CHAPTER 2

Eastern Railway: ***Audit of IT Governance with reference to implementation of PRIME and AFRES***

2.1	**Highlights**

Delays in acquisition of infrastructure and implementation of the system has already resulted in a time over run of three years and cost over run of Rs.1.63 crore, which were bound to increase as the system was yet to be tested and implemented.

(Para 2.6.1)

Avoidable expenditure of Rs.0.30 crore was incurred due to delay in purchase of hardware. Oracle licenses and other software were injudiciously purchased in excess of requirement.

(Paras 2.6.2 and 2.6.4)

Isolated implementation of additional software at a cost of Rs.0.13 crore with inadequate system security rendered it vulnerable to unauthorised access. The implementation was not in consonance with the extant orders of Railway Board and defeated its objective of uniform implementation of standard application in all railways.

(Para 2.7)

2.2	**Introduction**

Two applications namely **A**dvanced **F**inancial and **R**ailway **E**xpenditure Management **S**ystem (AFRES) and **P**ay **R**oll and **I**ndependent **M**odules (PRIME) were implemented in Eastern Railway. Whereas AFRES covers the Financial Management areas like Bill Passing, Book Keeping, Costing, Fuel, Assets, Cash & Pay, Budget & Finance, and Inspections etc PRIME deals with Payments, Recoveries, Leave account, Provident Fund, Pension and other activities of all Railway employees and also interfaces with AFRES sharing common database and information exchange. IT governance is the structure of relationships and processes to direct and control the organization in order to achieve the organization's goals by adding value while balancing risks and returns over IT and its processes. This review deals with the evaluation of IT governance in Eastern Railway with reference to implementation of the two applications.

IT governance in Eastern Railway was evaluated with reference to systems acquisition and implementation of PRIME and AFRES. COBIT (Control Objectives for Information and Related Technology) – an international framework was used to evaluate the IT Governance. The IT implementation processes were evaluated with reference to railway codal provisions with regard to planning and organization, acquisition, implementation and monitoring of the systems.

2.3	Audit objectives

Audit of IT governance in Eastern Railway was conducted with a view to assess the

- adequacy and effectiveness of IT planning and management to ensure proper organization and availability of requisite technological infrastructure; and

- effectiveness of implementation of the IT system and its integration with the business process.

2.4	Scope and methodology

The IT implementation processes have been evaluated with regard to planning and organization, acquisition, implementation and monitoring of the system, using COBIT (Control Objectives for Information and Related Technology), an international framework. The areas particularly covered were formation and working of the task force, implementation procedures adopted, procurement of hardware and software, user feedback, debugging and customization, trial/ parallel run and management reporting. User feedback was analyzed to bring out the lacunae in the system. Information was also gathered from interviews with staff and officers. However live data could not be analyzed as the system was yet to be implemented.

2.5	Planning and management

This domain of COBIT covers vision, strategy and tactics concerned with planning, communication and management so that a proper organization as well as technological infrastructure is put in place**.**

Audit observed inadequacies in the performance of the task force set up by the Railway Board and in planning and technical support from the Systems Development Team of Southern Railway.

2.5.1	Information technology organisation

In May 2002, Railway Board instructed Eastern Railway to form a task force consisting of FA& CAO (WST)[6] as Chairman, Director Finance (CCA[7]) as representative of Railway Board and Senior Electronic Data Processing Manager of Eastern Railway as secretary of the task force. Four other members from user departments were also to be nominated. The task force was entrusted with the overall responsibility of implementing the project as per time targets and was to meet and report the implementation status fortnightly to the Railway Board.

Audit observed that except for one user member and the secretary, the other members of the task force were not nominated by Eastern Railway (ER). Meetings of the task force were not held regularly. In spite of repeated reminders from the Railway Board, ER failed to intimate the status of implementation regularly.

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[6] Financial Advisor and Chief Accounts Officer (Works, Stores and Traffic)
[7] Computer Co-ordination of Accounting Policy

2.5.2 Inadequate planning

Though the Railway Board fixed June 2002 as the target date for commissioning the system, ER could only finalise the specifications of the operating system and processor platform by June 2002. It was observed that the objective of Railway Board to implement the system all over Indian Railways uniformly was not achieved in the absence of finalisation of source code and commissioning of hardware, which were prerequisites for the project. Further, the planning process also did not include the organisational model, geographical distribution, technological evolution, legal and regulatory requirements, future planning horizon, business process information re-engineering and staffing and costs as envisaged under COBIT. Performance indicators were also not incorporated in the plan. The chairman of the task force had also recorded that arrangement of minimum basic hardware and operating system to run the system on trial before the target date of 30 June 2002 was not a feasible proposition and that since ER was not given any of the pilot projects, it did not possess the requisite infrastructure to launch such a massive programme. This indicated that planning was inadequate.

