

2.2 IT Audit on “Systems for collection of Baseline Data and Applications for Energy Accounting in Jharkhand Bijli Vitran Nigam Limited under R-APDRP”

Executive Summary

Introduction

With focus on actual demonstrable performance in terms of sustained reduction in Aggregate Technical and Commercial (AT&C) losses and establishment of reliable automated systems for collection of accurate base line data, the Ministry of Power (MoP), Government of India (GoI) launched (December 2008) Restructured Accelerated Power Development and Reforms Programme (R-APDRP) through adoption of Information Technology (IT) in the areas of energy accounting.

The project was to be completed within three years from the date of sanction by MoP. The funds were to be provided as loan through Power Finance Corporation (PFC) which would be converted into grant of GoI only after completing the project within the prescribed time line. In Jharkhand, MoP sanctioned ` 225.72 crore in September 2009 for implementation of R-APDRP in 30 project towns.

We conducted an IT audit of Systems and Applications established under R-APDRP and analysed the data, assessed various controls built therein to ensure security, accuracy, completeness and reliability of data. Following are the main audit findings:

Financial position

* Out of total ` 75.96 crore received as loan from PFC and ` 65.11 crore received as loan from Government of Jharkhand (GoJ) during 2009-2015, only ` 56.95 crore (77 per cent) and ` 15.94 crore (24 per cent) respectively were utilised as on September 2015. The under utilisation of funds was mainly due to delay in execution and non-achievement project milestones.

(Paragraph 2.2.6)

Planning and implementation of IT infrastructure

* As of October 2015, only 17 out of 30 project towns have been declared ‘Go-live’ as against the extended timeline of September 2015 for completion of the project. Further, IT system and applications were not fully operational even after lapse of four and half years of initiation of the project. The main reasons for delay in completion of the project were delay in appointment of IT Implementing Agency (ITIA), incomplete asset mapping and consumer indexing by ITIA, inadequate manpower and deficient Detailed Project Reports (DPRs).

More than 60 *per cent* of installed Feeder/Distribution Transformer/Boundary meters were either defective or not transmitting data to the Data Centre. As such objective of complete energy accounting was defeated.

(Paragraph 2.2.7.1)

* The work of Annual Maintenance Contract (AMC) and on-site support for Data Centre (DC) and Data Recovery Centre (DRC) was not awarded after October 2014. As a result, ITIA had stopped (February 2015) operations at DRC due to non working of DG sets, CCTV system, AC systems, electrical equipments etc. Absence of proper maintenance and deficiency in the infrastructure poses serious threat to the security of the systems, servers and data.

(Paragraph 2.2.7.4 (ii))

* The Company prepared DPRs in-house and submitted (August 2009) to PFC before appointment of the IT Consultant. Due to deficient DPRs, the actual quantities and cost of items increased up to 158 *per cent* and 295 *per cent* respectively during execution. The increased quantities and cost are yet to be approved by PFC.

(Paragraph 2.2.7.5)

Observations on Application Software

* The IT application lacked input and validation controls to ensure capturing all meter-data from installed Feeder/Distribution Transformer/Boundary meters in the system. As a result day-wise meter transmission reports in case of 4513 out of 6793 meters were missing for days ranging between two to 1460 days thereby defeating the objective of complete energy accounting.

(Paragraph 2.2.8.1)

* The Company had no documented backup and restoration policy. As such, there was risk of accidental loss of data which may not be retrievable in absence of such policies.

(Paragraph 2.2.8.2)

* As the Company could not achieve the objective of 100 *per cent* metering of consumers, existing un-metered consumers in R-APDRP project area led to generation of erroneous AT&C loss reports.

(Paragraph 2.2.8.3)

2.2.1 Introduction

The Ministry of Power (MoP), Government of India (GoI) launched (December 2008) Restructured Accelerated Power Development and Reforms

Programme (R-APDRP) Part-A and Part-B with focus on actual demonstrable performance in terms of sustained reduction in Aggregate Technical and Commercial (AT&C) losses and establishment of reliable automated systems for collection of accurate base line data by adoption of Information Technology (IT) in the areas of energy accounting in the urban areas with a population of more than 30,000.

