

REPORT OF THE COMMITTEE REGARDING EVALUATING THE O&M EXPENSES OF KORADI THERMAL POWER STATION (KTPS) (3X660MW) of M/s MSPGCL



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ACKNOWLEDGEMENT

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The Committee expresses deep gratitude to Shri Praveen Gupta, Member (Thermal), CEA & Chairman of the committee for providing necessary guidance and setting up the objectives of the study. The Committee also thanks Shri T. Venkateswarlu (Chief Engineer, TE&TD Division CEA), Shri Gautam Ghosh (Chief Engineer, F&CA Division CEA), Shri R.N. Pujari (Chief General Manager, NTPC), Shri Bashruddin Khan (Chief Engineer, MPPGCL), Shri Deepak Kumar (Chief Engineer, UPRVNL) and Shri S K Lilhore (Addl Chief Engineer, MPPGCL) for sharing their views on various aspects of the O&M expenses, analysis and recommendations for improvements of the O&M practices at KTPS Supercritical Plant.

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ABBREVIATIONS

A&G	Administrative and General Expenses
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CSERC	Chhattisgarh State Electricity Regulatory Commission
CPI	Consumer Price Index
COD	Date of Commercial Operation
ECPL	Energyoptimaa Consultant Pvt Ltd
JP Nigrie	Jayprakash Nigrie Thermal Power plant (2 x 660MW)
KTPS	Koradi Thermal Power Station
L&T Nabha	Nabha Power Ltd (a wholly owned subsidiary of L&T Power Development Limited)
MERC	Maharashtra Electricity Regulatory Commission
MPPGCL	Madhya Pradesh Power Generation Company Limited
MPERC	Madhya Pradesh Electricity Regulatory Commission
MSEDCL	Maharashtra State Electricity Distribution Company Limited
MSPGCL	Maharashtra State Power Generation Company Limited
MYT	Multi Year Tariff
MW	Mega Watt
NTPC	NTPC Ltd (National Thermal Power Corporation Limited)
OEM	Original Equipment Manufacturer
O&M	Operation & Maintenance
PLF	Plant Load Factor
R&M	Repairs and Maintenance Expenses
SERC	State Electricity Regulatory Commission
SOP	Standard Operating Procedure
TE&TD	Thermal Engineering & Technology Development
UPERC	Uttar Pradesh Electricity Regulatory Commission
UPRUVNL	Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited
WPI	Wholesale Price Index

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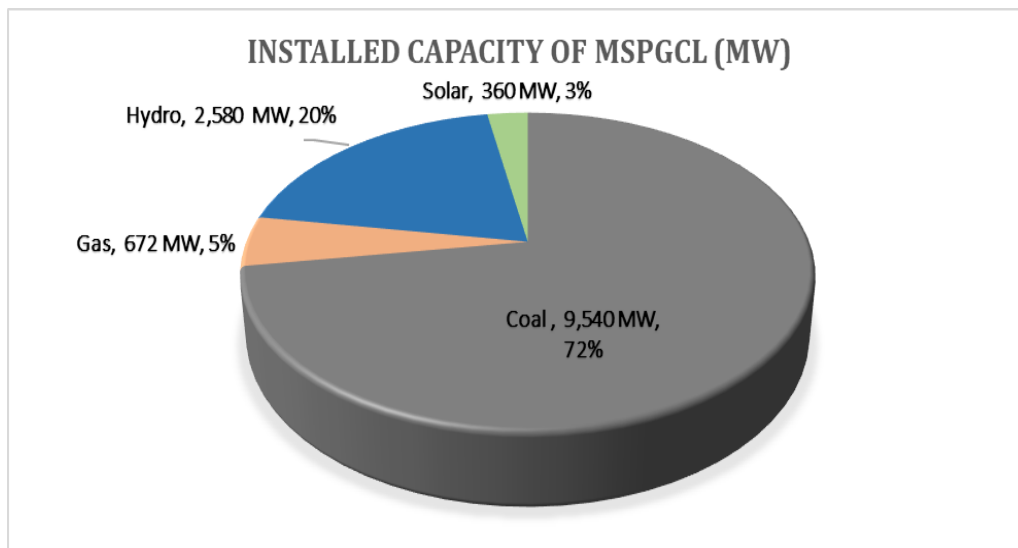
Chapter 1: Introduction

1.1 Background of MSPGCL

1.1.1 Maharashtra State Power Generation Co Ltd. (hereinafter referred to as “MSPGCL” / “MAHAGENCO”) has been incorporated under Indian Companies Act 1956. MSPGCL has been incorporated on 31.5.2005 and has obtained Certificate of Commencement of Business on 15.09.2005. MSPGCL is engaged in the business of generation and supply of Electricity and has been vested with generation assets, interest in property, rights and liabilities of MSEB.

1.1.2 At present, MSPGCL has an installed capacity of 13,152 MW, which comprises of coal based Thermal (nearly 75%, i.e. 9,540 MW) and a gas based generating station at Uran, having an installed capacity of 672 MW. There are 25 hydel projects, having capacity of 2580 MW. Further, it has also commissioned 359.86 MW Solar Power Projects.

Figure 1: Installed Capacity of MSPGCL as on 31 March 2024



1.2 Koradi Thermal Power Station (KTPS) overview

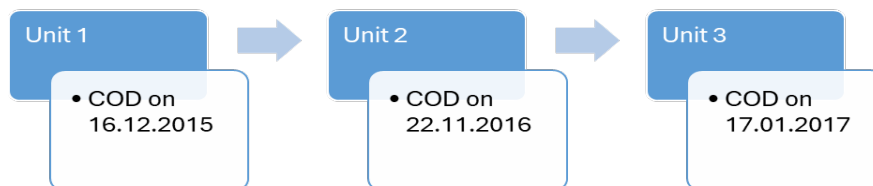
1.2.1 KTPS (2190 MW) operates 4 generating units consisting of 1 sub critical (1 X 210 MW) and 3 supercritical units (3 X 660 MW). KTPS started its operation in 1974 and is one among the nine active power stations operated and maintained by MSPGCL.

1.2.2 MSPGCL's Board, vide Resolution dated 28.01.2008 accorded administrative approval for implementation of 3 x 660 MW (2 x 660 MW Expansion Project and 1

x 660 MW Replacement Project) super-critical Units at Koradi TPS.

1.2.3 The COD details of the three units of KTPS are given below:

Figure 2: COD of Supercritical units at KTPS



1.2.4 KTPS operates its sub-critical and super critical units separately i.e the operational and administrative staff of supercritical units are completely different than old subcritical unit.

The detailed Technical Parameters of KTPS Supercritical Plant are given below:

Table 1: Main Plant technical specifications of supercritical units at KTPS

SN	Auxiliary Name	Unit	Specification & Details
1	Boiler	1	Mitsubishi Sliding Pressure Operation Once Through Supercritical Radiant Reheat Type Boiler, Make: - L&T-MHI Boilers Private Limited. Combustion Chamber Volume: - 19080 m ³
2	Turbine	1	TC4F Condensing Reheat Turbine Make: - Mitsubishi Heavy Industries, Ltd / LMTG MS. Temp.: - 565 deg. C, MS. Pressure: - 247 Kg/Cm ²
3	Coal Mill	6	Bowl Mill, Make: - L&T - Pulveriser Product Group, Model No: - MVM 32R. Design capacity: - 102 TPH Capacity: -1050 KW
4	CEP	3	Make: CGL Capacity: -1050 KW
5	MDBFP	1	Barrel Casing Multistage Make: - Clyde Union, Model No.: - FK6E33 Capacity: -8800 KW
6	TDBFP	2	Barrel Casing Multistage Make: - Clyde Union, Model No.: - FK6E40
7	APH	2	Rotary Regenerative Tri sector APH Make: - L&T Howden JV Model No.: - 33 VNT 1680
8	ID Fan	2	Variac axial Fan (Single Stage) Make: - L&T-Howden Capacity: -4600 KW
9	FD Fan	2	Variac axial Fan (Single Stage)

SN	Auxiliary Name	Unit	Specification & Details
			Make: - L&T-Howden Capacity: -1910 KW
10	PA Fan	2	Variac axial Fan (Two Stage) Make: - L&T-Howden
11	CW Motor	2	Make: - FLOWSERVE, Model No: - BCVI 175, Capacity: -3850 KW

1.3 Regulatory Principles

1.3.1 MSPGCL supplies to Maharashtra State Distribution Company Limited (MSEDCL), through a long term PPA dated 01.04.2009 for all its thermal, gas and hydro power generating units. While supplying all of its power to MSEDCL, the MSPGCL plants are considered as regulated plants under section 62 of the Electricity Act 2003 and have to adhere the prevailing tariff regulations and principles as specified by Hon'ble MERC. **MSPGCL is allowed to claim the expenses as per section 62 of the Electricity Act 2003 (on Cost-plus basis) subject to prudence check by Hon'ble MERC and norms specified in the MYT Tariff Regulations, as amended from time to time.**

1.3.2 The Hon'ble MERC determines the tariff of individual generating stations of MSPGCL in accordance with MERC MYT Regulations. MSPGCL is entitled to recover their prudently incurred expenses as approved by the Hon'ble MERC.

1.4 Issues regarding impact of O&M Norms on MSPGCL

1.4.1 MSPGCL informed CEA that post COD of its 3x660 MW supercritical plant in Jan 2017, KTPS was incurring significantly higher O & M expenses compared to the expenses allowed as per the norms specified by the Hon'ble MERC.

1.4.2 Further, MSPGCL stated that in the recent Mid-Term Review Order, dated 31.03.2023, the Hon'ble MERC has carried out the True-up of FY 2019-20 to FY 2021-22 where the MSPGCL has claimed the actual audited expenses. **The Variance of normative O&M expenses with the actual expenses along with the under recovery is outlined in the following table:**

Table 2: Financial Impact on KTPS due to under recovery of O&M Expenses

Financial Year	Normative O&M Expense for Koradi TPS (# 8 to 10) – 1980 MW	Actual O&M Expenses of Koradi TPS (# 8 to 10) – 1980 MW	Under recovery of O&M Cost
Rs. in Crores			
FY 2019-20*	310.83	408.53	97.70

Financial Year	Normative O&M Expense for Koradi TPS (# 8 to 10) – 1980 MW	Actual O&M Expenses of Koradi TPS (# 8 to 10) – 1980 MW	Under recovery of O&M Cost
FY 2020-21	296.80	327.19	30.39
FY 2021-22	307.49	414.94	107.45
Total	915.12	1150.66	235.54

**- As per MYT Regulations 2015*

- 1.4.3 MSPGCL highlighted that it has incurred a loss of Rs 235.54 Crore while comparing the actual audited O&M expenses vis-à-vis normative allowable O&M expenses under various Tariff orders issued under MERC MYT Regulations for two control periods (i.e. First control period is FY 2016-17 to FY 2019-20 and Second Control Period as FY 20-21 to FY 2024-25). MSPGCL raised concern that such burgeoning disallowances has raised a grave financial concern for the MSPGCL management, which is already struggling with increasing working capital loss burden due to under-recovery of revenue.
- 1.4.4 MSPGCL approached Central Electricity Authority (CEA) (copy given at Annexure 1.1) to evaluate and analyse O&M expenses and practices of KTPS supercritical units. Further, MSPGCL requested CEA that it may also recommend improvement of O&M practices if they are in deviance with other generating stations across the country.

1.5 Formation of Committee under CEA to Review O&M Expenses and Practices of KTPS

- 1.5.1 MSPGCL informed that they had invited suggestions/observations from various organisations and appointed them as technical consultant to evaluate the O&M practices at KTPS and to see whether their practices are at par with supercritical plants of other generating stations across the country.
- 1.5.2 MSPGCL informed that they have **internally investigated the prudence** of the expenses and normative variation leading to such losses and **found it prudent and justified**. However, MSPGCL was willing to explore unprejudiced view on the same and therefore is **willing for undertaking the evaluation of O&M expenses by a third-party**. MSPGCL wish that the third party along with prudence check of the O&M expenses also undertake analysis of existing practices and benchmarking against the expenses incurred by similarly placed generating units and norms specified by the respective regulators.
- 1.5.3 Accordingly, MSPGCL approached CEA to evaluate and analyse O&M expenses and practices of KTPS supercritical units and also to recommend improvement of O&M practices.

