

Rural Development Department

2.3 Information Technology Audit on Works and Accounting Management Information System

EXECUTIVE SUMMARY

Government of Odisha implemented Works and Accounting Management Information System (WAMIS), a workflow automation system in engineering departments. This was to bring efficiency and effectiveness in its functioning. Except accounting, all modules were utilised partially even after seven years of implementation.

WAMIS had weak management controls as Department had not prepared comprehensive user requirement specification. Changes proposed after implementation for incorporation in the system were not ensured. This created inconsistencies in electronic workflow. Business Continuity and Back up Plans were not framed. The Government had not exercised oversight over database administration by i) segregating duties or ii) putting compensating controls. As a result, unauthorised users accessed the database, logs were deleted, contractor's details were tampered with and records of vital tables were deleted.

WAMIS had design deficiencies like i) lack of audit trails, ii) absence of provisions for preparation of detailed estimates, iii) ineffective session management, iv) lack of validation controls. Besides, the system had issues like non-mapping of business rules, absence of centralised contractor database, non-provision of digital signature, etc.

Vouchers were booked in WAMIS, bypassing the workflow and without uploading of geo-tagged photographs in the system. WAMIS had improper design and defective global master tables. This made the data disintegrated and undue favour extended to the contractors several times.

The usage of WAMIS was as low as five per cent in the engineering departments and entire works were processed manually. Besides, divisions were also primarily dependent on manual records instead of system generated reports.

2.3.1 Introduction

Rural Development Department (RD Department), Government of Odisha (GoO) implemented Works and Accounting Management Information System (WAMIS). The Department awarded the work¹³⁴ to Centre for Development of Advanced Computing (CDAC), Pune in May 2009. The main feature of WAMIS was automation of technical functions and preparation of accounts. The objectives of WAMIS were i) preparation of budget estimates, ii) allotment of funds, iii) creation of work information along with capturing of

¹³⁴ Design, development, implementation and maintenance

contract award details. Subsequently, WAMIS was utilised in seven¹³⁵ other departments. WAMIS was a web based application, developed using Java in the front-end and MYSQL database at the back-end. Servers for the database and application were installed in the State Data Centre (SDC), Bhubaneswar. It consisted of five modules, viz., i) Budget, ii) Works and Billing, iii) Accounts, iv) MIS and v) Integration with Accountant General (Accounts & Entitlement) (AG (A&E)) for submission of monthly accounts.

RD Department, headed by Commissioner-*cum*-Secretary, was the nodal agency for implementation, maintenance, modification, etc., of WAMIS. CDAC maintained the database and application servers. During 2010-17, ₹2.71 crore was spent on software development, enhancement and maintenance, logistics support, manpower deployment and training.

2.3.2 Audit objectives

The Information Technology Audit was conducted to assess whether:

- * Planning and system development processes followed were robust;
- * The system met the Government's objectives of office automation;
- * Controls in Information Technology system were adequate and effective;
- * Adequate system security and Business Continuity features existed; and
- * Monitoring and supervision were adequate and effective.

2.3.3 Scope and methodology of Audit

Audit objectives, scope and methodology were discussed with the Commissioner-*cum*-Secretary, RD Department in an Entry Conference held in March 2017. Audit conducted data analysis using Computer Assisted Audit Techniques like MYSQL covering the period 2012-17. Audit test checked records of RD Department, Engineer-in-Chief (EIC), Rural Works, Bhubaneswar and 10¹³⁶ Rural Works/ Rural Water Supply & Sanitation sampled divisions. The Exit Conference was held with Commissioner-*cum*-Secretary, RD Department in September 2017. The replies of the Department have been incorporated in the report, wherever required. The Department accepted all the recommendations and agreed to implement the same to make the system robust.

¹³⁵ Works, Water Resources, Fisheries and Animal Resources, Housing and Urban Development (PH Division), Commerce and Transport, Energy and General Administration (Rent) Departments

¹³⁶ Rural Works Division, Bhubaneswar, Rural Water Supply & Sanitation Division, Cuttack, Rural Works Division-II, Jajpur, Rural Works Division-II, Bhadrak, Rural Water Supply & Sanitation Division, Balasore, Rural Works Division, Jaleswar, Rural Works Division, Sunabeda, Rural Works Division, Bolangir, Rural Works Division, Bhawanipatna and Rural Works Division, Ganjam

2.3.4 Audit criteria

The following criteria were adopted for the IT Audit:

- * User manuals/ Entity Relationship diagram/ project plans;
- * Service Level Agreements (SLAs) of WAMIS with the vendor;
- * Information Technology (IT) Act, 2000 and subsequent amendments;
- * Odisha Budget Manual, Central Public Works Accounts Code, Orissa Public Works Department Code including amendments, Schedule of rates and Analysis of rates; and
- * Instructions issued by Government of Odisha relating to implementation of WAMIS.

