

CHAPTER III

3 Review relating to Statutory corporation

**WEST BENGAL STATE ELECTRICITY BOARD
(NOW WEST BENGAL STATE ELECTRICITY
DISTRIBUTION COMPANY LIMITED)**

**INFORMATION TECHNOLOGY AUDIT ON
COMPUTERISATION OF BILLING AND COLLECTION OF
REVENUE**

Highlights

Revenue loss of Rs 89.83 crore due to lack of data validation checks to relate supply voltage and connected load.

(Paragraph 3.7.1)

Revenue loss of Rs 11.80 crore on account of undue allowance of special rebate.

(Paragraph 3.7.2)

Inadequate analysis of consumption pattern, causing non-conversion of L&MV consumers consuming more than 50 KVA to de-centralised bulk consumers resulted in restricted revenue income to the extent of Rs 14.47 crore.

(Paragraph 3.7.3)

Though the preparation of energy bills could be computerised, online collection and accounting could not be introduced fully. There was suspense/mismatch amount due to wrong posting of payments amounting to Rs 1.53 crore.

(Paragraph 3.7.4)

Revenue loss of Rs 54.92 lakh due to non-compliance of orders regarding category of consumers.

(Paragraph 3.7.5)

Unmetered connections to Lokdeep/ Kutir Jyoti beneficiaries totalling upto 44.62 per cent of the total resulted in incalculable loss to the Board and failure to comply with relevant norms.

(Paragraph 3.7.6)

Absence of Security Deposit Module in the Billing Software.

(Paragraph 3.7.7)

Introduction

3.1 West Bengal State Electricity Board (Board) was formed on 1 May 1955 under Section 5 of Electricity (Supply) Act 1948 and is regulated by the Electricity Act, 2003 to cater electricity to all categories of consumers ranging from ordinary villagers (say, Kutirjyoti/ Lokedeeep) to big industrial units. The main functions of the Board are to supply, transmit and distribute electricity in the State of West Bengal in the most efficient and economical manner. However, since 1 April 2007, the Board has been restructured as the West Bengal State Electricity Distribution Company Limited (WBSEDCL).

To overcome the inherent problems involved in the manual billing system, the computerisation of the billing system of the Board was undertaken to reduce billing errors and time, thereby ensuring better consumer services and enhancing the Board's efficiency and transparency in billing.

The application software introduced by Board in 1994-1995 aimed at:

- a. Preparation of energy consumption bills,
- b. Online collection and accounting,
- c. Analysis of the consumption pattern, and
- d. Attainment of complete revenue realisation.

Development of Software

3.2 An Electronic Data Processing (EDP) cell headed by a Deputy Chief Engineer under Chief Engineer (Distribution and Rural Electrification) was established in 1993 with the responsibility, *inter alia*, of developing an energy billing software.

Low & Medium Voltage Billing Software was initially developed by National Informatics Centre (NIC) in the year 1994-1995. Subsequently, the package was taken over by the Board. The Board developed the Bulk Billing Software (contract demand 50 KVA and above) in-house and implemented it in 1995. With the change of environment/ architecture (Client-Server) and tariff structure, application software for all types of billing were modified in-house a number of times. At present, the Operating System Software is SCO UnixWare and the Relational Data Base Management System is ORACLE.

The front-end tool is Developer 2000 and the utility software is Lotus Smart Suite. The latest software for PC-based on-line cash collection system for L&MV consumers was developed by RITES and linked with the Divisional Computer Centers (DCCs). The Board developed on-line cash collection software in-house for Bulk consumers. At the beginning of the collection day, data was uploaded by DCC-in-charge and downloaded at the closing of the day. Out of 467 cash collection centres, 155 centres were already being covered by this online cash collection system till 30 September 2007.

Organisational set up

3.3 The distribution of electricity is being done through five Zones, 17 Electricity Distribution Circles (EDCs), 47 Distribution (D)/ Operation & Maintenance (O&M) Divisions and 467 Group Electric Supply offices spread over the State as on 31 March 2007.

The billing system is distributed in three levels:

- (i) Centralised Bulk billing (contract demand 500 KVA and above) under Central Commercial Wing at Board's Headquarters level,
- (ii) De-Centralised Bulk billing (contract demand 50 KVA/HP and above up to 499 KVA) under Circle level, and
- (iii) Low & Medium Voltage (L&MV) (contract demand up to 49 KVA/HP) billing under Division levels.