1.5.4 Subsequently CEA inquired (copy given at **Annexure 1.2**) the details of O&M expenses from date of COD and sought for the reasons of higher actual O&M expenses. MSPGCL submitted its response on queries raised by CEA (copy given at **Annexure 1.3**).

1.5.5 Accordingly, CEA constituted a Committee under the Chairmanship of Member (Thermal), CEA vide OM dated 24.01.2024 (copy given at Annexure 1.4). The composition of the committee is as under:

- | | |
|---------------------------------|--|
| i. Member (Thermal), CEA | – Chairman of the Committee |
| ii. Chief Engineer (TE&TD), CEA | – Member |
| iii. Chief Engineer (F&CA), CEA | – Member |
| iv. Representative from NTPC | – Member (GM/ED level) |
| v. Representative from UPRUVNL | – Member (Chief Engineer level) |
| vi. Representative from MPPGCL | – Member (Chief Engineer level) |
| vii. Representative from MSPGCL | – Member Convener (Chief Engineer level) |

1.5.6 The Committee was also authorized to co-opt any other Member. **The terms of reference of the Committee were as follows:**

- To analyse/evaluate the O&M expenses of KTPS of MSPGCL.
- To analyse the existing O&M practices followed at KTPS and to suggest M/s MSPGCL the best O&M practices to be followed.

1.5.7 Accordingly, based on the nominations received from the members, the **composition of the Committee** stood as hereunder:

- | | |
|--|------------------|
| a. Sh. Praveen Gupta, Member (Thermal), CEA | - Chairman |
| b. Shri T Venkateswarlu, Chief Engineer, TE&TD Division, CEA | - Member |
| c. Shri Gautam Ghosh, Chief Engineer, F&CA Division, CEA | - Member |
| d. Shri R N Pujari, CGM, NTPC | - Member |
| e. Shri Deepak Kumar, Chief Engineer, UPRVUNL | - Member |
| f. Shri Bashruddin Khan, Chief Engineer, MPPGCL | - Member |
| g. Shri Prasanna Kotecha, CE, RCD, MAHAGENCO | -Member Convener |

1.5.8 The First meeting of the Committee was held on **28.02.2024** (Copy of meeting notice is given at **Annexure-1.5**). Member Convener made a presentation (copy given at **Annexure 1.6**) and highlighted the methodology adopted by Hon'ble MERC while formulating the O&M expenses norms for supercritical units and incurred financial loss due to variation between actual O&M expenditure and the normative O&M expenses. Member convener has also explained the efforts made

by MSPGCL so far in identification of the technical gaps by various consultancy organisations and its compliance to make the O&M activities at par with other organisations operating supercritical thermal units. The committee discussed various aspects of the O&M expenses and enquired for further detailed breakup on sub-heads of O&M expenses (copy of the Minutes of Meeting held on 28.02.24 at **Annexure 1.7**).

- 1.5.9 Member Convener shared the required details (copy given at **Annexure 1.8**) for evaluating and analysing the O&M expenses of KTPS. MSPGCL has also provided the sub-head wise breakup of O&M expenses in formats considered for submissions of details of O&M expenses by NTPC to Hon'ble CERC. Further, Member convenor requested the members for site visit required to assess the plant working & records at KTPS.

Chapter 2: O&M Expenses of Koradi TPS

2.1 O&M Expenses of KTPS Supercritical Units

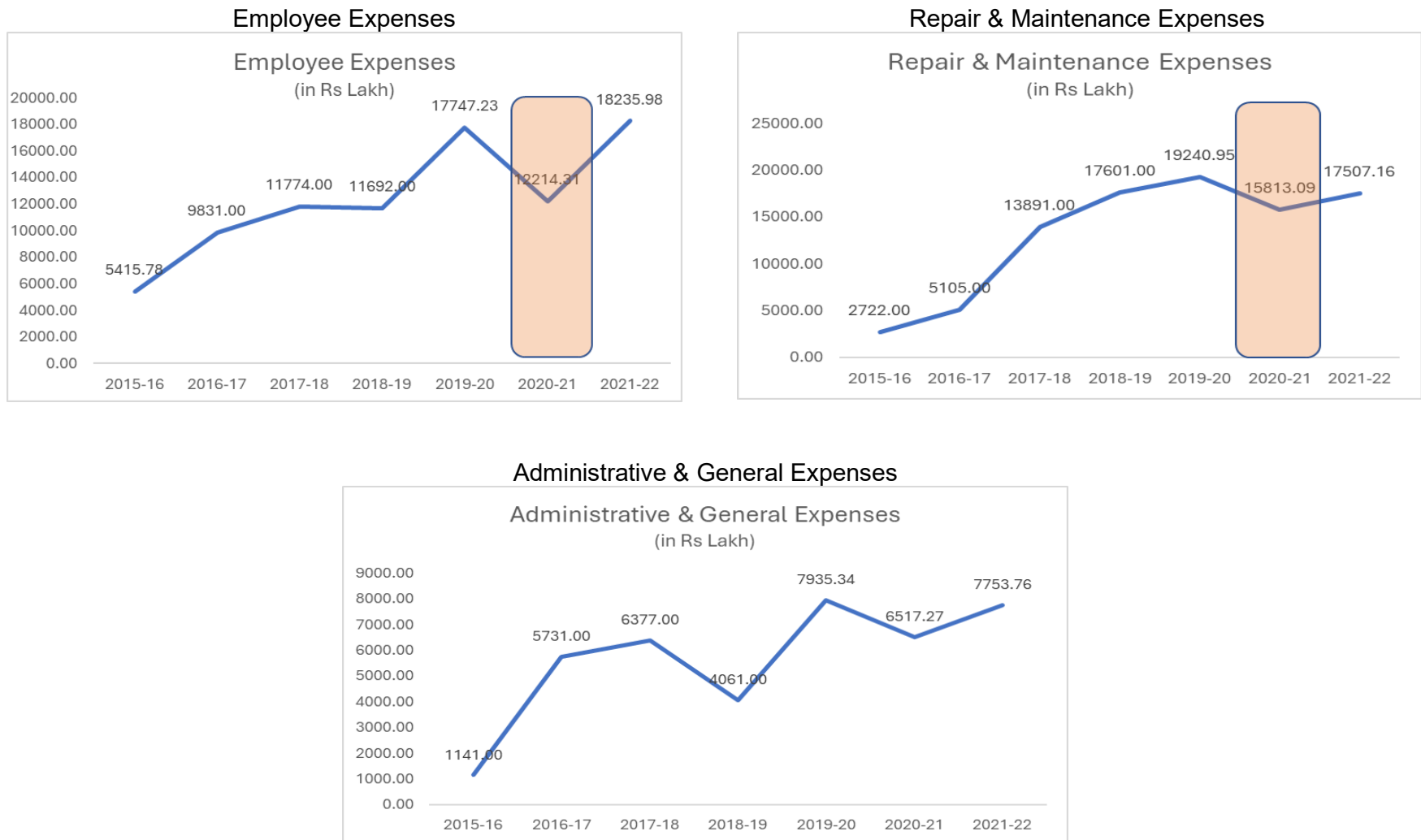
2.1.1 The detailed breakup of O&M expenses for the KTPS plant as provided by MSPGCL is given at **Annexure 2.1**. The summary of O&M expenses post commissioning of the supercritical units of KTPS is as under:

Table 3: O&M expenses of KTPS post COD (Rs. in Crores)

Particular	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Administrative & General Expenses							
Gross Expenses	11.41	57.31	63.77	40.61	79.35	65.17	77.54
Net Administrative & General Expenses	11.41	57.31	63.77	40.61	79.35	65.17	77.54
Repair & Maintenance Expenses							
Gross Expenses	26.96	48.85	135.01	170.67	187.03	154.06	171.98
Shareable Head Office expenses	0.26	2.20	3.90	5.34	5.38	4.07	3.09
Net Repair & Maintenance Expenses	27.22	51.05	138.91	176.01	192.41	158.13	175.07
Employee Expenses							
Gross Expenses	49.39	88.13	100.21	107.50	149.01	122.53	173.56
Shareable Head Office expenses	4.77	10.18	17.53	9.42	28.46	-0.39	8.80
Net Employee Expenses	54.16	98.31	117.74	116.92	177.47	122.14	182.36
Total O&M Expenses	92.79	206.67	320.42	333.54	449.24	345.45	434.97

2.1.2 The Committee has analysed the trend of individual component of O&M for KTPS over the years post commissioning and observed the following trend as shown below:

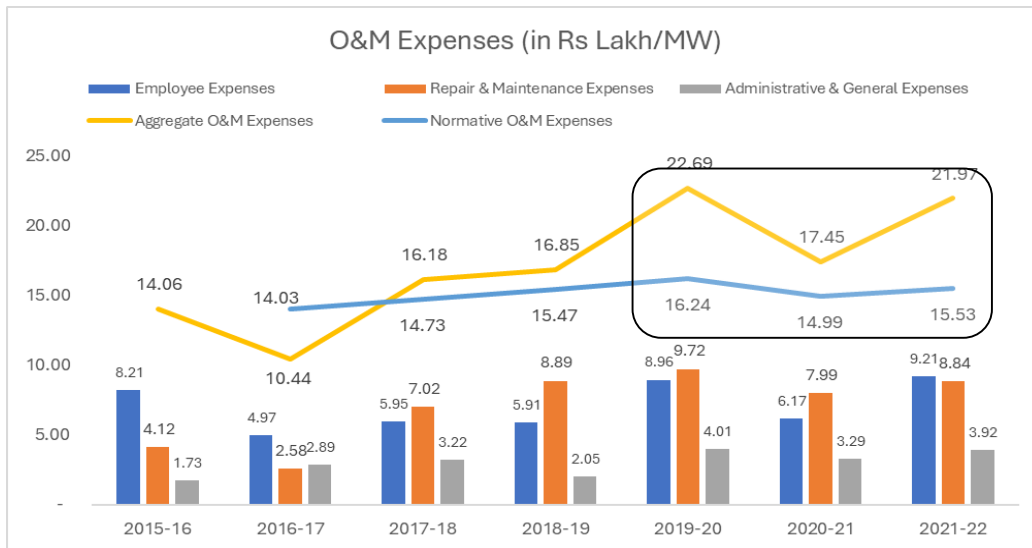
Figure 3: O&M expenses (in Rs Lakh) trend over years



2.1.3 As mentioned earlier, first, second and third super critical units of KTPS were commissioned during FY 2015-16, FY 2016-17 and FY 2016-17 respectively. Hence, true picture of the actual consolidated O&M expenditure will be reflected from FY 2017-18 onwards.

2.1.4 Further, the Comparative representation of MSPGCL's O&M expenses and its breakup vis-à-vis norms applied under the MERC MYT Regulations as provided by MSPGCL are as given below:

Figure 4: O&M expenses (in Rs Lakh/MW) over years

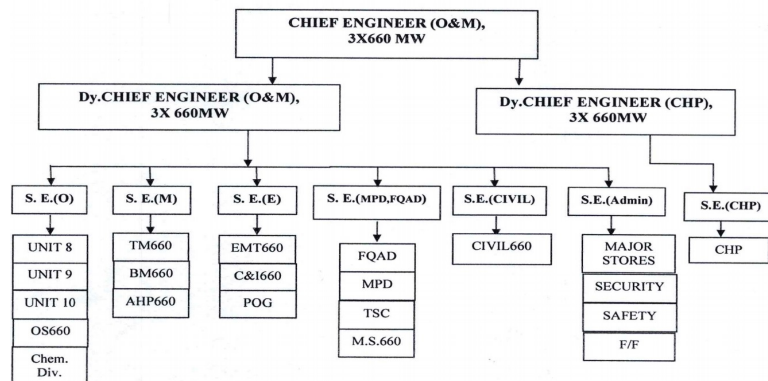


2.2 O&M practices at KTPS Supercritical plant

2.2.1 The operation management of supercritical thermal power plant has been kept separate from the sub-critical unit and hence the above expenses reflect only for super critical units. The operations at supercritical unit of KTPS are carried out as per the following organogram.

