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**'CIVIL ENGINEERING WORKSHOPS
IN INDIAN RAILWAYS', 'DELAY IN
BUILDING THE NEW RAIL BRIDGE
OVER RIVER SONE' AND 'SIGNAL
AND TELECOMMUNICATIONS'**

MINISTRY OF RAILWAYS

**PUBLIC ACCOUNTS
COMMITTEE
2014-2015**

FIFTH REPORT

SIXTEENTH LOK SABHA



**LOK SABHA SECRETARIAT
NEW DELHI**

FIFTH REPORT

PUBLIC ACCOUNTS COMMITTEE
(2014-2015)

(SIXTEENTH LOK SABHA)

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‘DELAY IN BUILDING THE NEW RAIL BRIDGE
OVER RIVER SONE’ AND ‘SIGNAL AND
TELECOMMUNICATIONS’

MINISTRY OF RAILWAYS

*Presented to Lok Sabha on 25.11.2014
Laid in Rajya Sabha on 25.11.2014*



LOK SABHA SECRETARIAT
NEW DELHI

November, 2014/Agrahayana, 1936 (Saka)

PAC No. 2033

Price: ₹ 45.00

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Published under Rule 382 of the Rules of Procedure and Conduct of Business
in Lok Sabha (Fifteenth Edition) and Printed by the General Manager,
Government of India Press, Minto Road, New Delhi-110 002.

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COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2014-15)

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* Vacant vice Shri Rajiv Pratap Rudy who has been appointed as Minister *w.e.f.* 9th November, 2014.

† Vacant vice Shri Jayant Sinha who has been appointed as Minister *w.e.f.* 9th November, 2014.

†† Vacant vice Dr. M. Thambidurai who has been chosen as Hon'ble Deputy Speaker, Lok Sabha and has since resigned from the membership of the Committee.

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2013-14)

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19. Shri Satish Chandra Misra
- ††20. Dr. V. Maitreyan
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22. Smt. Ambika Soni

* Elected *w.e.f.* 14th August, 2013 *vice* Dr. Girija Vyas appointed as Minister of Housing, Urban Development and Poverty Alleviation *w.e.f.* 17th June, 2013.

† Elected *w.e.f.* 3rd September, 2013 *vice* Dr. V. Maitreyan ceased to be a Member upon his retirement as a Member of Rajya Sabha *w.e.f.* 24th July, 2013.

†† Elected *w.e.f.* 3rd September, 2013 *vice* Dr. E.M. Sudarsana Natchiappan appointed as Minister of State for Commerce and Industry *w.e.f.* 17th June, 2013.

COMPOSITION OF THE SUB-COMMITTEE-I (RAILWAYS) OF
THE PUBLIC ACCOUNTS COMMITTEE
(2013-14)

Shri Prakash Javadekar — *Convenor*

MEMBERS

2. Shri Prasanta Chatterjee
3. Dr. V. Maitreyan
4. Shri Ramen Deka
5. Shri Jayaprakash Hegde

INTRODUCTION

I, the Chairperson, Public Accounts Committee, having been authorised by the Committee, do present this Fifth Report (Sixteenth Lok Sabha) on "Civil Engineering Workshops in Indian Railways, Delay in Building the New Rail Bridge Over River Sone and Signal and Telecommunications" based on C&AG Report No. 32 of 2011-12 Union Government—Railways relating to the Ministry of Railways (Railway Board).

2. The Report of Comptroller and Auditor General of India for the year ended March, 2012, was laid on the Table of the House on 20th December, 2012.

3. The Public Accounts Committee (2013-14) took up the subject for detailed examination and report. A Sub-Committee was constituted for the purpose. The Sub-Committee took evidence of the representatives of the Ministry of Railways (Railway Board) on the subject at their sitting held on 11th October, 2013. The Sub-Committee of PAC (2013-14) considered and adopted this Report at their sitting held on 14th March, 2014. As the Report could not be considered by the Committee during the term of the PAC (2013-14), the subject was again selected by PAC (2014-15) which considered and adopted the Report at their sitting held on 19th November, 2014. The Minutes of the Sittings form Appendices to the Report.