Apart from Central Commercial wing, 47 Divisional Computer Centres (DCCs) exist in the State for generation of energy bills and collection of revenues under the control of Divisional Managers or Circle Managers. Offices of the Divisional Managers are responsible for preparation of bills for L&MV consumers. Offices of the Circle Managers offices were responsible for preparation of Bills for de-centralized bulk consumers in concerned DCCs.

The revenues from electricity energy sales were realised at:

- (i) Central Commercial wing for Centralised Bulk and also for De-Centralised Bulk sales, if any consumer opted for it,
- (ii) Circle level for De-Centralised bulk sales, and
- (iii) Group Supply Offices and Call/Collection centers under Divisions.

Audit Objectives

3.4 The broad objectives of audit were:

- * To examine whether the stated aims of computerization of billing, i.e. reducing time and errors in billing and enhancing transparency were achieved,

- * To evaluate IT controls to ensure their adequacy, adherence to applicable business rules and terms and conditions of supply of electricity, and whether periodical operational instructions have been correctly incorporated in the software.
- * To assess whether the processes of revenue collection & proper accounting of revenue were streamlined to generally enhance economy, efficiency and effectiveness of the consumer services.

Audit scope and coverage

3.5 This IT Audit covered the computerized application monitoring, billing and collection system of the Board for Centralized and De-Centralized Bulk consumers and Low and Medium Voltage (L&MV) consumers.

Performance of the Board during the period 2002-07 was reviewed through analysis of data covering 16 Divisions (out of a total of 47), covering 12 Circle Offices (out of a total of 17) and all five Zones, and the Central Commercial wing at the Headquarters at Kolkata.

Audit methodology

3.6 The review involved study of the system and related records of the Board Headquarters. The data was analysed using Computer Assisted Audit Techniques (CAAT). The data maintained in the server at the 16 DCCs for the period from April 2002 to March 2007 were tested using Interactive Data Extraction and Analysis (IDEA) software and SQL queries. The results of the queries were examined to evaluate the adequacy of IT controls, to identify loss/omission of revenue and to ensure comprehensiveness of the software. The findings of the audit are discussed in subsequent paragraphs.

Audit Findings

3.7 Revenue loss due to lack of validation checks in Billing Software

Loss of Rs 89.83 crore on account of wrong calculation of energy charges vis-à-vis supply voltage

3.7.1 There was no validation check in billing software whereby the norms regarding connected load and connection of supply voltage could be maintained in case of centralized bulk consumers. The following were the established norms of the Board for class of supply voltage :

Connected Load/Contract Demand	Supply Voltage	Energy Charge (in Rupees)			
		Time of Day (To D)	2002-2003 to 2004-2005	2005-2006	2006-2007
For ultimate contract demand of 50 KVA and above but up to 1499 KVA	11/6.6/6 KV (High Voltage) Rate – E(bt)	N*	3.75	3.70	3.65
		P**	5.10	5.55	5.48
		O***	2.62	2.55	2.53
For ultimate contract demand of 1500 KVA and above but up to 14999 KVA	33KV (High Voltage) '02-'03 to '05-'07 Rate – F(t) '06-'07 Rate – F(bt)	N	3.65	3.53	3.47
		P	4.96	5.37	5.21
		O	2.55	2.47	2.40
For ultimate contract demand of 15000 KVA and above	66/132/220 KV (Extra High Voltage) '02-'03 to '05-'07 Rate – H(t) '06-'07 Rate – H(bt)	N	3.50	3.44	3.36
		P	4.76	5.16	5.05
		O	2.45	2.37	2.33

Lack of validation checks in billing system resulted in loss of Rs 89.83 crore.

Non-compliance to these norms, i.e. supply of electricity at the lower, and cheaper, level of supply voltage to 37 (out of 570) Centralized Bulk Consumers resulted in revenue loss to the extent of Rs 89.83 crore as per tariff rate for class of supply voltage for the period from April 2002 to March 2007.

The Management replied (October 2007) that migration of consumers from one level to other level is linked with many technical, administrative, and commercial parameters regulated by site offices as well as Commercial Wing of the then Board, now WBSEDCL. Thus, automatic migration of billing may not be judicious and this may attract future commercial complication. The Board further stated cited burden of extra expenditure involved in providing new service line for reduced contract demand and less line loss in providing supply at high voltage. The contention is not tenable as the Board, and State Electricity Regulatory Commission, after due consideration of such facts, frame tariff rates which in the instant cases, were violating the provisions leading to aforesaid loss of Revenue. The Board further stated that suggestion of Audit would be given due consideration after discussion with concerned Commercial Department and programme will be developed to generate reports for identification of consumers requiring such migration.

