2.4 Performance Review on Information Technology Support System for revenue billing in Allahabad and Varanasi towns of Purvanchal Vidyut Vitaran Nigam Limited, Varanasi

Highlights

Geographical Information System (GIS) mapping, meant for giving minutest details of the network and the connected consumers in a digital form was not available for monitoring despite incurring an expenditure of Rs.27.44 lakh.

(Paragraph 2.4.8)

Non updating of the master databank resulted in non-inclusion of 64 per cent cases of Varanasi town. Further, it had many duplicate service connection numbers, duplicate meters numbers and duplicate consumers, without prescribed fields values, vital fields as zero and consumers of higher tariff finding place in the lower tariff etc. which could not be corrected in the master databank.

(Paragraphs 2.4.10, 2.4.11, 2.4.12 and 2.4.15)

Before outsourcing the activity, the Company did not ensure participation of staff in trial run and monitoring of output to ensure error free generation of bills. For defective meters, the field of past three month's average consumption was not available. Thirty one per cent meters were defective since last 216 months. In 380 cases short assessment of Rs.36.14 lakh was noticed. In case of defective meters of domestic light and fan consumers, electricity charges were not charged for fixed units as done in other category of consumers resulting in short assessment of Rs.7.06 crore.

(Paragraphs 2.4.16, 2.4.17, 2.4.18 and 2.4.25)

The agreement with the Agency did not provide for obtaining system configuration details, staff skills, security features, IT audit by the Company or external agencies. Inadequate system configuration, security, storage capacity, efficiency and staff skills were noticed on physical verification. Further, the Company did not put in place its disaster recovery and business continuity plan.

(Paragraphs 2 4.21, 2.4.22, 2.4.23, 2.4.24 and 2.4.26)

Introduction

2.4.1 Purvanchal Vidyut Vitaran Nigam Limited, Varanasi (PuVVNL), a subsidiary of Uttar Pradesh Power Corporation Limited, Lucknow (UPPCL), was incorporated in May 2003 for distribution of energy in 21 districts of Eastern Uttar Pradesh. The Company serves about 24 lakh consumers having a connected load of 808.40 MW and energy sale of about 142.33 crore units with the basic objective of improving quality of electricity supply and services, increase consumer satisfaction, maximize revenue realisation and thereby make it commercially viable. To attain this objective, UPPCL felt the need for an information technology (IT) support system for maintaining a comprehensive databank of distribution network/consumers, accurate and speedy bill generation, bill distribution and collection of revenue.

UPPCL outsourced the billing and collection activity (through cheques) in 19 towns of the State during 2004-05. It included Allahabad and Varanasi towns under the jurisdiction of PuVVNL where the outsourcing was entrusted to KLG Systel Limited (Agency) in November 2004 at a contract value of Rs.7.36 crore[1]. The work comprised door-to-door survey of each consumer, indexing and allotment of unique identification number, updation and creation of master databank, development of geographical area road map, meter reading, bill generation, bill distribution, collection of revenue through cheques at consumers' doors, disconnection and reconnection of consumers *etc.*

Organisational set up

2.4.2 The Board of Directors of PuVVNL (Company) comprises of a full time Managing Director and two other Directors. The Company does not have any structured staff composition for IT support services from the corporate management to the base level for ensuring efficiency and effectiveness of the IT based services. The Deputy General Manager in-charge of a Circle of the respective towns are generally the Chief Executive Officer responsible for making payments to the outsourced agencies. Executive Engineer and his staff at the Urban Distribution Divisions are responsible for monitoring and control of activity of bill generation, revenue collection and other related works outsourced to the agency.

Scope of Audit

2.4.3 Scope of Audit included analytical review of the data bank of six[2] divisions of Varanasi and two[3] divisions of Allahabad towns for the latest billing cycle (reading of March 2007 billed in May 2007) to ascertain authenticity, accuracy and completeness of the databank for error free bill generation. For detailed scrutiny of related activities, one division each from Allahabad[4] and Varanasi[5] towns was selected. The correspondence files with the Agency, the new connection registers, permanent disconnection registers *etc.* maintained at the divisions were also test checked.