4. For facility of reference and convenience, the Observations and Recommendations of the Committee have been printed in thick type and form Part-II of the Report.

5. The Committee thank the Public Accounts Committee (2013-14) and their Sub-Committee for taking oral evidence of the Ministry and obtaining information on the subject.

6. The Committee would also like to express their thanks to the representatives of the Ministry of Railways (Railway Board) for tendering evidence before the Sub-Committee and furnishing the requisite information to the Committee in connection with the examination of the subject.

7. The Committee place on record their appreciation of the assistance rendered to them in the matter by the office of the Comptroller and Auditor General of India.

NEW DELHI;
24 November, 2014

03 Agrahayana, 1936 (Saka)

PROF. K.V. THOMAS,
Chairperson,
Public Accounts Committee.

REPORT

PART I

An Overview

The C&AG Report No. 32 of 2011-12 containing many aspects of Indian Railways was laid in Parliament on 20th December, 2012. The Committee took up three issues out of that Report for examination. They were 'Civil Engineering Workshops in Indian Railways'; 'Delay in Building the New Rail Bridge over River Sone'; and 'Signal and Telecommunication' based on Paragraph No. 3.2, Paragraph No. 3.4 and Chapter VI respectively of the said Audit Report. The Chairperson, PAC appointed a Sub-Committee under the Convenorship of Shri Prakash Javadekar, MP and a Member of the PAC to examine the issues and report to the main Committee.

In the process, the Sub-Committee obtained Advance Information/Written Reply/ Post-Evidence Information from the Ministry of Railways (Railway Board) besides taking oral evidence of the Ministry. The Sub-Committee also undertook an on-the-spot Study Visit to Civil Engineering Workshop, Mughalsarai and Research, Development and Standard Organisation (RDSO), Lucknow to get first hand information on the subject matters. Based on the written and oral deposition of the Railway Board and the field level information gathered by the Sub-Committee during their Study Visit, the three issues have been discussed separately in the following three Chapters of this Report followed by the Committee's Observations/Recommendations.

CHAPTER I

CIVIL ENGINEERING WORKSHOPS IN INDIAN RAILWAYS

I. Introductory

The Civil Engineering Workshops (CEWs) were established to fulfil the needs of manufacturing bridge girders, track components such as glued joints and various other items such as Platform Shelters, Foot Over Bridges, Push/Motor Trolleys, Lifting Barrier Gates, Gate Locks, etc. when fast expansion of railway network was taking place in the country and meagre facilities for the same were available. There are ten CEWs that were established between 1900 and 1965 and which are functioning on nine Zonal Railways. Seven Zonal Railways, which are not having their own workshop, have been attached with the existing workshops for taking care of their normal requirement. The Eleventh Five Year Plan (2007-12) had envisaged a critical role for Civil Engineering Workshops (CEWs) in view of anticipated increased demand for fabricated steel structures for re-building/re-girdering existing bridges to make them fit for running heavier axle load trains and construction of new bridges on the Dedicated Freight Corridors. As a result, the magnitude of the steel fabrication works to be undertaken by the CEWs was to increase substantially.

II. Modernisation of CEWs

1.2 Audit scrutiny revealed that the CEWs set up more than five decades ago were functioning with quite old machines and required technology upgradation. It was estimated in 1993 itself that each CEW would be required to invest funds to the tune of ₹ 40 to 50 crore towards modernisation during the next five years. Although a substantial requirement for steel fabrication was anticipated in Ninth Plan, a modest allocation of ₹ 90 crore only was earmarked in Eleventh plan for executing upgradation works. Subsequently, a seminar of CWM/CWE held in Pune in 2009 had recommended a comprehensive modernisation plan to increased automation and procure latest machines. It was assessed in June, 2009, that requirement of steel fabrication would increase from 10,000 to 30,000 MT per annum as against average annual production of 14,000 MT.

