

### Chapter 3 Application Controls

***Audit Objective II – Review the Application Controls to assess the extent to which they ensure proper authorisation, completeness, accuracy and validity of input data and transactions***

3. Application controls are specific to a particular IT application and provide assurance to the Administration that transactions are properly authorised, complete and accurate, and validity of transactions, their maintenance and other types of data input controls are in place. During the course of scrutiny/analysis of ICMS database/records, the following deficiencies in application controls were noticed:

#### **3.1 Deficiencies in integration between ICMS and other applications viz. PRS/COA/CGS etc.**

It was seen that integration between ICMS and other passenger and train service related applications were not implemented completely, as a result of which output from the ICMS were not used in the field operations.

##### **3.1.1 Non-utilization of ICMS for communicating Train Consists to PRS**

As per ICMS documentation, data of train/rake consist is to be sent to PRS for PRS charting and it should be sent to PRS at least four hours before scheduled departure time of the train. Test check of records revealed that:

- Consists of all trains were not reported to PRS through ICMS. These were also not communicated four hours before the scheduled departure of the train.
- Manual system of communicating train consist to PRS was still in operation.

Delay in communicating train consists to PRS did not serve the intended purpose of utilising the train consists for correct train charting.

(Annexure 30a and 30b)

##### **3.1.2 Non-Integration between ICMS and Coach Guidance System**

Coach Guidance System (CGS) indicates the position of each coach from engine along with train number to help passengers to board the train. Even though coach position was available in ICMS, non-implementation of integration with CGS led to manual feeding of data in CGS, over NR, NER and CR.

##### **3.1.3 Manual Data Feeding/Duplicity of Efforts- ICMS and COA**

As per ICMS manual, COA and ICMS applications are interfaced with each other for exchange of information. However, despite having an interface the train detention reasons were being fed in both applications manually as seen in NR, SCR and SECR.

Thus, the integration between ICMS and other applications was not complete and effective which led to populating same type of data in different applications involving usage of additional manpower as well as chances of discrepancies. Moreover, despite having MIS highlighting discrepancies, remedial action was not taken by Railways and MIS were not being used.

## 3.2 Mismatch in data between ICMS and PRS

### 3.2.1 Differences in Public Time Table

Though ICMS has integration with PRS, while creating train profile in ICMS, time table details were fed in ICMS. Time Table details were also populated in PRS and ICMS. Review of ICMS-PRS Public Time Table (PTT) Mismatch Summary<sup>1</sup> of 18 February 2016 revealed 421 instances of mismatch between Public Time Table of ICMS and PRS over all Zonal Railways. This mismatch was again noticed in respect of 368 trains on 23 March 2016 over all Zonal Railways, which indicated that Railway Administration did not take remedial action to rectify the mismatch in timings in the two applications.

### 3.2.2 Differences in distances recorded in ICMS and other Databases

Differences in distances recorded in ICMS and PRS were noticed as follows:

- In ER, for 92 trains there was mismatch in distance in ICMS and PRS Database. The difference ranged between 1.01 kms to 31.94 kms.
- Report No. 987 of ICMS pertaining to NWR, NFR and NR was showing mismatch of distance in ICMS and Block section of Rates Branch System (RBS)<sup>2</sup>.
- During comparison of distance between various stations, recorded in ICMS with Working Time Table distances, differences in the range of 2 kms to 81.59 kms were noticed between two sets of records on NR. A comparison of distances of three pair of trains, having same route details, revealed that there was a difference of 38 to 9.95 kms on NR.

## 3.3 Deficiencies in Master Data

### 3.3.1 Missing details in Coach Master Data

Effective control over master files is essential to ensure integrity of the data as the reliability of the system depends heavily on the correctness and completeness of the Master Data. During the evaluation of the master files of ICMS for the month of October 2015, it was observed that

- ICMS provided an online Report 'Missing Coach Master' for all Zonal Railways Gauge-wise, Vehicle type-wise (All, PCVs and OCVs) giving latest status of records of coaches for which important details like Base Depot, Base Workshop, Commissioning Data, Maximum Speed, Owing Division, POH due month, etc. During the check of the report dated 8 March 2016, it was noticed that, these basic details were missing in respect of 6845 records of all Zonal Railways ranging between 0 (NWR) and 720 (NR).
- ICMS data did not contain details of defence owned coaches of two<sup>3</sup> types even though the same were communicated by Defence department to Railway Board in 2014. The data was therefore incomplete.