Figure 5: KTPS Organisation Chart

KTPS (660 MW) ORGANISATION CHART:



2.2.2 MSPGCL informed that their O & M practices are as per industry standards and documented as per the ISO procedure and regular implementation is ensured

through internal audits. KTPS has developed standard operating procedure protocol for each and every equipment of the plant. Also, there is a special department assigned for quality check and preventive maintenance for the supercritical units. Further, they have religiously adopt the CEGB guidelines for O&M of the supercritical units at KTPS.

2.2.3 The Committee observed that KTPS operates as per prudent practices of plant operation and maintenance. The Committee recorded the submissions of KTPS regarding standard operating practices assigned for operating the supercritical power plants in line with OEM recommendations. All critical equipment in BTG & BOP area are mapped in SAP for preventive maintenance. Auxiliary change over schedule is mapped in SAP. There are series of O&M practices which are done on daily/weekly basis at the plant level, the same is produced as here under:

Figure 6: Key O&M activities and responsibility allocation

Sr. No	Day	Subject	Presented By Section
1	Daily	A. Performance Reports for 3X660 MW units. B. Tripping / Non tripping Events and causes thereof	POG
2	Daily	Short shutdown /Daily Defects of Units	MPD
3	Daily	Review emergency work orders pending more than a Day	All sections
4	Daily	Dry/Wet Ash system performance	AHP
5	Daily	Review equipment nonavailability of main plant, offsites	All sections
6	Daily	Discuss commercial performance	POG
7	Daily	Auxiliary power consumption Review	POG
8	Daily	Discussion on Temperature Excursion	OPERATION
9	Tue	Auxiliary outage more than 15 days review	MPD
10	Wed	Discuss opportunity Loss	All Maint section / Operation
11	Wed	Review of Emission /Effluent status	WTP
12	Thus	Review Protections Not Available/Bypassed	C&I
13	Fri	Conditioning Monitoring Status	CMC
14	Fri	Oil sample analysis Report	WTP
15	Sat	Safety Exception	SAFETY

2.3 O&M practice recommendations by Consulting Organisations

The Committee has queried on probable gap in necessary skillset requirement to operate and maintain supercritical unit by comparing with peer power plant operators like NTPC & L&T Nabha (having 660 MW units which are of similar technology). MSPGCL informed that they have collaborated with noted public and private organisations viz. NTPC, L&T Nabha Power Ltd, JP Nigri for evaluating their existing O&M practices at KTPS. The Committee noted **key suggestions/observations made by the NTPC/Technical consultants appointed by MSPGCL management for evaluating the O&M practices and the actions taken by KTPS.** Few of the observations and action taken by the KTPS on their respective suggestions are summarised in table below:

Table 4: Summary of Observations by technical consultants and action taken

Sr. No.	Observation on O&M activity and/or expense of KTPS	Action taken
1	Field quality Department is a must	KTPS based on its experience has already constituted a Field quality Department in its organisational structure. • Executive Engineer (In-charge), • Add. Ex Engineer. – 1 No. • Assistant Engineer. – 1 No. • Junior Engineer. – 1 No.
2	Knowledge Team (KT) groups should be engaged during overhauls	• During Annual Overhaul (AOH)/Capital Overhaul (COH) KT group are formed comprising of operation staff by assigning various responsibilities. • During Capital Overhaul of U-10 scheduled from 11/07/2023, Co-ordinator team was formed for effective Co-ordination of various overhaul activities.
3	Documents working is to be encouraged with check lists, inspection reports, completion protocols etc.	KTPS do prepare the Checklist. Inspection report and completion protocols are duly signed by the competent authority.
4	Records of DPM agenda is to be maintained	Agenda for DPM is prepared and is conducted as per Agenda in presence of DYCE. Daily attendance and MOM are also recorded in the same register. MOM is being reviewed once in a week.
5	CHP Daily Planning Meeting (DPM) is to be conducted by MTP. This should be attended by in-charge O&M twice a week and CE once a week	CHP DPM is conducted by DYCE CHP and Weekly Review Meeting is conducted by MPD in presence of all maintenance sections and CHP staff in presence of station head and higher officials
6	There should be integrated monitoring and management of coal quantity, quality, blending, water availability, recirculation, ASH disposal for the overall benefit of the station.	Integrated monitoring and management of coal quality, quantity blending, water availability, recirculation, ash disposable is currently not available. However, monitoring is being done separately as below: 1. CHP is monitoring & managing the coal quantity.\ 2. Quality, water availability & recirculation is monitored by water treatment plant. 3. Ash utilisation cell is monitoring the Ash disposal activities. 4. In future system will be developed for integrated management of above

Chapter 3: Analysis of Actual vs Normative O&M expenses

3.1 Approach by Committee

- 3.1.1 The Committee feels that in order to understand whether the O&M expenses are commensurate with prudent O&M practice, there is a need to understand the rationale of specifying the norms for KTPS super-critical units and analyse the actual O&M expenses in accordance with the same. The Committee has undertaken a comparative study of O&M practises and expenses for similarly placed super critical 660 MW units.
- 3.1.2 The Committee attempted to evaluate the process of setting up of the norms to analyze the gap observed between O&M expenses norms specified by MERC vis-à-vis actual expenses incurred by KTPS. Therefore, the Committee did a comprehensive evaluation of methodology for O&M expenses norms for supercritical units by Hon'ble CERC as well as Hon'ble MERC.

3.2 Due-diligence of KTPS O&M expenses

- 3.2.1 The Committee has inquired about the detailed breakup of O&M expenses of KTPS and other regulated utilities for the purpose of item wise comparison of expenses of similar utilities operating supercritical thermal power units across the country.
- 3.2.2 Key observations on each of individual O&M expense item in comparison with actual submitted details¹ of NTPC supercritical units are as below:
- In total there are 75 items under sub-expenses of Repair & maintenance, Employee, and Administrative Expenses within O&M expenses considered in NTPC O&M expense breakup. While MSPGCL has in total 31 items in different expense heads.
 - For the purpose of comparison of super-critical units, the following plants have been considered:

Table 5: Age comparison of different units

Plants	Installed Capacity	Average Age ² of 660 Units as on 31.03.23
Sipat Super Thermal Power Project	2 x 500 + 3 x 660 = 2980 MW	11.34
Barh Thermal Power Plant	3 x 660 + 2 x 660 = 3300 MW	8.75
Tanda Thermal Power Project	2 x 660+ 4 x 110= 1760 MW	2.62
Mauda	2 x 500 + 2 x 660=2320 MW	6.58
Solapur STPP	2 x 660 = 1320 MW	5.04

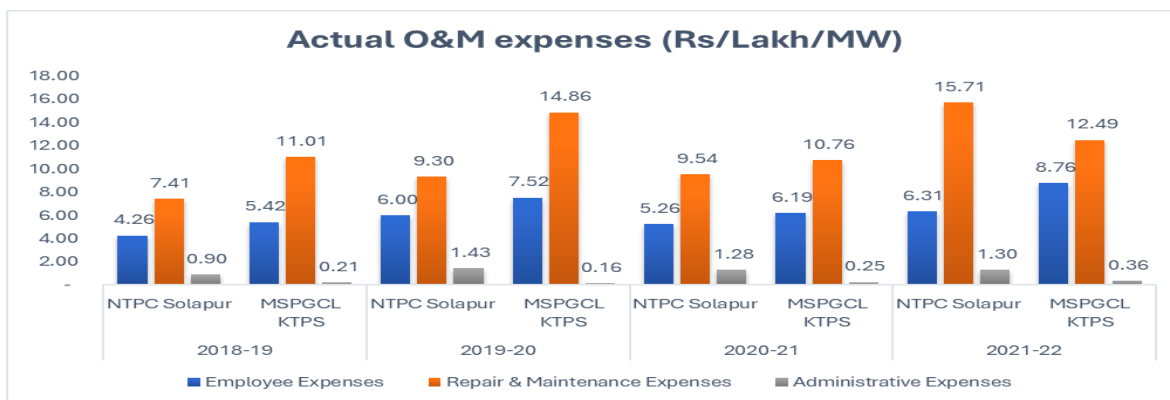
¹ NTPC's CERC Submissions along with Petition for Truing Up

² https://cercind.gov.in/O&M_Data2024.html

Plants	Installed Capacity	Average Age ² of 660 Units as on 31.03.23
Khargone	2 x 660 = 1320 MW	3.08
Koradi Super Thermal Power Station	3 x 660 = 1980 MW	6.62

- The Committee felt that considering the ageing of the plant and configuration of plant, NTPC Solapur and NTPC Mauda were found to be relevant compared to KTPS supercritical plant. However, for Mauda TPS, even though the detailed breakup is available at the website of CERC³, it is difficult to find the segregated O&M expenses details (i.e. breakup of O&M expenses for 660 MW from 500 MW units). The Committee felt that it will not be equitable comparison if such mix of O&M expenses are analysed vis-à-vis O&M expenses for KTPS supercritical units of 660 MW. The Committee also observed that it is not pragmatic to compare the O&M expenses of older supercritical units without considering the ageing factor.
- Accordingly, the Committee felt that taking note of the ageing factor, unit configuration and availability of segregated O&M expenses data for supercritical units, it is rational to consider comparing the O&M expenses of NTPC Solapur with KTPS supercritical units. The fact that both the plants lie in same state and region gives more strength for comparison as various factors contributing to O&M expenses are influenced by local operating conditions.
- The comparative analysis of NTPC Solapur vs MSPGCL KTPS has been done for the three heads of O&M expenses i.e. Employee Expenses, Repair & Maintenance Expenses and Administrative & General (A&G) Expenses, as given below:

Figure 7: O&M expense – NTPC Solapur vs MSPGCL KTPS



³ APPENDIX VIII of Operational Data from Stakeholders for consultation on CERC Tariff Regulations 2024

A. Employee Expenses

- The Committee observed that employee expenses for KTPS are comparatively higher than NTPC Solapur, however, due to lack of information e.g. wage considered for corporate office (contract) employees, pay structure approved by management board vis-à-vis the similar information for NTPC Solapur, it is difficult to decipher the real cause of such variation and thus share comments on the same.
- The Committee has also inquired for the Man/MW ratio details of the KTPS and NTPC Solapur and observed that the Man/MW ratio for KTPS is 0.46 compared to 0.16 for NTPC Solapur. The Committee inquired for reasons for higher Man/MW ratio for KTPS as compared to NTPC Solapur. KTPS provided the summary details as per table herein below:

Table 6: Manpower status at KTPS

3 X 660MW ,KORADI TPS (Gen,O&M)						
Sr. No.	Category	Post sanctioned	Post filled in	To be Relieved	Yet to Join	Resultant Vacancy / Surpluse (3-4+5-6)
1	2	3	4	5	6	7
	Pay Group-I	89	90	1	0	0
	Pay Group-II	239	238	2	5	-2
	Pay Group-III	863	575	4	5	287
	Pay Group-IV	0	1	0	0	-1
	Total	1191	904	7	10	284

- Committee noted that employee expenses and Man/MW ratio of KTPS is higher.
- KTPS further submitted to the Committee that the projected number of employees considered in Detailed Project Report was 800 and at the time of project conceptualisation, there was no benchmark available for 660 MW unit size except the National Electricity Plan-2017, which provides for average Man/MW under categories of Technical and non-Technical and the same was taken as guidance by MSPGCL for KTPS and the same is reproduced below:

Figure 8: Manpower Norm for Thermal Power Plant as per National Electricity Plan 2017

Table 14.3
Norms for Manpower

(Man/MW)			
S No	Particulars	Technical*	Non-Technical*
1	Thermal Generation	0.486	0.144
2	Renewable		
	Solar	0.550	0.165
	Wind	0.321	0.096
	Biomass	0.486	0.144
	Small Hydro	1.341	0.405
3	Hydro Generation	1.341	0.405
4	Nuclear	1.098	0.468
	Power System		
5	Transmission	1 Employee for 18.30 Ckt Km	30% of the Technical Manpower
	Distribution	12 persons per 10MVA(of 33/11kV S/S)	

*Norm for manpower considered is including regular as well as contractual employment. These norms are average of all sizes of generation capacity. However, value changes with plant site and size, higher the plant size lower is the Man/MW ratio. Further Man/MW ratio may further get reduced with increase in level of automation.