Audit objectives

2.4.4 Review of 'Information Technology Support System' as maintained by the outsourced agency for revenue billing and collection in eight selected divisions of Varanasi and Allahabad towns was conducted to assess whether:

- the objective for having the GIS[6] mapping for the electrical network trial runs were undertaken to ensures/consumers fulfilled;
- the master databank was regularly updated to ensure billing of all the consumers;
- Business Continuity and Disaster Recovery Plan was in place to save it from the risk of disruption of the billing and collection activity;

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1 Allahabad: Rs.3.26 crore and Varanasi: Rs.4.10 crore
2 Bhelupur, Machhodari, Ashapur, Chetmani, Chaukaghat and Orderly Bazar.
3 Mayohall and Rambagh.
4 Electricity Urban Distribution Division, Mayohall, Allahabad.
5 Electricity Urban Distribution Division, Machhodari,Varanasi.
6 Geographical Information System.

- adequate correct generation of bills;
- adequate control mechanism exists to ensure generation of correct energy bills and to prevent, detect and correct the errors/irregularities.

Audit criteria

2.4.5 The following audit criteria were used to ascertain whether the objectives stated as above were fulfilled:

- Comprehensiveness of the agreement entered into between the Company and the outsourced agency for safeguarding financial interests;
- Availability of IT skills and tools with the outsourced agency
- Existence of a system to verify outsourced agency's system configuration, security, controls and other inputs.
- Existence of a systematic approach to identify system weaknesses through an internal control mechanism.

Audit methodology

2.4.6 The data relating to revenue billing were analysed in June 2007 using computer assisted auditing tool *viz.* IDEA* for examining the correctness, completeness and integrity of the data. Besides examining the above data, the existence and adequacy of IT skills, PuVVNL staff participation, efficiency and effectiveness of IT support system was also assessed.

Audit Findings

2.4.7 Audit findings, arising from the performance review of information technology support system of outsourced agency for revenue billing in eight divisions of Varanasi and Allahabad towns of PuVVNL were issued to the Government (June 2007). These findings were further discussed in meetings with Chief Engineer (Commercial) in August 2007. Assessment of the outside Agency's system configuration and staff skills were also carried out in association with PuVVNL. The Review was also discussed in the Audit Review Committee for State Sector Public Enterprises (ARCPSE) held on 31 August 2007. The views expressed by the Management and members present in the meeting have been taken into consideration while finalising the review.

Non utilisation of GIS mapping

Company was not able to make use of GIS mapping rendering the expenditure incurred on it as unfruitful.

2.4.8 According to clause 4.1 to 4.3 of the agreement executed (November 2004) with KLG Systel Limited, the agency was to develop geographical area route maps of circles including mapping, documentation and indexing of sub-transmission and distribution networks on geographical area map for all the 33/11 KV sub-stations up to low tension lines and consumers and plotting the same on GIS maps at a cost of Rs.27.44 lakh. Further, as per clause 11 of the agreement, the agency was required to make the maps using legally procured digital satellite imagery of National Remote Sensing Agency (NRSA), Hyderabad and submit proof thereof. The GIS mapping was to be done using suitable software with provision of queries so that changes could be

* Interactive Data Extraction and Analysis package.

incorporated and to find details of the networks and the existing consumers in a digital format.

It was noticed by Audit that GIS mapping as prepared by the Agency was not available with any of the offices (including the corporate office) in a soft copy with supporting software and interface with the Agency's server. The GIS mapping was also not developed as per the technical specifications of the agreement. GIS mapping was to be updated on periodical basis but such updating was never done. As the Company was not able to make use of this mapping, the expenditure incurred on this work became unfruitful.

The Company, therefore, failed to identify the consumers' details (loads, linkage to the transformers, transformers to the secondary and primary sub-stations, billing and collection position *etc.*) to address load and voltage problems efficiently. It also failed to identify technical and commercial losses for each feeder and transformers to redress the anomalies of the network.

Management stated (August 2007) that it would get the GIS mapping installed on each division's system along with supporting software and linkage to server.

Non updating of master database

2.4.9 Clauses 4.4 and 5.1 of the agreement provided for developing a databank based on door-to-door survey of each consumer and consumer related records available with PuVVNL, allotment and indexing of unique identification number and updating of master databank before starting the activity of bill generation, bill distribution and collection of revenue (through cheques) at consumers' doors. It was noticed in audit that instead of developing the master databank as per this procedure, the agency obtained the billing data of the previous outsourced agency *viz.* Integrated Software Systems Limited, Lucknow (ISS) from the Company in a soft copy and started billing of the consumers without updating the previous data base. The coverage of door to door survey conducted by the agency was only partial and this resulted in non-billing of consumers, inconsistencies in the data bank, vital fields remaining blank, non-issue of first bills and other deficiencies as discussed in succeeding paragraphs.

