at DISCOM interface.
- To give load relief to existing 132 kV Chandur bazar & 132kV Achalpur s/stns.
- To cope up the forthcoming load of growing Agricultural sector.
- Reliable & quality power supply to the consumer at fag end.

**After detailed deliberation and discussion, the committee recommended the above proposal of establishment of 132 kV Karajgaon s/s Dist-Amravati for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

#### **Agenda Point No.57:**

**Scheme of Design, Supply, Installation and Commissioning of 33kV/22kV/132kV Capacitor banks at various EHV substations under Amravati, Aurangabad, Nashik, Nagpur, Karad and Pune zone under phase-V.**

MSETCL representative informed that Capacitor Banks under Phase-I and Phase-II is completed and Capacitor Banks under Phase-III & Phase-IV are partially completed.

The balance work of installation of Capacitor Banks under Phase-III & Phase-IV is under progress and expected to be completed within six months.

Complete and detailed review of Reactive Power Compensation requirement in respective zone is taken by C.E.s considering various aspects such as low voltage pockets/areas, excessive MVAR drawl on Power Transformer and low voltage at EHV buses under their jurisdiction in consultation and co-ordination with respective TCC & SLDC/ALDC. Accordingly proposal has been submitted by respective Zonal offices.

System study is carried out by STU department for proposed Capacitor Banks and recommended installation of proposed Capacitor Banks in all substations to improve the voltage profile along with load growth and for providing MVAR addressable.

MSETCL representative also stated commissioning of capacitor banks at various EHV establishments will provide following benefits :-

1. Improvement in voltage profile in the area fed by EHV S/s and maintaining voltage within prescribe limit.
2. Adequate MVAR compensation will be ensured.
3. Improvement in power factor & Power Quality.
4. Ampere Loading of the lines feeding the Substations and ampere loading of power transformers of the substations will be reduced.
5. Forced load shedding in event of overloading of Line / transformers will be avoided.
6. The numerous tap changing operations to maintain proper 33 kV bus voltage will be avoided.

**After detailed deliberation and discussion, the committee recommended the above proposal of scheme of Design, Supply, Installation and Commissioning of 33kV/22kV/132kV Capacitor banks at various EHV substations under Amravati, Aurangabad, Nashik, Nagpur, Karad and Pune zone under phase-V for consideration by GCC for inclusion in upcoming 5 year STU transmission plan.**

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

Chairperson –MTC  
Chief Engineer (STU)