2.5.3 Inadequate dissemination of technical expertise by Systems Development Team

Although the Systems Development Team of Southern Railway had developed the software, it did not render any assistance in implementing the software in ER except for supplying oracle software. Though, Railway Board had envisaged that one team from Southern Railway would assist ER in implementing the system, the same was not made available to ER. Testing and implementation of the application was outsourced to a private firm, as, according to ER, the limited number of personnel in the Systems Development Team of Southern Railway could not be expected to implement the application in all the zonal railways. Inadequate dissemination of technical expertise led to isolated attempts at customising the application at ER and the objective of uniformity in implementation of the application was not achieved.

2.6 Acquisition and implementation of the system

This domain of COBIT covers the realization of the IT strategy so that IT solutions are implemented and integrated into the business process. In addition, this domain covers changes in and maintenance of existing systems to ensure that the life cycle is continued for these systems.

Audit observed that there were delays in acquisition of infrastructure. Apart from time and cost overruns, Audit noted injudicious purchase and inconsistent customisation of software without obtaining user requirements, resulting in avoidable expenditure.

2.6.1 Time and cost over runs

The project was to be implemented in ER by June 2002 at an estimated cost of Rs.1.76 crore. Railway Board took one year, from July 2001 to June 2002, to fix the specification of operating software and processor platform. However, the railway administration is yet to procure the required hardware though three

years had elapsed from June 2002. The software also required modifications, which was not completed till date (June 2005). Thus, inability of ER to provide proper infrastructure has resulted in a time over run of three years. Further, ER revised its estimate for implementing the project to Rs.3.39 crore mainly due to the increase in the costs of RISC servers and oracle licences. The servers and oracle licences, which were previously estimated at Rs.0.42 crore and Rs.0.08 crore respectively, were expected to cost Rs.1.80 crore and Rs.0.25 crore respectively as per the revised assessment. Failure to acquire the hardware and software as per schedule resulted in a cost over run of Rs.1.63 crore, which was avoidable. The extent of cost over run and time over run was bound to increase even more as the system was yet to be tested and implemented.

ER stated that owing to rapid pace of technology, quick obsolescence and continuous upgradation in IT hardware, superior products were available with increased cost implications; the higher cost paid was for products with higher customer value. The reply was not acceptable since quick obsolescence was an ongoing process in IT sector and acquisition of infrastructure cannot be indefinitely delayed awaiting the advent of superior products. Utility of the products has to be correlated to the intended use.

2.6.2 Avoidable expenditure due to delay in purchase of hardware

Railway Board advised (May 2002) the task force to provide two servers and 10 to 15 PCs. Accordingly, in May 2002, ER hired two servers and 5 PCs for a period of 11 months at a cost of Rs.0.02 crore for porting and customization of PRIME and AFRES. This hardware, however, was returned without completion of porting and customization rendering the expenditure infructuous. Subsequently, in May 2003, ER procured five more PCs at a cost of Rs.0.02 crore for the same purpose and in March 2004 purchased six Xeon servers along with other hardware at a cost of Rs.0.25 crore.

Audit observed that even though the requirement of RISC servers to implement PRIME and AFRES was known well in advance, ER processed the procurement of RISC servers only in February 2005, by which time an expenditure of Rs.0.30 crore was already incurred on hire and purchase of temporary servers, PCs (used as servers) and Xeon servers. Thus, expenditure could have been avoided had the final hardware been purchased at the outset.

2.6.3 Networking

Although the application was an online project, no networking was done except in small Local Area Networks in Headquarters and divisions separately. The tender for networking was yet to be finalised.

2.6.4 Injudicious procurement of software

Against the requirement of 65[8] Oracle 8i EE users license and three licenses each of two other softwares (Form Developer and Report Developer) projected by ER, Southern Railway released an order for Oracle 8i, five numbers each of

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[8](Headquarter-15, Howrah- 25 . and Asansol-25)

Form Developer and Report Developer as committed off-take for ER. ER received 65 licenses out of which only 39 licenses[9] could be utilized by it. Audit observed that there was already a stock of Oracle licenses for sixteen users in Howrah division, which was not taken into account while assessing the quantity to be indented. Hence, ER received 42 Oracle licenses, two Form Developers and two Report Developers approximately costing Rs.0.12 crore in excess of requirement. In May 2002 a release order was issued for supply of Oracle licenses (25 users) costing Rs.0.05 crore to Asansol Division of ER. Since the Division had no hardware for installing the same, it was forced to return the licenses to the purchaser. Southern Railway also issued a release order for supply of 175 numbers of Oracle 8i (EE) along with software support for Workshops, while none of the Workshops was included in the project.