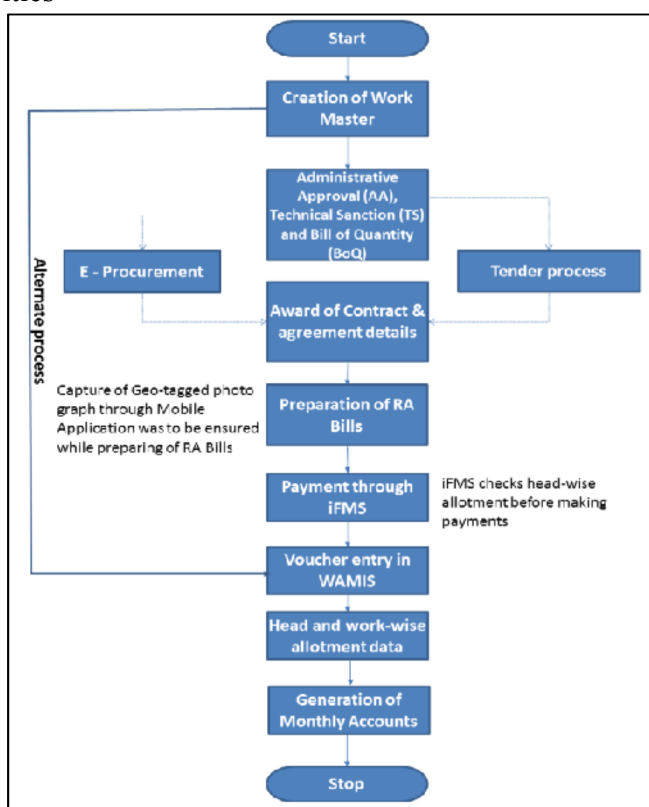
Audit Findings

2.3.5 General Control

2.3.5.1 Bypassing the electronic workflow of WAMIS

WAMIS was developed to automate the activities performed at the divisional offices such as i) capturing of data on work information, ii) Administrative Approval (AA), iii) Technical Sanction (TS), iv) Bill of Quantity (BoQ) and v) Contract Award. Besides, the system had provision of generation of Running Account (RA) Bills. After payment through iFMS¹³⁷, the vouchers were entered for generation and submission of Monthly Accounts to the AG (A&E), Odisha. The workflow processes involved in operation of WAMIS are depicted in *Chart 2.3.1*.

Chart 2.3.1: Workflow of WAMIS



As seen from the chart, WAMIS had provision to bypass the process of capturing AA, TS, Contract Award details, RA Bills, etc. RD Department instructed all divisions to fully automate accounting process through WAMIS

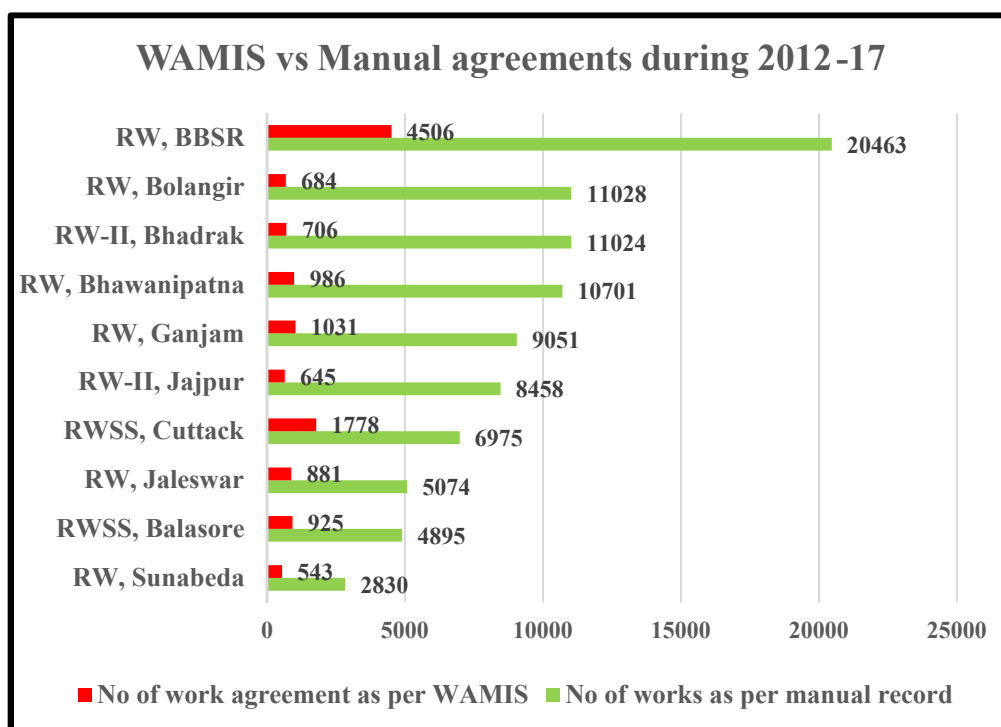
¹³⁷ iFMS - Integrated Financial Management System

and discontinue the manual maintenance of cash book from July 2009. Subsequently, RD Department also instructed all divisions to process RA Bills and submit monthly accounts to AG (A&E) through WAMIS from 2012.

The divisions did not use WAMIS to process all the RA Bills. Some RA Bills were also processed manually. The divisions also made payments using the alternate process without entering the critical details¹³⁸. Data analysis revealed that the divisions processed RA Bills of only 80,316 (12 *per cent*) out of 6,71,243 works¹³⁹ through WAMIS as of March 2017. Remaining 88 *per cent* bills were processed manually. The voucher details of these bills were re-entered in WAMIS using the alternate process for generating the monthly accounts. This was confirmed in Audit in 10 test checked divisions. In these divisions, 31,462 works records were created. However, 12,685 agreements were entered and 8,099 RA bills were generated from WAMIS. The manual agreement register of 10 test checked divisions also showed that 90,499 agreements were executed during 2012-17. However, only 12,685 agreements were available in WAMIS.

Out of ten test-checked divisions, five divisions¹⁴⁰ had utilised WAMIS negligibly for capturing of works and generation of RA bills. The other five divisions had utilised the system to a very less extent as could be seen in *Chart 2.3.2*:

Chart 2.3.2



Audit noticed that RD Department had not enforced the inclusion of required validations and changes proposed by different users in the software. In

¹³⁸ AA, TS, BoQ, award of contracts, agreements with contractors, RA bills *etc.*

¹³⁹ Including split works

¹⁴⁰ RW-II, Bolangir, RW, Bhawanipatna, RW-II, Bhadrak, RW-II, Jajpur, and RW, Bhubaneswar

absence of this, the divisions preferred the manual processes bypassing the workflow of WAMIS. Therefore, WAMIS was implemented partially in all the divisions and failed to generate reliable MIS reports. As a result, the data captured became inconsistent and disintegrated. This caused serious deficiencies in the system as discussed in the subsequent paragraphs.

