The Company stated (October 2016) that the 25 MVA transformer at Bhusawal was lifted by the contractor in May 2016 and the contractors were being pursued to repair the transformers. The reply was however silent regarding non encashment of BG.

Non disposal of obsolete (CT and PT) transformers

3.8.8.2 Fifty three Current Transformers (CT) and Potential Transformers (PT) procured during 2008-10 costing ` 80.32 lakh was lying idle at Major Store 'A' Baramati as on October 2016. The Company in its meeting with MSEDCL decided (November 2010) not to use 0.2 Class type CT and PT.

Audit observed that though the Company decided in 2010 not to use these CT and PT, these had not been disposed off and were still lying in store (December 2016).

Conclusion

The capacity utilisation of number of transformers was far below their installed capacity due to incorrect assessment of load. The Company did not consider the transformer in stock and released due to augmentation/repairs/ conversion while assessing the additional requirement. This resulted in excess procurement.

The Company did not prescribe and follow guidelines/criteria for storage of good condition transformers removed from service to avoid subsequent expenditure on its repair, overhauling, re-insulation and oil filtering. As a result, the Company had to incur expenditure in overhauling at the time of reinstallation.

The matter was reported to the Government/Management (September 2016); their reply was awaited (December 2016).

Maharashtra State Power Generation Company Limited

3.9 *IT Audit on the implementation of Fuel Management Process Module under SAP-ERP System*

Introduction

3.9.1 Maharashtra State Power Generation Company Limited (Company) is engaged in generation and sale of electricity; having installed capacity of 12,077 Mega Watt (MW), as of March 2016, which included Thermal, Hydro, Solar and Gas Power plants. Thermal *i.e.* coal based energy constituted majority of the plants (8,640 MW *i.e.* nearly 70 *per cent*) while one gas based generating station at Uran, had installed capacity of 672 MW. The Chairman & Managing Director and other Directors of the Company are nominated by MSEB Holding Company Limited. The Information Technology needs of the Company are overseen by the Chief General Manager (IT) under the overall supervision of Director (Operations).

Computerisation in the Company

3.9.2   In order to bring about an end-to-end automation of all business processes, the Company had taken initiatives since 2007 to implement SAP-ERP System for the existing processes. Administrative approval for the same was accorded by the Board of Directors (BoD) in 2007. The Company appointed (May 2008) M/s. KPMG Advisory Services Private Limited as Project Management Consultant (PMC) for assisting the Company in implementation of SAP-ERP System. The SAP-ERP System was planned for mapping the manual processes and replacement of individual decentralised/ standalone software.

The objectives of the Company for SAP-ERP implementation were:

•   Enabling the Company to improve its operational and financial efficiency by increasing the availability of Plants, reducing working capital requirement, optimising inventories of fuel and spares and streamlining the accounts functionalities for efficient cash flow management.

•   Providing real time Management Information System for fast, efficient and transparent decision making at the highest levels.

•   Integrating existing systems to address issues relating to data management to avoid duplication of efforts, accuracy, timelines and comprehensiveness of management information.

•   Setting in place a system to capture information to build accountability for performance, across organisation levels at the Corporate office and the Plants.

The work of implementation of the SAP-ERP System was awarded (April 2010) to M/s. Larsen and Toubro Infotech Limited (LTIL) who was the lowest bidder at a price of ` 29.80 crore[34] after approval of the BoDs (November 2009). LTIL was awarded the work of supply, implementation, post implementation support, Annual Support (AS) and Annual Technical Support (ATS) of SAP package based Integrated Business Solutions. The project consisted of eleven modules[35] and was to be completed in two phases[36] covering all units. The first phase, which commenced in June 2010 was completed in September 2011 and the second phase commenced in October 2011 was completed by November 2011 within the stipulated period of 18 months (from June 2010). The designing of the SAP-ERP System was undertaken from June 2010 and project went live for all locations in November 2011. The ATS by LTIL provided for supply of upgrades/updates/

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34 Total cost includes License Cost ` 8.41 crore, ATS ` 5.06 crore, Implementation cost
   ` 9.60 crore and AS ` 6.73 crore
35 Enterprise Asset Management (EAM), Plan to Supply (PTS), Order to Cash (OTC),
   Procure to Pay (PTP), Quality Assurance and Control (QAC), Fuel Management Process
   (FMP), Project Monitoring and Control (PMC), FICO-Posting to Finalisation (PTF)/Plan
   to Control (PTC), Recruit to Retire (RTR), Environment Health and Safety (EHS) and
   Energy Data Management (EDM)
36 Phase-I covering Head office at Mumbai, Coal Office at Nagpur, Pophali Hydro Plant,
   Uran Gas Plant, TPS at Bhusawal, Chandrapur, Khaperkheda and Nashik
   Phase-II covering TPS at Koradi, Hydro circle at Nashik, Paras, Parli and Pune

patches for all modules at an annual payment of ` 1.01 crore. Annual Support by LTIL with a dedicated onsite help desk, at an annual payment of ` 1.35 crore was also to be provided for entire SAP-ERP System, for a period of five years from the date of expiry of one month after implementation of Phase-II *i.e.*, up to December 2016.

The Fuel Management Processes Module (FMPM) was one of the 11 modules under SAP-ERP System which detailed the complete processes of fuel procurement and its management and covered the working of Fuel Management Cell at Headquarters, Coal Handling Plant, Major Stores and Fuel Accounting at Thermal Power Station (TPS). This module also provided an interface with the Railways, weigh bridges, *etc.* The designing of the FMPM started in June 2010 and it went live in November 2011 along with other modules.

