

MAINTENANCE OF COST RECORDS FOR A TRANSMISSION COMPANY

Abstract

Electricity transmission companies play a vital role in the power sector by transporting electricity from power stations to distribution utilities and larger consumers through high-voltage transmission lines and substations. Unlike manufacturing companies, transmission companies operate on a network-based service where a major part of the expenses goes toward shared infrastructure.

Maintenance of cost records for such companies involves careful identification of cost centres, precise classification of direct and indirect costs, and adoption of scientifically justified cost allocation bases. This article outlines a practical approach for maintaining cost records, preparing cost sheets and line-wise cost statements in line with Cost Accounting Standards and the Electricity Industry Cost Records framework.



CMA Sorabh Sethi

Practicing Cost Accountant
Lucknow

sorabh_cwa@yahoo.com

Introduction

A transmission company manages and operates an integrated infrastructure that includes:

- ⊙ Multiple Extra High Voltage transmission lines
- ⊙ One or more transmission & pooling substations
- ⊙ Grid control & load dispatch systems
- ⊙ Protection and automation systems
- ⊙ Communication networks & administrative offices

Since electricity flows through an interconnected network, many costs are common and cannot be identified directly with individual transmission lines. Therefore, cost records should account for individual line costs, substation costs, and common transmission services.

Cost per CKM Determine Cost per Circuit Kilometre	Line Cost Cost of each transmission line	Substation Cost Cost of operating substations
Service Cost Cost of common transmission services	Wheeling Cost Cost of wheeling or power transmission	Margin Analysis Overall Margin and profitability

Cost Centres Structure

For effective cost accounting and tracking, a transmission company should setup three distinct tiers of cost centres:

A. Transmission Line Cost Centres Independent cost centres for each line: • Line A Line B Line C • Line D Line E Line F	B. Substation Cost Centres Maintained separately by voltage or type: • 400 KV GIS Substation • 220 KV AIS Substation • Pooling Substation	C. Common Cost Centres Shared & Administrative functions: • Corporate Office & IT • Load Dispatch Coordination • HR, Finance & Regulatory
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COST RECORDS

Classification of Costs

Proper classification ensures clarity and transparency in the accumulation of costs:

Nature of Cost / Expense Item	Cost Classification Category
Tower maintenance	Transmission Line Cost
Conductor replacement	Transmission Line Cost
Insulator replacement	Transmission Line Cost
Line patrolling	Transmission Line Cost
Transformer maintenance	Substation Cost
Breaker maintenance	Substation Cost
Relay maintenance	Substation Cost
Auxiliary power	Substation Cost
Control room expenses	Substation Cost
Regulatory expenses	Common Corporate Cost
Audit Fees	Common Corporate Cost
Professional Charges	Common Corporate Cost
Corporate Administration	Common Corporate Cost
Finance Cost	Preferably Asset-wise or Project-wise

Repairs & Maintenance (R&M) Cost Handling

Repairs & Maintenance are a major cost driver in transmission utilities. A critical mistake in practice is treating R&M as a single category. R&M expenses must be separated before being allocated.

R&M Category	Amount (Rs Lakhs)	Percentage Share
Line Maintenance	420.00	70.5%
Substation Maintenance	160.00	26.8%
Common Maintenance	16.00	2.7%
Total R&M Expenditure	596.00	100.0%

Substation Expenses & Cost Allocation Methodology

Substations are shared facilities serving multiple

transmission lines. Expenses such as transformer maintenance, breaker maintenance, relay testing, battery banks, auxiliary power, control room expenses, security, and fire protection must first be collected under the respective Substation Cost Centre, and then allocated to connected lines using appropriate cost drivers.

Expense Category	Suggested Cost Driver / Allocation Base	Rationale / Standard Basis
Transformer Maintenance	MVA Capacity	Directly proportional to capacity rating
Bay Maintenance	Number of Bays	Relates to physical bay equipment deployed
Protection System	Number of Feeders	Protective relays correspond to line feeders
Auxiliary Power	Actual Consumption (kWh)	Energy consumed for cooling & control ops
Security Expenses	Area Covered (Sq.m / Asset Value)	Proportional to physical footprint
Civil Maintenance	Asset Capital Value	Reflects building and structure scale

Treatment of Finance Cost

Interest and finance costs typically relate to capital assets. Allocating finance costs based solely on Circuit Kilometre (CKM) alone can lead to distort costs because EHV lines and GIS substations have significantly different capital intensities. Preferred allocation bases are:

- ⊙ **Gross Fixed Assets (GFA):** Allocates based on original asset creation cost.
- ⊙ **Capital Employed:** This represents the net funds that are specifically invested in transmission infrastructure.
- ⊙ **Project Cost / Loan Utilisation:** Directly links interest on specific term loans to the assets that have been funded.