The Department while accepting (September 2017) the observation stated that Accounts module was selected for implementation first in RD Department. These were gradually extended to other user departments. Incorporation of changes proposed by other user departments and integration with AG and treasuries took most of the time for implementation. However, all modules were targeted for implementation and electronic workflow as envisaged would be enforced.

2.3.5.2 Non-preparation of Software Design Document (SDD)

RD Department has specified the broad requirements to CDAC without preparing detailed User Requirement Specification (URS). As per the agreement, CDAC was required to prepare the Software Requirement Specification (SRS). CDAC was to conduct a detailed study of the workflow in RD Department's functional branches. The study involved interaction with the officials. SRS was also to be prepared as per the codal provisions including instructions of the Government. The SRS was to contain what the system would provide. This was to become the basis for the design and development of the application. Further, CDAC was also required to prepare the SDD detailing how the system was to be developed to take care of the activities mentioned in the SRS.

Audit observed that CDAC implemented its software developed for Maharashtra Public Works Department after customisation. It had not prepared any SRS or SDD. Hence, rules specified in OPWD and CPWA Codes could not be incorporated to cover all the functions of the user departments flawlessly. As a result, the users¹⁴¹ had to seek additional features and integration with other existing applications continuously. Thus, WAMIS was incomplete and open-ended.

The Department stated (September 2017) that i) on the basis of documents prepared for Goa and Maharashtra, WAMIS was implemented in Odisha, ii) the validation was not enforced in the system. The system was kept open-ended due to non-acceptance by all the stakeholders and frequent change requests.

2.3.5.3 Deficiencies in change management

As per the agreement (May 2009 and April 2014), RD Department would give in writing the proposed changes, if any, for incorporation in the software. CDAC would respond within specified time along with the cost escalation, if any, for the changes. Such changes were required to be approved by RD Department. Audit noticed that RD Department instructed CDAC for changes in the software design and incorporation of additional features in WAMIS.

¹⁴¹ Rural Development, Water Resources, Works and Housing & Urban Development Departments

The changes proposed were i) facility for provision of digital signature for approval of bills, ii) generation of contractor's work certificate, iii) restriction for excess expenditure over allotment and iv) expenditure without allotment. Besides, i) provision to track the change of password, ii) system generated request to change the password in every three months, etc., (*Appendix 2.3.1*) were also requested.

Audit observed that the provision for passing of bills and submission of monthly accounts using digital signature was not implemented at the divisional level. Generation of contractor's works certificate using the software was also not implemented at the divisional level. In 2,578 cases¹⁴², the names of the contractors in the vouchers captured in the database were different from the names in the monthly accounts submitted to AG (A&E).

Thus, WAMIS was running without the required changes suggested by the users and therefore, all the modules of WAMIS could not be used.

The Department accepted (September 2017) the fact and stated that some of the requirements were not implemented on account of changed priorities. However, the same would be targeted for implementation after due consultation with all the stakeholders.

2.3.5.4 Absence of Business Continuity/ Disaster Recovery Plans

As per the best practices, the Department acquiring the IT system was required to frame Business Continuity Plan (BCP) and Disaster Recovery Plan (DRP). CDAC had not framed any backup policy and WAMIS had been running without any BCP/ DRP even after seven years of its implementation. In the absence of BCP/ DRP, the users were unaware of the procedure to be followed in the event of disruptions caused by any disaster.

The Department stated (September 2017) that after completion of security audit of WAMIS, the system would be placed in the production server of the State Data Centre (SDC). They would also prepare policy documents.

2.3.5.5 Inadequacies in Database Administration

Database Administrator (DBA) was responsible for the performance, integrity and security of a database and had the privilege to alter the database. Therefore, DBA should not be given other responsibilities like system administration, help desk and data entry.

Audit observed that CDAC was continuing both as system administrator and DBA along with user management, help desk and master data entry. RD Department had not trained its officials for database administration through appropriate segregation of duties and supervisory review of access logs. Besides, RD Department did not have detective controls over the use of database and user management to avoid vendor dependency.

As CDAC had complete control over WAMIS, the activities of the DBA could not be monitored. Audit found that three unauthorised users¹⁴³ accessed WAMIS on 81 occasions. User access logs were deleted on 846 occasions

¹⁴² Pertaining to RW Division-I, Ganjam

¹⁴³ 1689, 1690 and 1691

during July 2013 to January 2017. Further, contractors' details were tampered with in 2,578 cases of RW Division-I, Ganjam. Also, work proposals and contract award details were deleted as elaborated in **Paragraph 2.3.7.2**. Due to lack of audit trail, the impact of the same could not be assessed.

The Department stated (September 2017) that audit trail would be incorporated in the system. Further, a responsible person from the Department would be assigned monitoring of the activities in the system after all the modules of WAMIS were used.

2.3.6 Security and End User Control

2.3.6.1 Absence of audit trails

As per the best practices, audit trails¹⁴⁴ should be captured in the tables for enforcing accountability and detective control against any manipulation of records in database. Audit found that the critical tables having work information details¹⁴⁵ did not contain any field for audit trail. This deficiency disabled the provision to i) detect erroneous transactions like creation of multiple work identities (Ids), ii) incorrect capturing of work award details, *etc.* Thus, responsibility for such violations could not be fixed.

The Department stated (September 2017) that audit trail would be incorporated in future.