Scope of Audit

3.9.3 The present audit of FMPM in SAP-ERP System covered the designing, development, implementation and the working of the FMPM for the period from September 2011 to 31 March 2016. The present audit covered the FMPM implemented by the Company at five[37] coal based TPS out of the seven coal based TPS and one gas based TPS.

Audit objectives

3.9.4 The audit objectives were to ascertain whether:

• there existed a proper plan for computerisation, commensurate with Company's Mission and Objectives and requirements;

• the documentation including Business Rules, Regulations and procedures of the Company were adequately mapped into the system;

• the information in the database was complete, accessible, accurate and reliable;

• adequate security controls were in place;

• the benefits expected from the FMPMs is utilised by other modules through inter-linkages; and

• implementation of FMPM had improved the efficiency, effectiveness and economy in fuel management of the Company.

Audit criteria

3.9.5 In pursuing Audit objectives, audit adopted the following criteria:

• Business rules, regulations and procedures of the Company;

• Board resolutions;

• Contract with LTIL;

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37 Bhusawal, Chandrapur, Khaperkheda, Koradi and Nashik

• Various control and security parameters as prescribed in policies of the Company, if any; and

• Orders/Circulars for constitution of IT Steering Committee and its functioning.

Audit methodology

3.9.6 The FMPM under SAP-ERP System and its linkages with other modules was analysed using IDEA software, Smart Exporter software and Audit Information System functionality of the SAP-ERP System.

Audit findings

System acquisition, development and implementation

Non-preparation of SRS and URS and absence of IT Policy

3.9.7 The audit findings regarding the implementation of FMPM are as follows:

3.9.7.1 The basic requirement for implementing an ERP solution involves a thorough study of the business processes by Project Core Committee (PCC) which consisted of the Company's Process-Business Owners/Department Heads/CGMs. Any major IT system development and its implementation requires detailed User Requirement Specification (URS) and System Requirement Specifications (SRS) in the absence of which certain business processes may not get mapped. Although PCC was formed, the Company had not prepared URS and SRS and the nature of consultation between the implementation team and the users were not available on record. It was stated in the SAP Handbook that the PCC would provide guidance and inputs to finalise TO-BE processes and were responsible for business process sign-off and its implementation. The PCC did not prepare documents like URS, SRS and Study Design resulting in non-mapping of essential business processes in the SAP-ERP System, as brought out in subsequent paragraphs. Audit observed that implementation of the SAP-ERP System was undertaken without formulating and adopting a formal IT Policy.

The Management while accepting (October 2016) that there was no documented/formulated IT Policy/roadmap stated that the formulation of the same will be undertaken in near future. It was also stated that, workshops with Subject Matter Experts (SME) from all locations including HO were conducted along with module wise core team and a Business Owner for each function was identified for finalisation of business requirements. The common and interfaced processes were discussed among business owner(s) in PCC meetings and were documented as part of Business Blue Print (BBP) which was handed over to SAP team for configurations.

The reply of the management is not tenable since it was observed that the Company had not considered all the requirements at the user level in TPS which, in turn, forced the users to rely on excel/legacy data for many reports.[38]

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38 Coal Claims, Performance Incentives, Monthly Coal Cost Report, ZFMP_OCM5_REPT *etc.*

It was accepted at the exit conference that standard SAP functions were matched with the current processes but not to all the user requirements.

Interfacing of prevailing IT solutions with SAP-ERP System

3.9.7.2 As per Article 6.2 of the Agreement dated 6 April 2010 with LTIL, the SAP system was to be interfaced with various applications *viz.* GCR-For Analytics, E-Tendering, Exchange Server, Data Exchange in the CPF System, Weigh Bridge (WB) and Biometric Attendance System. Accordingly, interfacing of E-Tendering and the WB application software (Weigh Tech Software) with the FMPM was in the scope of work of LTIL. Audit observed that the Company had not integrated the above two applications with FMPM at the Company's TPSs resulting in non-fulfilment of contract conditions as detailed below:

A) E-Tendering System: The E-Tendering system for procurement of imported coal was implemented by the Company before implementation of FMPM. With the implementation of FMPM, the same should have been interfaced with the FMPM. As this was not done, there was repetition of work since data captured in E-Tendering application had to be re-entered manually into the FMPM with consequential delays and scope for human errors.

Management admitted (October 2016) that the interfacing of the E-Tendering system with the SAP-ERP system, though not done till date, will be implemented in the near future.

B) Weighbridges: The interfacing of Weigh-Tech software and FMPM was successfully done at all TPS, except in Bhusawal TPS. It was observed that the details of coal received by rail and unloaded at tippler were not captured into the WB interface (Weigh-Tech) automatically due to non-functioning of dedicated systems at the tipplers. This forced the Coal Handling Plant (CHP) at the TPS to maintain manual records at tipplers and manual data entry in Weigh-Tech system at Coal Accounting Section of the TPS and subsequent uploading on to FMPM. As explained by the IT Section of the Company, the option for manual data entry provided was to be used in the case of manual unloading of wagons, if required. Audit however observed that the manual data entry was being done on a regular basis, thus defeating the purpose of automation at Bhusawal TPS.