1.3 Audit also observed that the average age profile of machines in CEWs ranged from 22 to 47 years against the expected average codal life of 15 years. No plan for modernisation of the CEWs had been prepared as on date, as recommended in the seminar in Pune. Out of the Plan allocation of ₹ 90 crore, the actual investment upto September, 2011 was ₹ 17.32 crore only, ₹ 6.45 crore for augmentation works and ₹ 10.87 crore for procurement of machinery. In seven CEWs, the procurement of new machines and execution of augmentation works was nil/negligible.

1.4 In the above context, the Committee desired to be apprised of the concrete efforts made for the modernisation of the CEWs. In reply, the Ministry submitted that

modernisation/upgradation had been a continuous process undertaken in engineering workshops as per requirement and availability of funds. The existing machines which were quite old were replaced in a phased manner with machines of improved technology through Machinery and Plant programme of the Railway as per availability of funds. However, paucity of funds has been a constraint for providing new technology machines and augmentation of infrastructure in bridge workshops.

1.5 Asked to state the measures taken to overcome the fund constraints, the Ministry, admitting that the funds allocated were less than the demand projected, submitted that the terms of references of the Committee set up to take holistic review of the workshops also included examining and identifying the requirement of new machinery/technology along with other infrastructural requirements for technological upgradation of each workshop. The Ministry further stated that once the Committee's recommendations were submitted and accepted, an action plan would be made accordingly for providing new technology machines and augmentation of infrastructure in Bridge workshops. The phase-wise requirement of funds would be assessed and pursued accordingly.

1.6 The Committee then enquired about the precise reasons for the procedural delays hampering modernisation and steps taken to obviate recurrence of such delays. In reply, the Ministry stated that modernisation of a workshop involved procurement of machinery and/or civil works. Procurement of machines was mainly done through COFMOW/Stores department and it took about two to three years to procure/commission the machines due to the procedures involved. The Ministry further stated that a Committee had been set up to undertake holistic review of each workshop which would also include identification of their modernisation/technological needs. The Committee was required to undertake holistic review of each workshop, *inter-alia*, examining the following issues and make recommendations:

- (a) To examine and identify requirement of new machinery/technology along with other infrastructural requirements for technological upgradation of each workshop.
- (b) To examine and suggest desirable product mix with a view to facilitate development of core competency of each workshop and considering cost of manufacture.
- (c) To examine requirement and availability of manpower.
- (d) To examine issues relating to productivity, capacity assessment/utilization, cost manufacture and relevance of workshops, keeping in view existing and future needs.
- (e) To examine the conversion factors applied for converting and producing of general items in Equated Units (EUs) terms and suggest modifications, if any.
- (f) Any other issue which Committee may consider relevant.

1.7 Asked to intimate the latest status of the Committee set up to undertake holistic review of each workshop, the Ministry aprised that the Committee had visited

nine workshops and its deliberations were in progress. The Ministry also stated that the Committee had not given any interim report so far and it was expected that the Committee would submit the full report by 31 December, 2013.

1.8 On being asked to state categorically the measures taken/contemplated to speed up the modernization process, the Ministry submitted that the existing machines which were quite old were being replaced with improved technology machines through Machinery and Plans Programme of the railways as per availability of funds. EOT cranes, road mobile cranes, fork lift trucks etc. have been provided to strengthen/upgrade the handling system in some workshops. Measures have also been taken for augmentation of steel bridge girder fabrication capacity of some of major workshops. Workshops at Manmad, Sabarmati, Mughalsarai and Arakkonam have since successfully completed fabrication of welded open web girders for 25 Ton loading standard involving multiple stage inspection of RDSO.

