11. Transmission system strengthening beyond Kolhapur for export of power from Solar & Wind Energy Zones in Southern Region

11.1. CEA stated that the following transmission system had been agreed in the 2nd SRSCT meeting held on 10.06.2019 for evacuation of power from Solar Energy Zone in Gadag, Karnataka:

Gadag SEZ (2500 MW)

i. Establishment of 400/220 kV, 5x500 MVA Gadag Pooling Station.
ii. Gadag PS-Koppal PS 400 kV (high capacity equivalent to quad moose) D/C Line.
iii. Gadag PS-Narendra (New) PS 400 kV (high capacity equivalent to quad moose) D/C Line.
iv. 220 kV line bays for interconnection of solar projects (8 nos.)
v. 1x125 MVAr (400 kV) bus reactor at Gadag PS.
vi. Upgradation of Narendra (New) to its rated voltage of 765 kV level alongwith 2x1500 MVA transformer and 1x330 MVAr Bus Reactor.
vii. Upgradation of Kolhapur (PG) to its rated voltage of 765 kV level alongwith 2x1500 MVA transformer and 1x330 MVAr Bus Reactor.
viii. Upgradation/charging of Narendra new - Kolhapur (PG) 765 kV D/c line (initially charged at 400 kV) to its rated voltage of 765 kV along with 1x330 MVAr switchable Line Reactor on Kolhapur (PG) end of each circuit.

It was also noted that the proposed system strengthening in the inter-regional corridors and system strengthening beyond Kolhapur in Western region shall require all-India study.

11.2. Further, in the 3rd meeting of NCT held on 20th & 28th January, 2021, it was agreed that Strengthening of Kolhapur (PG) - Kolhapur (MSETCL) 400 kV section may be taken in WRPC(TP) based on the operational constraint reported by POSOCO.

Subsequently, POSOCO vide letter dated 02.02.2021 (Annexure-IX) has intimated that during Dec'20 – Jan'21, the power flow in the Kolhapur (PG) - Kolhapur(MSETCL) 400kV D/c line has been observed very high with 'N-1' non-compliance. NLDC and RLDCs are taking various measures in operations such as reduction in power order of HVDCs toward southern region (Talcher – Kolar, Bhadravati, Raigarh – Pugalur) to relive the loading of Kolhapur (PG) - Kolhapur(MSETCL) 400 kV D/c line.

11.3. System studies were carried out with the following considerations:

i. Scenario: Solar Max (June, 24 Afternoon Peak) with high generations in Narendra complex (Kudgi, Raichur, Bellary, Gadag SEZ & Koppal WEZ)
ii. All India Demand of 235GW considered (against EPS demand of 266GW)
iii. Demand for WR & SR as 73 GW & 56 GW respectively (against 19th EPS demand of 85 GW & 75 GW respectively)
iv. For simulating the worst case scenario:
- 100% Solar Despatch has been considered at Gadag SEZ (2500MW)
- 85% Wind Despatch has been considered at Koppal WEZ (2500MW)
- 90% Thermal Despatch has been considered at Kudgi TPS (3x800MW)

With this, the Net SR Surplus in Solar Max scenario works out to 7800 MW with SR to WR inter-regional flow to the tune of 9300 MW. LGB is shown at Annexure-X.

v. Narendra New existing 765/400kV 2x1500MVA ICTs are seen to be heavily loaded in all study cases. Hence, addl. (3rd) 1x1500MVA, 765/400kV ICT has also been considered at Narendra New S/s. System strengthening, if any, in Southern Region is out of the scope of the present study.

vi. LILO of both circuits of Warora Pool – Parli (PG) 400 kV D/c line at Parli (M) (Implementation by MSETCL) has been considered in studies as agreed in the 2nd WRPC(TP) meeting held on 04.09.2021 and needs to be expedited by MSETCL.

11.4. The following alternatives were studied and the study results are attached as Annexure- XI:

i. Kolhapur (PG) (GIS) - Kolhapur (MH) reconductoring with conductor of min capacity of 2100 MVA at nominal voltage & with Kolhapur 765/400kV 3rd 1500MVA ICT

ii. Kolhapur (PG) (GIS) - Kolhapur (MH) 2nd D/c line with conductor of minimum capacity of 2100 MVA at nominal voltage & with Kolhapur 765/400kV 3rd 1500MVA ICT

iii. Kolhapur (PG) (GIS) - Pune (PG) (GIS) 765 kV D/c line along with Kolhapur (PG) (GIS) - Kolhapur (MH) reconductoring with conductor of min capacity of 2100 MVA at nominal voltage*

iv. Kolhapur (PG) (GIS) - Solapur (PG) 765 kV D/c line along with Kolhapur (PG) (GIS) - Kolhapur (MH) reconductoring with conductor of minimum capacity of 2100 MVA at nominal voltage

v. LILO of Solapur (PG) – Pune (PG) (GIS) 765 kV S/c line at Kolhapur PG along with Kolhapur (PG) (GIS) - Kolhapur (MH) reconductoring with conductor of min capacity of 2100 MVA at nominal voltage*

vi. Narendra New – Solapur (PG) 765kV D/c line along with Kolhapur (PG) (GIS) - Kolhapur (MH) reconductoring with conductor of min capacity of 2100 MVA/Ckt at nominal voltage and with Narendra-Madhugiri-Salem-Tuticorin charged at 400 kV & Narendra New-Kolhapur 765 kV D/c line charged at 400 kV

11.5. CTU stated that Alt- iii is providing an additional path to Pune S/stn which is a load centre.

11.6. CEA stated that Alt-vi is technically feasible and a cost effective option involving Narendra New - Solapur (PG) 765 kV D/c line of appx.150 km. This would avert the need of upgrading Kolhapur to 765 kV level. Also, the losses in case of Alt-vi were observed to be minimum. Further, as far as providing additional path to Pune is concerned, it may be noted that Pune(GIS) is well connected at 765 kV and 400 kV level.