At Chandrapur STPS, coal was received through Roadway, Railway, Ropeway and Unique Train System (UTS). Although interfacing facility of WB with FMPM was available in case of coal received through Railways, the interfacing from WB in the case of Lorry Receipt (LR) was not done till date. As a result, the TPS entered data manually into the FMPM.

Management stated (October 2016) that Weighbridge interfacing for Roadway, UTS and Ropeway could be explored only after technical feasibility study though interfacing was implemented for Railway Mode Receipt at all plants.

The reply of the management is not tenable as the Company failed to ensure proper utilisation of the integrated WB interface resulting in repetition of efforts for recording the weights and subsequent feeding into the system and defeating the purpose of implementation of the system at wagon tipplers. Technical feasibility study for interfacing of Ropeway, UTS and ropeway should have been undertaken before implementation of the module.

Generation of reports through legacy software

3.9.7.3 Though a period of more than four years had lapsed since the implementation of the FMPM, the use of Legacy/other software continued as under:

➢ Legacy software (such as Power Plant Management System (PPMS)) was in use for preparation of various reports such as Coal Receipt Report (CRR), coal mill feeding, stone claims and its compensation, monthly coal cost report, *etc*.

Management stated (October 2016) that the reports, which were non-commercial and are provisional/*ad-hoc* in nature and used only for reporting purpose were generated outside SAP System.

The reply is not tenable as the data is already available in SAP-ERP and hence, reports should have been customised in SAP-ERP for efficient usage and functioning of the system. Preparing these reports in legacy software led to repetition of efforts in maintenance of this data in a different format.

➢ Interface for receipt of coal at Chandrapur STPS by Unique Train System (UTS) and Ropeway mode to the FMPM was not working and hence was being re-entered manually into FMPM.

Management in its reply stated (October 2016) that integration of WB interface with SAP-ERP for receipt through UTS, Ropeway could be explored only after technical feasibility study. The reply is not tenable since transportation of coal by Ropeway and UTS existed at TPS Chandrapur, and the same should have been included in the agreement.

Underutilisation of Annual Technical Support Services

3.9.7.4 As per Article 13 of the Contract, LTIL was to provide support and maintenance for all the licensed software products supplied at an annual cost of ` 1.01 crore for a period of five years from the date of expiry of one month post implementation support of Phase II. This included provision of upgrades, updates and patches of the products to the Company as and when released. This also required a technical upgrade of the installation to the new version, when required by the Company. Further, as per Article 1.1.2, LTIL was to suggest on requirement of hardware and networking.

Audit observed that:

➢ The SAP version used by the Company is SAP ECC 6.0 EHP 4.0 with SAP NetWeaver 7.01 whereas the latest version released by SAP with additional functionalities is SAP ECC 6.0 EHP 7.0 with SAP NetWeaver 7.03.

➢ More than 50 *per cent* of the computers (935 out of 1,497) utilising the SAP-ERP System were being run on outdated Windows XP Operating System which were not compatible with latest versions of SAP.

➢ The SAP client version used by the Company was not the latest version. Functionalities in the SAP-ERP System implemented at various locations of the Company were carried out through the usage of multiple outdated versions of the SAP-ERP package out of which one version *viz*., SAP Logon 710 expired on 12 April 2011, *i.e.* during the System Implementation phase itself.

Management replied (October 2016) that up-gradation of old systems would be done in a phased manner since the compatibility of the machines was checked only with the SAP version which existed at the time of implementation. Further, due to system constraints, the upgradation of new SAP client's version would be taken with the SAP support partner after upgradation/replacement of old machines and operating systems.

The reply of management is not tenable since the Management should have planned its resources in line with the requirement for implementing the system. LTIL too did not adhere to Clause 5.7 (2) of the Tender document wherein technical upgrade of installation to new version had to be done when required by Company.

Thus, it was observed that in spite of incurring an annual expenditure of ` 1.01 crore for ATS, both the Company and LTIL had not ensured availability of compatible hardware and/or software for the implementation of updates of SAP-ERP System as per terms of the contract.

Post Implementation Review

3.9.7.5 Post Implementation Review of the FMPM by a third party or by Internal Audit wing of the Company was not undertaken till date. Submission of Report of Business Benefit Review after Go Live and advising future roadmap for enhancing ERP effectiveness, which was to be submitted by the PMC (M/s. KPMG), within three months after Go Live (*i.e.* by March 2012) was submitted only in June 2013.

Management stated (October 2016) that CGM-Internal Audit would be requested to arrange the post implementation review of SAP.

Change Management Plan

3.9.7.6 The SAP-ERP System including the FMPM went live on 30 November 2011. The Company had not formulated/adopted a change management plan to ensure smooth transition of business processes through SAP-ERP System including FMPM after expiry of the contract period with

LTIL for AS and ATS, in December 2016. The plan for capacity building and training imparted to the IT team as well as users in the Company for independent functioning had not been formulated (June 2016).

Management during exit meeting (August 2016) admitted that change management plan was not formulated.

Intellectual Property Rights (IPR) in respect of Customised Software

3.9.7.7 As per the Tender, the Intellectual Property in the context of the customised software developed, was to be considered as 'work made for hire' and was exclusive property of the Company. The Company however had not ensured protection of its IPR in respect of the customisations made in the FMP Module.