- The Committee observed the manpower requirement based on aforementioned methodology and considering the status details provided by KTPS are as below:

Table 7: Manpower requirement scenarios

Particular	UoM	
Project Capacity	MW	1980
Technical		0.486
Non-Technical		0.144
Manpower Requirement as per NEP	Nos	1247.4
Manpower Sanctioned at KTPS	Nos	1191
Manpower at present at KTPS	Nos	904
Manpower projected in DPR	Nos	800
Contract employees at KTPS	Nos	2474

Note: Contract employees are similar to Corporate Office employees at NTPC Solapur

- The Committee observed that CEA has issued Norms for Manpower Requirement in Thermal Power Sector⁴ in December 2022. The aforesaid norm specifies the norms under Survey & Investigation, Construction, and O&M. The report defines the formula for manpower requirement as given below:

$$\text{Manpower requirement} = \text{Project Capacity (MW)} \times \text{Multiplication Factor (MF)} \times \text{Complexity Factor (CF)}$$

Multiplication factor is considered based on following:

⁴

https://cea.nic.in/wpcontent/uploads/tpm_i/2023/06/FINAL_report_of_the_committee_on_manpower_requirement_norms_in_thermal_power_sector.pdf

Multiplication Factor Table for Plants Under Operation (Man/MW)					
Unit Size (MW)	1 Unit	2 Units	3 Units	4 Units	5 Units
200 – 300	0.692	0.519	0.450	0.415	0.381
500 - 600	0.491	0.369	0.319	0.295	0.270
660 - 800	0.420	0.315	0.273	0.252	0.231

Complexity factor considers various parameters (i.e., size of plant, distance from coal mines, Expanse, Ash management and utilisation, Ash dyke operation, Ease of Outsourcing, Water management and optimisation, FGD plant, Safety and disaster mgmt., quality of fuel, technology and climate conditions). Accordingly, the matrix for complexity factor has been suggested as High (1.2), Medium (1.10), and Low (0.80).

- The manpower requirements as per the methodology adopted by CEA results in Manpower requirement for KTPS as herein below:

Table 8: Manpower Requirement as per CEA Norm

Particular	UoM	
Project Capacity	MW	1980
Multiplying Factor		0.273
Complexity Factor		1.2
Manpower Requirement	Nos	649

- **The Committee has observed that the Man/MW ratio at KTPS is higher compared to the prevailing CEA benchmark.**
- Chairman of the Committee along with three members viz. Shri T. Venkateswarlu (Chief Engineer, TE&TD Division, CEA), Shri Bashruddin Khan (Chief Engineer, MPPGCL) and Shri Prasanna Kotecha, (CE, RCD, MAHAGENCO & Member Convener) visited the KTPS on 17.05.2024.

During the site visit, KTPS plant officials shared the Government of Maharashtra notification under Minimum Wage Act 1948 dated 30th August 2019 and its subsequent notifications attached herewith as **Annexure 3.1**. Vide such notification, Govt. of Maharashtra has specified the minimum rates of wages payable to the class of employees under skilled, semi-skilled and unskilled category. KTPS Officials explained that KTPS belongs to Zone I of such notification for basic minimum rates of wages. The Committee observed that such notification is binding on MSPGCL for their respective plants across state and acknowledged that it is close to the labour cost specified by Central Govt.

The Committee observed that variation lies on key item heads of employee costs viz. Salaries, Gratuity, Pension, Provident Fund, Leave Encashment and other staff welfare expenses. The Committee also observed that the minimum wage rate as per GoM Notification combined with higher Man/MW contributes to higher employee expenses.

B. Repair & Maintenance Expenses

- The Committee has observed that consumables of spares and stores are approximately at same level for both KTPS and NTPC Solapur.
- The Committee observed that the Repair & Maintenance Expenses for KTPS are generally higher compared to NTPC Solapur except FY 2021-22. The Committee inquired with KTPS regarding the same and it was submitted that the same was due to mandatory repairs and spares procurement activities and also the unit overhaul. As part of detailed justification, KTPS submitted that it is majorly because of the accounting provisions of loss on obsolescence of stores in the FY 2019-20 to the tune of Rs 41.74 Crore which reduced to Rs 2.91 Crore in FY 2020-21 and Rs 11.14 Crore in FY 2021-22. Another reason submitted was on account of the CSR expenses made towards ash pond upkeep mandated as per environmental norms.
- During the site visit by the Committee Members, the KTPS officials has brought forth an important aspect which has a bearing on the repair & maintenance expenses i.e. rising of metal prices. Officials informed the Committee that the major spares that are subjected to wear and tear are metallic in nature and post COVID-19, the metal prices have significantly increased for Iron and Copper etc., and this has significant bearing on the regular repair & maintenance expenses.
- MSPGCL informed the Committee about the MERC Capex Regulations 2022, which has introduced some strict provisions for items to be covered under Capex and it further escalated repair and maintenance expenses that was earlier & elsewhere considered as capital expenditure, the relevant provisions are reproduced herein below:

Figure 9: MERC Capex Regulations 2022

3.19 The indicative list of various categories of Schemes that shall not be allowed as Capital Investment Schemes (DPR as well as Non-DPR) for Generating Companies/ Businesses or Transmission Licensees/Businesses or Distribution Licensees/Businesses/ MSLDC is as follows:

- (a) Replacement/repairing of individual items such as Current Transformer (CT), Potential Transformer (PT), Lightning Arrestor (LA), Circuit Breaker (CB), Distribution Box, Cables, LT switchgears, protection system, Insulators and Hardware after failure;
 - (b) O&M/overhauling of the equipment such as CB, Transformers, ICTs, Coal Mills, Boiler, Compressor, Generator, Alternator, Coal Handling Plant, Ash Handling Plant, etc.;
 - (c) Replacement of small part of the entire system such as Relays of Sub-stations, control, protection and communication panels of Sub-station equipment, replacement of the panel meters, reprogramming of meters;
 - (d) Replacement of the members of the Transmission Towers, increasing height of the towers, replacement of few towers, replacement of few spans of the conductor of Transmission lines, re-earthing of the Sub-stations and Towers, Strengthening of Towers/Poles, replacement of motors, gearbox, Stators, Rotors, Coal Mill parts, Security System (including digital), replacement of protection and control system, water supply system, replacement of ancillary system/Street Lights, etc.;
 - (e) Premature Replacement of Air Insulated Substation (AIS) with Gas Insulated Substation (GIS)/Underground Cables/Transmission Lines/other equipment before completion of Useful Life, and even after completion of Useful Life in cases where replacement is not justified based on the diagnostic test reports/Study report;
 - (f) Foundation strengthening of the Towers/Poles, substation equipment, internal civil work, repair and maintenance of office/residential quarters/guest house and office building, Metal spreading in yard, furniture, Repair and maintenance of control rooms, Compound wall for the Sub-stations and empty land, street light replacement, R&M of existing roads and buildings, etc.;
 - (g) Procurement of maintenance spares, Annual Maintenance Contract (AMC);
 - (h) Beautification projects unless the same is justified as per the pre-decided Policy;
- **The Committee has set aside the submissions of KTPS in this regard, as the effect of the same will potentially be reflected in actual O&M expenses for the FY 23-24 onwards and the same might be get considered by Hon'ble MERC while approving the O&M expenses or while setting up the O&M expenses norms for future period.**
 - The Committee recorded that the Hon'ble CERC in its recently issued CERC Tariff Regulations 2024 has stated that any items, other spares of capital nature, valuing up to Rs. 10 lakhs and additional capital expenditure of an individual asset costing less than Rs. 20 lakhs, to be considered as part of the normative O&M expenses. The impact of this is yet to be known and will be evaluated only during truing up of years under the ensuing control period.

C. Administrative & General (A&G) Expenses

- **The Committee observed that the A&G expenses of KTPS supercritical units are comparatively lower than NTPC Solapur.**
- The Committee observed that there are significant electricity charges applicable for NTPC Solapur, however, there is no electricity consumption charges to be paid to MSEDCL because of the mutual agreement between the two and such electricity consumptions are netted off in their respective bills raised as part of the PPA. The committee has also observed that the Security expenses of NTPC Solapur are higher as compared to KTPS.

3.3 Comparison of O&M norm across SERC and CERC

3.3.1 The Committee has analysed the O&M norms specified by various regulatory commissions to understand the prudence of the claim of the KTPS that norms are inconsistent and inadequate for supercritical units. The table below highlights the O&M expenses norm for 600 MW and above generating units in different states:

Table 9: Comparative of O&M Expenses Norm across SERCs and CERC

Normative O&M Expenses (in Rs. Lakh/MW/Year)							
Year	CERC	MERC	OERC	MPERC	UPERC	KERC	JSERC
FY 16-17	16.27	14.03	16.27	16.27	16.27	16.27	16.27
FY 17-18	17.30	14.73	17.30	17.30	17.30	17.30	17.30
FY 18-19	18.38	15.47	18.38	18.38	18.38	18.38	18.38
FY 19-20	20.26	16.24	20.26	20.26	20.26	20.26	20.26
FY 20-21	20.97	14.99	20.97	20.97	20.97	20.97	20.97
FY 21-22	21.71	15.53	21.71	21.71	21.71	21.71	21.71
FY 22-23	22.47	16.09	22.47	22.47	22.47	22.47	22.47
FY 23-24	23.26	16.67	23.26	23.26	23.26	23.26	23.26
FY 24-25		17.27					24.07

3.3.2 MSPGCL informed that the O&M expenses norms for 600 MW and above generating units were either absent in most of the states or have been adopted in line with Hon'ble CERC Regulations, except by Hon'ble MERC. The detailed breakup and references of O&M expenses norms specified by various regulatory commissions are provided in **Annexure 3.2**.

3.3.3 The Committee also observed that CERC norms for O&M expenses for 600 MW and above generating units existed prior to one specified by the Hon'ble MERC and thus provides credence to analyse the methodology adopted by these two regulatory bodies.

3.4 Methodology adopted for setting up norms for O&M expenses for 600 MW and above units

A. Approach by Hon'ble CERC

3.4.1 Hon'ble CERC while formulating the norm for O&M expenses for different MW units of thermal power plant follows a methodology to reflect upon cost-reflective recovery and also restrict certain expenses that need to be aligned with predetermined inflationary escalations. Accordingly, the methodology as adopted by the Hon'ble CERC varies for existing thermal station with more than 5 years of operational history and for new generating station with less than 5 years of operational history.