Non-billing of consumers

2.4.10 The agency reported in September 2005 that there were 213463 consumers (in six divisions of Varanasi) existing as per its survey. Out of this, 137602 consumers[*] (64 *per cent*) were categorised as (i) using direct connection without meters, (ii) whose premises were permanently locked (iii) and who denied entry for survey. The cases of direct connections were to be dealt with in accordance with clause 8.1 of the Code 2005 and Section 135 of Electricity Act, 2003; the cases of entry denied were to be dealt with as per clause 6.2 (c) of the Code and the cases of premises permanently locked were to be re-surveyed for identifying the status and the authenticity of the report of the agency. Progress made to regularize these large cases of consumers was not available on record. The data in respect of the divisions of Allahabad was not provided to audit.

[*] 71385 direct connections *plus* 33248 consumers premises permanently locked *plus* 32969 cases of entry denial.

It was also observed that 268 consumers of LMV-4 and LMV-6 tariff categories (public/private institutions, industrial units, *etc.*) of Mayohall division of Allahabad were not finding place in the billing ledgers of the current data bank. The division did not raise any billing advises in respect of these consumers despite the knowledge about these consumers.

In five other cases, the consumers were not having meters or service connection numbers in the databank but were billed on a fixed charge basis after these consumers approached PuVVNL on their own. Identification of all such cases was not possible because of non conduct of a comprehensive door to door survey by the outsourced agency.

Showing concern on the alarming situation of non-billing of consumers, the management stated (August 2007) that the agency did not have a proper server, adequate and skilled manpower, sufficient, safe and secure hand-held machines *etc.* to handle such large volume of transactions. Further, the divisions did not have any control on the data with the agency on account of lack of IT skills. The divisions also did not know whether correct rates had been applied, all the consumers had been billed and the consumers billed had received their bills. In many cases, meters were available in the premises of the consumers but agency had not filled in meter numbers in the billing ledgers. Management admitted (August 2007) the failure of the agency in view of lack of skilled manpower deployment and expressed the view that while outsourcing the activity in 2004, the past working experience of the agency should have been considered and lowest quoted rates should not be the only criterion for the selection.

Inconsistencies in the databank

Inconsistencies in the databank resulted in presence of 1728 duplicate service connection numbers, 3905 duplicate meter numbers and 121 duplicate consumers.

2.4.11 The Computerised system of the agency lacked controls to detect cases of duplicate/triplicate service connection numbers, duplicate or fictitious meter numbers, duplicate consumers. An analysis in audit revealed presence of 1728 cases of duplicate service connection numbers, 3905 cases of duplicate meter numbers, and 121 cases of duplicate consumers. The details are given below:

Division	Duplicate/Triplicate service connection Nos.	Duplicate meters*		Duplicate consumers having all identical field values
		Nos.	Extent of repetition	
Varanasi				
Bhelupur	404	1193	2 to 13	77
Machhodari	435	834	2 to 780	34
Ashapur	112	214	2 to 1516	Nil
Chetmani	175	371	2 to 56	2
Chaukaghat	54	217	2 to 190	2
Orderly Bazar	217	226	2 to 1201	2
Total	**1397**	**3055**		**117**
Allahabad				
Mayohall	86	124	2 to 141	2
Rambagh	245	726	2 to 224	2
Total	**331**	**850**		**4**
Grand total	**1728**	**3905**		**121**

Source: Electronic databank of the divisions.

* Includes fictitious meter numbers.

The presence of duplicate meter numbers to such a large extent was because of fictitious entries made for this field value. Availability of a large number of duplicate/triplicate consumer numbers indicated the possibility of crediting the payment of one consumer in the account of some other consumer. Presence of duplicate consumers may lead to double billing of consumers. This position showed that the databank was fraught with serious errors and the objective of correct realisation of revenue from all the consumers could not be met.