<sup>1</sup> Report No. 981

<sup>2</sup> A database of routes and distances in IR

<sup>3</sup> MLACCW and MGSCNY

### 3.3.2 Non-capturing of capacity of PCV type of coaches

Analysis of ICMS table containing details of Coach Type Master pertaining to all Zonal Railways revealed that Coach Capacity of 93 types of PCV (Passenger Carrying Vehicle) coaches was not defined in the Coach Type Master table. The coach capacity of 48 types of coaches was marked/defined in the database, but their seat/berth capacity was not defined. Coaches of ten types were defined/marked as composite class of coaches in the master database (viz. they had two type of classes) but number of seat/berth for both the classes in respect of six types of coaches were not defined/defined in the master data.

If the basic information about the coach viz. its seat/berth capacity is not captured correctly, the coach data cannot be used for its optimal utilization.

### 3.3.3 Non-availability of details of loco number in Master Data

As discussed with CRIS during the course of audit, Master data of locos is populated in ICMS from FOIS. It was seen that there were 1101 records containing 11 different loco numbers which did not appear in Loco Master Table.

Further analysis of these 11 locos with reference to the Loco Status Report in ICMS revealed that only one loco (No. 40241) belong to Passenger Service and remaining locos either belonged to Goods Service or the details were not available in the ICMS report. Data analysis of COA-ICMS-Loco table further revealed that out of 83396 records, 203 locos pertaining to 2916 records, were not available in loco master. Test check of these locos in ICMS loco status report on SER revealed that many of the locos were not available in the ICMS report or other locos pertained to Goods Service. Loco Master Data was, thus, incomplete.

## 3.4 Discrepancies in Coach/Train/Loco Attributes

The following application controls were found to be deficient resulting in incomplete and wrong data.

### 3.4.1 Non-validation of Coach data

As per Railway Board order (May 2006), Codal life of IRS and Steel Body Coaches has been fixed as 30 and 25 years respectively. As the date of built is basic data for calculation of age of a coach as on a given date, it should be available with every coach in Master Table. Condemnation of a coach depends upon the built date of the coach. Data Analysis of Coach Master revealed that

- In all Zonal Railways, 2445 coaches did not have coach built year in ICMS database which resulted in inaccurate MIS report relating to age-wise details of coaches. There were 1205<sup>4</sup> over-aged coaches on IR with age between 30 and 50 years.
- In respect of 315<sup>5</sup> coaches, coach factory turnout date was prior to coach built date.

<sup>4</sup> Total 1205: CR-373, ECOR-34, ECR-36, ER-54, IR-16, KR-7, NCR-44, NER-28, NFR-28, NR-187, NWR-33, SCR-36, SECR-30, SER-116, SR-5, SWR-27, WCR-42, WR-109

<sup>5</sup> Total 315: WCR-1, NFR-2, NWR-3, SECR-3, NER-4, ECR-5, ECOR-6, CR-14, NCR-17, SWR-20, SCR-23, SR-23, SER-24, WR-24, NR-36 and ER-110

- Out of 71447 coaches of all Zonal Railways, in 697<sup>6</sup> coaches, the dates of induction into service were shown 01 to 33 years before the date of built of coaches. Three coaches of NCR had induction dates between the year 2019 and 2020. Test check revealed that 12<sup>7</sup> coaches had invalid induction dates like "01/01/0200", "31/12/2114" etc.
- In 11 Zonal Railways, the dates of induction of 43<sup>8</sup> coaches in master data were prior to coach factory turnout dates and difference was in the range of one day to 109267 days, which was illogical.
- Out of 71447 coaches in Coach Master Table, in 68673 coaches division particular was captured and in remaining 2774 coaches division particular were not available. In ER, the system was showing location Howrah (HWH) under Kharagpur (KGP) division whereas KGP division pertains to SER.

The above indicated lack of validation checks to identify status of coaches which could enable the Railway Administration to take well-informed decision for optimum usage of coaches.