11.7. CTU stated that in case of Alternative vi, with full generation at Kaiga Nuclear Power Plant, there is possibility that Narendra New – Solapur (PG) 765 kV D/c line may become overloaded. Accordingly, before finalizing any alternative, it is suggested to hold a joint study meeting

11.8. POSOCO stated that there is a need to resolve the overloading of Kolhapur (PG) – Kolhapur 400 kV D/c line as the line is currently 'n-1' non-compliant.

11.9. CEA and CTU stated that as re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line is required in all alternatives, accordingly, the same can be agreed to be taken up.

11.10. After detailed deliberations, members agreed for the following:

(i) Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line with conductor of minimum capacity of 2100 MVA/Ckt at nominal voltage along with bay upgradation work at Kolhapur (MSETCL).

(ii) The strengthening requirement beyond Kolhapur other than re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line would be studied in separate joint study meeting with CEA, CTU, WRPC & POSOCO.

9. The relevant extracts of the 5th meeting of the "National Committee on Transmission" (NCT) was held through VC on 25.08.2021 and 02.09.2021 are as follows:

"5.6. Transmission system strengthening beyond Kolhapur for export of power from Solar & Wind Energy Zones in Southern Region- Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line.
5.6.1. CEA stated that in the 4th meeting of NCT held on 20th & 28th January, 2021, it was agreed that Strengthening of Kolhapur (PG) - Kolhapur (MSETCL) 400 kV section may be deliberated in WRPC(TP) meeting based on the operational constraint reported by POSOCO. The issue was deliberated in the 3rd meeting of WRPC(TP) held on 14.06.2021 wherein reconductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line with conductor of minimum capacity of 2100 MVA/Ckt was agreed.
5.6.2. NCT made the following recommendation:

Sl. No	*Name of the scheme*	*Mode of implementation*	*Justification*
1.	*Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line Estimated cost: Rs 54 cr. Implementation timeframe: 15 months from date of issue of MoP OM*	*RTM*	*Remedial measure to overcome operational constraint ('N-1' noncompliance) reported by POSOCO.*

The details of the scheme is given below:

Sl. No	*Name of the scheme*	*Capacity /km*
1.	*Re-conductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line Estimated cost: Rs 54 cr. Implementation timeframe: 15 months from the date of issue of MoP OM*	*Re-conductoring length – 60 km approx. 400 kV bay upgradation- 2 nos.*

"

10. We are of the view that in the instance case, the petitioner carried out the stringing of new conductors on existing towers using the same RoW, and also, the

Petitioner carried out the replacement of terminal bay equipment with high-rating equipment. It is further observed that reconductoring is considered as technical upgradation due to the fact that only replacement of existing conductors is taking place.

11. In the instant case, the Petitioner has replaced the conductors of Kolhapur (PG)- Kolhapur 400 kV D/c line with HTLS conductors and claimed COD of the ckt-1 as 9.03.2023 and ckt-2 as 1.09.2023. The details of the existing transmission line and tariff approval details of the same is as follows:

Name of the transmission line	**COD of the assets considered**	**Petition No under which Tariff is approved.**
400 kV Kolhapur- Mapusa Transmission line Ckt I and Ckt II	Ckt-I of the transmission asset was put under commercial operation on 1.1.2003 and Ckt-II on 1.12.2002	Vide order dated 23.12.2021 in Petition No. 211/TT/2020 has trued-up tariff for 2014-19 and granted tariff for 2019-24 tariff Period.
LILO of 400 kV D/C Kolhapur-Mapusa at 400 kV Kolhapur GIS (New) along with associated bays and 125 MVAR Bus Reactor along with associated bays at 400 kV Kolhapur GIS (New)	12.11.2015	Vide order dated 27.9.2021 in Petition No. 208/TT/2020 has trued-up tariff for 2014-19 and granted tariff for 2019-24 tariff Period.

12. As per the above, it is observed that the petitioner first implemented 400 kV Kolhapur- Mapusa Transmission line in the year 2002/2003, and further LILO of 400 kV Kolhapur- Mapusa Transmission line at the Kolahapur (New) GIS Substation was implemented in the year 2015. The existing 400 kV Kolhapur- Mapusa Transmission line has already completed 21 years, and LILO has completed about 8 years as on 9.3.2023. Regulation 3(73) of 2019 tariff Regulations defines useful life in relation to transmission lines as 35 years. The towers installed in both assets have not completed their useful life, and only their conductor and associated bay equipments have been replaced under the re-conductoring scheme. We observe that the transmission assets covered in the instant Petition are not new assets. Instead, they are reconductoring and upgrading the already existing assets, which are expenses in the nature of Additional

Capitalization in the assets, for which the tariff has already been approved. The Petitioner is, accordingly, directed to claim the capital cost incurred towards the Reconductoring of Kolhapur (PG) – Kolhapur 400 kV D/c line under additional capital expenditure (ACE) under Transmission System associated with System Strengthening-XVII in the Southern Region in Petition No. 208/TT/2020 while filing true-up of tariff for 2019-24 and determination of tariff for 2024-29 Period.

13. Accordingly, we deem it proper to dispose of this Petition and grant liberty to claim the subject assets as Additional Capitalization under the main tariff Petition.

sd/-	**sd/-**	**sd/-**
(Harish Dudani)	**(Ramesh Babu V.)**	**(Jishnu Barua)**
Member	**Member**	**Chairperson**