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# AVOIDABLE PAYMENT OF COMPENSATION CHARGES FOR LOW POWER FACTOR - V.O. CHIDAMBARANAR PORT TRUST

MINISTRY OF PORTS, SHIPPING AND WATERWAYS

PUBLIC ACCOUNTS COMMITTEE
(2023-24)

HUNDREDT AND SIXTH REPORT

SEVENTEENTH LOK SABHA


LOK SABHA SECRETARIAT
NEW DELHI

*PAC NO. 2336*

# HUNDRED AND SIXTH REPORT

## PUBLIC ACCOUNTS COMMITTEE
## (2023-24)

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MINISTRY OF PORTS, SHIPPING AND WATERWAYS


*Presented to Lok Sabha on:* *08-02-2024*

*Laid in Rajya Sabha on:* *08-02-2024*

LOK SABHA SECRETARIAT
NEW DELHI

February 2024/ Magha 1945 (Saka)

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*Not appended to the Report

# COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2023-24)

**Shri Adhir Ranjan Chowdhury - Chairperson**

**MEMBERS**

**LOK SABHA**

2. Shri Subhash Chandra Baheria
3. Shri Thalikkottai Rajuthevar Baalu
4. Shri Bhartruhari Mahtab
5. Shri Jagdambika Pal
6. Shri Pratap Chandra Sarangi
7. Shri Vishnu Dayal Ram
8. Shri Rahul Ramesh Shewale
9. Shri Gowdar Mallikarjunappa Siddeshwara
10. Dr. Satya Pal Singh
11. Shri Brijendra Singh
12. Shri Rajiv Ranjan Singh alias Lalan Singh
13. Shri Jayant Sinha
14. Shri Balashowry Vallabhaneni
15. Shri Ram Kripal Yadav

**RAJYA SABHA**

16. Shri Shaktisinh Gohil
17. Dr. K Laxman
18. Shri Derek O'Brien*
19. Shri Tiruchi Siva
20. Dr. M. Thambidurai
21. Shri Ghanshyam Tiwari
22. Dr. Sudhanshu Trivedi

**SECRETARIAT**

1. Shri Sanjeev Sharma - Joint Secretary
2. Shri Partha Goswami - Director
3. Shri Alok Mani Tripathi - Deputy Secretary
4. Shri Vijay Mishra - Committee Officer

*Elected w.e.f. 19.08.2023 consequent upon retirement of Shri Sukhendu Sekhar Ray, MP on 18.08.2023.

# INTRODUCTION

I, the Chairperson, Public Accounts Committee (2023-24) having been authorized by the Committee, do present this One Hundred and Sixth Report (Seventeenth Lok Sabha) on **"AVOIDABLE PAYMENT OF COMPENSATION CHARGES FOR LOW POWER FACTOR - V.O. CHIDAMBARANAR PORT TRUST"** based on para 19.4 of C&AG Report No. 4 of 2018 relating to the Ministry of Ports, Shipping and Waterways.

2. The Report of Comptroller and Auditor General of India was laid on the Table of the House on 04-04-2018

3. The Public Accounts Committee (2023-24) took oral evidence of the representatives of Ministry of Ports, Shipping and Waterways on 31-10-2023. The Committee considered and adopted this Report at their sitting held on 05- 02-2024. The Minutes of the sittings of the Committee are appended to the Report.

4. For facility of reference and convenience, the Observations and Recommendations of the Committee have been printed in bold and form Part-II of the Report.

5. The Committee would like to express their thanks to the representatives of the Ministry of Ports, Shipping and Waterways for tendering evidence before them and furnishing the requisite information to the Committee in connection with the examination of the subject.

6. The Committee also place on record their appreciation of the assistance rendered to them in the matter by the Committee Secretariat and the Office of the Comptroller and Auditor General of India.

**NEW DELHI**
**05 February, 2024**
**16 Magha, 1945 (Saka)**

**ADHIR RANJAN CHOWDHURY**
**Chairperson,**
**Public Accounts Committee**

## REPORT ON AVOIDABLE PAYMENT OF COMPENSATION CHARGES FOR LOW POWER FACTOR- V.O. CHIDAMBARANAR PORT TRUST BASED ON PARA 19.4 OF C&AG REPORT NO. 4 OF 2018

## PART-I

## REPORT

The VOC Port (V.O. Chidambaranar Port Trust) is responsible for distributing power to over 185 consumers within the Port premises, catering to various Port-related activities, infrastructure development, and maintenance contractors. Due to the diverse nature of consumers and the vast distribution area, the power demand and, consequently, the power factor varied, leading to low power factor issues. To address this, the Port initiated efforts to improve the power factor, closely monitoring it from November 2012. A Harmonic analysis test conducted in 2013 prompted the installation of Automatic Power Factor Correction (APFC) panels at major load centers in 2015.

2. The Committee also found that the Port diligently tracked power factor improvements, showcasing a gradual enhancement from July 2017 to November 2018. Subsequently, the installation of an energy monitoring facility by November 2017 further demonstrated consistent improvements in power factor maintenance from December 2017 to October 2019, consistently exceeding the prescribed value of 0.9.