The programme also envisaged installation of Supervisory Control and Data Acquisition (SCADA)/ Distribution Management System (DMS)¹ in the towns having a population over four lakh and annual energy input of 350 million units. The Power Finance Corporation (PFC) was the 'Nodal Agency' for operationalisation and implementation of the programme.

Activities to be covered under Part-A *inter-alia* included determination of base-line AT&C losses, Geographic Information System (GIS) mapping of the distribution network and Consumer Indexing, automatic data logging for all Distribution Transformers (DTRs) and Feeders to a centralised Data Centre, adoption of IT applications for meter reading, billing and collection, energy accounting and auditing; Management Information System; establishment of IT enabled Consumer Service Centre etc. Further, distribution network strengthening projects were to be covered under Part-B.

Jharkhand Bijli Vitran Nigam Limited (Company) has taken up the implementation of R-APDRP, Part-A, in the State. Out of 30 project towns, 17 have been declared 'Go-live' (October 2015). Further, the work of Part-B and SCADA are yet to be taken up.

2.2.2 Audit Objectives

The IT audit was conducted to:

* gain assurance that adequate planning was done for implementation of the IT system as envisaged under the programme and that the project was implemented economically, efficiently and effectively in order to meet objectives of the programme; and

* verify that adequate controls were in place to ensure security, accuracy, reliability and consistency of data in order to fulfil the business requirements of the Company;

2.2.3 Audit Criteria

Audit criteria were derived from the following sources:

* Programme guidelines of R-APDRP issued by MoP, GoI;

¹ A reliable and automated state of art system for real time monitoring and control of urban power distribution network encompassing all distribution sub-stations to achieve loss minimisation, load balancing and improvement in voltage and efficient planning of network for future growth.

- * Detailed Project Reports (DPRs) of the programme;
- * Request For Proposals (RFPs);
- * Instructions issued by MoP, GoI/PFC and the Government of Jharkhand (GoJ) in this regard; and
- * Best IT practices.

2.2.4 Organisational Set-up

As per provisions in R-APDRP guidelines, the scheme was to be implemented in the State by erstwhile Jharkhand State Electricity Board (JSEB) and after its unbundling, by distribution utility- Jharkhand Bijli Vitran Nigam Limited (Company).

Under the provision of Memorandum of Agreement signed (July 2009) by MoP, PFC, GoJ and the Company for implementation of the programme in Jharkhand, a Distribution Reforms Committee was constituted (March 2011) under the Chairmanship of the Chief Secretary, GoJ to monitor the projects under R-APDRP at the State level. The Principal Secretary, Energy Department, GoJ, the Chairman and the Member (Distribution) of the Company were its members.

The General Manager, R-APDRP of Company was appointed (January 2009) as Nodal Officer for implementation of the programme, assisted by 13 Electrical Superintending Engineers of Electric Supply Circles of the Company, who were designated as CEOs to supervise the work at field level. The organisational chart of the Company for implementation of project is given in **Annexure-2.2.1**.

2.2.5 Audit Scope and Methodology

The IT audit was conducted during April to July 2015 covering the period 2008-2015. The records relating to implementation of the project were test-checked in the offices of General Manager (R-APDRP) and In-charge, Data Centre, Ranchi. Eight² project towns along with their Circle offices were selected to verify the implementation of the project at field level. We obtained (June 2015) the R-APDRP databases and analysed (July-August 2015) the same using IDEA (a computer assisted audit tool) to ascertain reliability, accuracy and consistency of data.

We discussed the audit objectives, criteria, scope and methodology with the Managing Director (MD), Company in an entry conference held on 15 June 2015. The draft report was issued to the Management and the Government on 12 August 2015. The exit conference was held on 26 October 2015 with the Principal Secretary, Department of Energy, GoJ and MD of the Company. The reply of the

² Lohardaga (pilot town), Dumka (one out of the two Go-live projects) and six project towns (Chakardharpur, Jamshedpur, Dhanbad, Chaibasa, Ranchi and Mahijam) from the remaining 27 projects by adopting simple random sampling method.