**(Annexure 31)**

### **3.4.2 Invalid Coach Numbers**

In April 1996, Railway Board prescribed five digit coach numbering system. The first two digits would indicate the year in which the coach was built and the next three digits would indicate the type and the individual number of the coach.

Analysis of coach numbers of all Zonal Railways revealed that coach number was less than five digits in 3325<sup>9</sup> cases and the coach number exceeded five digits in 13069<sup>10</sup> cases. Test check also revealed that first two digits did not indicate year of built of coach. Thus, the coach numbering system was not as per extant orders.

### **3.4.3 Discrepancy in Coach Condemnation Details**

Analysis of the table containing details of condemnation of 4629 coaches revealed that the table contained two records each for 328<sup>11</sup> coaches having two different dates of condemnation. However, the status of coach in one of the records was 'recommendation for condemnation' (Code – RECDMN) and in the second record, it was for condemnation. Thus, table contained invalid data for condemnation of coaches.

In 231<sup>12</sup> instances on 15 Zonal Railways it was noticed that year of condemnation of coach was mentioned as "2099" which was not realistic and reflected deficiencies in input controls. It was also seen that, name of the Zonal Railway

<sup>6</sup> Total 697: ECOR-2, KR-2, ECR-5, NER-5, SER-6, NWR-7, WCR-10, NCR-11, SR-13, ER-15, SECR-17, NFR-22, WR-62, SWR-83, CR-94, SCR-144 and NR-199

<sup>7</sup> Total 12: NER-3, ER-5, NR-2, SCR-1 and SWR-1

<sup>8</sup> Total 43: CR-1, ECR-1, NWR-1, SECR-2, WR-2, ECOR-4, SER-4, SR-5, NR-6, SCR-8, NER-9

<sup>9</sup> Total 3325: KR-13, NCR-34, IR-38, WCR-42, SR-45, SWR-47, SCR-51, ER-83, ECOR-84, NER-91, ECR-108, SER-124, NWR-192, SECR-219, WR-319, CR-372, NR-524, NFR-939

<sup>10</sup> Total 13069: KR-3, NFR-4, WCR-4, NWR-11, ECR-16, NCR-24, IR-41, CR-50, SWR-51, SECR-176, NER-241, ER-415, SCR-444, ECOR-939, NR-1126, SR-1469, SER-3214, WR-4841

<sup>11</sup> NR-72, SER-90, ECR-68, ER-34, SR-31, WR-17, SECR-5, NWR-5, SCR-2, NFR-2, ECOR-2

<sup>12</sup> Total 231: SCR-1, SECR-1, WCR-1, NER-2, NCR-3, NFR-3, NWR-3, ER-4, NR-5, WR-5, ECOR-17, SWR-35, SER-40, CR-42, KR-69

was captured in place of name of the workshop which condemned the coaches which indicated lack of controls to validate the data input. (WR, NR).

#### **3.4.4 Mismatch/Discrepancies in POH Due Years**

Analysis of POH history data and coach master data revealed instances where data of POH due years captured in Coach Master table and POH History table were not matching (WR, NR). Test check revealed that in 55 instances, coach built year and Coach POH due year were same.

### **3.5 Non-validation of train/loco data**

#### **3.5.1 Lack of controls to validate Train Pipelines Confirmation Data**

In respect of 666 trains owned by nine<sup>13</sup> Zonal Railways, the train pipeline (viz. route details of train) was confirmed but confirmation time was not captured and in 3325 trains of all Zonal Railways, Pipelines conformation time was captured but status was not confirmed as confirmation status flag was N. Thus, the system was capturing incomplete and inconsistent information and lacked adequate validation controls for capturing information.

#### **3.5.2 Non-capturing of complete details for detention of trains**

In case of detention of trains, ICMS provides facility to capture reasons for detention to enable Railway administration to take remedial action. Analysis of train detention data revealed that out of 364738 transactions, in 296 transactions of all Zonal Railways, detention codes (reasons) for detention/train loss were recorded but detention sub-codes/sub-reasons were not recorded. For example, there were four sub-reasons (Detention sub-code) for detention on account of weather (Detention Code – WEA<sup>14</sup>) but system did not enforce capturing of sub-reasons for weather. It was further noticed that in 590 cases of all Zonal Railways, remarks were not recorded.