Management stated (October 2016) that SAP-ERP is product of M/s SAP; all changes/modifications have to be done with permission of SAP. Hence, IPR is with SAP/LTIL as per contract agreement. Reply of Management is not tenable since it is contradictory to Clause 4.12.1 of the Tender which clearly mentioned that the IPR on customised software was exclusive property of the Company.

Underutilisation of SAP-ERP licenses

3.9.7.8 Scrutiny of the usage of licenses revealed that out of 1386 allocated Dialog (professional) user licenses and 5035 allocated Communication (ESS[39]) user licenses, 595 licenses were not in use for a period ranging from one month to more than three years. Also, in 1144 instances, users, after allocation, have not logged in to the system for a period ranging from a minimum of one year to a maximum of more than four years. Thus, there was no laid down mechanism for monitoring the usage of the SAP-ERP System by users who were allocated Professional and Communication User licenses.

Management replied (October 2016) that Communication users are the ESS users, who used the system through portal to check personal things like pay slips, leave and ITAX deductions. SAP Professional Users (end users, who carry out transactions as per their roles and authorisations) are monitored continuously and disabled if not utilised on monthly basis.

The reply of management is not tenable since it was found that professional user was not disabled on non-utilisation.

Migration issues

3.9.7.9 As per contract LTIL was to develop conversion programs to convert data from legacy system format to SAP upload format. Audit however observed that the data pertaining to period prior to implementation of FMPM was not integrated, thereby limiting the accessibility of the Management to utilise prior period data for decision making.

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39 Employee Self Service

Management stated (October 2016) that it was decided to 'Go Live' with Business Critical Data and SAP Mandatory data. The remaining data would be built or uploaded in SAP as and when required by the stakeholder/management. The reply is however not acceptable since it has been five years after 'Go Live' and yet data from legacy system is not integrated in FMPM.

Mapping of Business Processes in FMPM

3.9.7.10 Though Business Blue Print (BBP) envisaged inclusion of various processes/reports for missing/unconnected wagons/overload/Demurrage for raising claims, it was found that the same was not included in the Agreement. This has led to non-mapping of various business processes in the FMP Module, as stated under:

Claims against Coal companies

➤ **Short delivery of coal**

The TPS of the Company procured coal from coal companies like Western Coalfields Limited (WCL), South Eastern Coalfields Limited (SECL), Mahanadi Coalfields Limited (MCL) and Singareni Collieries Company Limited (SCCL) for which payments to suppliers are required to be passed/paid and compensation claims have to be raised for short delivery of coal. It was seen that the Company had not made suitable provisions in the FMPM for raising these claims for short delivery. As a result, these are being prepared manually by each TPS and forwarded to SE Coal Office, Nagpur, who then takes up the issue with the concerned coal company.

➤ **Grade slippage**

Though grade slippages were prevalent in coal received in TPS, there was no mechanism in place to claim the grade slippages in FMPM. Also the system did not capture the applicable grade of the coal based on the entry of Gross Calorific Value (GCV). This was confirmed from TPS Bhusawal and SE Coal Office, Nagpur.

Management stated (October 2016) that grade slippage claims were processed and generated in SAP-ERP FMP module and was in place.

It was however observed during verification that Grade slippage claims were done manually till 31 March 2016 and not through SAP-ERP System though provision existed in the system for generation of claims.

➤ **Receipt of foreign material (other than stones)**

There was no mechanism in the FMPM to capture the weights of foreign material (other than stones) received with coal. Consequently, no claims were raised against coal companies either through FMPM or otherwise.

➢ **Claims against Railways**

No provisions were made in the FMPM to capture, generate and monitor claims against Railways for missing wagons, missing rakes, excess service tax, wrong route charges, wrong wagon load charges, *etc*. These were also being done manually. Also, no request was raised by any TPS for creating these provisions in FMPM.

➢ **Claims against Liaison Agents**

It was seen that no provision has been made in the FMPM for calculation of recoveries from Liaison Agents on account of increase in percentage of transit loss, idle freight, penal freight, late receipt of Railway Receipt (RR), *etc*. and that the same was being done manually. This resulted in MIS Reports being incapable of depicting actual amounts receivable from liaison agents. Recoveries were proposed separately and the same were debited while effecting the payments at Accounts Section.

Other processes not mapped

➢ **Taxation parameters**

It was seen that while processing the invoices at TPS the taxation parameters for Excise Duty and cess thereon, VAT, Clean Environment Cess, Royalty, *etc*. were not mapped in the FMPM system and amount of taxes payable were entered manually.

Thus, it was observed that due to non-mapping of various processes as mentioned above, the Company has not reaped full benefits of implementation of FMPM.

➢ **Underloading Problem**

The freight for transporting the coal was to be paid to Railways on the basis of Carrying Capacity (CC) of RR. As per Coal Supply Agreement (CSA), claims towards under loading were to be claimed from coal companies based on CC of Electronic Printout (EP) given by the Coal Companies. It was however noticed that in all TPS, under loading of coal in FMPM was calculated on the basis of CC of RR and the claims were manually submitted to Coal companies based on EP.

➢ **Multiple coal invoices not processed through FMPM**

It was noticed at the SE Coal Office, Nagpur, which consolidated all coal claims, that in case a single rake was received at TPS containing coal loaded at different sidings with one RR and multiple coal invoices, there were no provisions in FMPM for regulating such coal claims.