Management and views of the Government in exit conference have been incorporated suitably.

2.2.6 Financial Performance

Funds for the project were to be provided in form of loan from PFC which was to be converted into grant of GoI only after completion of the project within the timeline (upto September 2012 extended upto September 2015) prescribed by PFC.

For Jharkhand, MoP sanctioned (September 2009) ` 225.72 crore under R-APDRP Part-A for 30 project towns (**Annexure-2.2.2**) of which GoI sanctioned a loan of ` 160.61 crore routed through PFC and remaining ` 65.11 crore was sanctioned as loan by Government of Jharkhand (GoJ).

Details of funds received as loan from PFC as well as GoJ and expenditure incurred therefrom is given in **Table - 2.2.1** below:

Table 2.2.1

(` in crore)

Year	Funds from PFC		Funds from GoJ	
	Receipt	Expenditure	Receipt	Expenditure
2009-10	30.00	-	-	-
2010-11	-	0.10	-	-
2011-12	18.18	20.84	37.26	0.08
2012-13	-	12.06	27.85	4.77
2013-14	27.78	20.78	-	5.77
2014-15	-	3.17	-	5.31
2015-16 (upto September 2015)	-	1.50	-	-
Total	75.96	58.45	65.11	15.93

(Source: Information furnished by the company)

It may be seen from the above table that as of September 2015, total amount of ` 75.96 crore was received as PFC loan, of which ` 58.45 crore (77 per cent) was utilised; and ` 65.11 crore was received as loan from GoJ, of which ` 15.93 crore (24 per cent) was utilised. The under utilisation of funds was mainly due to delay in execution and non-achievement project milestones.

2.2.7 Planning and implementation of IT infrastructure

2.2.7.1 Non-fulfilment of objectives due to tardy execution of the project

As per programme guidelines, Part-A projects were to be completed within three years of sanction of the projects *i.e.* by September 2012. Subsequently, time extension was granted by GoI up to September 2015 with stipulation that no further extension would be granted and the conversion of loan to grant would be limited to the towns completed till extended time. The project on completion

would have ensured 100 *per cent* energy accounting with a view to reduce AT&C losses.

Only 17 out of 30 project towns have been declared ‘Go-live’ as of October 2015 and IT system and applications were not fully operational even after lapse of four and half years

We noticed in audit that only 17 out of 30 project towns have been declared ‘Go-live’ as of October 2015. Also, the IT system and applications were not fully operational even after lapse of four and half years of award of work against the targeted period of eighteen months. The main reasons for delay in completion of the project were delay in appointment of IT Implementing Agency (ITIA), incomplete asset mapping and consumer indexing by ITIA, inadequate manpower and deficient Detailed Project Reports (DPRs) as discussed in paragraphs 2.2.7.2, 2.2.7.3, 2.2.7.5 and 2.2.7.6.

We also noticed that more than 60 *per cent* of Feeder/DTR/Boundary meters were either defective or not transmitting data to the Data Centre. As such objective of the project to ensure complete energy accounting was defeated.

Further, post Go-live activities like consumer billing and collection, new connection, disconnection were not done through the system and reports regarding AT&C loss, high loss feeders, Feeder/DTR wise performance were not being generated due to lack of familiarity of Company staff with the system.

In reply, the Management stated (December 2015) that 17 towns have been declared ‘Go-live’ upto October 2015 and correction of the erroneous data in all modules is being initiated as per findings of the Core Committee.

Fact remains that had the correction of data was initiated earlier, the project could have been completed timely. As of December 2015, 13 towns are yet to be declared ‘Go-live’.

Recommendation:

The Company should fix a specific timeline for completion of the project and initiate post Go-live activities immediately to achieve its intended objectives.