(Annexure 32)

#### **3.5.3 Wrong Description of Locos**

In loco type table, the description of WDM3D type of loco was recorded as 'XXXXXXXXXXXXXXXXXX'. There were 484<sup>15</sup> locos of WDM3D type, over 14 Zonal Railways for which description could not be ascertained.

#### **3.5.4 Movement of sick coaches by wrongly marking them as fit coaches**

It was noticed at Katihar station of NFR that coach No. ECR WGSCN 02244 (of ECR) was made sick on 30 January 2016 at 15:36 hours. Train examination revealed that the coach required major repair and was needed to be sent to its owning railway. In order to move the coach, the sick coach was marked as fit and released for attachment with rake. Thus, the sick coach was wrongly marked as fit for movement purpose and during the movement period, ICMS depicted wrong status of coach. Similar instances were noticed at WR and SCR also. This

<sup>13</sup> NER-5, SR-30, NR-31, SCR-34, SECR-73, NFR-92, CR-107, NWR-120, WR-174

<sup>14</sup> WEA(Weather) – FOG (Fog), FL(Flood), CY(Cyclone), LD(Landslide)

<sup>15</sup> Total 484: SWR-7, ECR-14, SER-15, ER-21, NCR-23, NFR-26, NER-31, WR-43, ECR-45, NR-50, SR-50, SCR-51, WCR-51, CR-57

showed that the user was not aware of the procedure to be followed for managing sick coaches in ICMS.

### **3.6 Discrepancies in data of Stations, Division, Yard, Base depot, Interchange Station and sick coaches**

#### **3.6.1 Station Details**

Out of 12310 stations defined over all Zonal Railways, 4685 stations were not marked as valid as the value of their flag was zero and it also included stations having valid codes, such as JUC (Jalandhar City), PWL (Palwal), DR (Dadar), PNVL (Panvel) stations etc. Out of 7625 valid stations of all Zonal Railways, 143 stations in 47 divisions of IR had two to four station names. Due to inadequate data validation, 585 instances of duplicate station names with different station codes containing 289 station names were noticed on 67 divisions over IR.

Both ends of 7525 stations were defined as "End1"/"END1" and "End2"/"END2" which did not convey proper directions/ends of the station. Traction of 3668 stations of 73 divisions of IR was not marked.

In SR, the station name PONDICHERRY displayed under the profile of Train No.12898 still remains, though its name has been changed as PUDUCHERRY during 2006 itself.

Over NWR, analysis of 345 records revealed that base depot codes for 08 and 63 Locos were shown as GIM and PUEJ respectively but no base depots with such codes were available over NWR jurisdiction.

#### **3.6.2 Discrepancies in Yard Data**

Yards of NR, SCR were mapped wrongly to other Zonal Railways. Two yards of WR were wrongly mapped to station code of CR. Similarly, in WR, wrong mapping of stations with division/yard were noticed. Surat Yard was shown in Vadodara Division instead of Mumbai Central and Vadodara Station yard was incorrectly shown under Mumbai Central instead of Vadodara. In ECR, many instances of wrong mapping of yards were noticed. Yard code YD under Mugalsarai (MGS) division has been mapped to six different station codes though such yard code was available in MGS division.

#### **3.6.3 Discrepancies in Interchange (IC) Station Data**

In five<sup>16</sup> Zonal Railways, it was observed that 11 interchange stations were defined incorrectly between Divisions. Some of them did not even belong to the Zone. In SWR, data/information in respect of 28 out of 34 interchange stations was incorrect.

#### **3.6.4 Multiple/Duplicate records of sick coaches**

Analysis of data pertaining to the year 2015 containing sick operations details revealed that records having same coach ID, same coach event, same coach event date, same coach sick ID, same station were recorded multiple times ranging

<sup>16</sup> NR - Okhla and Panipat, SCR - Nellore and Tenali Jn., ECR - Simariya and Patna, SER - Kharagpur and Ahmadnagar and ER - Barrackpore and Kalyanpur

from 2 to 33. The system, thus, failed to restrict duplicate entries.