2.3.6.2 Inefficient user management

Analysis of the database showed that 6,018 user Ids were created for 3,427 units¹⁴⁶ primarily based on the designations of the users. At the divisional¹⁴⁷ level, two user Ids were assigned to each EE for accounts and billing. Also, one each for DAO, AEs, JEs and Auditors, *etc.*, were assigned for using WAMIS. The estimators/ clerks posted in divisions were assigned with processing of works of different sub-divisions. Audit noticed that 215 user Ids were assigned to different users in 10 test-checked divisions. The deficiencies noticed are discussed below:

- * **Multiple users with same username:** In 10 test-checked divisions, six estimators and 11 Auditors were using the same user Id in RW Division, Bhubaneswar. DEOs of seven¹⁴⁸ test-checked divisions were using the username on behalf of all the clerks, estimators, JEs and AEs. All the estimators, clerks, JEs and AEs were using the same user Id in RWSS, Balasore. Four Auditors and JEs/ AEs were using common user Id in RW, Sunabeda. Database analysis revealed that the work

¹⁴⁴ Date of creation of record, users created and updated, *etc.*

¹⁴⁵ AAs, TSs, contract award details, RA bills, item-wise measurements, recovery of statutory deductions, *etc.*

¹⁴⁶ Secretary (Finance), DAG (Works Accounts), Puri, four Departments, 12 Chief Engineer Offices, 54 Superintending Engineer Offices, 508 Divisions, 655 Sub-Divisions and 2,192 Sections

¹⁴⁷ A division was divided into two to five sub-divisions headed by Assistant Executive Engineer (AEE)/ Assistant Engineer (AE) and under each sub-division, two to seven Sections, headed by Junior Engineers (JEs) were working

¹⁴⁸ RWSS, Cuttack; RW Division-II, Jajpur; RW Division-II, Bhadrak and RW, Jaleswar, Ganjam, Bhawanipatna and Bolangir

proposals and contract award details were deleted in 4,04,954 instances. Due to use of one user Id by multiple employees, accountability could not be fixed on such erroneous transactions.

- * ***Incomplete logs in cases of transfer of officials:*** The user Ids assigned to the EE/ DAO of the divisions in the initial phase were still being used till date. Provision to inactivate the username on transfer and creation of new username on joining of new officer was not made. Only the passwords were being changed on joining of the successors. Besides, the system captured the details of immediate predecessor and prior to that no information was available. During April 2008 to March 2017, 38¹⁴⁹ EEs and 47¹⁵⁰ DAOs were transferred. In the absence of log details of the transfers in the database, the incumbents could not be held responsible for any mismanagement¹⁵¹, if any, occurred during the said period.
- * ***Absence of Single Sign-on mechanism:*** Each EE was assigned two usernames, i) one for accounts and ii) another for works & billing module instead of single sign-on mechanism. Thus, the system had become less user-friendly in the absence of single sign-on.

Audit noticed that, 25,176 multiple work proposals were created in 10 sampled divisions and incorrect details of contract award were captured in 121 cases in two¹⁵² test-checked divisions. Besides, instances of non-entry of work measurement in 21,730 cases were noticed. Short recovery of statutory deductions (VAT) without remarks in 150 cases were also noticed. In the absence of creation of employee specific username and log details, responsibility for erroneous transactions could not be fixed.

The Department agreed (September 2017) that single sign-on mechanism could be achieved, but such employee-based workflow was not envisaged. Provision for employee specific user login should be made to enforce accountability.

2.3.7 Application Controls

WAMIS had five modules and deficiencies noticed in these modules are discussed below.

2.3.7.1 Deficiencies in Budget Module

Budget Management System (BMS) was to be developed in WAMIS at a cost of ₹ 5 lakh as per the agreement (May 2009) executed with CDAC. The module was developed and web-hosted in April 2010. BMS provided for i) preparation of budget estimates, ii) allocation of budget, iii) surrender,

¹⁴⁹ RW, Jajpur: 7; RW, Jaleswar: 4; RW, Ganjam: 3; RWSS, Cuttack: 2; RW, Bhubaneswar: 2; RW, Bolangir: 2; RWSS, Balasore: 8; RW-II, Bhadrak: 2; RW, Bhawanipatna: 4 and RW, Sunabeda: 4

¹⁵⁰ RW, Jajpur: 5; RW, Jaleswar: 4; RW-II, Bhadrak: 5; RWSS, Balasore: 5; RWSS, Cuttack: 4; RW, Bhubaneswar: 6; RW, Bolangir: 5; RW, Bhawanipatna: 4; RW, Sunabeda: 3 and RW, Ganjam: 6

¹⁵¹ Short recovery of security deposit and income tax and other erroneous transactions

¹⁵² RW, Ganjam and R.W Division-II, Bhadrak

iv) re-appropriation of allotment and v) interlinking with other modules. The objective was to control expenditure as per allotment. However, the RD Department did not use the budget module, instead performed budget functions through iFMS¹⁵³. As a result, the divisions manually entered the head-wise budget data for generation of monthly accounts in WAMIS to submit the same to AG (A&E). Audit noticed that the divisions did not properly enter the budget allotment data in monthly accounts though available in iFMS. As a result, the head-wise¹⁵⁴ expenditure figure exceeded the allotment in 486 instances in 10 test checked divisions. Therefore, AG (A&E) rejected the monthly accounts 38 times during January 2014 to March 2017. Besides, the divisions had booked the excess expenditure in WAMIS over the allotment available in iFMS in 30 instances. This happened due to irregular re-appropriation of funds in minor/sub-heads under major heads like 2059, 2216, 4059 and 3054.

Thus, the budget module was not completely integrated with iFMS.

The Department stated (September 2017) that the work-wise allotment would be given by the controlling office through budget module. Also, head-wise allotment would be taken care of by iFMS.

2.3.7.2 Deficient Works and Billing Module

Works and billing module was envisaged to automate the entire technical activities of the engineering departments/ divisions. On analysis of the database, Audit noticed the following deficiencies.