2.2.7.2 Delayed appointment of IT Implementing Agency

As per programme guidelines, an IT Implementing Agency (ITIA) was to be appointed on turnkey basis only from the panel of ITIAs notified by PFC. The ITIA was to supply, install and commission an integrated solution within the broad framework provided in the System Requirement Specification (SRS) document. It was responsible for integration of the IT systems created under the programme in all project areas, Centralised Customer Care Centre, Data Centre and Disaster Recovery Centre.

Against the target of completion of the project within three years, 14 months elapsed only in selection of ITIA

For ITIA selection, a tender was floated (September 2010) and Letter of Intent (LoI) was issued (January 2011) to the successful bidder, M/s HCL Infosystems Ltd. at a cost of ` 138.31 crore with the completion period of 18 months from the date of LoI.

Though, the entire project was to be completed within three years from the date of sanction (September 2009), 14 months elapsed only in selection of ITIA.

The Management accepted (December 2015) the audit observation.

2.2.7.3 Incomplete Asset Mapping and Consumer Indexing

ITIA was to carry out Differential Global Positioning Survey (DGPS) for Geographic Information System (GIS) Asset Mapping of all electrical networks viz. High Tension/Low Tension lines, Poles, Distribution Transformers, Power Sub-Stations and Consumer Indexing. As directed by PFC, the field officers/line men at the sub-division level of the Company were also to be associated with ITIA to expedite the GIS work.

We noticed in audit that ITIA placed orders to National Remote Sensing Centre (NRSC), Department of Space, GoI, Hyderabad for procuring satellite imagery of eight project towns in November 2011 and of remaining 22 towns in January 2012. On receipt of the imageries, activities of GIS mapping and consumer indexing started (March 2012). But the progress of work was not satisfactory as the manpower deputed by ITIA was insufficient.

We also noticed that the GIS data, Consumer Indexing and Asset Mapping for Lohardaga project town (pilot town) was completed in October 2012. Further, Asset Mapping of 26 towns and Consumer Indexing of 20 towns were completed in October 2015. But these activities were yet to be completed in three major project towns viz. Ranchi, Dhanbad and Jamshedpur (October 2015).

In reply, the Management stated (December 2015) that ITIA is being pursued for deputing adequate manpower to complete the Asset Mapping and Consumer Indexing of remaining towns.

The reply is not acceptable as Asset mapping of three major towns and Consumer Indexing of nine towns covering almost 75 per cent of total consumers are yet to be completed.

2.2.7.4 Deficiencies in setting-up of Data Centre and Disaster Recovery Centre

(i) Undue favour extended to the contractor

As per RFP, ITIA was to set-up a Data Centre (DC) at Ranchi to house computer systems and associated components for providing continuous access to various business process applications of the Company to other offices situated at different sites and store the data. Further, a Disaster Recovery Centre (DRC), was also to be set-up by ITIA at Jamshedpur as replica of the DC for redundant backup of data. The works were to be completed within 12 months from the date of LoI i.e. by January 2012. The Company was to provide the DC and DRC buildings to ITIA with complete physical infrastructure.

We noticed in audit that the Company floated RFP (January 2012) for design, supply, installation, commissioning, maintenance and operation of physical infrastructure for DC and DRC. As per RFP, the bidders were to quote for the main BOQ (the critical non IT infrastructure works) items as well as optional BOQ (on-site support and Annual Maintenance Contract) items.

After tender evaluation, LoI for the main BOQ works in DC and DRC was issued (July 2012) to a firm, at a cost of ` 7.71 crore with the completion period of 79 days and 120 days respectively. However, the firm had suggested some additional equipment for DC and DRC in their bid itself, though these were not part of either main BOQ or optional BOQ items. The Company decided to procure these additional items from the same firm and placed the work order at a cost of ` 3.95 crore without competitive bidding thereby extending undue favour to the firm.

The works of physical infrastructure at DC and DRC were completed and handed over to ITIA in March 2013 and June 2013 respectively and DC and DRC were commissioned in September 2013 and March 2014 respectively.