1.9 The Sub-Committee then desired to know the target date given to RDSO, Lucknow to revive the Consortium Bridge workshops. In reply, the Ministry stated that *vide* Railway Board's letter dated 18 April, 2013, RDSO had been advised to review the consortium to Bridge Workshops and organize regular meetings. The agenda items for discussion in the meeting had already been circulated and the meeting of consortium of bridge workshops was scheduled to be held on 12th and 13th September, 2013 at Plant depot, Mughalsarai, East Central Railway.

1.10 Asked to state the outcome of the meeting held on 12th and 13th September 2013, the Ministry apprised that in the meeting of consortium of Bridge Workshops, several items were discussed *e.g.* issues related to modernization/mechanization and improvements of Workshops, repair to workshop infrastructure and machinery, dedicated fabrication works for each workshop, inspection schedule of girders by RDSO, procurement of steel, adoption of standard fabrication practices etc. The Minutes of the Consortium of Bridge Workshops has been sent by Chief Engineer (Works)/ Central Railway and the same were reportedly under examination at RDSO/Railway Board for issuing further order.

III. Installed Capacity and Production Planning

1.11 Audit observed that the key factor of production plan of workshop is its installed capacity that determines the optimum production level. The determination of installed capacity of a workshop is essential to help the management to identify production bottleneck imbalances, idle capacity and prepare measures for efficient use of resources; to assess the optimum level of operators and to allocate apportion and absorb the costs of operations.

1.12 But Audit scrutiny revealed that data regarding installed capacity was not available in five CEWs and in the remaining five CEWs, it had not been reassessed at regular intervals. Audit further pointed out that the installed capacity of Arakkonam workshop was reduced injudiciously. There was under-utilisation of installed capacity in four CEWs.

1.13 In the above context, when the Committee desired to know the reasons for non-availability of the data on the installed capacity and lack of reassessment of the

installed capacity at regular intervals, the Ministry in their written deposition, submitted as under:—

"Capacity of workshop mainly depends on available infrastructure including machinery and handling equipments lay out, manpower, product mix being manufactured etc. Till recently, neither any alternative fabrication process was introduced nor there were significant changes in core activities of the workshops which may have necessitated reassessment of installed capacity of workshops. Mainly unserviceable/old machines have been replaced. Thus need was not felt to reassess the installed capacity of the workshops. However, now some of the workshops have switched over or in the process of switching over to fabrication of welded open web girders confirming to enhanced 25-Ton loading standard. Also the product mix has undergone substantial changes with some workshops almost stopping manufacturing of major track items to give thrust to fabrication of steel bridge girders in line with Board's directives. Thus, once product mix undergoing changes gets stabilized, the capacity of workshops will be reassessed keeping in view ongoing capacity augmentation activities giving due consideration to availability of manpower which is diminishing every year due to superannuation etc."

1.14 The Committee then enquired about the reasons/justifications for reduction in the installed capacity at Arakkonam. In reply, the Ministry stated as under:—

"One of the major factors for determination of the capacity of a workshop is the manpower and the number of shifts utilized for production. In respect of Arakkonam workshop, the staff strength of technicians has been declining every year and the vacancies due on retirement are not being filled (except 4 vacancies) for the last many years. The declining manpower and elimination of night shift activities have caused reduction in capacity of workshop."

1.15 Asked to state the categorical measures taken/proposed to prevent under-utilization of capacity of CEWs, the Ministry deposed as under:—

- "(i) Machines which are quite old are being replaced with improved technology machines in phases as per availability of funds.
- (ii) Material handling system in workshop is being strengthened/upgraded, where required, by way of providing EOT cranes, road mobile cranes, fork lift truck etc. as per availability of funds.
- (iii) Efforts are being made to regularly improve the product mix with a view to reduce the production of general items as far as feasible. This will help in maintaining the fabrication of same item for longer period. Some workshops have already reduced significantly manufacturing of general items.
- (iv) Provision of stand by generator sets, where required, to overcome power failures as per availability of funds."