Figure 10: For Existing Plants with more than 5 years operational history

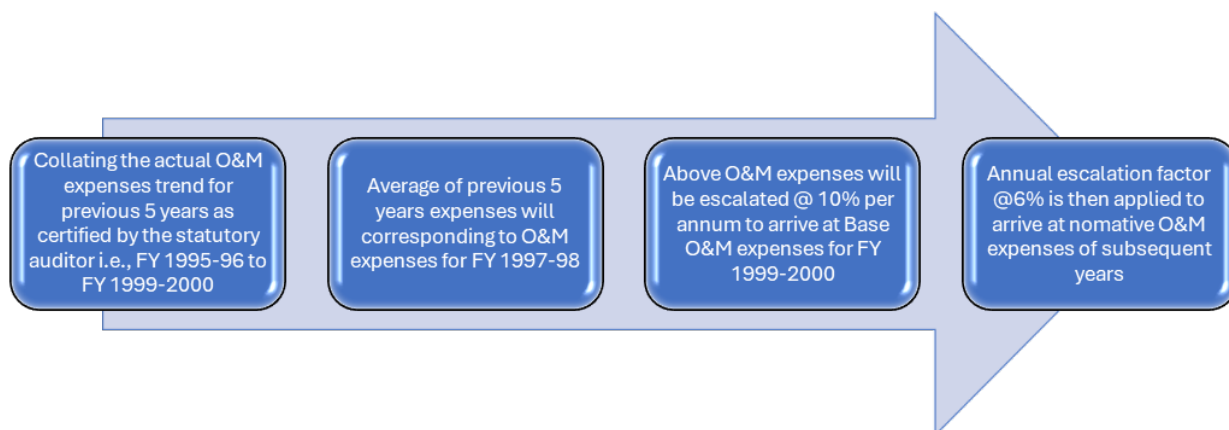
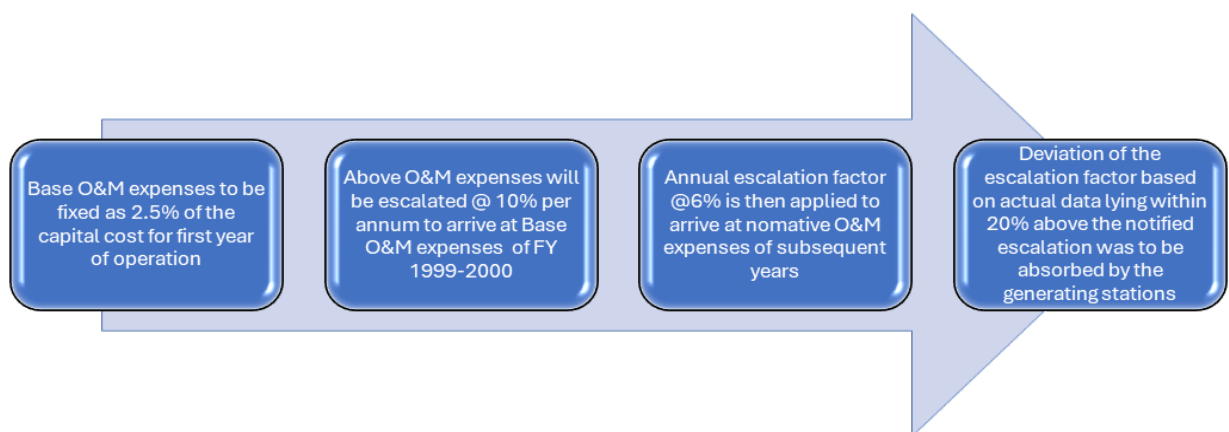


Figure 11: For New Generating Stations with less than 5 years operational history



- 3.4.2 Accordingly, the Hon'ble CERC periodically notifies the normative O&M expenses for thermal stations on the basis of unit sizes of 200/210/250 MW based on the past years actual data, besides approving norms for unit sizes of 500 MW and above. In spite of introduction of new units like 300/330/350 MW and 600 MW and above sets, Commission continued with the approach of approving O&M norms on the basis of unit sizes in case of coal based generating stations.
- 3.4.3 Further, the "**Statement of Objects and Reasons**" of CERC (*Terms and Conditions of Tariff*) Regulations, 2019 (copy given at **Annexure 3.3**), clearly states that in respect of stations proposed to have 600/660 MW sets and above, **due to absence of any representative data, the Commission has decided to set O&M norms for the 600/660 MW and above sets at 10% lower than the norms for the 500 MW sets considering economy of scale.** Therefore, the data of 500 MW Sets have been considered by Hon'ble CERC for determining the norms of 660 MW for both CERC Tariff Regulations 2014 & 2019.
- 3.4.4 Accordingly, the Hon'ble CERC has specified the normative O&M expenses for the control period FY 2014-2019 as herein below:

Figure 12: Normative O&M expenses as per CERC Tariff Regulations 2014

29. Operation and Maintenance Expenses:

- (1) Normative Operation and Maintenance expenses of thermal generating stations shall be as follows:

(a) Coal based and lignite fired (including those based on Circulating Fluidised Bed Combustion (CFBC) technology) generating stations, other than the generating stations/units referred to in clauses (b) and (d):

(in Rs Lakh/MW)

Year	200/210/250 MW Sets	300/330/350 MW Sets	500 MW Sets	600 MW Sets and above
FY 2014-15	23.90	19.95	16.00	14.40
FY 2015-16	25.40	21.21	17.01	15.31
FY 2016-17	27.00	22.54	18.08	16.27
FY 2017-18	28.70	23.96	19.22	17.30
FY 2018-19	30.51	25.47	20.43	18.38

3.4.5 The Committee observed that the Hon'ble CERC while formulating the O&M expenses norm for various unit sizes, emphasises its reliance based on actual audited expenses for at least five years and take due regard to the ageing factor. In addition to this, escalation factor considered for proposing the norms for different years of the control period take adequate inflationary impact on O&M expenses for ensuing years. The Committee observed that when the actual data wasn't available for 600 MW sets including the capital cost benchmark, the Hon'ble CERC took the representative figure of O&M expenses for 500 MW units across the country for different central generating stations including state generating stations having such capacity units and applied the above-mentioned methodology to arrive at the norm for 600 MW sets and above.

3.4.6 Subsequent to the aforementioned, the Hon'ble CERC while formulating the norm for control period FY 2019-20 to FY 2023-24, duly recognised the underlying principle and formulated the normative O&M expenses as given below:

Figure 13: Normative O&M expenses as per CERC Tariff Regulations 2019

35. Operation and Maintenance Expenses:

(1) Thermal Generating Station: Normative Operation and Maintenance expenses of thermal generating stations shall be as follows:

- (1) Coal based and lignite fired (including those based on Circulating Fluidised Bed Combustion (CFBC) technology) generating stations, other than the generating stations or units referred to in clauses (2), (4) and (5) of this Regulation:

(in Rs Lakh/MW)

Year	200/210/ 250 MW Series	300/330/ 350 MW Series	500 MW Series	600 MW Series	800 MW Series and above
FY 2019-20	32.96	27.74	22.51	20.26	18.23
FY 2020-21	34.12	28.71	23.30	20.97	18.87
FY 2021-22	35.31	29.72	24.12	21.71	19.54
FY 2022-23	36.56	30.76	24.97	22.47	20.22
FY 2023-24	37.84	31.84	25.84	23.26	20.93

Provided that where the date of commercial operation of any additional unit(s) of a generating station after first four units occurs on or after 1.4.2019, the O&M expenses of such additional unit(s) shall be admissible at 90% of the operation and maintenance expenses as specified above;

3.4.7 Accordingly, the Hon'ble CERC while formulating the normative O&M expenses acknowledged the following:

- **Ageing leads to higher O&M requirements and thus entails to higher O&M expenses. Thus, newer plants require less O&M expenses compared to older plants.**
- **Fixed escalation rate taking into account the WPI and CPI indexation to allow annual increment in O&M expenses, may not capture variations due to unexpected expenses such as wage revision etc. and thus should separately be allowed subject to prudence check.**
- **Normalisation factor of 0.90, 0.85, and 0.80 in normative O&M expenses has to be considered to reflect upon the economy of scale benefits in expansion units in same plant configuration**
- **There could be overlapping of O&M expenses and compensation allowances because of overlapping expense items, such costs should be segregated and isolated while formulating norm.**

3.4.8 This is to be highlighted that while formulating the normative O&M expenses for the FY 2019-20, the Hon'ble CERC considered an escalation of ~10% for the base year considering the impact of the pay-revision, which is reflective of the industry practice. Hon'ble CERC subsequently applied the annual escalation based on CPI and WPI indexation to arrive at the normative O&M expenses for the respective years of the control period.

B. Approach by Hon'ble MERC

i. For the MYT Regulations 2015 - Control Period FY 16-17 to FY 2019-20

3.4.9 MSPGCL informed that at the time of formulation of MERC MYT Regulations 2015, the State did not have any supercritical units in operation and so there was no data for decision making based on actual O&M expenses for the supercritical plants in the State. However, as Hon'ble MERC was cognizant of upcoming supercritical units at KTPS as projected in their respective Business Plan, while issuing the Approach Paper on MERC MYT Regulations 2015, has proposed O&M expenses norm for 600 MW units for the first time.

3.4.10 MSPGCL informed the committee about the methodology as adopted by Hon'ble MERC in specifying the O&M expenses norm for the existing and newer generating units under MYT Regulations 2015.

Figure 14: For Existing Plants with existing unit sizes with COD before Aug' 2005

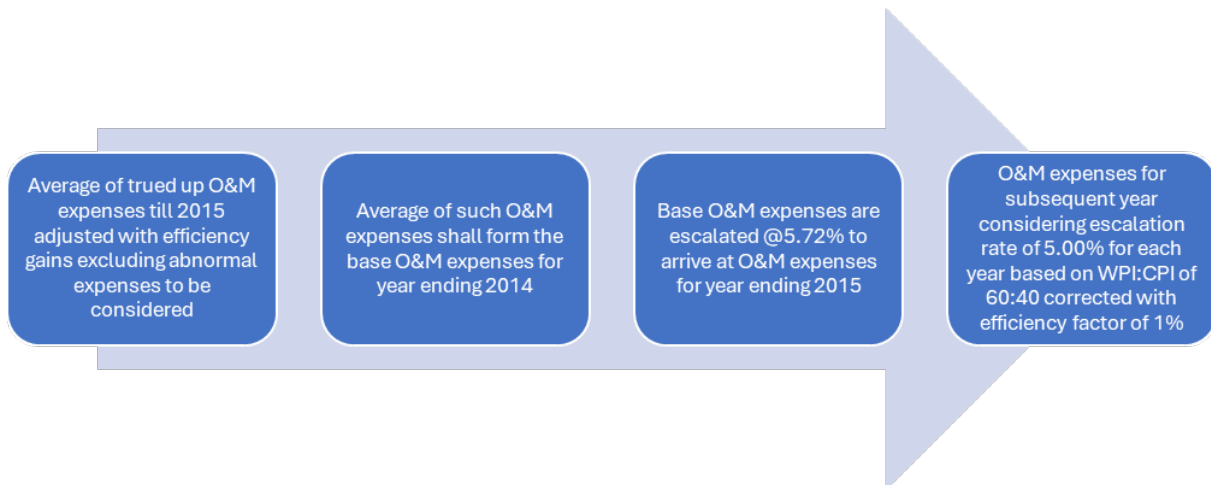
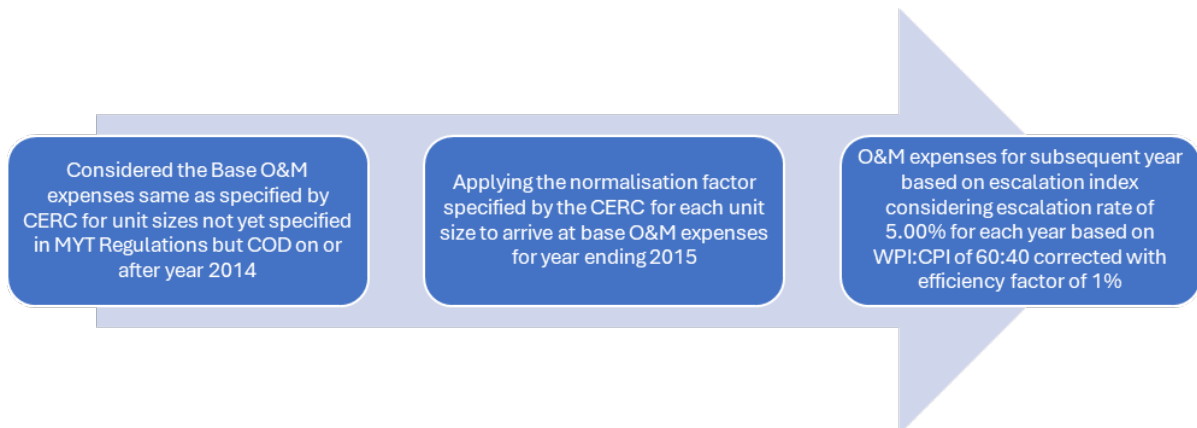