2.6.5   Customisation of software

Audit observed that user requirements were not obtained which led to inconsistency in customisation apart from the avoidable expenditure in modification and customisation.

- Review of modules of PRIME and AFRES revealed that there was a module viz., "Catering" but no program had been incorporated in the module either in the development stage or in the modification stage. In the absence of such a program, it would not be possible to maintain the activities of the catering accounts through PRIME and AFRES.

- Audit observed that 256 custom changes were made in the system at ER Headquarters whereas the number of changes in Asansol Division was 34. No details were available in respect of Howrah Division. Audit observed that for the same software different customization was undertaken by different users of the same category at an approximate expenditure of Rs.0.15 crore[10] indicating that requirement of customisation was not properly assessed and it has been undertaken as and when noticed. Scrutiny of accounts and records further revealed that there were many change requests received from the users and 81 of them required modification of even the source code.

2.6.6   Acceptance of software not conforming to codal provisions

Audit observed that two formats (Ledger and Section Code) were developed in the system, which did not conform to the formats given in the codes prevailing in Indian Railways.

2.6.7   Trial run and parallel run

In the system development cycle trial run is undertaken to find out the errors in the system and parallel run is undertaken to assess stability of the system after removal of such errors by necessary modifications in the system.

Even though customisation of the system undertaken in October 2004 was yet to be completed, records indicated that a parallel run for the entire bill units of

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[9] **(Head Quarters 15, Howrah (HWH) 12 and Asansol (ASN) 12)**
[10] **Rs.0.10 crore already incurred and Rs.0.05 crore yet to be incurred**

accounts department in ER was undertaken in November 2002. This was not acceptable since it is not possible to undertake parallel run prior to complete development of the system.

ER claimed subsequently that it had conducted a parallel run of payroll module since February 2005 and live run in respect of pension from May 2005. As yet, ER has only produced a pay bill generated for 23 employees for verification.

2.7 Isolated implementation of additional software

Railway Board reiterated in November 2003 that zonal railways should not invest monies on isolated attempts of computerisation viz; Provident Fund accounting, bill passing, personnel functions etc. as the investment would be rendered infructuous since system development teams were specifically formed for uniform implementation of standard applications on all railways. It further mentioned that local variants of applications lack in standard development procedures and were thus fraught with risk of frauds. The General Manager/ER, however, directed the Chief Personnel Officer, in January 2004, to plan a user friendly project for making relevant staff service particulars such as provident fund balance, leave and loan etc. available on a touch screen kiosk to enable any member of staff to retrieve his details on an interactive basis. The software was developed in a manner that a touch screen would accept the employee's Provident Fund number as input, validate its correctness and thereafter display all the details of an employee.

The system was commissioned in March 2004 in Headquarters office. Seven other similar systems were also commissioned in all divisions and workshops over ER during the year 2004-05 at a total cost of Rs.0.13 crore. Development of all these systems was not in consonance with the objective of the Railway Board of uniform implementation of standard applications in all the railways.

Audit scrutiny further revealed that though the system was designed to function like an ATM, the requisite system security e.g. sign-on entry, insertion of hardware key, access restriction with password etc was not provided in the system for checking users' identity. Under the existing system, therefore, anybody could gain access to the system by inputting a Provident Fund number. This left the accounts of 1,33,613 numbers of employees having a total Provident Fund balance of Rs.1,483.49 crore (as of March, 2005) vulnerable to unauthorised access.

2.8 Recommendations

- Railways need to ensure adequate planning and provision of required hardware to avoid further delay in implementation of the application and avoid additional expenditure.

- User's requirement should be invariably taken into account for development /customization of applications.

2.9   Conclusion

The IT Governance environment in Eastern Railway was found lacking in timely and proper implementation of major IT initiatives. The software applications were customised without obtaining users' requirements. This led to modifications of the system with added cost. The system could not be implemented within the stipulated period due to poor functioning of the task force responsible for implementation of the project, non-procurement of specified hardware and modifications of software. Poor implementation of the system resulted in cost and time overrun, which were likely to increase further.