- * ***Absence of provision for preparation of detailed estimate of works:*** As per OPWD Code, a detailed estimate should be prepared for each work¹⁵⁵. Preparation of detailed estimate was one of the core functions of the divisions. Audit observed that there was no provision in WAMIS to prepare the detailed estimate for a work and the same was being prepared manually. Till 2014-15, the division entered the individual items of a work in WAMIS. Thereafter, provision was made to upload the Bill of Quantity (BoQ) using MS-Excel. Audit also noticed that the BoQ of work was uploaded in e-procurement portal for online tender using a customised template.

Thus, absence of facility for preparation of estimate and non-integration of WAMIS with e-Procurement led to duplication of work at each stage.

- * ***Gaps in vital fields:*** As per work-flow in WAMIS, a user was required to enter the work information. The information was stored in a table with an auto generated work Id with incremental sequence of one. The work Id generated in the table was updated in another table with the option of splitting the work into different parts. In split table, another

¹⁵³ Integrated Financial Management System is a software being managed by Directorate of Treasuries and Inspection (DTI) for preparation of budget estimates and allocation, surrender, re-appropriation of fund across the State

¹⁵⁴ Head-wise indicates a head of account comprising a particular 'Major head, Sub-major head, Minor head, Sub head, Detailed head and Sub-detailed head'

¹⁵⁵ Except petty works and repairs

unique work split Id was generated with incremental sequence of one. The split Id generated in the split table was updated in contract award table where contractor Id, agreement amount, *etc.*, were stored. On analysis of WAMIS, Audit found 4,731, 5,869 and 4,00,223 gaps in the sequence of three major tables¹⁵⁶. Work details for 2,324 works pertaining to 11 divisions involving a payment of ₹ 767.28 crore were not available in the work proposal table. This indicated that the work details were deleted after making payments to the contractors. As a result, details of works could not be assessed from the system.

Further, 31,462 work proposals¹⁵⁷ were created in 10 sampled divisions as of March 2017. Of these, the contract award details for 16,072 cases involving payment of ₹ 3,165.14 crore were not available. This occurred since the i) divisions passed the RA Bills using manual process and ii) entered the payment vouchers in the accounts module using alternate process. This has been discussed in **Paragraph 2.3.5.1**.

The database became disintegrated, unreliable and generated unreliable MIS report due to such deletion. Besides, the actual number of works completed and work-wise expenditure could not be assessed. This made the system vulnerable. In the absence of audit logs and audit trails, Audit could not identify the users who deleted the data.

The Department confirmed (September 2017) the fact and stated that this was due to manual entry of vouchers which would be restricted after bill-wise integration with iFMS. It also stated that estimate module would be developed in WAMIS and integration of WAMIS with e-procurement had been initiated.

2.3.7.3 Multiple login session from same machine

WAMIS was designed for multiple concurrent login allowing the users to connect from multiple devices or browsers at the same time. Therefore, the required security features¹⁵⁸ were to be provided.

Audit observed that CDAC had made provision to capture the user Id, login time, logout time and IP address of the logged in session in one table from 8 March 2017. As of 31 March 2017, 65,630 records were captured. On analysis of the access logs in respect of 10 sampled divisions, Audit noticed that in 1,565¹⁵⁹ out of 3,287¹⁶⁰ records, the users had concurrent logins¹⁶¹. As the username assigned to the users were not employee specific, accountability could not be enforced on the users.

¹⁵⁶ Work proposal, split works and contract award of the database respectively

¹⁵⁷ Except proposals for wages and work charged salary

¹⁵⁸ Notifying user of concurrent sessions, provision for sign out from all active sessions, alert to the user for unusual login activity, provision for automatic session timeout

¹⁵⁹ RW, Bhubaneswar: 532; RW-II, Jajpur: 7; RW, Jaleswar: 175; RW-II, Bhadrak: 28; RWSS, Balasore: 260; RWSS, Cuttack: 86; RW, Bolangir: 21; RW, Sunabeda: 97; RW, Bhawanipatna: 302 and RW, Ganjam: 57

¹⁶⁰ RW, Bhubaneswar: 1,054; RW-II, Jajpur: 46; RW, Jaleswar: 452; RW-II, Bhadrak: 34; RWSS, Balasore: 491; RWSS, Cuttack: 191; RW, Bolangir: 65; RW, Sunabeda: 266; RW, Bhawanipatna: 538 and RW, Ganjam: 150

¹⁶¹ Same user accessed a resource on the computer once again, when a logged in session of the same user was active

The Department stated (September 2017) that this would be incorporated in WAMIS.

2.3.7.4 Inconsistent scheduled date of completion for works

As per OPWD code, penalty for delay in completion would be calculated from the scheduled date of completion in terms of number of days. WAMIS was designed to automatically calculate the scheduled date of completion, after entering the date of commencement and work period (in months). However, the field for scheduled date of completion was kept editable with a date picker in the user screen allowing users to modify the dates.

Analysis of database revealed that the scheduled date of completion was wrong in 6,165 out of 2,73,829 records by one day to 6,563 days. In 10 test-checked divisions, 391 similar cases were found. This had happened as the divisions had entered wrong dates and the system accepted those in the absence of proper validation. Audit verified manual records of 10 sampled divisions and found that the dates as per manual records were correct. Thus, absence of validation controls and non-provision in WAMIS to calculate penalty for delay/ incentive for early completion of a work, made the system inefficient. This resulted in failure in achieving the objective of complete automation. Besides, these deficiencies made the system generated agreement registers incorrect and unreliable.

The Department stated (September 2017) that provision would be made not to alter scheduled date of completion. Additionally, another field would be inserted in the system to enter the actual date of completion for calculating delay in completion of work.