Figure 15: For New Generating Stations of newer unit sizes having COD on or after year 2014



3.4.11 The Committee noted that as the Hon'ble MERC was aware of the commissioning of supercritical unit during the control period of MYT regime i.e. FY 2016-17 to FY 2019-20, and hence in the "**Discussion Paper for Multi Year Tariff Regulations**

for the Control Period from FY 2016-17 to FY 2019-20” (copy given as **Annexure 3.4**) issued in September 2015, it is stated in para 4.3.3 that:

*“It may be noted that CERC Tariff Regulations, 2014 specify per MW basis O&M expenses norm for new coal-based generation station for four categories: (i) 200/210/250 MW sets (ii) 300/330/350 MW sets (iii) 500 MW sets and (iv) 600 MW and above sets. The existing MERC MYT Regulations, 2011 specify the norms for only two categories. It may be noted that VIPL-G has commissioned its plant in second Control Period having capacity of 2 x 300 MW. **Considering the Business Plan submitted by Generating Companies during second Control Period, it may also be noted that units having different sizes such as 300 MW, 500 MW, 660 MW, etc. are likely to come in third Control Period. Hence, it is required to provide the norms for such sizes on the basis of CERC norms.”** (emphasis added)*

3.4.12 Further, MSPGCL submitted that as per Section 61 of the Electricity Act 2003, the Appropriate Commission while determining the tariff shall be guided by the principles and methodologies specified by the Central Commission for determination of the tariff applicable to generating companies and transmission licensees and accordingly, the Hon’ble MERC has stated in the discussion paper that it has derived the norms of the units on the basis of CERC norms.

3.4.13 Accordingly, as per the **MERC MYT Regulations 2015**, the O&M norms approved by the Hon’ble MERC is outlined below:

Figure16: O&M Expenses Norm specified in MERC MYT Regulations 2015

45.2 New Generating Stations and Generating Stations that achieved COD on or after August 26, 2005 :—

(a) For Coal based Generating Stations :—

Particulars	Rs. Lakh/MW			
	200/210/250 MW Sets	300/330/350 MW Sets	500 MW Sets	600 MW Sets and above
FY 2016-17	23.80	19.70	15.59	14.03
FY 2017-18	24.99	20.68	16.37	14.73
FY 2018-19	26.24	21.71	17.19	15.47
FY 2019-20	27.55	22.80	18.05	16.24

Provided that for the Generating Stations having combination of above Sets, the weighted average value for operation and maintenance expenses shall be allowed :

Provided further that the norms shall be multiplied by the following factors for arriving at norms of O and M expenses for additional Units in respective Unit sizes for the Units whose COD occurs on or after 1.4.2016 in the same Station :

200/210/250 MW	Additional 5 th and 6 th Units	0.90
	Additional 7 th and more Units	0.85
300/330/350 MW	Additional 4 th and 5 th Units	0.90
	Additional 6 th and more Units	0.85
500 MW and above	Additional 3 rd and 4 th Units	0.90
	Additional 5 th and above Units	0.85

3.4.14 It was observed that while formulating the norm for 600 MW and above sets, the Hon’ble MERC has considered the approach adopted by the Hon’ble CERC for

formulating the O&M norm for 600 MW sets and above by considering the 90% of the O&M expense provided for 500 MW sets.

3.4.15 The Committee observes that though the approach adopted by Hon'ble MERC appears similar to the same adopted by Hon'ble CERC, however, the difference lies in terms of representative figure considered for 500 MW sets. The Committee observed that there were only three units of 500 MW sets under existence and operation while formulating the norm for 500 MW sets for MERC MYT Regulations 2015 viz., Khaperkheda Unit 5, Bhusawal Unit 4 & 5. The details of COD of these units are as under:

Table 10: Computation of O&M expenses norm as per MERC MYT Regulations 2015

MSPGCL Plants of 500 MW units	Capacity (MW)	CoD	Days of Operation	
			31-03-2013	31-03-2014
			2012-13	2013-14
Khaperkheda Unit-5	500	16-04-2012	350	365
Bhusawal Unit 4	500	16-11-2012	136	365
Bhusawal Unit 5	500	03-01-2014		88

3.4.16 Thus, Committee observed that it may be the case that norms for MERC MYT Regulations 2015 for 660 MW units were formulated considering around one and half year actual O&M expense details for Bhusawal Unit 4 and around two years actual O&M expenses for Khaperkheda Unit-5.

3.4.17 MSPGCL submitted that this has resulted in lower O&M expense norms under MERC MYT Regulation 2015 (for 500 MW and 600 MW above sets) since **for initial 2-3 years, the O&M expenses are generally low in new units as there is no significant ageing effect in installed equipment's / machineries** at the plant. A comparison of O&M expense allowed by CERC vis-à-vis MERC is given as under:

Figure17: O&M expense comparison CERC vs MERC

29. Operation and Maintenance Expenses:

(1) Normative Operation and Maintenance expenses of thermal generating stations shall be as follows:

(a) Coal based and lignite fired (including those based on Circulating Fluidised Bed Combustion (CFBC) technology) generating stations, other than the generating stations/units referred to in clauses (b) and (d):

(in Rs Lakh/MW)

Year	200/210/250 MW Sets	300/330/350 MW Sets	500 MW Sets	600 MW Sets and above
FY 2014-15	23.90	19.95	16.00	14.40
FY 2015-16	25.40	21.21	17.01	15.31
FY 2016-17	27.00	22.54	18.08	16.27
FY 2017-18	28.70	23.96	19.22	17.30
FY 2018-19	30.51	25.47	20.43	18.38

45.2 New Generating Stations and Generating Stations that achieved COD on or after August 26, 2005 :—

(a) For Coal based Generating Stations :—

Particulars	Rs. Lakh/MW			
	200210250 MW Sets	300/330/350 MW Sets	500 MW Sets	600 MW Sets and above
FY 2016-17	23.80	19.70	15.59	14.03
FY 2017-18	24.99	20.68	16.37	14.73
FY 2018-19	26.24	21.71	17.19	15.47
FY 2019-20	27.55	22.80	18.05	16.24

Provided that for the Generating Stations having combination of above Sets, the weighted average value for operation and maintenance expenses shall be allowed :

Provided further that the norms shall be multiplied by the following factors for arriving at norms of O and M expenses for additional Units in respective Unit sizes for the Units whose COD occurs on or after 1.4.2016 in the same Station :

200/210/250 MW	Additional 5 th and 6 th Units	0.90
	Additional 7 th and more Units	0.85
300/330/350 MW	Additional 4 th and 5 th Units	0.90
	Additional 6 th and more Units	0.85
500 MW and above	Additional 3 rd and 4 th Units	0.90
	Additional 5 th and above Units	0.85

CERC Regulations 2014-19



MERC MYT Regulations 2015

3.4.18 The Committee noted that the Hon'ble CERC, in case of new thermal units for which actual expense data are not available, opts to consider either the base O&M expenses fixed at 2.5% of the capital cost for first year of operation or whenever both the capital cost and operational history based actual audited expenses are not available, considers the immediate lower capacity thermal plants with close resemblance to arrive the norms, using economy of scale factors.

3.4.19 The Committee has studied the MYT Regulations 2015 issued by the Hon'ble MERC and CERC Tariff Regulations issued by Hon'ble CERC regarding the norms for O&M expenses for 600 MW and above sets. Following observations are made:

- **The actual audited details of at least 5 years data (wherever available) gives more representative data since for initial 2-3 years, O&M expenses are significantly low in new units. In case data for the same is not available for 5 years, approach of CERC as mentioned at 3.4.18 seems to be reasonable.**
- **Ageing factor has positive correlation with increasing O&M expenses and accordingly, norms should differentiate the O&M expenses for newer and older units.**

3.4.20 MSPGCL highlighted the variation in methodology adopted and the consequential impact in arriving the base O&M expenses for 660 MW and above sets in the state of Maharashtra.

Table 11: O&M Expenses Norm as per CERC vis-à-vis formulated by MERC

Year	Normative O&M Expenses (Rs Lakh/MW)		
	As per CERC Tariff Regulations 2014	MERC MYT Regulations 2015	Variation in norm formulation
FY 16-17	16.27	14.03	2.24
FY 17-18	17.30	14.73	2.57
FY 18-19	18.38	15.47	2.91
FY 19-20	20.26	16.24	4.02

3.4.21 MSPGCL stated that other SERCs have adopted the methodology as specified by Hon'ble CERC and thus have no major variation in their O&M expenses norm for supercritical units. The Committee observes that the norms for 500 MW unit may not be representative and comprehensive as it covers only two such units with operational history of ~2 years.

3.4.22 MSPGCL has provided the comparison of absolute values of actual O&M expense incurred by it w.r.t O&M expense which could be allowed as per CERC and MERC norms:

Table 12: Variation of actual O&M expenses w.r.t MERC norm and CERC Norms

Year	Total O&M expenses for 1980 MW (3*660 MW) (Rs Cr)			Variation in O&M expenses (Rs Cr)	
	As per CERC norms	As per MERC norms	Actual O&M Expenses	Actual vis-à-vis CERC norms	Actual vis-à-vis MERC norms ^{\$}
FY 16-17*					
FY 17-18	331.12	281.93	320.42	10.70	-38.49
FY 18-19	351.79	296.10	333.54	18.25	-37.44
FY 19-20	387.78	310.83	449.24	-61.46	-138.40

*-since all the three units are commissioned and operated for full year from FY 2017-18, the same is considered for comparison purpose.

^{\$}-Only variance with MERC norms is highlighted as the amount approves differs due to pay revision impact and sharing mechanism.

3.4.23 As highlighted from the above table, the O&M expenses incurred for Koradi Supercritical thermal units are in line with the CERC norms with minor variation for FY 2019-20 as exception, as additional cost incurred due to inevitable Repair & Maintenance. Further, it is observed that actual expenses of KTPS vis-à-vis allowed expenses as per MERC norms vary significantly causing additional financial burden of around Rs 214.33 crores in the aforementioned years.

ii. **For the MYT Control Period FY 2020-21 to FY 2024-25:**

3.4.24 MSPGCL informed that the Hon'ble MERC has issued the "EXPLANATORY MEMORANDUM ON DRAFT MAHARASHTRA ELECTRICITY REGULATORY

COMMISSION (MULTI YEAR TARIFF) REGULATIONS, 2019” (copy given as Annexure 3.5) highlighting the approach adopted for determining the norms for the generating station which is outlined as below:

- For computation of norms for various categories, the actual O&M expenses for existing generating stations have been considered. The category-wise generating stations considered are as under:
 - a. 200/210/250 MW sets- Paras Unit 3 & 4, Parli Unit 6, 7 & 8 and TPC-G Unit 8
 - b. 300/330/350 MW sets- VIPL-G Butibori Unit 1 & 2
 - c. 500 MW sets - Bhusawal Unit 4 & 5, Chandrapur Unit 8&9 and Khaparkheda Unit 5
 - d. 600/660 MW sets – Koradi Unit 8, 9 & 10
- The actual O&M expenses, subject to prudence check of the Commission, have been considered for FY 2015-16 to FY 2017-18 for analysis purposes. The actual O&M expenses norms for the category has been computed based on weighted average of installed capacity.
- In case of MSPGCL’s Generating Stations, the Commission has considered the O&M Expenses of Rs. 2301.25 Crore for FY 2016-17, which was actual O&M Expenses approved after true-up. The O&M Expenses have been apportioned to Generating Stations in proportion of O&M expenses of Rs. 2751.13 Crore as submitted by MSPGCL in their Mid Term Review Petition.
- The three-year average of actual O&M expenses norms achieved on per MW basis for these categories has been computed and considered as norms for FY 2016-17.
- Average of actual O&M expense norm considered for FY 2016-17, have been escalated at the inflation factor to arrive at actual expense norm for FY 2019-20.