3. To enhance energy efficiency, an energy audit conducted by M/s. Petroleum Conservation Research Association recommended measures such as installing energy-efficient LED lights, addressing load imbalance in transformers, and upgrading AC units. In response, the Port implemented changes, including switching to LED lights, balancing transformer loads, and upgrading old AC units to 5-star rated and inverter AC units.

4. As a result of these initiatives, the VOC Port has successfully maintained a power factor above the prescribed value since February 2018, thereby eliminating the need to pay compensation charges. The Port's commitment to energy efficiency is further evidenced by ongoing efforts to implement energy audit recommendations and continually improve its power factor.

5. In March 2012, the Tamil Nadu Electricity Regulatory Commission (TNERC) stipulated that the Average Power Factor (APF) of consumer installations for **High Tension** (HT) service

connections should not be less than 0.90. Compensation charges would be imposed if the average power factor fell below the specified limit. The Indian Electricity Grid Code (IEGC) also mandated consumers to generate sufficient reactive power to maintain the stipulated Power Factor (PF) in the network. Furthermore, regulation 13(3) of the Tamil Nadu Electricity Distribution Code (TNEDC), 2008, obligated consumers to enhance the power factor of their connected loads in accordance with the code's provisions.

6. The V.O. Chidambaranar Port Trust (Port) received 22 KV High Tension (HT) power supply from a 230/110KV Auto substation near Muthiapuram, Tuticorin, with a maximum demand of 3500 KVA per month. Starting from November 2012, Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) began imposing compensation charges on the port as it failed to maintain the stipulated PF level of 0.90. To avoid these charges, the port conducted a Harmonic analysis test in 2013 through M/s Edge Technologies, Hyderabad. The test recommended installing active harmonic filters with neutral compensation and avoiding leading PF.

7. After analyzing the HT bills and the Harmonic analysis test report in February 2014, the port decided to install compensating equipment at major load centers. Consequently, in December 2015, the port installed Automatic Power Factor Correction (APFC) Panels with seven percent detuned harmonics filters at seven locations, incurring a cost of ₹20.35 lakh.

8. However, an audit revealed that, despite the installation of APFC panels in December 2015, the PF did not improve as expected, ranging between 0.76 and 0.88 from January 2016 to July 2017. The port failed to conduct a performance appraisal of the installed equipment, did not identify other locations requiring APFC panels, and did not take corrective measures. Consequently, the port had to pay a penalty of ₹1.46 crore as compensation charges during the period from January 2016 to July 2017.

9. In August 2017, the Port's reply mentioned various reasons for the reduced PF, such as increased non-linear loads and variable load due to crane/equipment utilization. The Port claimed to have taken steps to improve PF and expected improvement based on the installations of APFC panels. However, the response of the Port was countered with the fact that maintaining PF at 0.9 was a statutory requirement, and despite conducting tests and spending ₹20.35 lakh on APFC panels, there was no improvement in PF. The Port did not measure the performance of the installed APFC panels, did not identify other locations for installing more panels, and did not conduct an energy re-audit. The Ministry, in its reply in November 2017, mentioned that the port had awarded a work order to install energy monitoring devices to monitor load distribution among port users.

10. The audit in their finding concluded that the Port's failure to comply with the statutory requirement of maintaining PF at 0.9 resulted in paying avoidable compensation charges amounting to ₹1.46 crore. They also noted the reply of the Ministry that the performance of the energy monitoring devices in maintaining the stipulated PF of 0.90 would be reviewed in future audits.

11. Explaining their responses on the Audit observations, the representatives of V.O. Chidambarnar Port Trust stated as follows:

> "Sir, this is basically compensation for low cost factor. The Audit made certain observations. Post that, the Port Authority has taken a number of steps. One, they have installed an APFC panel so that there is no such recurrence of this problem. Secondly, the load distribution among the port users is monitored closely and power factor has gradually improved. We have also installed energy monitoring facility in November, 2017. A third-party energy audit has been conducted through DEE and the Audit recommendations have been complied with."

12. To a query about the reasons attributed for not adhering to the stipulated powerfactor (PF) of 0.9 level by VOC Port, the Ministry in its written replies stated as under:

1) "VOC Port is receiving 22KV power supply with maximum demand of 3500KVA from TANGEDCO and distributing the power supply to more than 185 consumers inside the Port premises for Port related works, infrastructure developments works and contractors in maintenance work.
2) Even though the Maximum demand is 3500KVA, Port for its own consumption is utilizing only 246KVA and the remaining KVA are used by the Port users, PPP operators, contractors, etc.
3) The power demand of different consumers varies in accordance with their activity, variable demand from time to time and due to the vast distribution area, the power factor varies.
4) In the TNERC tariff schedule for low power factor surcharge applicable to HT consumers, the word '0.9lag' has been modified into '0.9'. Prior to this modification in the tariff, compensation charges for VOC Port had not arised due to maintaining the prescribed power factor. However, immediately after implementation of this change in the provision, PF compensation charges had generated in the monthly energy consumption bills for the reasons different types of consumers and their varying power demands and vast area of the Port premises. Hence there was low power factor experienced in Port.
5) This has been given serious attention considering different types of consumers and vast area involved.
6) VOC Port is taking earnest efforts to maintain power factor above prescribed value with the installed energy monitoring devices, APFC panels, etc., equal load distribution to the transformers and by insisting the Port Users to install of corrective equipments".