2.3.7.5 Incomplete database design

As per the best practices, master table was to be created as a single source for common business data with unique Ids for referencing across multiple tables. WAMIS had several master tables like office master, village master, district master, account head master, *etc.* These were used for processing the works at the divisions. Audit observed the following deficiencies:

- * WAMIS did not have a master table for recovery types, rather the users were permitted to create the same. In the database, 43,812 types of recovery/ refund/ payment heads were created. Of these, 818 such cases were found in 10 sampled divisions. Different transaction types were created for the same purpose with different nomenclature (**Appendix 2.3.2**). As there were specific transaction types being used in divisions, CDAC should have designed the master table for such recoveries with unique Ids. Thus, the system became inefficient in generating consolidated reports on such recoveries.
- * Audit noticed that 27 divisions recovered ₹4.61 crore towards 'Additional Performance Security (APS)' against 265 vouchers¹⁶². These recoveries were supposed to be collected at the time of agreement and not through RA bills. RW Division-II, Bhadrak created

¹⁶² During September 2010 to March 2017

two separate transaction types ‘MDLC’ and ‘Withheld’. Against these, it recovered the APS¹⁶³ of ₹ 2.42 lakh from contractor’s bills.

- * Similarly, RW Division, Bhawanipatna recovered APS of ₹ 4.65 lakh out of ₹ 17.41 lakh from RA bills’. Hence, the contractor completed the work without recovery of entire APS of ₹ 17.41 lakh.

Thus, lack of proper master data for capturing recoveries at the division level made the database inconsistent. This had also given scope to the divisional users to by-pass the codal provision to unduly favour the contractors.

The Department stated (September 2017) that database was designed as per the feedback received from stakeholders. However, suggestions would be discussed with all the stakeholders and accordingly, the same would be incorporated in WAMIS.

2.3.7.6 *Inconsistencies in selection of contractor during voucher entry*

As per workflow mechanism in WAMIS discussed in *Paragraph 2.3.7.2*, for each work proposal, a work Id was auto generated with an incremental sequence of one. The work Id updated in contract award table where contractor Id, agreement amount, *etc.*, were stored. The divisions were required to enter the gross amount and contractor name by selecting the drop down menu in voucher entry screen. The entry was to be made after payment of the bills through iFMS¹⁶⁴. Thereafter, the user was to select cheque number¹⁶⁵ and work name from the drop-down menu. Then the details of statutory recoveries of the particular voucher would be entered.

Audit found discrepancies in 52,701 cases pertaining to 10 test checked divisions. The discrepancies were found between the contractors to whom work was awarded and the contractors to whom the payments were made against the same work. In 41,816 cases, the works were awarded to a particular contractor but payment vouchers were booked against a different contractor for the same work Id. In 10,885 cases, though one contractor was awarded a particular work but while entering payment vouchers, multiple contractors were booked.

Audit test checked 108 cases and found that the actually awarded contractors were paid through iFMS. However, incorrect contractor/ work was selected from the drop down menu during voucher entry in WAMIS. Different Ids were used during capture of contract award details and processing of payment

¹⁶³ When the bid amount is seriously unbalanced, *i.e.*, less than the estimated cost by more than 10 *per cent* and within 15 *per cent*, in such an event the successful bidder will deposit the additional performance security to the extent 1.5 times of the differential cost of the bid amount and 90 *per cent* of the estimated cost in shape of NSC/ STDR/ TDR duly pledged in favour of EE

¹⁶⁴ The divisions used to make payment through manual cheque prior to December 2014 and enters the details in iFMS, however, from December 2014, the division used system generated cheques through iFMS

¹⁶⁵ From 2016 onwards, the online cheques used to make payment in iFMS get updated in WAMIS

vouchers. This happened due to existence of multiple contractor Ids of a particular contractor.

Thus, there was absence of complete integration with iFMS to fetch the payment related information and lack of validation. This led to booking of incorrect amount against a contractor as well as work in WAMIS. As a result, the monthly account submitted to AG (A&E) did not reflect i) actual payment made to a particular contractor or ii) actual expenditure of a work, thereby, making it unreliable.

The Department while accepting (September 2017) the fact stated that the discrepancies occurred due to manual voucher posting. Once the bill integration with iFMS was completed, all passed bills would be converted into vouchers and change of work/ contractor name would not be allowed.

2.3.8 Input and validation control

2.3.8.1 Lack of validation controls in according approvals and sanctions

As per OPWD Code, for every work (except repair works), the AA and TS from the competent authorities should be obtained before execution of the work. Further, EE had no power to accord AAs for original works. However, he had the financial power to accord TS up to ₹ 1 crore in case of original works. Besides, the provisions stipulated that time limit for completion would not ordinarily be more than one month for the works costing up to ₹ 50,000.

Audit noticed that contracts were awarded without AAs in 61,018 cases and work orders were issued prior to AAs in 2,659 cases. Besides, unauthorised accordance of AA and TS by EE beyond the delegated financial power in 1,05,979 cases, etc., were noticed. These are detailed in **Appendix 2.3.3**. Audit test checked 160 records in 10 test checked divisions and observed the following irregularities (**Table 2.3.1**).