3.4.25 The Committee has observed that while formulating the normative O&M expenses for second control period under MERC MYT Regulations 2019, **the Hon’ble MERC has reduced the base O&M expense norm for FY 2020-21 (Rs 14.99 Lakhs/MW) as compared to FY 2019-20 (Rs 16.24 Lakhs/MW) for 600/660 MW sets (i.e ~ 7.7% reduction).** The same is highlighted as below:

Figure 18: Normative O&M expenses as per MERC MYT Regulations 2015 vis-à-vis MYT Regulations 2019

45.2 New Generating Stations and Generating Stations that achieved COD on or after August 26, 2005 :—

(a) For Coal based Generating Stations :—

Rs. Lakh/MW

Particulars	200/210/250 MW Sets	300/330/350 MW Sets	500 MW Sets	600 MW Sets and above
FY 2016-17	23.80	19.70	15.59	14.03
FY 2017-18	24.99	20.68	16.37	14.73
FY 2018-19	26.24	21.71	17.19	15.47
FY 2019-20	27.55	22.80	18.05	16.24

Provided that for the Generating Stations having combination of above Sets, the weighted average value for operation and maintenance expenses shall be allowed :

Provided further that the norms shall be multiplied by the following factors for arriving at norms of O and M expenses for additional Units in respective Unit sizes for the Units whose COD occurs on or after 1.4.2016 in the same Station :

200/210/250 MW	Additional 5 th and 6 th Units	0.90
	Additional 7 th and more Units	0.85
300/330/350 MW	Additional 4 th and 5 th Units	0.90
	Additional 6 th and more Units	0.85
500 MW and above	Additional 3 rd and 4 th Units	0.90
	Additional 5 th and above Units	0.85

MERC MYT Regulations 2015

47.2 New Generating Stations and Generating Stations that achieved COD on or after August 26, 2005

a) For Coal based Generating Stations:

Rs. Lakh/MW

Particulars	200/210/250 MW Sets	300/330/350 MW Sets	500 MW Sets	600/660 MW Sets	800 MW and above
FY 2020-21	27.89	21.08	18.54	14.99	13.49
FY 2021-22	28.89	21.84	19.21	15.53	13.97
FY 2022-23	29.93	22.63	19.90	16.09	14.48
FY 2023-24	31.01	23.44	20.62	16.67	15.00
FY 2024-25	32.13	24.29	21.36	17.27	15.54

Provided that for the Generating Stations having combination of above Sets, the weighted average value for operation and maintenance expenses shall be allowed:

Provided further that the norms shall be multiplied by the following factors for arriving at norms of O&M expenses for additional Units in respective Unit sizes for the Units whose COD occurs on or after 1.4.2020 in the same Station:

MERC MYT Regulations 2019

3.4.26 The Committee has observed that the Hon'ble MERC as per the Explanatory memorandum has stated that the total O&M expenses of MSPGCL has been apportioned based on the actual expenses for FY 2016-17 of Rs. 2,301.25 Crore with total O&M expenses of Rs. 2751.13 crore as submitted in Mid Term Petition. Average of actual O&M expense norm considered for FY 2016-17 have been escalated at the inflation factor to arrive at actual expense norm for FY 2019-20.

3.4.27 Committee has noted that for 500 MW units, the norms were increased in FY 20-21 probably because now the 500 MW units were old and ageing effected started to creep in. However, in case of 660 MW supercritical units of KTPS, it is observed that first 660 MW unit was commissioned in December 2015 and remaining 2 units were commissioned in November 2016 and January 2017 respectively. Thus, it can be seen that all the units were recently commissioned when compared with the period considered (i.e. FY 2016-17) for framing of MYT Regulations 2019. **As mentioned earlier that for initial 2-3 years, O&M expenses of the units remain significantly low and that could be the reason behind reducing the base norm for new control period by the Hon'ble MERC.**

3.4.28 Details of COD, actual O&M expenses and expenses approved as per MERC regulations as provided by MSPGCL are given below:

Table 13: Computation of O&M Expenses norm as per MERC MYT Regulations 2019

MSPGCL Plants of 660 MW units	Capacity (MW)	CoD	Days of Operation	
			31-03-2016	31-03-2017
			2012-13	2013-14
Koradi Unit 8	660	16-12-2015	107	365
Koradi Unit 9	660	22-11-2016		130
Koradi Unit 10	660	17-01-2017		74

MSPGCL Plants of 660 MW units	Operation & Maintenance Expenses (in Rs Cr)																
	MERC Approved			Actual			Entitlement considering Efficiency gains/losses			O&M expenses for FY			Average	Projected O&M			
	FY 15-16	FY 16-17	FY 17-18	FY 15-16	FY 16-17	FY 17-18	FY 15-16	FY 16-17	FY 17-18	FY 15-16	FY 16-17	FY 17-18		FY 17-18	FY 18-19	FY 19-20	FY 20-21
Koradi Unit 8	38.25			81.57			52.69			180.23							
Koradi Unit 8-9-10		142.48	281.93		172.86	320.42		152.61	294.76		293.68	567.24	347.05	355.97	364.19	377.12	390.51

Note: Escalation considered for FY 17-18 as 2.57%, FY 18-19 as 2.31%, and 3.55% for FY 19-20 onwards

MSPGCL Plants of 660 MW units	Average O&M expenses for FY 20-21		O&M Expenses for FY 20-21 as per MERC MYT Regulations 2019	
	Rs Crore	Rs/Lakh/MW	Rs/Lakh/MW	Rs Crore
Koradi Unit 8-9-10	390.51	19.72	14.99	296.80

3.4.29 Thus, MSPGCL highlighted that against the actual required O&M expenses norm of Rs. 19.72 Lacs/MW and CERC norms of Rs. 20.97 Lacs/MW for FY 2020-21, the Hon'ble MERC has considered the norms of Rs. 14.99 Lacs/MW resulting in under recovery for MSPGCL.

3.4.30 Further, the table given below highlights the variation in methodology adopted and the consequential impact in arriving the base O&M expenses for 660 MW and above sets in the State of Maharashtra.

Table 14: O&M Expenses Norm as per CERC vis-à-vis formulated by MERC

Year	Normative O&M Expenses (Rs Lakh/MW)			
	As per CERC Tariff Regulations 2014	As per discussion Paper on MERC MYT Regulations 2015	MERC MYT Regulations 2015	Variation in norm formulation
FY 20-21	20.97	14.98	14.99	5.98
FY 21-22	21.71	15.51	15.53	6.18
FY 22-23	22.47	16.06	16.09	6.38
FY 23-24	23.26	16.63	16.67	6.59

3.4.31 Accordingly, the variation in O&M expenses resulted because of deviations in methodology adopted for norm formulation between Hon'ble CERC and Hon'ble MERC.

Table 15: Disallowances to MSPGCL due to O&M expenses norm in second control period

Year	Normative O&M Expenses (Rs Lakh/MW)		Total O&M expenses for 1980 MW (3*660 MW) (Rs Cr)		Variation in O&M expenses (Rs Cr)
	As per CERC Tariff Regulations 2014	MERC MYT Regulations 2015	As per CERC Tariff Regulations 2014	MERC MYT Regulations 2015	MYT Regulations Norm vis-à-vis CERC Norms
FY 20-21	20.97	14.99	401.37	286.91	-114.46
FY 21-22	21.71	15.53	415.53	297.24	-118.29
FY 22-23	22.47	16.09	430.08	307.96	-122.11
FY 23-24	23.26	16.67	445.20	319.06	-126.13

3.5 CERC Tariff Regulations 2024

3.5.1 The Committee has taken note of the recently formulated O&M expenses norm by Hon'ble CERC and compared the same with previous CERC Tariff Regulations 2024.

Figure19: O&M Expenses Norms of CERC: Old vs New

35. Operation and Maintenance Expenses:

(1) **Thermal Generating Station:** Normative Operation and Maintenance expenses of thermal generating stations shall be as follows:

- (1) Coal based and lignite fired (including those based on Circulating Fluidised Bed Combustion (CFBC) technology) generating stations, other than the generating stations or units referred to in clauses (2), (4) and (5) of this Regulation:

(in Rs Lakh/MW)

Year	200/210/ 250 MW Series	300/330/ 350 MW Series	500 MW Series	600 MW Series	800 MW Series and above
FY 2019-20	32.96	27.74	22.51	20.26	18.23
FY 2020-21	34.12	28.71	23.30	20.97	18.87
FY 2021-22	35.31	29.72	24.12	21.71	19.54
FY 2022-23	36.56	30.76	24.97	22.47	20.22
FY 2023-24	37.84	31.84	25.84	23.26	20.93

Provided that where the date of commercial operation of any additional unit(s) of a generating station after first four units occurs on or after 1.4.2019, the O&M expenses of such additional unit(s) shall be admissible at 90% of the operation and maintenance expenses as specified above;

CERC Regulations 2019-24



(in Rs Lakh/MW)

Year	200/210/ 250 MW Series	300/330/ 350 MW Series	500 MW Series	600 MW Series	800 MW Series and above
FY 2024-25	40.92	34.04	27.17	25.78	23.20
FY 2025-26	43.07	35.83	28.60	27.13	24.42
FY 2026-27	45.33	37.71	30.10	28.56	25.70
FY 2027-28	47.71	39.69	31.68	30.06	27.05
FY 2028-29	50.21	41.78	33.34	31.64	28.47

CERC Regulations 2024-29

3.5.2 The Committee noted that there is upward revision in Norms specified by CERC for the period FY 2024-25 to FY 2028-29 which appears consistent with its philosophy highlighted in Section 3.4.7.

3.6 Financial impact on MSPGCL due to O&M disallowances

3.6.1 In addition to the notional variations that has resulted due to deviations in methodology adopted for formulation of O&M expenses norm, the Committee has also looked into actual O&M expenses of KTPS and compared the same with norms specified. The table herein below highlights the comparison of norms vis-à-vis actual O&M expenses incurred by KTPS for the corresponding period.

Table 16: Disallowances in O&M expenses due to Actual vis-à-vis Normative

	Year	Normative O&M Expense (Rs lakh/ MW/ Year)						O&M Expense (Rs Crore)			Financial Impact on O&M Expenses of MSPGCL (Rs Crore)	
		As per discussion Paper on MERC MYT Regulations	As per CERC Tariff Regulations 2014	As per CERC Tariff Regulations 2019	MERC MYT Regulations 2015	MERC MYT Regulations 2019	Actual Audited Expenses	As per MERC MYT Regulations	As per CERC Tariff Regulations 2014	As per MERC Submission	Scenario 1: Actual vis-à-vis MERC Regulations	Scenario 2: Actual vis-à-vis CERC Regulation Adoption
First Impact Years	FY 16-17	14.03	16.27		14.03			268.53	311.41			
	FY 17-18	14.73	17.30		14.73		16.07	281.93	331.12	318.25	-36.32	12.87
	FY 18-19	15.47	18.38		15.47		16.84	296.10	351.79	333.46	-37.36	18.33
	FY 19-20	16.24	20.26		16.24		20.63	310.83	387.78	408.53	-97.70	-20.75
Second Impact Years	FY 20-21	14.98		20.97		14.99	16.52	286.91	401.37	327.19	-40.29	74.17
	FY 21-22	15.51		21.71		15.53	20.96	297.24	415.53	414.94	-117.70	0.59
	FY 22-23	16.06		22.47		16.09	-	307.96	430.08			
	FY 23-24	16.63		23.26		16.67	-	319.06	445.20			
	FY 24-25	17.22				17.27	-	330.55	-			

Note – True-up of FY 2023-24 and FY 2024-25 is pending to be undertaken by hon'ble MERC and will be undertaken in the Tariff petition to be submitted in November 2024 as per MYT Regulations.