13. When asked as to why the energy monitoring devices were not installed to ensure that the stipulated power factor of 0.9 level is adhered to, the Ministry in its written reply stated as under:

"As per TNERC tariff, wherever the average power factor is less than the stipulated limit, compensation charges have to be levied. In the TNERC tariff schedule for low power factor surcharge applicable to HT consumers, the word '0.9lag' has been modified into '0.9'. Prior to this modification in the tariff, compensation charges for VOC Port had not arisen due to maintaining the prescribed power factor. However, immediately after implementation of this

change in the provision, PF compensation charges had generated in the monthly energy consumption bills for the reasons different types of consumers and their varying power demands and vast area of the Port premises.

To improve the power factor, the Port has installed energy monitoring devices in the distribution areas around 10km, to monitor the load distribution among the Port users. The Port has conducted Harmonic analysis test for the entire Port electrical network during 2013. Based on the recommendations of Harmonic analysis test, Port has installed APFC panels at major load centers during 2015. Port has completed installing energy monitoring facility by Nov 2017. VOCPA is maintaining power factor more than prescribed value and no compensation charge is paid since February 2018".

14. When asked whether the Ministry have undertaken any review of the installed energy as on date and whether the required PF level is now being adhered to, the Ministry in its written reply informed as under:

1) "Yes. VOC Port is taking efforts to adhere to maintain power factor above prescribed level. The measures taken / being taken by the Port are furnished below.

a) Since maintaining of correct power factor is statutory requirement, the port is insisting all the Port users to install power factor corrective equipments. Port users are being insisted to use Meters with facility to measure average power factor both under leadingand lagging condition. The Port is imposing penalty for Port Users who maintaining power factor lower than prescribed limit. Loss incurred by the Port were compensated through revenue generated from penalty paid by the Port users on account of maintaining low power factor.

b) The Port has installed energy monitoring devices in the distribution areas around 10km, to monitor the load distribution among the Port users.

c) The Port has conducted Harmonic analysis test for the entire Port electrical network during 2013. Based on the recommendations of Harmonic analysis test, Port has installed APFC panels at major load centers during 2015.

d) Load distribution among the Port users is closely monitored.

e) VOCPT conducted energy audit through BEE enlisted firm M/s.Petroleum Conservation Research Association, Chennai. In the energy Audit report, it is mentioned the power factor of the Port has increased above 0.9. Based on the energy audit recommendations, Port has implemented the following:

i) Changed all conventional light to LED lights

ii) Equal load distribution of transformers in Port area
iii) Changed old AC units into 5 star rated and inverter AC units

2) Subsequently Port has completed installing energy monitoring facility by Nov 2017. It is informed that the Port has achieved power factor above 0.9.

3) VOCPA is maintaining power factor more than prescribed value. No compensation charge is paid since February 2018".

## PART-II

## OBSERVATIONS/RECOMMENDATIONS

The Committee note with concern the avoidable payment of compensation charges amounting to Rs. 1.46 crore by the V.O. Chidambaranar Port Trust (Port) due to its failure to maintain the prescribed power factor level of 0.90. Despite the installation of Automatic Power Factor Correction (APFC) Panels in December 2015, the power factor remained suboptimal, ranging between 0.76 and 0.88 from January 2016 to July 2017. The Committee find that lack of a performance appraisal system for the installed equipment and the failure to identify additional locations for APFC Panels resulted in the payment of avoidable compensation charges during the specified period. The Committee would, therefore, recommend a comprehensive performance appraisal of the installed APFC Panels and establishment of a continuous monitoring mechanism to ensure sustained compliance with the prescribed power factor level. The Committee would also like to urge the Port to identify and install APFC Panels at other locations within its premises, addressing the root causes of the suboptimal power factor.The Committee would also like to emphasise on accountability and efficiency in meeting statutory requirements.

2. The Committee also recommend undertaking a comprehensive energy re-audit to further enhance energy efficiency and power factor improvement. This energy audit should assess the current power factor, the performance of existing equipment, and explore new technologies or measures for greater efficiency. Collaborative efforts with Port users, including PPP operators and contractors, should be strengthened to ensure collective adherence to power factor requirements, with incentives for compliance and penalties for non-compliance.

3. Keeping in view the above, the Committee would also like to emphasize the

need for transparent reporting by the Port on its power factor performance, containing, inter alia, details/measures taken to improve the same. This reporting would ensure accountability and would serve as a crucial aspect of preventing avoidable compensation charges in the future.

NEW DELHI
05 February, 2024
16 Magha, 1945 (Saka)

ADHIR RANJAN CHOWDHURY
Chairperson,
Public Accounts Committee

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