COST RECORDS

Sequential Workflow for Cost Sheet Preparation

Step 1: Direct Line Cost

Direct Line Manpower + Line Maintenance + Line Security + Power Charges

Step 2: Substation Allocation

Add Allocated Substation Cost (via MVA, Bays, Feeders drivers)

Step 3: Corporate Overhead

Add Common Corporate Cost Allocation (via Gross Block / CKM)

Step 4: Finance Cost

Add Allocated Finance Cost (via GFA / Capital Employed)

Step 5: Total Cost of Transmission

Sum of Steps 1 through 4

Step 6: Revenue Comparison

Compare Total Cost against Approved Tariff Revenue

Step 7: Margin & Profitability

Determine Line-wise Margin and Cost per CKM

Structure of Proforma Cost Statement

Particulars / Cost Head	Total Business (Rs)	Line A (220 KV)	Line B (400 KV)
Quantitative: CKM (Circuit Km)	1,200	400	800
Quantitative: Number of Towers	3,100	1,000	2,100
Direct Line Operating Costs	1,450,000	450,000	1,000,000
Allocated Substation Costs	850,000	250,000	600,000
Administrative & Corporate Overheads	320,000	100,000	220,000
Allocated Finance Cost	1,100,000	300,000	800,000
TOTAL COST OF TRANSMISSION	3,720,000	1,100,000	2,620,000
Transmission Tariff Revenue	4,500,000	1,350,000	3,150,000
MARGIN / NET PROFIT	780,000	250,000	530,000
Cost per CKM (Rs/CKM)	3,100.00	2,750.00	3,275.00
Revenue per CKM (Rs/CKM)	3,750.00	3,375.00	3,937.50
Margin per CKM (Rs/CKM)	650.00	625.00	662.50

Good Practices vs. Common Pitfalls

Recommended Good Practices ✓	Common Mistakes Observed ✗
• Maintain detailed maintenance records for each asset and bay.	• Entire R&M allocated only on Circuit Kilometre (CKM)
• Keep records of transformer and line outages.	• Substation costs merged with line costs or ignored
• Record voltage-wise transmission statistics	• Interest and finance costs allocated arbitrarily
• Track line-wise manpower deployment & registers	• No separate cost centre established for substations
• Track substation-wise auxiliary consumption	• Common overheads allocated without documented basis
• Reconcile Cost Records with Financial Accounts	• Absence of reconciliation between cost & financial books

Conclusion

An accurate cost accounting system for a transmission company should recognise that a transmission network is an integrated infrastructure consisting of transmission lines, substations and common corporate services. Preparation of reliable cost records requires separate identification of direct line costs, substation costs and common overheads, followed by allocation using technically appropriate cost drivers. Such an approach results in more meaningful line-wise cost statements, supports tariff determination, improves regulatory reporting and strengthens managerial decision-making. **MA**

Key References & Regulatory Framework

1. *Companies (Cost Records and Audit) Rules, 2014*

(as amended)

2. *Guidance Note on Cost Audit of Power Industry, issued by the ICAI.*
3. *The Institute of Cost Accountants of India (ICAI) — Cost Accounting Standards (CAS) issued by the ICAI. Mainly, CAS-3 (Production and Operation Overheads), CAS-12 (Repairs and Maintenance Cost), CAS-13 (Cost of Service Cost Centre), CAS-11 (Administrative Overheads), CAS-16 (Depreciation and Amortization), CAS-17 (Interest and Financing Charges), CAS-8 (Cost of Utilities), CAS-7 (Employee Cost) and CAS-6 (Material Cost) provide the principles for classification, measurement, assignment and disclosure of costs in cost records and cost statements.*
4. *Central Electricity Regulatory Commission (CERC) — Regulations and related transmission regulations*

Ref. No.: G/128(88)/08/2026

28th August, 2026

NOTIFICATION

In pursuance of the Regulation 146 of the Cost and Works Accountants Regulations, 1959, the Council of the Institute of Cost Accountants of India in its 360th Meeting held on 21st May, 2025 and 14th July, 2025 has dissolved the following Chapter of The Institute of Cost Accountants of India:

The Institute of Cost Accountants of India – Jajpur-Keonjhar Chapter
Gangadham, Tarini Market Near Dama Pati Cement, Jajpur Road
Jajpur,
Odisha – 755 019


CMA (Dr.) Debaprosanna Nandy
Secretary (Officiating)

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The Institute of Cost Accountants of India – Rajpur Chapter
39, Rakhal Ghosh Road, Nandan, P.O.Rajpur
Kolkata – 700 149


CMA (Dr.) Debaprosanna Nandy
Secretary (Officiating)