The field of father's/husband's name was deleted from the data bank. In many cases, the address column contained only partial entries. The serving of notices under Section 3 and 5 using the computerised databank for correct bill of Uttar Pradesh Electrical Undertakings (Dues Recovery) Act, 1958 generation and collection of revenue was not possible because of incomplete addresses.

The Management stated (August 2007) that all such cases of duplicacy would be scrutinised and appropriate action would be taken to correct the position.

2.4.12 It was noticed in audit that out of 129190 consumers of one billing cycle, sequence no. was blank in 1062 cases, feeder number was blank in 1062 cases, consumer index number was blank in 1010 cases and sanctioned load was zero in 21 cases of consumers as detailed below:

Name of Division	Total consumers	Sequence no.	Feeder number	Consumer index number	Sanctioned load
Varanasi					
Orderly Bazar	10304	52	52	No field	2
Ashapur	9576	55	55	55	3
Bhelupur	21191	43		43	0
Chowkaghat	9617	391	391	391	1
Chetmani	18409	72	72	72	0
Machhodari	23289	27	27	27	8
Total	**92386**	**640**	**640**	**588**	**14**
Allahabad					
Mayohall	17289	0	0	0	2
Rambagh	19515	422	422	422	5
Total	**36804**	**422**	**422**	**422**	**7**
Grand total	**129190**	**1062**	**1062**	**1010**	**21**

Source: Electronic databank of the divisions.

The Management stated (August 2007) that they would examine these cases.

2.4.13 The billing databank did not contain the fields of consumers' details, and meter details as stipulated in clause 4.4.2 of the agreement. The consumer's details that were not available in the databank include security deposit, name of the concerned Junior Engineer, monthly assessment of the consumer based on connected load and status, type of service lines, overhead line and cable service from pole/bracket/underground cable. Similarly, the meter details that were not available include manufacture's serial number, departmental serial number, date of installation of meter, physical condition of the meter and seal, viewing glass, sign of tampering (if any), seal on the meter body/meter terminal plate, number of digits, physical location of the meter (approachability, readability and identifiability), status of wiring/service cable (OK, cuts, joints, tampering, clustered, *etc.*).

The Management stated (August 2007) that they were not able to exercise any control on account of lack of IT skills and that these issues would be sorted out in consultation with the Agency.

Non capture of 'Unique Electricity Consumption' consumption

2.4.14 Paragraph 6 of agreement with the agency provides for developing "Unique Electricity Consumption (UEC)" patterns based on each consumer's connected load and past consumption. This was to check consumers' premises in case of abnormal variations of their load and consumption. UEC patterns were not available in the database maintained by the agency.

Actual consumption of 4564 consumers (out of 129190 consumers) was on higher side as compared to sanctioned load ranging from 216 to 28080 units.

In the absence of UEC in the data bank, the consumption pattern of healthy meters (HLT) where meter readings were available was calculated in audit on the basis of sanctioned load for a period of one month in respect of all consumers. It was noticed that the actual consumption of 4564 consumers (out of 129190 consumers) was on higher side ranging from 216 to 28080 units in all the divisions when compared with the sanctioned load as detailed below:

Division	Total consumers	LMV-1		LMV-2 and others	
		No. of consumers	Range of excessive units*	No. of consumers	Range of excessive units
Varanasi					
Orderly Bazar	10304	187	216-19440	51	360-16200
Ashapur	9576	128	216-4752	29	360-7560
Bhelupur	21191	859	360-8640	532	360-33120
Chaukaghat	9617	565	432-14904	132	720-10800
Chetmani	18409	753	216-28080	59	360-25200
Macchodari	23289	386	216-3024	70	360-5400
Total	**92386**	**2878**		**873**	
Allahabad					
Mayohall	17289	370	216-15552	92	360-25200
Rambagh	19515	307	216-15120	44	360-5040
Total	**36804**	**677**		**136**	
Grand Total	**129190**	**3555**		**1009**	

Source: Electronic databank of the divisions.

This indicated the need for checking consumers' installations to ascertain the actual load and to regularize the excess loads as per procedure of Code, 2005.

The Management stated (August 2007) that they would look into the matter.