➢ **Manual invoice preparation**

Fly ash includes all categories of coal ash generated at TPS collected by Electrostatic Precipitator (ESP) and the same was to be disposed by sale to

achieve the mandatory ash utilisation to achieve environmental safety norms. Manual invoices were prepared at TPS though this was a regular activity and should have been mapped in FMPM.

Management stated (October 2016) that the process of ash sale and invoice generation was mapped in the system in SAP-OTC module**.** The reply is not tenable as the Company continued to generate manual invoices which was duplication of the process.

➢ **Daily closing balance of unloaded wagons**

Scrutiny of Daily Coal Consumption/Receipt Report revealed that closing balance of wagons on any particular day was calculated as only the absolute difference of total wagons received and unloaded on that day, without considering the closing balance of unloaded wagons of the previous day. These flaws in the System Design should have been detected during the User Acceptance Testing (UAT) phase and corrected.

Financial issues

Excess payment towards Octroi

3.9.7.11 As per Section 192(1) of Mumbai Municipal Corporation (MMC) Act, 1888, a tax, at rates not exceeding those specified in Schedule H, shall be levied on articles mentioned in the said schedule, on the entry of said articles into Mumbai for consumption, use or sale therein and the said tax was called an 'Octroi'. As per Supplementary Note to Chapter 85 of Schedule H (under Section 192(1) of the MMC Act), (head 8524) 'Information Technology Software' means any representation of instructions, data, sound or image, including source code and object code, recorded in a machine readable form, and capable of being manipulated or providing interactivity to a user, by means of an automatic data processing machine and was to be charged Octroi at an advalorem of 5.5 *per cent*. Further, as per Rule 3 of Municipal Corporation of Greater Mumbai, Octroi Rules, 1965, articles which were imported into Greater Mumbai not for consumption but for immediate exportation, from the place of import to the place of export were exempted from payment of Octroi.

Scrutiny of the Contract Agreement with LTIL revealed that 1100 Professional User Licenses and 4500 ESS User Licenses were obtained on which ` 34.16 lakh was paid as Octroi at the rate of 5.5 *per cent*. The Company however, utilised only 236 Professional User Licenses and 415 ESS User Licenses within Greater Mumbai limits and the balance 864 Professional User Licenses and 4085 ESS User Licenses were utilised outside Greater Mumbai limits for which payment of Octroi amounting to ` 27.83 lakh was avoidable.

It is pertinent to note that the PMC (KPMG) had recommended (November 2009) that the Company should obtain opinion of Octroi Consultant on rates and the assessable value. The details of the appointment of Octroi Consultant, to ascertain the levy of Octroi, during the tendering process however, were not available for Audit scrutiny. Moreover, Management stated

that the SAP-ERP licenses were destined for Mumbai and the Octroi was paid accordingly. The reply was not correct since the licenses were for use at locations outside Greater Mumbai limits and were exempted from payment of Octroi as per the Octroi Rules and the Company should have ascertained the applicability of Octroi before making payments.

Management stated (October 2016) that the matter was taken up for seeking the views of Octroi Consultant.

General Controls

3.9.8 General controls regulate the environment in which the IT application is operated and includes disaster recovery and business continuity planning, access controls both physical and logical access and organisational issues such as segregation of duties and providing adequate training. Thus, General controls are aimed at ensuring that the assets of the project are not put to risk and this requires risk assessment and preventive measures prior to implementation of the system.

Inadequate segregation of duties

3.9.8.1 In any major IT system, the duties and responsibilities of various IT staff are required to be properly defined and segregated. Segregation of duties is a fundamental control requirement as it reduces the risk of error and fraud.

IT staff of the Company at its TPS did not however, have well defined job specifications and responsibilities with demarcation of duties. Dedicated core IT Teams were not in place at each TPS for FMPM to ensure processing of claims raised by various TPS which included preparation, authorisation and consolidation. Since most of the transactions were interlinked, non-segregation of duties and responsibilities adversely affected functioning of the system and resulted in repetition of efforts.

Management stated (October 2016) that the segregation of duties and assignment of work related to FMP module was under the purview of the plant authorities. The staff structure and roles/authorisations at different plants were defined and assigned in the system as per the requirement of the plant and FMP module users were transacting entries within the stipulated SAP open period. The claims generated and saved in the system were authorised by respective data owner/user entities. Only the claims for the period prior to implementation of SAP-FMP module were done manually or in legacy system.

The reply of the management is not tenable as the segregation of work was not done and documented to ensure track of the transactions and audit trail based on the roles assigned to the users.

Inadequate Training and absence of Core IT Teams

3.9.8.2 Audit observed that the change management plan comprising training and skills development for preparing the organisation's human resources to

handle new challenges pertaining to the implementation and use of the FMPM did not exist. TPS Parli stated that they required training in FMPM, as they were unaware of complete functionalities and reports in FMPM. Further, it was noticed in all TPS that the users who were trained initially in FMPM were transferred and their replacements were not trained. Core Teams for FMS implementation were not in place at all the TPSs as seen by audit, thereby raising ownership issues of the Application System and consequential dependence on the system provider (LTIL). Although the Company paid ` 1.35 crore annually for AS to LTIL, the implementation of FMPM and user acceptance at TPS level was not uniform across all TPS of the Company. It was observed that while at Nashik TPS data were captured and processed through FMPM, the same was manually entered at Bhusawal and Chandrapur TPS in many instances.

In reply the Management admitted (October 2016) that key Power Users identified and trained at various locations during and till the SAP stabilisation had been transferred/replaced without ensuring transfer of knowledge for continued operation.