Loss of Rs 11.80 crore on account of undue allowance of rebate

3.7.2 The Board tariff rate provided for four *per cent* rebate to consumers having supply voltage from 33 KVA to 66KVA, eight *per cent* to those having 132KVA voltage and above, and in 2006-07 only, 10 *per cent* to consumers having supply voltage of 220 KVA.

The Board sustained loss of Rs 11.80 crore due to extending undue rebate to consumers.

It was however found during data analysis that undue rebate was allowed to 19 consumers above their entitlement. As these consumers, as already pointed out in above para No. 3.7.1, had been provided service connection from a higher supply voltage to which they were not even justifiably entitled, their

*N- Normal Hours, from 06:00 Hrs to 17:00 Hrs.

**P- Peak Hours, from 17:00 Hrs to 23:00 Hrs.

***O- Off Peak Hours, from 23:00 Hrs to 06:00 Hrs.

claim to rebate as per the higher supply voltage was consequently ultra vires, leading to loss of revenue worth Rs 11.80 crore.

Loss of Rs 14.47 crore due to non-compliance with provisions relating to conversion of consumer category from lower to higher supply voltage

Failure to convert L&MV consumers to HV consumers category resulted in loss of Rs 14.47 crore.

3.7.3 According to Paragraph 22(E) of General Conditions of Supply of the Board, if a low and medium voltage (L&MV) consumer crosses maximum demand of 50 KVA in any month, he will be billed at the rate of High Voltage category of consumers, instead of Low Voltage, for that given month. If such excess demand is crossed thrice in a financial year, the consumer would be *automatically* transferred under De-Centralised Bulk Consumer Category and the said consumer should execute an agreement in the prescribed Agreement Form meant for High Voltage supply for the desired contract demand as he considers appropriate, but in no case below 50 KVA. Also, tariff notification (December 2001) of W.B. Electricity Regulatory Commission also spelt out that the De-Centralised Bulk rate would be applicable to all types of Industrial Consumers, whose aggregate rated installed capacity exceeds 50 KVA and the monthly maximum demand would be 50 KVA or above.

Data analysis showed that there were 3,902 instances in eight DCCs where L&MV consumers had crossed 50 KVA of consumption in a given month but had not been billed at the appropriate rate of High Voltage consumer. The consequent loss to the Board was therefore Rs 8.57 crore.

Moreover, it was revealed that 136 consumers of eight DCCs had not been *automatically* converted to De-Centralised Bulk Consumer although their consumption was more than 50 KVA and above in at least three months in a financial year. There was no provision in the software to make the *automatic* change as desired under the rules and as a result, the change-over to De-Centralised Bulk Category was not taking place. The Board consequently suffered a revenue loss of Rs 5.90 crore on account of non-realisation of contract demand charges at the rate of Rs 180 per KVA per month as stipulated in the tariff orders for High & Extra High Voltage consumers i.e., for contract demand of 50 KVA and above.

The Management replied (October 2007) that migration of consumers from one level to the other level is linked with many technical, administrative and commercial parameters regulated by site offices as well as Commercial Wing of the then Board, now WBSEDCL. Thus, automatic migration of billing may not be judicious and this may attract future commercial complication. The reply was cited problems in conversion from one category to another but was silent as far as huge revenue loss and non monitoring was concerned.

Mismatch and suspense amounting to Rs 1.53 crore

Failure to identify and match the bills with the amount paid against them led to Rs 1.53 crore lying unadjusted.

3.7.4 The database revealed that certain amounts realized from L&MV consumers were lying unadjusted and were being kept under Suspense head due to wrong posting and/or mismatch. The amount accumulated during the period of audit was Rs 1.53 crore as ascertained during the data analysis in nine DCCs given below. This was primarily on account of the Board's failure

to properly identify and match the bills with the amount paid against them, even in a computerized billing and revenue collection system.

Division-wise suspense/mismatch amount as available from backup data of nine DCCs is exhibited below:

Division /Circle	Amount (Rupees)	Number of Consumers involved
Bidhannagar-I	1197607.38	277
Bidhannagar-II	2410662.32	2403
Bankura	2660779.58	5338
Behala	1408908.18	2690
Garia	423870.59	951
Berhampur	5076230.91	6379
Sreerampur	1244078	1698
Siliguri	881846.87	1313
Purulia	1918547.87	2157
Total	15303983.83	21049

This not only showed a lack of validation controls of data input in the software but also absence of unique parameters for identification of the consumers. Thus, the consumers were getting neither reliable nor satisfactory services.