Incorrect Application of tariff

2.4.15 When the names and address of the consumers in domestic light and fan category (LMV-1) was sorted, it was noticed in audit that 149 consumers were falling under LMV-2 (shops, hotels, private guest houses, commercial establishments, cinema *etc.*) or LMV-4 (societies, public and private institutions, hostels *etc.*) categories. Thus, they were billed under lower category of tariff. The details are given below:

Sl. No.	Division	LMV-1 category having higher tariff consumers (No. of consumers)
Varanasi town		
1	Bhelupur	33
2	Machhodari	36
3	Ashapur	16
4	Chowkaghat	08
5	Chetmani	14
6	Orderly Bazar	05
	Total	**112**
Allahabad town		
7	Mayohall	32
8	Rambagh	05
	Total	**37**
	Grand total	**149**

Source: Electronic databank of the divisions.

* As compared to the units worked out on the basis of sanctioned load, supply taken as 24 hours, number of monthsx30 and factor as per annexure 6.3 of "The Uttar Pradesh Electricity Supply Code, 2005 (page no. 96).

The above inconsistency in the application of tariff was made possible due to non-identification of correct category of consumers by the agency.

Non assessment of defective meters

2.4.16 Clause 4.4.1 (g) (ii) of the agreement provide for development of software and database as per the respective Rate Schedules of tariff. For defective meters, the Rate Schedule applicable from 1 December 2004 provide for billing on the basis of average consumption of previous three billing cycles or in cases of non-availability of such data, on the basis of average consumption of subsequent three billing cycle after a correct meter was installed. This method was to be followed till the defective meter was replaced/repaired and the billing was restored on the basis of actual consumption recorded by the meter.

It was noticed in audit that the databank did not have consumption for previous three billing cycles to enable billing at average consumption when a meter becomes defective. The billing ledger showed billing status of consumers as having defective meters but did not have required data for generation of bills on the basis of average consumption during past three months. Further, in many cases, the last reading dates indicated in the billing ledgers were pertaining to the period November 1986 to March 1994 indicating that correct consumption for billing was not available since then. The number of defective meters as per one billing cycle's databank revealed that the defective meters accounted for 31 *per cent* of the total meters installed.

It was also noticed that hypothetical meter numbers were entered into the databank. The databank that was to be developed on the basis of door to door survey could have shown such hypothetical meters distinctly to enable segregation thereof from the real meters and appropriate action in future planning.

The Management stated (August 2007) that this was a matter of serious concern and agreed to look into the matter.

Generation of bills was not based on meter readings

Generation of bills was not based on meter readings despite availability of meter readings resulted in short assessment of Rs.36.14 lakh in 380 cases.

2.4.17 For cases involving defective meters of domestic light and fan consumers (LMV-1), bills were issued on the basis of fixed charges plus Rs.120 per KW/month. It was revealed in audit that in cases of a number of consumers, billing (at the rate of Rs.120 per month per KW) was done on the pretext that meters were defective despite availability of meter readings. In some cases, the meter readings indicated higher consumption than the assessment made. In such cases, the bills should have been generated for the units consumed. Analysis of the consumption on the basis of meter digits *minus* last OK reading revealed that in 380 cases, the electricity charges recoverable were more than the electricity charges assessed at Rs.120 per month for the number of months from last OK reading date till the current reading date. This resulted in short assessment of Rs.36.14 lakh in 380 cases of one billing cycle as detailed below:

Division	Number of cases	Consumption over last OK readings*	Electricity charges (Rs.)	Billed at Rs.120 per KW/month (Rs.)	Short billed (Rs.)
Bhelupur	106	409291	1046846	97800	949046
Machhodari	80	270677	622842	97080	525762
Ashapur	60	303731	758489	217440	541049
Chetmani	57	258808	647141	201480	445661
Chaukaghat	32	221812	523679	119160	404519
Orderly Bazar	45	386266	998351	250252	748099
Total	**380**	**1850585**	**4597348**	**983212**	**3614136**

Source: Electronic databank of the divisions.

While accepting the facts, the Management stated (August 2007) that this was a matter of serious concern and agreed to take corrective action.

Incorrect generation of bills amounts in LMV-I category consumers having defective meters

2.4.18 Further analysis revealed that in all cases of LMV-1 category consumers (Domestic Light, Fan and Power consumers) where the meters were defective, the agency billed the consumers at a flat rate of Rs.120 per KW/month although the units sold were shown at 80 units per KW/month and electricity duty was also assessed on 80 units. For 80 units, the assessment of electricity charge per KW/month worked out to Rs.163** as per LMV-1 tariff. The assessment at Rs.120 per KW/month was to be paid provisionally by the consumers and was to be adjusted against the bills of actual consumption raised subsequently on the basis of meter readings.