(ii) Non-operation of DRC

We further noticed that the Company placed the work order (September 2013) for Annual Maintenance Contract (AMC) and on-site support of DC and DRC for one year at a price of ` 36.33 lakh to the executing firm. However, the order for AMC and on-site support was not extended after October 2014 and regular maintenance of physical infrastructure was not carried out thereafter. As a result ITIA had stopped (February 2015) operations at DRC due to non working of DG sets, CCTV system, AC systems, electrical equipments etc. Absence of proper maintenance and deficiency in the infrastructure poses serious threat to the security of the systems, servers and data.

The Management, while accepting the audit observation, stated (December 2015) that the work of AMC and on-site support was being done by untrained manpower. However, the reply was silent on placing work order for additional equipment without competitive bidding and non-awarding of AMC to any firm.

Fact remains that had the AMC been awarded to any competent firm, the DRC could have been functioning properly and security of Systems and data could have been ensured.

Recommendation:

The company should deploy a competent firm for maintenance of DC and DRC to ensure security of systems and data.

ITIA had stopped operations at DRC due to non working of DG sets, CCTV system, AC systems etc.

2.2.7.5 Deficiency in preparation of DPRs

As per R-APDRP guidelines, the Company was to prepare DPRs for each project area either with the help of IT consultant empanelled by PFC or in-house in case they have skill and expertise so that a realistic DPR could be prepared.

We observed that the Company prepared the DPRs in-house for the selected project towns under Part-A and submitted (August 2009) to PFC before appointment of IT Consultant. The Steering Committee constituted by MoP approved (September 2009) DPRs of 30 project towns for ` 225.72 crore.

Due to deficient DPRs, BoM quantities were increased upto 158 per cent and cost of items increased upto 295 per cent

However, Bill of Materials (BoM) in the DPRs were subsequently increased upto 158 per cent and cost of items increased upto 295 per cent during execution. The increase in quantities and cost is yet to be approved by PFC (October 2015). Thus, DPRs prepared by the Company were deficient.

In reply, the Management accepted (December 2015) the audit observation.

2.2.7.6 Inadequate manpower

Company created (November 2010) 20 posts of Assistant Engineer (IT) against which 13 posts were filled and further hired (November 2013) 30 IT engineers through outsourcing at an annual cost of ` 1.23 crore; it deployed one engineer in each project town. Further, MoP directed (March 2014) to deploy at least one more IT professional in each of the 30 towns and 10 professionals for addressing the software/hardware issues at Data Centre as the scarcity of dedicated IT manpower was severely hampering the implementation of the programme.

Further, a committee, constituted (July 2013) to frame service rules, cadre rules and working arrangement of IT engineers in the Company, recommended (November 2013) the creation of two posts of Chief Engineers (IT), eight Superintending Engineers (IT), 18 Executive Engineers (IT) and 49 Assistant Engineers (IT). But the Company failed to appoint any IT engineers. Thus, the requirement of human resource for operation of the IT system established under R-APDRP was not adequately addressed.

In reply, the Management stated (December 2015) that one post of General Manager (IT), four posts of Deputy General Manager (IT), 10 posts of Sr. Manager and 20 posts of Assistant Engineers have been created.

However, the fact remains that no additional IT engineer has been recruited so far.

Recommendation:

The Company should recruit adequate IT manpower immediately.

2.2.7.7 Insufficient Capacity Building

As per RFP, ITIA had to organise professional training of 31 days to 60 Executive Engineers, 200 Assistant Engineers/Junior Engineers and 30 Senior Managers

comprising of core implementation group of the Company across business functions and IT. End User training was also to be imparted to the teams comprising of five to ten persons on a 'Train the Trainer' basis, who would in turn train other end users. The training was to be coordinated within the overall project implementation strategy.

We noticed in audit that ITIA organised (July 2015) two days 'Training for Trainer' on modules on Metering, Billing and Collection for 'Go-live' towns in which only 32 officers of higher and middle management were trained. Thus, adequate training was not imparted by ITIA for efficient use of the system.