Non-updation of User Manuals

3.9.8.3 A User Manual is a tool to facilitate the day to day functioning and utilisation of the System implemented. As per the scope of work the designing and completion of end-user training manuals of the implemented FMPM was the responsibility of PMC (M/s KPMG) in coordination with functional module team leaders.

Audit observed that elaborate and detailed User Manuals were not available with the Users of FMPM and the functioning of the Users was regulated by a SAP Handbook released in August 2013 which gives concise but not detailed information to the end-user. Though a period of almost three years have elapsed since the release of this Handbook, it has not been updated till date to cover the changes, enhancements, *etc.* carried out in the process of customisation of the FMPM.

Audit further observed that certain Reports pertaining to the FMPM[40] though generated through the SAP-ERP System were not mentioned in the SAP Handbook thereby rendering end-users unaware about the functionalities of these Reports. Thus, non-updation of the SAP Handbook which served as a user manual in the absence of elaborate user manuals, deprived the end-users of the additional functionalities and reports.

The Management replied (October 2016) that, as there was no major change in implemented processes, the revision of SAP-ERP handbook was not done.

The reply is not tenable since provision for generating additional reports than those specified in the handbook had been made but the users were unaware of the same.

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40 ZFMP_COAL_CLAIM_REP, ZFMP_CONS_DAILY, ZFMP_RAKE_DIV_REPORT, ZFMP_RAKE_MONITOR, ZFMP_UNLOAD_REPORT

IT Security

Lacunae in Logical Access Controls

3.9.8.4 Although the Company had adopted a password policy in 2012, the Password Policy such as length of the password, periodicity of passwords, *etc.* had not been strictly adhered to. The number of days for change of System level, User level and all other passwords though defined as 15 days, 30 days and 60 days respectively in Password Policy were non-functional in FMPM.

As a result of non-defining of number of days for changing password in the SAP-ERP system, it was noticed that out of 1,757 Professional users allocated, 51 users were using their initial passwords while out of 5,171 ESS user licenses issued, 3,326 users were using their initial passwords. Number of users under FMPM who had not changed their initial passwords was not separately available.

Non-enforcing of password policy and absence of periodical changes in passwords do not augur well for the Company as the same is necessary to protect confidentiality of information and integrity by avoiding unauthorised access to the SAP-ERP system.

The Management admitted (October 2016) that the password policy in SAP-ERP System needed strengthening and would be implemented on an urgent basis.

Inoperative System Audit functionality

3.9.8.5 (A) System Audit conducted using Audit Information System Function in SAP-ERP revealed that the SAP CCMS Admin Workplace (Security) - Maintenance functions utilised to identify memory problems in good time, to check the security of database system and to monitor performance was disabled.

Management stated (October 2016) that SAP CCMS would be turned ON only after discussion and thorough analysis with SAP & Implementation partner. Making it ON may lead to generating logs and may impact system performance.

(B) It was observed that the functionality of Security Audit Log, which is a tool designed for audit trail in SAP-ERP System, was disabled by the Company citing the reason that activation of the same takes up commercial storage space. Thus, security related changes to SAP-ERP environment like changes to User Master records, details of successful and unsuccessful logon attempts to provide higher level of transparency and successful or unsuccessful transaction starts to enable the reconstruction of a series of events were not being recorded in the system due to this disabling of Security Audit Log.

Management stated (October 2016) that enabling of Security Audit Log will also be verified with SAP & Implementation partner SAP standard.

Absence of business continuity planning and disaster recovery mechanism

3.9.8.6 Business continuity planning is essential to ensure that the organisation can prevent disruption of business and resume processing in the event of a total or partial interruption of information availability. In order to restore the information processing capability at the earliest in event of a disaster, a business continuity plan was required to be formulated by the Company outlining action to be taken.

It was observed that the Company had not implemented a full-fledged disaster recovery centre even after four years of implementation of the SAP-ERP System. It was also noticed that there was no offsite storage location and backup taken on tapes at Mumbai was retained at Mumbai itself. Further, there were no records/logs to ensure that the backup files were tested to ensure their integrity.

The Management stated (June 2016) that proposal for implementation of Business Continuity plan as well as Disaster Recovery centre has been approved and process of tendering for the same was in progress.

Application Controls

3.9.9 Application controls are included in IT Systems to provide assurance that all transactions are valid, authorised, complete, accurate and properly recorded. Shortcomings in application controls noticed during audit are discussed in succeeding paragraphs.

Absence of Audit Trails in Master tables

3.9.9.1 Audit trail is a record displaying who has accessed the system and what operations were performed during a given period of time. An audit trail of changes to data in the system is to be maintained and any change made in a record is to be time stamped and logged. In Transactions modifying critical data, the audit trail must record the user responsible for the modification. The audit trail must operate on nominated Tables and Data items and a facility to report on audit logs should exist.

Though, the FMPM has a role based security model, it was observed that there were no provisions to capture details of the user performing transactions relating to the creation/modifications/deletions, *etc.* of records contained in the Master Tables of the customised FMPM. In the absence of this trail, critical data could be tampered with and the system could be rendered vulnerable to unauthorised manipulation.

The Management stated (October 2015) that this would be discussed with LTIL so as to activate it without affecting the commercial storage space and performance of the system.