Table 2.3.1 showing Audit observations on lack of validation controls in according approvals and sanctions

Issue	Observation
Work Order issued prior to AA	In 13 out of 25 test-checked cases, the work orders were actually issued prior to the AA. In two cases, Collector had accorded the AAs without mentioning the dates. In six cases, the work order date was incorrectly entered in the database. In the remaining four cases, the AAs were not found on record.
Accordance of AA by EE beyond eligibility limit	In 17 out of 30 test checked cases of deposit works having estimated cost above ₹ 50,000, AAs were accorded by different authorities ¹⁶⁶ other than the EE. In 13 cases, the AAs were not on record. Similarly, in 20 out of 40 ¹⁶⁷ test

¹⁶⁶ Collectors: 3, CDMO: 3, Director (OMSM): 10 and Western Odisha Development Council (WODC): 1

¹⁶⁷ Non-Residential building: 21, Residential Building: 19

	checked works on residential and non-residential building, AAs were accorded by different authorities.
<i>Accordance of AA as well as TS by EE</i>	In 21 out of 32 test checked cases, the TSs were accorded by the EEs. The AAs were accorded by different authorities except, in one case where the AA was not obtained for the work. However, the authority for issue of AA as well as TS for these works were shown as EE in the database.
<i>Unauthorised accordance of TS by EE</i>	In one case of RWSS, Cuttack, the original work was split into 283 sub-works and contracts worth ₹ 3.20 crore was awarded. Verification of files of these split works showed that the TS was accorded by the EE instead of SE in violation of codal provisions.
<i>Contracts awarded without technical sanction</i>	The TS details of 48 works were not available in the database. In two ¹⁶⁸ cases pertaining to RW Division-II, Bhadrak and RW Division, Ganjam, the TS were not obtained from the competent authority before the award of contract.
<i>Excess time allowed for work</i>	In 18,517 cases, the works costing below ₹ 50,000 were allowed excess time ranging from two months to 639 years-one month for execution. In 10 test checked divisions, 3,456 similar cases were found. On test check of 40 cases, time period of more than one month was given to the contractors for completion of the works.

(Source: Records of concerned divisions)

The above irregularities occurred due to absence of validation and non-mapping of the provisions of the OPWD Code in the system.

The Department stated (September 2017) that every validation would be put in the system, once all the users become familiar with all modules.

2.3.8.2 Agreements captured multiple times

As per OPWD Code, agreement registers were required to be maintained at the divisional level. Each register started from 1st April with initial number as '1' and continued with an increment of one till 31st March of the succeeding year.

Audit noticed that 2,73,829 agreements were captured in the system. Of these, 17,934 agreements were captured multiple times (duplicates) within the same financial year. In 10 test checked divisions, 25,176 multiple work proposals were created for the same work. Funds were allotted to the works under

¹⁶⁸ RW Division-II, Bhadrak – one case (Jhatiasahi-Mangalapur Road under S/R, Estimated Cost: ₹ 40.00 lakh) and RW Division-I, Ganjam – one case (Repair and renovation of U.G. High School at Dhumachai, Estimated Cost: ₹ 8.95 lakh)

different heads of account. As the system did not have provision to assign different heads of account to a work, the divisions created multiple work proposals for the same work. As a result, the actual number of works executed by a division got inflated in the MIS reports. WAMIS failed to calculate the actual expenditure incurred for a particular work.

Thus, due to system deficiency, the user had to create multiple work proposals for the same work with different heads of accounts. Accordingly, multiple agreements were entered for the same work and payment was also made.

The Department stated (September 2017) that tagging of multiple charts of account with a work had been developed and would be put to use in future.

2.3.8.3 Non-capture of critical dates in awarding process

OPWD Code provided that execution of the contract agreement and order to commence work should be given within 15 days after acceptance of the tender.

Audit found that in nine cases¹⁶⁹ pertaining to four divisions, the contractors were allowed time from two to six months from the date of acceptance of tender to submit the additional performance security¹⁷⁰. Besides, the divisions waited till the contractors reported for signing of agreements without cancelling the tender. As the system did not have the provisions to capture the date of acceptance of tender, audit could not make 100 *per cent* verification.

Thus, non-provision to capture the date of acceptance of tender and issue of letter of acceptance, the division extended undue advantage to the contractors.

The Department stated (September 2017) that the integration of e-procurement and WAMIS was in process and accordingly the issue would be taken care of.

2.3.8.4 Incomplete capture of agreements

As per OPWD Code, each work should have separate agreement with the contractor. Even the split up works would be treated as separate works and separate agreements should be executed. Further, in WAMIS, there was provision to enter the agreements for each work/ split up work, but the divisions had not entered the agreement details in WAMIS.

Audit found that only 1,737 agreements were entered in WAMIS against 20,075 agreements in RW Division-II, Bhadrak and RW Division, Ganjam during 2012-17. Audit noticed that the division had executed 1,129 agreements pertaining to 121 works during 2013-15 with an agreement value of ₹ 5.57 crore. The works had been split into 4 to 10 sub-works. However, in the database, details of only 160 agreements pertaining to 42 works were entered with incorrect agreement value of ₹ 12.43 crore. Thus, the agreement register generated from WAMIS showed incorrect number and value of contracts.

¹⁶⁹ RW Division-II, Bhadrak: 03 cases (Work Id: 2324, 1748 and 1644); RW Division-I, Ganjam: 04 cases (Work Id: 2160, 2595, 2930, 3258); RW Division, BBSR: 01 case (Work Id: 3665) and RW Division, Bhawanipatna: 01 case (Work Id : 1613)

¹⁷⁰ To be furnished by the contractor within 15 days of receipt of letter of acceptance

The Department stated (September 2017) that Divisions would be directed to enter all agreements and bills in the system.

2.3.8.5 *Deficiencies in capturing and uploading of geo-tagged photographs*

In WAMIS, CDAC had developed a mobile application which would help the JEs/AEs/EEs to upload the geo-tagged photographs of the works in the server. RD Department decided (July and August 2013) to upload the photographs of all original works of roads, buildings above ₹ 25 lakh, bridges, pipe water supply every month irrespective of the progress made. In November 2013, it was decided to upload geo-tagged photographs of all the works every month.

On analysis of the database, Audit noticed the following deficiencies.