In reply, the Management stated (December 2015) that ITIA appraises the procedure of working of software modules to the field officials as and when required in addition to two trainings at headquarter level.

The reply confirms that training was not imparted as stipulated in the RFP.

Recommendation:

The Company should organise professional training as envisaged in the RFP.

2.2.8 Observations on Application Software

An Application software solution was envisaged in the R-APDRP guidelines to cater to the functions of the Company, which was to be deployed on a centralised architecture wherein various offices of Company were to be connected to the system through Data Centre. The software was conceptualised to enable Company in receiving data of energy import and energy export from the entire distribution network viz. Feeders, Ring Fence (RF) i.e. Boundary and Distribution Transformers (DTRs) in order to serve requirements for energy accounting, auditing and reporting.

These services were re-usable across multiple technologies, languages and operating systems, and could also be accessed by the applications on different devices, like a Smart phone. Services could be utilised by the internal utility Web Applications, Customer Self Service and Customer Care Services portals.

In order to achieve the stated goals of R-APDRP, the application software was developed by ITIA as a web application for facilitating the availability of real time information across the distribution network and between field offices and higher management. However, given the connectivity challenges faced in the state a dedicated Multi-Protocol Level Switching (MPLS) connectivity was also established by a Network Broadband Service Provider with the secondary connectivity support of V-SAT.

We observed that all 17 modules (**Annexure-2.2.3**) of the R-APDRP application were deployed at the Data Centre and user access profiles had been created for generating reports and deriving AT&C losses, DTR wise as well as Feeder wise

for any project town. Audit observations on data analysis are discussed in succeeding paragraphs:

2.2.8.1 Inadequate input and validation controls

In R-APDRP application for energy accounting, metering was to be done for energy import and export from Feeder level to DTR and Boundary meters. To capture the inputs from various meters, a communicating device was to be installed in all Meters, which transmits the meter-readings directly to the Data Centre at a 30 minutes periodicity. A consolidated energy consumption report was also to be transmitted for each meter once a day. These day-wise consolidated figures are then processed for Energy accounting purposes viz. generating reports of AT&C losses, Transmission and Distribution losses, billing etc.

We noticed during data analysis that out of 9654 Feeder/DTR/Boundary meters installed, the communicating devices were installed in only 6793 meters. We further noticed that out of these 6793 meters, day-wise transmission reports of 4513 meters were missing for days ranging between two to 1460 days. Some illustrative cases of these meters are given in **Annexure-2.2.4**. As such the quantum of energy exported/imported/consumed in respect of these meters was not accounted for which led to erroneous reporting of AT&C losses.

Day-wise transmission reports of 4513 meters were missing for days ranging between two to 1460 days

This clearly indicates that the application does not have input and validation controls to ensure capture of meter-data from all meters into the system. Data-inputs of meter-reading in respect of all meters are mandatory to ensure completeness of data for calculating the AT&C losses, as reduction in AT&C losses is the main objective of R-APDRP.

On being asked for reasons for non-transmission of data by these meters, the Company stated (August 2015) that main reasons for the above were disconnected and defective meters, burnt/damaged communicating devices and non-compatible meters installed.

In reply, the Management corroborated the facts raised in the audit observation and stated (December 2015) that ITIA has been directed to ensure the consistency, reliability and completeness of the data.

Recommendation:

The company should address the input and validation control issues pointed out above to ensure consistency, reliability and completeness of data. Responsibility may also be fixed on individual officers for such failure.

2.2.8.2 Inadequate controls for Data Security

Business Continuity Planning (BCP) is the preparation and testing of measures that protect business operations and also provide the means for recovery of data in the event of any loss, damage or failure of facilities. A sound backup policy, a

well documented user and password policy should be prepared before commissioning of the system.

We noticed during audit that the Company had no documented backup and restoration policy as of now, even though 17 project towns have been declared 'Go-live'. Thus, there was a risk of accidental loss of data, which may not be retrievable in absence of such policies.