The Board replied (October 2007) that since only 155 cash collection centres out of 467 were online as on 30 September 2007, this problem, which was due to offline entry of data pertaining to L&MV consumers, persisted. The Board is equipping itself to eliminate this problem by implementing on-line cash collection system in all Group Electric Supply Offices in the near future.

Incorrect categorisation of consumer

3.7.5 The Board issued a circular (March 1994) where the categorization of commercial consumers, as per their nature of business, was clearly spelt out. As per the norms, consumers such as Hatcheries, Petrol Pumps, Press, Garages, Schools, Training Institutions etc. should be categorized as “Commercial”. However, the available data showed that without assigning sufficiently documented reasons, many such consumers were categorized as “Industrial”, “Domestic” etc. and allowed the correspondingly lower rate of energy charge leading to loss of revenue.

During test check of consumers in 12 DCCs, it was noticed by audit that:

- * A large percentage of the types of entities referred to above, ranging from 1.7 per cent to 45.9 per cent have been categorized as “INDUSTRIAL”, “GOVERNMENT” etc., allowing them lower energy charges.
- * The number of such entities as could be found from the databases in the DCCs seemed to be surprisingly low. The table below shows the

number of schools and petrol pumps (only IOC), for example, in some of the Divisions as per the audited database vis-à-vis the corresponding figures from the Directorate of School Education and Indian Oil Company (IOC):

Name of the division	Schools	
	As per database	As per Directorate of Secondary Education
Bankura	109	3975
Howrah	73	3764
Siliguri	74	863
Bardhaman	78	5573

Name of the division	Petrol Pumps	
	As per database	As per Indian Oil Company
Malda	13	34
Murshidabad	12	42
Purulia	5	13
Purba Medinipur	2	53

This proves that many consumers of the aforesaid types have not even been entered in the master consumer database, thereby either leading to:

- * Lower energy charges being collected on account of wrong categorization, or
- * Possibility of illegal/un-metered electricity being supplied to many of such entities.

Due to wrong classification and absence of proper validation checks of data with reference to 'consumer type' field in the Consumer Master Table, as evident from the test audit, the Board suffered a revenue loss of Rs. 54.92 lakh against only 14 cases of consumers which were examined in six DCCs.

Management in their reply (October 2007) stated that, finalization of the Consumer category etc. are actually done by the respective Electric Supply/Distribution Circle/Central Commercial Department depending upon the supply voltage, load demand and actual use of power by the intending consumer. After necessary entry in the consumer master table by the site people, a report is developed by the respective DCCs and sent to concerned offices for their examination and validation before commencement of billing etc. The management assured to send a detailed report after examination on case to case basis.

Potential Loss due to unmetered Kutir Jyoti/ Lokdeep consumers

3.7.6 As per the scheme, single point domestic connection with one light point would be provided to each eligible beneficiary of BPL category and belonging to SC/ST and those residing in declared Dalit Bastees.

All such connections, as per norms, should be metered and any household consuming power beyond 25 units in a month should be liable to pay energy charges for *all* the units consumed on the basis of recorded consumption as per meter reading.

Test-check of the database, compared to the administrative report and Progress Review Technique (PRT) Reports, revealed completely divergent figures on the number of Kutir Jyoti/ Lokdeep beneficiaries as given below:

Kutir Jyoti/ Lokdeep Beneficiaries	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
As per Database of 9(*) DCCs	3801	3829	5787	9603	12960
As per PRT Report of 9 DCCs	18368	16017	13915	14241	17861
As per Annual Reports	(Annual Reports exhibit static figure for Purulia (472) and Malda (8210) Districts for the years 2002-2003 and 2005-2006. Figure for other DCCs not available in Annual Reports)				
As per PRT Report for <i>whole</i> West Bengal	67166	69770	64280	63515	61862
As per Annual Report for <i>whole</i> West Bengal	128931	128931	128931	128931	Report not yet published
As per the Proposal for Annual Plan	135617	135617	135617	135617	135617

* Bidhanagar-II, Berhampore-II, Barasat, Siliguri, Garia, Tamluk, Purulia, Malda, Behala.