### 3.7 Other areas where data was found to be illogical/invalid

#### 3.7.1 Negative Lie Over Period

Lie over period is the period during which a rake is kept unused at a station or yard in between its use for scheduled trains. As per ICMS<sup>17</sup>, 21<sup>18</sup> rake links had negative Lie Over Period which was not logical.

#### 3.7.2 Non-capturing of movement details and showing invalid reasons for movement of Light Engine

During analysis of ICMS tables containing light engine movement related data, pertaining to SER and NR, it was observed that all the movements of Light Engine were not captured in ICMS. Data pertaining to ER, NCR and ECR showed invalid reasons such as 0, 1, 11,111, LE etc. in 66, 79 and 1228 records respectively.

#### 3.7.3 Absence of validation in field “Validity To date” and “Validity From date”

Analysis of data pertaining to train validity details sent to COA (viz. data that was stored in pipeline table) revealed that there were 252 records where train “Validity To date” was prior to “Validity From date” and the difference was in the range of 1 day to 184 days. This shows absence of input control on these two dates.

#### 3.7.4 Capturing of invalid data in ICMS

- In table containing data on train detention<sup>19</sup> instance were noticed where ‘section\_code’ indicated same section codes e.g. BXN-BXN, SHM-SHM, ASR-ASR, ANVT-ANVT against different train numbers though the station codes should be different. (SER, NR)
- Data pertaining to loco enroute failure showed instances where Train Number contained alpha-numeric characters instead of numeric values.
- The Train Number<sup>20</sup> field had invalid data (such as /, 00000,00, A, P, B, S, D. /WL etc.).

### 3.8 Non-updation of Repair, Maintenance and Depreciation Charges

As per Para 869 of Indian Railway Finance Code Vol. I, inter railway adjustment is required to be done for the working expenses i.e. repair, workshop maintenance, depreciation and interest charges on provision of engines, on the basis of engine hour outage and on provision of passenger coaches on the basis of total kilometers earned though rakes/passenger coaches running on more than one railway system.

Review of the ICMS Report<sup>21</sup> as well as records of accounts department over

<sup>17</sup> Report No. 962 (dated 20.06 2016)

<sup>18</sup> NR-1, CR-1, ECR-2, ER-4, NCR-1, NFR-2, SER-1, SR-6, SWR-3

<sup>19</sup> Dy\_Train\_Detention

<sup>20</sup> Table Name LOCO.COA\_MU\_LOCO\_TRG\_ON\_DEP

<sup>21</sup> Report No. 808 and 1521

four<sup>22</sup> Zonal Railways revealed that the ICMS reports were not in use in their existing forms as the charges for the above mentioned elements were not found updated in ICMS as per extant orders<sup>23</sup> and the charges were being computed manually.

In respect of Report No. 1521, it was noticed that the rates for Repair & Maintenance and Depreciation charges were not dynamic viz. ICMS Report number 1521 depicted same rates when the report was viewed for different period of time/years, though the rates were different. Thus, the report gave incorrect information for different period of time/years.

**(Annexure 33)**

### **3.9 Helpdesk Services**

There were 505 ICMS related complaints/grievances of different railways pertaining to October 2014 to October 2015 which were not resolved and pending for disposal on 7 October 2015. Out of 505 complaints/grievances, 256 complaints/grievances were registered between 7 October 2014 to 1 April 2015 viz. they were more than six months to 12 months old and remedial action was not taken. These complaints pertain to all the Zonal Railways<sup>24</sup>.

**(Annexure 34)**

*The above findings indicated that ICMS lacked adequate application controls to ensure data accuracy, consistency and completeness. The integration between ICMS and other applications was also not very effective to avoid manual intervention in the operations/data input.*

During Exit Conference (October 2016), Railway Board agreed with the audit observations. As regards, mismatches in Time Table data in PRS and ICMS, it is stated that remedial action is being taken to rectify the mismatch.

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<sup>22</sup> NCR, ECR, NR, ER

<sup>23</sup> RB circulated rate of charges for adjustment of these elements for the year 2015 and 2016 vide letter No.F(C)/2003/27/1 dated 30.04.2015 and 21.04.2016.

<sup>24</sup> Including Konkan Railway, Integrated Coach Factory and Railway Board