1.16 The Committee desired to be apprised of the production target for each of the proceeding five years and the actual output product-wise. In reply, the Ministry submitted that CEWs have been manufacturing large number of general items in addition to fabrication of steel bridge girders depending upon the requirements/situations arising during the year. Hence, product wise targets were not specified and resource utilization assessed with the yardstick of 1.0 equated tone/man/month.

1.17 Asked to state whether the system of recording machine hour utilization been introduced in all the CEWs, the Ministry stated that the record of machine hour utilization was being maintained/introduced in Engineering workshop at Jalandhar, Lucknow, Bongaigaon, Lallaguda and Sini for major machinery. Necessary steps were being taken by Arakkonam and Sabarmati workshops for maintaining the necessary record for major machines.

1.18 In evidence, the Committee desired to known about the private participation in girder manufacturing. In response, the Member (Engineering) Railway Board submitted:—

"The private industry in girder manufacturing did not develop too much. Apart from the Railways, we only had the PSUs like the BBJ and Bridge & Roof Company. They are the major PSUs which have been manufacturing girder for us. So, the main disadvantage of this was that both these companies were based in Kolkata. Other than Kolkata, there used to be a lot of problems. We revived the steel girders because steel quality improved; fabrication technology improved. Riveting was very much labour-intensive. So, when the welding technology came, we modernised our workshops. Then, the private companies started coming in, seeking approval from the Railways to permit them also to manufacture girders. L&T was the first company which is outside the PSUs, outside the Railways. We have now about five or six parties which are approved. For example, for the Ganga Bridge at Patna, there are three fabricators. One is G.P. Tanpa, the other one is Royal Infrastructure and Munger is with BBJ. The Bogibeel Bridge in Assam is a major Bridge. This is a joint venture between L&T and Ramboll of Denmark. So purely, still there are only four or five Indian companies which can manufacture the girders. Anybody can do platform shelter and minor fabrication. But the large span open web girders are manufactured only by four or five parties."

1.19 Asked to state the requirement and production capacity of the PSUs and the private companies, the Member (Engineering) Railway Board apprised:—

"Requirement is quite matching. The PSUs have a fixed target. The Railways is generally producing of 5000-6000 tonnes per annum. Whatever is the excess requirement that is taken by the private parties. Of course, right of refusal is with all railway workshops. No officer can go to the market unless he has a certificate from the local workshop saying that it is unable to manufacture because it has adequate workload. So, no bridge workshop can complain that its production capacity is short because of lack of orders. That certificate is mandatory before doing the tender."

1.20 On being asked to mention the price comparison between the PSUs and the Private Companies, the representative of the Ministry further deposed.

"The Private Companies concentrate only on bulk orders. They have the economy of scale. Their price is normally 10 per cent lower than our price. But when we take one girder, then the price is much higher. For example, for Chakibonk in Pathankot and the Konkan Railway, we faced the same problem. For one girder, you have to make all the jigs, fixtures and templates. The private companies will not do it unless they have large number of girders."

1.21 The Committee enquired about the downgrading and upgrading of the workshops as part of the modernisation process. In response, the Member (Engineering), Railway Board apprised:—

"We are continuing with it. We are downgrading where the private industry is flourishing and the requirement has come down. If you see the surrender in the Arakkonam Workshop, it is very high because the activities in which they were specialised in are not required any more. But we are not doing it in Bongaigaon and Gorakhpur because still there are a lot of old bridges and the restoration of bridges are required, especially during Monsoons. So, we are not closing down anything but the activity of downgrading and upgrading keeps on going."