It was further explained (October 2016) that the basic Audit trails for the critical Masters data and transactions performed by users in system was maintained in SAP. Security Audit Logs helped administrator to find the

causes for system failures which would be verified with SAP and implementation partner for customised functions. This could be implemented after rollout of standard SAP Security Audit logs system.

Non-accounting of coal received through Unconnected Wagons[41]

3.9.9.2 The entire process of coal management from receipt of coal till its consumption was dealt with in the FMPM module and thus non-accounting of coal received through unconnected wagons resulted in the cost of such coal not being considered in the computation of generation cost. Scrutiny of the coal received during the period 1 April 2010 to 31 March 2016, revealed that 303 wagons containing 22,785 MT of coal at six[42] TPS received through unconnected wagons had not been accounted for in the records of the Company. It was further observed that the unaccounted coal was also consumed.

Management clarified (October 2016) that every un-connected wagon was accounted in SAP FMP module but its stock (GR) was taken into account only after a valid railway connection was available against it. The stock (GR) could not be taken in the system as the details (source/colliery/RR) of un-connected wagon were not available at the time of its receipt.

The reply of the Management did not however state the accounting of coal received through unconnected wagons.

Non-capture of information in respect of Sick Wagons[43]

3.9.9.3 Audit observed that though there was a provision to record information in respect of Sick Wagons (SWs) in FMPM (ZFMP_wagon_report), TPS did not capture details of SWs (except Koradi TPS). In the case of Koradi TPS, the practice of capturing the details of SWs in the consignments was undertaken through FMPM and the same was also reported to the Railway authorities. Proportionate amount of demurrage excluding the demurrage on SWs however, was being worked out manually at Koradi TPS.

It was observed that no SW had been recorded at Chandrapur STPS (CSTPS) since the implementation of FMPM, though maximum quantity of coal was received at CSTPS compared to other power stations. Due to non-capturing of details of SWs in the FMPM, the Company/TPS could not calculate the exact quantum of such excess payment on account of demurrage charges through the FMPM.

Management stated (October 2016) that there was a provision in the system for SW, and it appeared that CSTPS was not using the same.

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41 Wagons delivered to Company's TPS by Railway, which were originally despatched to another entity/TPS. Hence no match found in RR and Invoice for such wagons in Company's records. As per arrangements with Railways, such wagons were to be accepted and unloaded subject to wagon-to-wagon reconciliation in future
42 Bhusawal, Chandrapur, Khaperkheda, Koradi, Nashik and Paras
43 Wagons received in TPS in technically damaged condition and could not be unloaded/ removed without due repairs by Railways

Invalid data due to absence of validation checks

3.9.9.4 Data entry in FMPM in the fields where manual data entry was allowed should be adequately validated. Audit observed that non-provision of proper validation mechanism in the system resulted in inability to capture complete, requisite and vital information/reports as under:

- Table showing trip details of a rake displayed the trip in date as 5/9/1912 which was unrealistic. This indicated lack of proper validation controls while implementing the system.

- Table showing trip details of a rake displayed the trip out date prior to trip in date in 51 cases. This indicated lack of proper validation controls while implementing the system.

- Table showing Detention time of rakes based on Rake in Date/time & Rake out date/time in two cases (TRIP NO 011206032 and 071207063) was 8,833 hours and 8,811 hours which was due to incorrect data entry by users which were not validated by the system. The Company in its reply admitted that this had occurred due to non-existence of the Weigh-bridge interface at the time of data entry and hence validation was not done.

- Scrutiny of tickets[44] revealed that non-provision of checks to prevent data of closed tickets from further modifications after corrective action.

The cases of wrong data entry pertaining to date and time fields can be avoided if provisions are made to capture the system date and time automatically with due validation checks.

The Management stated (October 2016) that all the errors pointed out in audit pertained to data entry in the initial stages of SAP-ERP implementation, when validation checks were not enforced in the system.

The reply of Management is not acceptable since the existence of junk data till date indicated that cleansing of this data in the system was not undertaken by the Company. Also, erroneous data pertaining to post implementation period was present in the system.

Incomplete and inaccurate MIS Reporting System

3.9.10 MIS Reports provide real-time, online information for fast efficient transparent decision-making at higher levels. Scrutiny of MIS reports associated with FMPM revealed inaccuracies and incompleteness which are discussed as under:

(A) Coal Claim Reconciliation Report: The Coal Claim Reconciliation Report for the period April 2009 to December 2014 listed only three Grade Slippage cases at Khaperkheda TPS (valuing ` 0.17 crore, weighing 0.12 lakh MT from WCL) whereas scrutiny of physical records for the same period

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44 Complaints raised by users for support by sending emails to erpsupport@mahagenco.in as prescribed in FMPM

revealed Grade Slippage cases valuing ` 7,029.42 crore weighing 1,333.11 lakh MT in all the TPS.

Management stated (October 2016) that in SAP-ERP coal claims were generated from April 2014 onwards and were available in a SAP report if all the required details were available with the user and entered in the system. Hence the coal claim figures for the period April 2009 to December 2014 was incomparable and not rational.

The reply of the Management is not tenable since records pertaining to the period after April 2014 were also not available in the SAP-ERP System.

(B) Daily Coal Consumption/Receipt Report: The FMPM captured availability of day to day levels of stock of coal at each TPS. It was however noticed that the data pertaining to coal stock in the Daily Coal Consumption/ Receipt Report of Parli TPS was erroneous as the monthly closing stock of March 2016 in the OCM5[45] report did not match the annual closing stock for the year 2015-16. Further, the closing stock of coal at the TPS was negative during 13 May 2015 to 23 July 2015 due to incorrect formula applied.