3.6.2 Further, MSPGCL informed the committee that as per the MYT Regulations, O&M expenses are classified as part of the controllable parameters, as highlighted

herein below:

“9.2 Variations or expected variations in the performance of the Petitioner, which may be attributed by the Commission to controllable factors include, but are not limited to the following: —

(a) Variations in capitalisation on account of time or cost overruns or inefficiencies in the implementation of a capital expenditure Scheme not attributable to an approved change in its scope, change in statutory levies or force majeure events;

(b) Variation in Interest and Finance Charges, Return on Equity, and Depreciation on account of variation in capitalisation as specified in clause (a) above;

(c) Variation in technical and commercial losses;

(d) Variation in performance parameters;

(e) Variation in amount of interest on working capital;

(f) Variation in operation and maintenance expenses;

(g) Variation in Coal transit losses.

3.6.3 The Committee noted that the MERC MYT Regulations recognises both the controllable and uncontrollable parameters and accordingly has specified the mechanism for sharing of efficiency gains or loss on account of such expenses. The relevant provisions are given below:

“11. Mechanism for sharing of gains or losses on account of controllable factors—

*11.1 The approved aggregate **gain** to the Generating Company or Licensee or MSLDC on account of controllable factors shall be dealt with in the following manner: —*

*(a) **Two-third** of the amount of such gain shall be **passed on as a rebate in Tariff** over such period as may be stipulated in the Order of the Commission under Regulation 8.4;*

(b) The balance amount of such gain shall be retained by the Generating Company or Licensee or MSLDC.

*11.2 The approved aggregate **loss** to the Generating Company or Licensee or MSLDC on account of controllable factors shall be dealt with in the following manner: —*

*(a) **One-third** of the amount of such loss may be **passed on as an additional charge in Tariff** over such period as may be stipulated in the Order of the Commission under Regulation 8.4;*

(b) The balance amount of such loss shall be absorbed by the Generating Company or Licensee or MSLDC.” (Emphasis added)

3.6.4 The Committee also recognised the fact while undertaking the truing up, though the tariffs and performance parameters for MSPGCL are being determined plant wise, however, under the provision of sharing of efficiency gains or loss on

account of controllable or uncontrollable parameters are done on MSPGCL as whole. The Committee acknowledged that such sharing of efficiency loss marginally bridges the gap between actual and normative allowance. In addition, the Committee observed that such action cross-subsidises the efficiency gains of efficient plants to cross-subsidise the losses of some plant bearing losses due to such parameters and even after apportioning the same for KTPS, **the financial losses resulting due to deviation of actual vis-à-vis norms specified for KTPS are wide enough to ignore.**

3.6.5 The Committee accordingly has evaluated the recognizable claim of the KTPS in line with MERC MYT Regulations considering the efficiency loss share allowed to MSPGCL for the aforesaid years. The Committee taken note of the fact that since plant wise efficiency gains/losses are not computed by the Hon'ble MERC, the same has been done on pro-rata basis for KTPS to understand the allowable O&M expenses for KTPS for such years under contention. The table herein below highlights the disallowances claimed by MSPGCL against norms specified in their respective tariff orders.

Table 17: O&M Expenses – MSPGCL Submission vs MERC Approved

	Year	Normative O&M Expense (Rs lakh/ MW/ Year)			O&M Expense (Rs Crore)			Financial Impact on O&M Expenses of MSPGCL (Rs Crore)	
		MERC MYT Regulations 2015	MERC MYT Regulations 2019	Actual Audited Expenses	As per MERC MYT Regulations	MSPGCL Submissions	MERC Approved	Scenario 1: Actual vis-à-vis MERC Regulations	Scenario 2: Actual vis-à-vis MERC Approved
First Impact Years	FY16-17	14.03							
	FY17-18	14.73		16.07	281.93	318.25	294.04	-36.32	-24.21
	FY18-19	15.47		16.84	296.10	333.46	308.55	-37.36	-24.91
	FY19-20	16.24		20.63	310.83	408.53	343.40	-97.70	-65.13
Second Impact Years	FY20-21		14.99	16.52	286.91	327.19	306.93	-40.29	-20.26
	FY21-22		15.53	20.96	297.24	414.94	343.31	-117.70	-71.63
	FY22-23		16.09						
	FY23-24		16.67						
	FY24-25		17.27						

3.6.6 The Committee observed that even if the allowable O&M expenses within the ambit of MERC MYT Regulations are considered, the disallowance appears to be high. MSPGCL stated that this may eventually affect not only the O&M practices but also the finances of the company as whole.

Chapter 4: Conclusions and findings of the Committee

4.1 Findings of the committee related to normative O&M framework

The Committee duly acknowledge that the Hon'ble MERC holds a *Carte Blanche* authority when it comes to formulating regulations for the state. The Committee only intend to put forward suggestions, observations or recommendations to MSPGCL within ambit of scope of the Committee based on the data/information provided by MSPGCL.

- a) **The Committee observed that the Hon'ble CERC, while formulating the O&M expenses norms for various unit sizes, emphasises its reliance on actual audited expenses for at least five years and takes due regard to the ageing factor.**

The actual audited O&M expenses of at least 5 years (wherever available) give more representative data since for initial 2-3 years, O&M expenses are significantly low as there is no ageing effect crept into the plant. The average of last 5 years O&M expenses represent the mid-year value and is escalated by 10% per year to arrive at base O&M value for the next control period.

Further, escalation factor has to be considered for proposing the norms for different years within the control period to take adequate inflationary impact on O&M expenses for ensuing years.

- b) Further, it was observed that in case data for O&M expenses for the last 5 years is not available, approach of CERC as mentioned at 3.4.18 seems reasonable. *i.e in case of new thermal units for which actual expense data is not available, CERC opts to consider either the base O&M expenses fixed at 2.5% of the capital cost for first year of operation or whenever both the capital cost and operational history based actual audited expenses are not available, it considers the immediate lower capacity thermal plants with close resemblance to arrive at the norms, using economy of scale factors.*
- c) Thus, Committee has noted that when the actual data wasn't available for 600 MW sets including the capital cost benchmark for framing CERC Tariff Regulations 2014-19, the Hon'ble CERC took the representative figure of O&M expenses for 500 MW units across the country for different central generating stations including state generating stations having such capacity units and applied the methodology to arrive at the norms for 600 MW sets and above.
- d) **The Committee acknowledges that the O&M expenses of newer plants in initial year do not reflect the ageing impact, however, after deterioration crept in and thus require increasing O&M expenses. Ageing factor has positive**

correlation with increasing O&M expenses and accordingly, there should be differentiation in the O&M expenses norms for newer and older units.

- e) The Committee found the methodology of CERC consistent in various control periods. For instance, the methodology for O&M expenses based on actual incurred and allowed expenses for existing thermal units has been uniform over the control periods viz., 2009-14, 2014-19, 2019-24 and 2024-29.
- f) The Committee observed that the minimum rates of wages payable to the class of employees under skilled, semi-skilled and unskilled category as specified by Govt. of Maharashtra is close to the minimum rates of wages as per the Central Govt.
- g) The Committee observed that norms for MERC MYT Regulations 2015 for 660 MW units were understood to have been arrived at by considering around one and half year actual O&M expense details of Bhusawal Unit 4 (500 MW) and around two years actual O&M expenses for Khaperkheda Unit-5 (500 MW) with economy of scale factor 0.9.

Based on the above, the Committee observed that the Normative O&M Expenses as per MERC MYT Regulations 2015 is less by Rs 2.24 Lakh/MW during FY 2016-17 vis-à-vis CERC 2014-19 tariff regulations.

- h) The Committee also observed that in case of 660 MW supercritical units of KTPS, first 660 MW unit was commissioned in December 2015 and remaining 2 units were commissioned in November 2016 and January 2017 respectively. It is understood that Actual O&M expenses for FY 2016-17 was considered for framing of O&M expenses of 600/660 MW sets in MYT Regulations 2019.

Based on the above, the Committee observed that under MERC MYT Regulations 2019, base year O&M expense norm for FY 2020-21 (first year of MYT regulations 2019) was reduced substantially to Rs 14.99 Lakhs/MW as compared to Rs 16.24 Lakhs/MW for FY 2019-20 (last year of MYT regulations 2015) for 600/660 MW sets (i.e ~ 7.7% reduction). As mentioned earlier that for initial 2-3 years, O&M expenses of the units remains significantly low and that could be the reason behind reducing the base norm for new control period by the Hon'ble MERC.

- i) MSPGCL informed the Committee that the rising metal prices will have a bearing on repair & maintenance expenses.

4.2 Suggestions to improve the prudence of O&M expenses

- a) **Employee Expenses need to be controlled:** The Committee has observed that the Man/MW ratio at KTPS is higher compared to CEA benchmark, in addition to the fact that overall salaries, wages and allowances component for KTPS is also

higher compared to NTPC stations. The Committee has observed the variation lies on key item heads of employee costs viz. Salaries, Gratuity, Pension, Provident Fund, Leave Encashment and other staff welfare expenses.

The Committee has observed that earlier there was no benchmark available for manpower requirement for thermal power plant based on unit size. However, CEA has issued a norm for manpower requirement in December 2022. Hence, MSPGCL at KTPS need to align its manpower requirement accordingly. The Committee acknowledges the fact that MSPGCL being a state government PSU has to abide by the GoM Notifications for wage revision notifications issued from time to time, however, the same has to be submitted for consideration in methodology specified for determination of O&M expenses norm.

- b) **Repair & Maintenance expenses need to be controlled:** The Committee feels that as per the Hon'ble MERC Capex Regulations 2022, there is likelihood that it may increase the repair & maintenance expenses in ensuing years, therefore the classification of Capex and Opex overhaul need to be prudently and cautiously planned, executed and represented for cost-recovery.

The Committee suggested MSPGCL to be cognizant of such changes and align their repair & maintenance and capital overhaul planning accordingly to obviate the impact on their O&M expenses. MSPGCL may raise their constraints before Hon'ble MERC for their kind consideration.

- c) **Administrative & General Expenses:** The Committee has observed that though the A&G expenses are less than comparative NTPC supercritical units, yet the detailed due-diligence reflects significant incurrence resulted due to scraping loss, price variation clauses and related to plant office upkeep, the same need to be revisited and prudence may be exercised to explore options to reduce the same.

4.3 Additional measures to improve O&M practices

- a) **Adoption of best practices:**—During the site visit, the KTPS officials has demonstrated their prudent plant O&M practices as well as the preventive maintenance protocol followed by O&M department, however, there is a need to have industry interaction on periodic basis with other thermal generators of such plant configuration. This will enable KTPS to improvise their prevailing practices if needed or adopting best O&M practices followed by other thermal generators in the country.
- b) **Deployment of recommendations by third party technical consultants:** During the site visit, the KTPS plant officials has mentioned that they are under constant

pursuit to improve their O&M practices and has taken the services of external experts from esteemed organisation.

The Committee feels that there should be a periodic review of KTPS O&M practices. The periodicity may be decided by the MSPGCL management to ensure Compliance of suggestions given by the third-party experts to improve O&M practices.

----- (Prasanna Kotecha) Chief Engineer MSPGCL & Member Convener	----- (T Venkateswarlu) Chief Engineer, TE&TD Division, CEA	----- (Gautam Ghosh) Chief Engineer, F&CA Division, CEA
----- (R N Pujari) Chief General Manager, NTPC	----- (Deepak Kumar) Chief Engineer, UPRUVNL	----- (Bashruddin Khan) Chief Engineer, MPPGCL
----- (Praveen Gupta) Member (Thermal), CEA & Chairman of the Committee		

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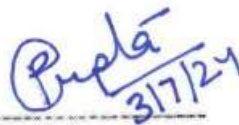
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