We further noticed that there were no documented user/password policies. Normal password controls procedures viz. restriction on unsuccessful login attempts by the users or automatic lapse of password after a predefined period or system enforced periodical change of password were absent. There was no documentation of active users. Given the above, risk to data security is inferred as high.

The Management stated (December 2015) that System Requirement Specification (SRS) contained storage and backup policy. ITIA has to complete user acceptance testing as per SRS only.

The reply is not acceptable as the database also contained data of 17 'Go-live' towns which could be secured only after adopting these policies.

Recommendation:

The Company may devise a Business Continuity Plan to mitigate the risk of data security.

2.2.8.3 Un-metered consumers in R-APDRP project area

As per the objective of the R-APDRP, each and every point of energy input and energy output should be accounted for in the entire project area (towns) to measure the accurate AT&C losses.

We noticed in audit that 437 consumers in the Lohardaga project town were unmetered and being billed at a flat rate as per Rural Tariff plan. As such, in the absence of metering devices, energy usage data of the town and the accuracy of the loss calculated through the system was affected.

In reply, the Management stated (December 2015) that all Electric Superintendent Engineers (CEOs) have been directed to ensure 100 *per cent* metering of consumers in all project-towns.

The fact remains that metering of all the Consumers in the project towns was not done so far.

Recommendation:

The Company should meter all consumers for accuracy and completeness of baseline data in the system.

2.2.8.4 DC and DRC established in the same seismic zone

Seismic zone is a region where seismic activity remains fairly constant. Each nation has divided entire area in various zones. From data recovery site selection perspective, Primary and Data Recovery sites should be preferably in different seismic zones as it would help to curb issues arising from various seismic activities like earthquake etc.

**DC and DRC
established in same
seismic zone.**

We noticed in audit that the DC and DRC established in September 2013 and March 2014 at Ranchi and Jamshedpur respectively falls under the same seismic zone. As such providing uninterrupted services to its customers and end users by the Company may not be ensured during seismic disasters.

The Management accepted (December 2015) the observation.

Conclusion and Recommendations

* As of October 2015, only 17 out of 30 project towns have been declared 'Go-live'. Further, IT system and applications were not fully operational even after lapse of four and half years of start of the project. More than 60 *per cent* of installed Feeder/Distribution Transformer (DTR)/Boundary meters were either defective or not transmitting data to the Data Centre, thereby defeating the objective of the project to ensure complete energy accounting.

The Company should fix a specific timeline for completion of the project and initiate post Go-live activities immediately to achieve its intended objectives.

* Due to non-award of work for Annual Maintenance Contract (AMC) and on-site support for Data Centre (DC) and Disaster Recovery Centre (DRC) after October 2014, the maintenance of assets of DC and DRC was not carried out properly. As a result, IT Implementing Agency (ITIA) had stopped operations at DRC due to non working of DG sets, CCTV system, AC systems, electrical equipments etc.

The company should deploy a competent firm for maintenance of DRC building to ensure security of systems and data.

* Due to deficient Detailed Project Reports (DPRs) prepared by the Company, the actual quantities and cost of items increased up to 158 *per cent* and 295 *per cent* respectively during execution.

* The application lacked input and validation control to ensure capture of all meter-data from installed Feeder/DTR/Boundary meters in the system. As day-wise meter transmission reports of 4513 out of 6793 meters were missing for days ranging between two to 1460 days, thus the objective of complete energy accounting was not achieved.

The company should immediately address the input and validation control issues to ensure consistency, reliability and completeness of data. Responsibility may also be fixed on individual officers for such failure.

* Due to non-achievement of the objective of complete metering, existing un-metered connections in R-APDRP project area led to generation of erroneous report on Aggregate Technical and Commercial (AT&C) losses.

The Company should meter all consumers for accuracy and completeness of baseline data in the system.

* In the absence of documented Business Continuity Plan, there was risk of accidental loss of data.

A Business Continuity Plan may be devised by the Company to mitigate the risk of data security.