1.22 Asked to state specifically whether a comprehensive and rationale plan had been chalked out in this regard, the representative of the Ministry deposed:—

"The meeting has taken place at the RDSO. It will give the rationale plan as to what girder is manufactured, how much will be manufactured in-house. It will issue a ten year programme. Emergency girders are all manufactured in-house. It is the support arrangement. When we make the restoration which needs the temporary girder, that also is manufactured in-house because it is a very safety and critical item. So, we do not want any compromise in quality on that. One Crib may be used once in five years but the day it is used is important. So, those are manufactured in-house."

1.23 The Committee then desired to know the important service being rendered by the workshops to meet the immediate and long term requirements. In response, the Chairman, Railway Board submitted in evidence:—

".....The Railway Workshops do a very important service when we fail from the trade, when we need things almost instantly. For it is not possible to place an order on the trade because it requires tender finalisation, supply, etc. to go into contractual details. But when it comes to our workshops since they are of our own, we can re-distribute what we have allotted depending on the requirement. There is a distribution programme of various workshops as to what girders will go where. It is a year-on-year basis. We do not have to wait for a very long time. To that extent, they also do an excellent job for meeting the immediate and unforeseen requirements."

1.24 The Committee then enquired about the details of the manpower vacancies in all the CEWs. In their written deposition, the Ministry furnished the following information:—

S1. No.	Name of workshop	Railway	Total Vacancies as on 31.03.2012
1.	Engineering Workshop at Manmad	CR	240
2.	Engineering Workshop at Mughalsarai	ECR	52
3.	Engineering Workshop at Jalandhar	NR	148
4.	Engineering Workshop at Lucknow	NR	142
5.	Engineering Workshop at Gorakhpur	NER	98
6.	Engineering Workshop at Bongaigaon	NFR	26
7.	Engineering Workshop at Arakkonam	SR	213
8.	Engineering Workshop at Lallaguda	SCR	7
9.	Engineering Workshop at Sini	SER	261
10.	Engineering Workshop at Sabarmati	WR	192
Grand Total			1379

1.25 Expressing concern at such large number of vacancies in various CEWs, the Committee queried about the sanctioned strength *vis-a-vis* the staff on roll and measures taken to bridge the gap. In response, the Ministry furnished the following updated data:—

Workshop	Railway	Sanctioned	Staff as on	Vacancies	Action being taken to fill
		strength as on 01.04.2013	roll on 01.04.2013	as on 01.04.2013	up the vacancies
1	2	3	4	5	6
Manmad	Central	1019	855	164	The creation of vacancies and filling up of vacancies is a continuous process due to continuous
Mughalsarai	East Central	611	517	94	
Jalandhar	Northern	634	488	146	retirement, periodic review of cadre position etc.
Lucknow	Northern	604	412	192	Therefore, as such no target date has been fixed for filling up the vacancies
Gorakhpur	North Eastern	499	426	73	However, the action for filling up the vacancies
Bongaigaon	North East Frontier	318	272	46	through Railway Recruitment Board,
Arakkonam	Southern	1175	964	211	Railway Recruitment Cell & Departmental promotions
Lallaguda	South Central	226	216	10	etc. is being taken as required. Further, the Committee set up to

1	2	3	4	5	6
Sini	South Eastern	627	372	255	undertake holistic review will also deliberate on manpower requirement and availability of the workshops.
Sabarmati	Western	833	618	215	
Total		6546	5140	1406	

1.26 In view of the proposal made in the CWMs/CEWs seminar held in 2009 that production schedule meeting be held at the Railway Board's level preferably twice a year, the Committee enquired about the reasons for not doing so. In reply, the Ministry submitted that the recommendation of CWMs/CWEs seminar held in IRICEN Pune on 13th and 14th July, 2009 that production schedule meeting be held at Railway Board's level preferably twice a year was not accepted by the Board as the same was not considered necessary. However, these meetings were regularly held at various levels in Zonal Railways to analyse the demands and capacity and for planning production schedule of concerned workshops.

1.27 In response to a specific query of the Committee, the Ministry apprised that there were no Engineering Colleges in the country exclusively pertaining to the Railways.