Not only was there a complete mismatch of figures between various sources, but in the absence of necessary entries in the databases which would have been helpful in examining the eligibility and consumption pattern of the Lokdeep/ Kutir Jyoti consumers, loss of revenue on account of excess consumption could not be ascertained.

It was also revealed in audit, from a study of the PRT Reports of the Board, that the authority failed to provide meters to all Lok Deep/ Kutir Jyoti consumers. At least 27602 of such consumers (44.62 *per cent*), out of a total of 61862 live consumers were not provided with meters till 31 March 2007.

The management replied that database for master, billing, payment information of Kutir Jyoti /Lokdeep consumers in L&MV billing application existed. So desired report can be generated from the database as and when required. While the above is not contested by audit, the discrepancies pointed out between the software database and the various reports were not adequately analysed or replied to by the management.

Absence of Security Deposit Module in the Billing Software

The Board did not design Security Deposit Module in the billing system.

3.7.7 Though Security Deposit is a part of the billing procedure, the transaction details of the Security Deposit module is not uploaded in the billing system i.e. Security Deposit module is not integrated with billing modules. Moreover it does not have fields to capture the present status of security deposit of a particular consumer, interest element and also for Tax Deducted at Source (TDS) on interest payable on Security Deposit as per the provisions of the Indian Income Tax Act, 1961.

The Management replied that for the L&MV consumers, the Security Deposit module, including TDS as per Income Tax Act, was implemented in January 2007. It further stated that in case of Bulk consumers, Security Deposit module was implemented two years back with subsequent modification/ addition of modules as per State Electricity Regulatory Commission and that the Security Deposit module of De-Centralized Bulk was integrated with the billing as well as finance application.

Reply of the management is not tenable as test data analysis revealed that Security Deposit exhibited for Centralized Bulk consumers does not corroborate the figure (from 2005-2006) shown in the Consumer Master table in respect of “Krishna Silicate and Glass Works, Consumer No. C-11003”. Further no TDS field was found in the Security Deposit module as is evident from statement of Global Agrocare (Consumer No. D-13394) for the year 2006-2007.

Other points of interest

3.8.1 It was observed in audit that that discrepancies exist between the figures for actual revenue realised as given in the Annual Performance Reports and as according to the database. There was a cumulative difference of Rs 270.78 crore in five years period of 2002-07.

3.8.2 The number of meters and number of consumers differed among various master tables in the DCCs. Though the management gave various possible reasons for the mis-match of the figures, the fact itself was not denied. It is evident therefore that the database did not correctly portray the actual number of *either* meters *or* consumers at any given point of time.

3.8.3 The total number of bills raised did not match with the total number of consumers during the period of April 2002 to March 2007

3.8.4 Test-check of data backup of 12 DCCs revealed that in 73641 cases during the period 2002-07, the *current* meter reading date was earlier than that of *previous* meter reading date which indicates poor data validation control.

The Management in their reply (October 2007) stated that validation for such deviation has been included in the new version of the software without specifying since when this software has been implemented. As seen by audit, this validation was not in place during the entire audit scope.

Conclusion

Though the preparation of energy consumption bills was initiated, the aim of total online collection and accounting, analysis of the consumption pattern and attainment of complete revenue realization etc. were yet to be achieved. The computerized on-line cash collection system could not be introduced in all the supply stations.

The computerised billing system under implementation lacks in data validation controls. The database is also incomplete in as much as it does not provide the information in respect of all categories of consumers under the Board. This is evident of the fact that the Board failed to ensure reliability & transparency of the system and consumers satisfaction to its maximum level.

Thus objectives of fully computerized billing system to reduce billing time and errors, to ensure the best of consumer services, to enhance efficiency and to ensure transparency could not be fully achieved.

Recommendations

- * Software for processing applications for new service connections should immediately be introduced in all the DCCs and all the levels up to Group Supply offices should vigorously follow the extant orders to avoid both deliberate/ unintentional manipulations.**
- * Similarly, applications for enhancement of contract demand need to be processed through a suitable module to comply with the extant orders/ circulars and the time schedules scrupulously followed.**
- * Database needs to include the information regarding uniqueness of consumers' identity etc. The database for contract demand for L&MV categories of consumers, especially for the industrial & commercial consumers, should also be maintained so that the conversion from L&MV to Bulk category could be effected through analysis of variance report regarding consumption pattern. This might help the Board to reduce the loss through pilferage/ unauthorized use of power etc.**