Incorrect assessment of LMV-1 category consumers having defective meters resulted in short assessment of revenue amounting to Rs.7.06 crore.

Compared to the assessment on the basis of 80 units per KW/month, the short assessment of electricity charges for the period from December 2004 to May 2007 worked out to Rs.7.06 crore in 25744 cases of defective meters as detailed below:

Division	Number of cases				Short assessment (Rs. in crore)			
(a) Varanasi	**IDF**	**ADF**	**RDF**	**TOTAL**	**IDF**	**ADF**	**RDF**	**Total**
Bhelupur	1574	1486	796	3856	0.38	0.53	0.16	1.07
Chetmani	1619	1016	815	3450	0.61	0.15	0.08	0.84
Orderly Bazar	2171	527	556	3254	0.66	0.15	0.08	0.89
Chowkaghat	491	213	500	1204	0.14	0.04	0.07	0.25
Ashapur	2282	537	584	3403	0.47	0.13	0.05	0.65
Machhodari	1601	1053	1328	3982	0.26	0.06	0.09	0.41
Total (a)	**9738**	**4832**	**4579**	**19149**	**2.52**	**1.06**	**0.53**	**4.11**
(b) Allahabad								
Mayohall	2768	576	625	3969	1.56	0.13	0.16	1.85
Rambagh	888	900	838	2626	0.63	0.27	0.20	1.10
Total (b)	3656	1476	1463	6595	2.19	0.40	0.36	2.95
Grand total (a+b)	**13394**	**6308**	**6042**	**25744**	**4.71**	**1.46**	**0.89**	**7.06**

Source: Electronic databank of the divisions.

* (meter digits *minus* last OK reading)*Multiplying factor.

** 70 units X Rs.1.90 plus 10 units X Rs.3.00.

The earlier billing agency (prior to December 2004) was showing previous consumption for each consumer in the billing ledger to enable estimation (if required) of average consumption for billing in case the meter becomes defective. The Company needed to devise appropriate mechanism to save it from loss of revenue in such cases.

The Management stated (August 2007) that the billing as per fixed units was as per the UPPCL's earlier orders because average consumption was not available for long periods in these cases. The fact, however, remains that under assessment continued even with reference to the orders of UPPCL.

Errors in calculations of bill amounts

2.4.19 As depicted in the table below, there were 5195 cases out of 129190 consumers of eight selected divisions where the electricity charges calculated by the computerised system was slightly different from the actual electricity charges leviable as per tariff schedule.

Division	Cases with wrong calculation of electricity charges in respect of non domestic consumers (LMV2 tariff)
Varanasi	
Bhelupur	29
Machhodari	874
Ashapur	216
Chetmani	595
Chaukaghat	176
Orderly Bazar	154
Total	**2044**
Allahabad	
Mayohall	3113
Rambagh	38
Total	**3151**
Grand total	**5195**

Source: Electronic databank of the divisions.

The Management replied that these cases of incorrect calculations would be rectified.

Deficiencies in the general control environment

2.4.20 The agreement entered into with the Agency did not provide for the system specifications of hardware to be used, arrangement for back ups and other hardware, *etc.* There was no mechanism with the management to gain assurance about the information security.

2.4.21 Physical verification of the Agency's system at Allahabad and Varanasi towns revealed that it did not have server that allows computers in a network to have a shared resource. It used non-branded Pentium-4 as servers which did not fall in the category of high-end servers as pointed out by the management itself. Due to non-use of high-end servers, the system configuration of the Agency had limited storage capacity, affecting the speed

for processing of input data, data security, reliability and linkage to GIS mapping.

2.4.22 Clause 4.4.1 (g) (iii) of the agreement with the Agency provide for taking daily back up data on DAT drive and to keep it safe at a location different from the server room for safety purposes. A review of the system configuration with the agency revealed that it did not have the DAT drive for taking back ups and the same was done through 200 GB external hard disc drive that were prone to risk of damage and loss of data.