CHAPTER II

DELAY IN BUILDING THE NEW RAIL BRIDGE OVER RIVER SONE

I. Introductory

Sone Nagar (SEB)—Mughalsarai (MGS) section (124 km) is a vital corridor for movement of coal, other minerals and goods from Bengal-Bihar-Jharkhand fields to North India and is a part of the Grand Chord (Mughalsarai Asansol) on the Delhi-Howrah route. To cater to the increasing traffic load, it was planned to lay an additional line between SEB—MGS which necessitated a three-line bridge over river Sone. Audit pointed out that there was already a decision in January, 1990 to replace the existing bridge over River Sone on age-cum-condition basis. Therefore, the simultaneous completion of both these works together was imperative because absence of a third line between Dehri-on-Sone (DoS) and SEB would result in erosion of line capacity of the section from the envisaged 83 paths to 72 paths and accordingly the Railway Board, in November, 1992 directed that the works should be progressed simultaneously. However, the work of construction of the third line between DoS and MGS (excluding the bridge work) was sanctioned in 1990-91 and the work was progressively completed and opened for traffic between 1997-2002 at a cost of Rs. 262.24 crore. But the Bridge work was neither sanctioned nor progressed simultaneously. The administrative sanction for the bridge work was accorded only in 1997-98.

II. Delay in sanctioning the work of Bridge

2.2 In the above context, the Committee desired to be apprised of the reasons for delay in sanction and completion of work and specific efforts made to complete the work at earliest. In their written deposition, the Ministry submitted as under:—

"For provision of 3rd line between Sone Nagar and Dehri-on-Sone stations in Mughalsarai-Sone Nagar section, a bridge was required across river Sone. However, any new bridge could have been constructed only at adequate distance from the existing bridge to ensure its safety during the period of construction of new bridge. The new bridge also needs to be connected to Sone Nagar and Dehri-on-Sone by suitable modifications in respective yards. Further, the existing bridge on river Sone which was constructed during 1898 (*i.e.* more than 90 years old at the relevant time) was showing signs of distress and having speed restriction on both Up and Down lines. Also, the girders of Down Line were of 'early steel' requiring replacement. The bearings also required modifications due to adoption of enhanced MBG 1987 loading on Indian Railways. Thus, replacement of existing bridge was also under consideration. If bridge for additional line was taken up independent of the replacement of existing bridge then there would be technical complications in location of above two bridges and their connections with Sone Nagar and Dehri-on-Sone yards. Thus, due to technical constraints, construction of bridge for additional line and

replacement of existing bridge were required to be undertaken concurrently. Hence, it was decided that all the bridge works on Sone river (new bridge for the 3rd line and replacement of existing bridge) should be integrated and taken up as a separate project. Thus the new bridge for 3rd line was not included in the work of 3rd line sanctioned in 1991.”

2.3 Asked to state the latest progress of the 3rd line work, the Ministry submitted that the 3rd line had already been commissioned except bridge over river Sone which was expected to be commissioned during 2013-14 alongwith the required modification to Dehri-on-Sone and Sone Nagar Yard.

2.4 To a specific query as to why there was a delay of seven years in sanctioning the work of bridge after the third line of work was sanctioned, the Ministry stated as follows:—

“Due to constraints of funds and resources, the 3rd line work was divided in two phases. The work from Dehri-on-Sone to Pahleza, Karwandiya to Shiusagar Road and Karmnasa to Mughal Sarai was included in phase-I and remaining seven block sections were included in phase-II. It was decided in April, 1994 to start the execution of work included in phase-II. Thereafter action was initiated for award of contracts etc. for the same. As on March, 1997 total progress of 3rd line work achieved was 41%. Thus, it may be seen that there was no abnormal delay in sanctioning the bridge work.”