- * ***Non-uploading of photographs of all the works:*** 6,71,243 work proposals were created of which the divisions uploaded 23,707 photographs relating to 3,498 work Ids. In 10 test checked divisions, 31,462 work proposals were created, of which 3,942 photographs pertaining to 1,632 works were uploaded without having date/ time on it.
- * ***Uploading of irrelevant photographs:*** The uploaded photographs of majority works were incongruous to the specified works. As a result, the actual progress of the work could not be verified from the photographs. Sample photos of the same are shown below:



Photo of HL bridge at 2nd Km on Bahadapadar - Nadinipalli



Photo of LAC Building at Sagargaon

- * ***Mismatch between geo-tagged location and the actual work location:*** Audit compared the geographical location details of the uploaded geo-tagged photographs in WAMIS with the geo-spatial data provided by ORSAC¹⁷¹. Audit noticed that there was mismatch in geo-tagged photos and actual location details.

Thus, the divisional officers had not ensured that the relevant photographs for all the works were validated and uploaded in WAMIS every month. As a

¹⁷¹ ORSAC - Odisha Space Application Centre

result, the higher officers could not monitor the actual physical progress of the work at the location specified in the database.

The Department stated (September 2017) that automatic validation of actual location with work location could be incorporated in the system, once it was accepted by all the stakeholders.

2.3.9 Output controls

2.3.9.1 Deficient MIS module

MIS module was developed for generation of reports to monitor the physical and financial progress. On verification of the system, the following deficiencies were noticed (*Table 2.3.2*).

Table 2.3.2 showing various deficiencies in MIS module

Issue	Observation
No provision to generate important reports	The RD Department instructed (February 2012) CDAC to make provision in the WAMIS for Health & Family Welfare Department to access reports relating to progress of building as majority of deposit works were given by it. The same had not been provided in WAMIS as of July 2017. As a result, the beneficiary department was unable to know the progress of the deposit works.
Failure to generate important reports	The system generated reports based on calendar year ¹⁷² only instead of financial year. The report was also not as per different types of agreements (P1, K2, F2, etc.) being used in divisions. As a result, the divisions were still depending on the manual reports/ registers.
Absence of reports in excel format	CDAC was to make provision for generation of reports in excel format. However, the reports could be generated only in pdf format at divisional level. As a result, the divisions could not do any analysis as per the requirements of higher authorities.
Output error	During analysis of the reports generated through WAMIS, Audit noticed the following: i) The technical sanction register in WAMIS showed works of sinking of tube wells under the work type 'bridge'. The deficiency was due to lack of validation between the description of the work and the type of work. ii) The reports generated by the system did not bear the name and type of report. iii) The system was unable to generate the total works executed at a given time. Instead, the user was required to select the year and work type several times for different work types for getting the entire work details of a particular year.

(Source: Records of concerned divisions)

¹⁷² January to December

The Department stated (September 2017) that customisation of MIS would be incorporated in the system after consultation with other user departments. Further, export facility in excel would be added and inconsistencies in MIS reports would be removed.

2.3.10 Monitoring and evaluation

2.3.10.1 Ineffective monitoring of higher authorities

RD Department had constituted (March 2012) a committee¹⁷³ for looking after the implementation of WAMIS. Subsequently, it instructed (July 2013, May and August 2014, June 2015), the EICs/ CEs/ SEs of Rural Works Organisation to monitor the utilisation of all modules. They had to submit the physical and financial progress of every scheme fortnightly/ monthly. Besides, the RD Department decided (February 2015) that all the divisions of RW/ RWSS would identify one AE/ JE as Nodal Officer at the divisional level for better utilisation of WAMIS.

Audit observed that the EICs/ CEs/ SEs had not furnished the physical and financial progress of the schemes every fortnightly/ monthly. Therefore, the same could not be monitored at State level. Further, nodal officers were not designated for WAMIS at the divisions, except in two divisions. Effective steps were not taken to fix responsibility for non-submission of the fortnightly/ monthly reports on usage of the modules by the divisions. As a result, the deficiencies occurred continuously. Thus, the objectives of implementation of WAMIS could not be achieved.

The Department stated (September 2017) that WAMIS would soon be used as a monitoring tool and no physical report would be sought from EIC/ CE/ SE.

2.3.11 Conclusion

WAMIS was implemented by RD Department to automate the technical and functional activities in engineering departments. However, WAMIS failed to achieve its objectives even after seven years of its implementation as all modules except accounting, were utilised partially. The divisions of RD Department had utilised WAMIS for processing Running Account Bills to the extent of 12 *per cent* only and had processed most of the works manually.

WAMIS had weak management controls. The system was implemented i) without preparation of software design documents, ii) testing reports of the changes proposed and iii) their incorporation in the system. Business Continuity and backup policies were not framed. Budget module was not utilised due to non-integration with iFMS. As a result, incomplete data was fed in the monthly accounts and the same were rejected by AG (A&E) on many occasions. This also created additional workload for the users.

RD Department did not exercise adequate control over Database Administration activities. WAMIS had design deficiencies in user management, lack of audit trails and absence of provisions for preparation of

¹⁷³ Chief Engineer, RW-I, RD Department; Chief Engineer, Buildings, Works Department; Chief Engineer, RWS&S; Assistant Financial Adviser, WR Department and Deputy General Manager, OCAC

detailed estimates. Besides, the system lacked validation controls, non-mapping of business rules and non-provision of digital signature. This resulted in deviation of the codal provisions and passing of bills without uploading of geo-tagged photographs in the system. Inconsistent and poor quality data in WAMIS led to generation of incorrect MIS reports serving little purpose.

2.3.12 Recommendations

- * Business processes should be reviewed as per OPWD Code and incorporated in the workflow in WAMIS with proper validations.
- * Business Continuity Plan and Disaster Recovery mechanism for WAMIS should be framed and put in place.
- * Complete integration of e-procurement, iFMS and WAMIS should be done to avoid duplication of work and generation of accurate and reliable reports.
- * Proper documentation should be obtained from the vendor along with source code to avoid excessive dependence on vendor support in maintenance of WAMIS.
- * Provision for audit trail, employee specific login credentials and digital signature should be made in the system.