Management stated (October 2016) that Program to calculate Opening stock, RDRL Receipt and Closing Balance had a bug. This bug was rectified and informed to users.

This was verified and it was found that the mismatch of the monthly closing stock of March 2016 with the annual closing stock for 2015-16 still existed in the system. The negative closing stocks noticed earlier during the period 13 May 2015 to 23 July 2015 were however, found rectified.

In four TPS, though no wagons were unloaded in 15 instances, the Net Coal Receipts on the respective dates showed receipt of 1,68,398 MT of coal. Railway Receipts of Nashik TPS for 01 March 2016 was negative (-18,228 MT).

The Management stated (October 2016) that the figures were arrived after considering actual receipt, reversal adjustments, *etc*. The reply was not tenable as FMPM contained provision for receipts through different modes, diversions to/from various TPS, *etc*. which were kept blank by users which in turn led to negative data entry in the column pertaining to Railway Receipts.

Thus, incompleteness, inaccuracy and unreliability of the MIS reports generated through the FMPM necessitated the Company to utilise reports created and obtained through the usage of legacy system for monthly Operational Committee Meetings. The unavailability of MIS reports for decision-making by top-level Management was also pointed out by the PMC in May 2015.

Management stated (October 2016) that even though SAP implementation was similar to IT systems, effective utilisation of the same totally depended on the

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45 OCM5 report shows the daily receipts, consumption and opening and closing stock and can be generated for any specified period

business owners/stakeholders involvement and approach towards utilisation of systems.

Conclusion

Following were the achievements and non-achievements of the implementation of FMP Module of the SAP-ERP System with reference to the Agreement with LTIL and the Business Blue Print.

Achievements	Non-Achievements
Creating Annual Contract (for Imported coal)	SRS and URS document not done
Creating Purchase Request by SE Coal office	Data migration from legacy software not achieved (Data prior to September 2011)
Training (partial)	Training (partial)
Capturing RR details from FOIS	Security procedures (Password policy, audit trails, validation controls, Intellectual Property Rights w.r.t customisation of FMPM)
Interfacing of Weighbridges (partial – only at TPS Nashik)	User responsibilities (segregation of duties)
Preparation of Coal Receipt Report	Disaster Recovery Plan
Preparation of Purchase Order	Data Management (Business continuity) and backup procedures
Preparation of Goods Receipt Note	Issue of sign off from end users for closure of all issues raised during the post-implementation period (Final Completion Certificate for SAP/ERP)
Processing of Invoices	Change Management plan
Booking of transit loss	Interfacing of Weighbridges (partially not done at Bhusawal, Chandrapur, Khaperkheda, Koradi, Paras and Parli)
Conversion into common coal	Interfacing of E-tendering
	Approval of Contract and agreement
	Instances of sick wagon
	Lodging of various claims (railways and coal companies-overloading/under-loading of wagons, grade slippage, demurrage, oversized stones, *etc*.)

Besides:

➢ The Company was yet to formulate and document a formal IT policy. Provisions had not been made to protect the Intellectual Property Rights with respect to customisation of the module.

➢ During processing of Invoices, the details of RR were not captured by the Finance wing at TPS and processing of claims by SE Coal Office at Nagpur were continued to be done manually.

➢ The implementation of FMPM at all the TPS was not uniform as the users were unaware of complete functionalities and reports in FMPM.

➢   Absence of audit trails in master tables, non-capturing of information, absence of validation controls, *etc.* resulted in incorrect and invalid report generation.

➢   The Company continued use of legacy software for generating various reports evidencing lack of full transition to FMPM.

Recommendations

➢   *The Company may formulate and document a formal IT policy. Further, provisions may be made to protect the Intellectual Property Rights with respect to customisation of the module.*

➢   *The Company may prepare a Business Continuity Plan and Disaster Management Plan.*

➢   *The Company may ensure that SRS and URS were prepared after due consultation with users to ensure implementation of any major IT Systems so as to ensure mapping of critical business processes in the system.*

➢   *The Company may impart adequate training to ensure achievement of objectives set forth for implementation of IT Systems to improve operational and financial efficiency and reduce continued dependency on the service provider.*

➢   *The Company may prepare change management plan to ensure independent functioning of FMPM after expiry of the contract with LTIL.*

➢   *The Company may ensure interfacing of different systems for integration of ERP software.*

➢   *The Company may define job specifications and responsibilities along with demarcation of duties among the IT staff at TPS. Core IT Teams may be established at TPS level also so as to ensure complete usage of the Module by users.*

➢   *The Company may customise and generate all the required reports in FMPM ensuring full transition and discontinue use of legacy software for fast, efficient and transparent MIS.*

The matter was reported to the Government (July 2016); their reply was awaited (December 2016).

Maharashtra State Road Development Corporation Limited

3.10   *Non-recovery of toll from Contractor*

The Company did not verify the traffic data provided by the contractor and recover its share of ` 54.59 crore in excess toll revenue.

Maharashtra State Road Development Corporation Limited (Company) invited (February 2014) tender for toll collection contract at Kini and Tasawade for 104 weeks with an estimated realisation of ` 265 crore and the work was awarded (May 2014) to the highest bidder M/s. Raima Manpower &