2.4.23 The agreement does not stipulate any clause for IT audit of its system and databank by independent IT auditors of the Company or external auditors to ensure prevention, detection, and correction of errors.

2.4.24 Clause 10.0 (ii) provides that the contractor should have adequate number of professionals as mentioned in the agreement whose educational qualifications and expertise details must be furnished to the Company. These include (a) professional expertise in computer programming/operation; (b) electrical engineers with degree from recognised institute; (c) professionals trained in accounting and commercial aspects and (d) trained electricians, wiremen, linemen in electrical trade having "A" class valid license in the trade concerned issued by Director of Electrical Safety. A review of the staff strength and their qualifications as employed by the agency revealed (August/September 2007) that it did not have the skilled staff as stipulated in the agreement.

Inadequate acceptance testing

2.4.25 For success of computerised system of billing and collection of revenue, it is necessary that trial run of the software is undertaken in association of a skilled team of members of user divisions/circles before commencement of work by outsourced agency. The trial run should have been carried out considering the tariff structure, possible errors in billing, posting of collection, updating of assessment in case of dishonoured cheques, updating of bill revision/permanent disconnection cases, reconciliation of assessment, realisation, waiver and closing arrears, carry forward of arrears, working out of unit consumption in case of change of meter, defective meters, audit trails, generation of notices under Section 3, its indication in the databank and many other such requirements.

A comprehensive trial run programme could have provided a reasonable assurance in meeting the objectives of correct bill generation. No trial runs or acceptance testing was, however, ever carried out by UPPCL or PuVVNL of the computerised system put to use by the outsourced agency. In the absence of appropriate trial run, the data bank had deficiencies leading to incorrect generation of bills.

It was observed in audit that there were cases where (i) databank showed an unbelievable consumption of 3,33,33,333 units against a sanctioned load of 1 KW, (ii) billing ledger incorrectly showed incorrect number of consumption of units as compared to consumption calculated on the basis of meter readings, (iii) application of minus load and unrealistic factors in billing, *etc.* Such aberrations were found in all the test checked divisions of Varanasi and Allahabad towns and such errors in calculations were avoidable and happened because of inadequate trial runs.

Lack of adequate disaster recovery and business continuity plan

2.4.26 The Company did not have a formal disaster recovery and business continuity plan to provide reasonable assurance that the data processing operations could be regained effectively and in a timely manner, should a disaster render automated systems of the outsourced agency non-operational. The key configuration items (hardware, software, personnel and data assets), which were indispensable for continuity of the IT activities had not been identified through a proper risk analysis and counter measures were not outlined.

In the absence of a business continuity and disaster recovery plan, a significant disaster impacting the outside agency's servers and other computing systems ran the risk of paralyzing the billing and collection activity of the Company that would seriously hamper the main activity.

The management stated (August 2007) that they were not satisfied with the system configuration, capability, skills of staff employed by the Agency.

Acknowledgement

2.4.27 Audit acknowledges the co-operation and assistance extended by different levels of officers of the Company/Government at various stages of conducting the performance audit.

The above audit findings were reported to the Government in June 2007; the reply is awaited (October 2007).

Conclusion

The Company has risked the main activity of bill generation and collection of revenue as it is not able to derive expected benefit by outsourcing of the activity at a cost of Rs.7.36 crore. This is due to the fact that the Company could not ensure authentic, accurate, efficient and effective data bank for error free bill generation due to inadequate trial run of the software, lack of checking and monitoring of billing ledgers, lack of application controls and inadequate internal control and monitoring mechanism.

Recommendation

- **The Company should develop adequate infrastructure of skilled manpower and IT tools to check errors and omissions committed by the outsourced agency;**
- **The Company should identify and document the required checking and monitoring to be done by its own staff at divisional level;**
- **Geographical Information System (GIS) mapping should be obtained by each division with supporting software and linkage with the server to have the network, connected consumers and other details;**
- **The Company should ensure technical capability and skilled manpower deployment by the outsourced agency while awarding the contract;**

- **The Company should ensure obtaining of back up of each months databank in an editable format to ensure analysis, linkage and retrieval of data in case of need and to save it from disaster of the Agency's system;**
- **The Company should put in place its own internal control and monitoring mechanism for prevention, detection and rectification of deficiencies committed by the outsourced agency through its own IT skilled staff.**