2.5 Audit pointed out that the Eastern Railway requested Railway Board to sanction the new Sone bridge at an estimated cost of ₹ 125.63 crore in 1991-92 based on techno-economic survey carried out by them in January 1990 and further investigation was carried out by M/s Stup Consultants thereafter. However, the administrative sanction for the bridge work was accorded only in 1997-98 and sanction for detailed estimates of ₹ 248.64 crore in December, 1999. The contract was awarded to M/s AFCONS Infrastructure Ltd. in April 2003.

2.6 In the above context, when the Committee desired to be apprised of the delay to an extent of more than four years in the award of works after administrative sanction was accorded, the Ministry stated as under:—

“The work was awarded to M/s AFCONS infrastructure Ltd. in April, 2003 with a completion period of 48 months and the work was commenced by contractor in right earnest. However, there was steep rise in market prices of cement and steel in 2004-05 contractor had started representing for extra payments more than what was permissible under price variation clause. As under extant rules, it was not permissible to consider contractor’s request to give higher compensation for abnormal increase in cost of steel and cement more than what was permissible under price variation clause in the contract agreement and contractor had stopped the work at site, the contract was foreclosed in October, 2009 without risk and cost of contractor.

After short closure of old contractor in October, 2009 contractor was issued notice to witness the final measurements. The final measurements were recorded

on 16.01.2010 and balance quantities were worked out. Thereafter, tenders for balance work were opened on 30.04.2010 and after one round of negotiations contract was finally awarded on 09.05.2011. Though somewhat more time was taken but keeping in view the complex nature of work involved, it cannot be considered as excessive.

The tender for balance work was awarded in May, 2011 at a cost of ₹ 26.80 crores. The work re-commenced immediately and balance work of superstructure was completed by November 2011. For the balance miscellaneous work such as guide bunds, protection bunds, stone pitching etc. work is in progress.”

2.7 Audit pointed out that the execution of work was inordinately delayed as the approved design and drawings were supplied to the contractor in piecemeal during execution of work, the last being in February, 2006 i.e. 35 months after the award of contract. The contractor, however, failed to complete the work within the extended period of contract (December, 2009) on account of sharp increase in price of raw materials and the contract had to be foreclosed without any financial liability.

2.8 In the above context, the Committee enquired about the reasons for an inordinate delay of 35 months in providing the approved design and drawing to the contractor. In reply, the Ministry stated that the design/drawings of different components of the bridge were supplied to the contractor in phases in a manner such that delays do not affect the progress of bridge work which was not unusual for an important bridge work of that size.

2.9 The Ministry further clarified that the work involved construction of about 3 km long important bridge having 93 spans of 30.48 m each. Finalisation of design and drawings for such an important bridge required series of consultations, deliberations by specially constituted Technical Advisory Group (TAG) which also included outside eminent experts and modifications which was always a time consuming process. The design has been finalized with due expediency keeping in view the complexities involved.

III. Planning and Execution Lapses

2.10 Audit scrutiny revealed that there had been certain planning and execution lapses on the part of the Indian Railways. When asked whether the Railway Board had taken any action to streamline the system so as to avoid recurrences of such lapses, the Ministry clarified as under:—

“For an important bridge project of this size, time taken in preparation of scheme/ drawings cannot be considered to be excessive. However, there was a steep rise in market prices of cement and steel just after commencement of bridge work in 2004-05. The contractor had started representing for extra payments (more than what is permissible under price variation clause) on account of abnormal hike in prices of steel and cement during the intervening period. Railway had taken requisite steps/action to resolve the issue including by setting up High Level Committee. As under extant rules, it was not permissible to consider the contractor’s request to give higher compensation for abnormal increase in cost

of steel and cement more than what is permissible under price variation clause in the existing contract agreement and contractor had stopped the work at site, the contract was foreclosed in October 2009 under clause 61 of General Conditions of Contract *i.e.* without risk and cost to contractor. This had necessitated award of fresh contract for the execution of the left over work. Thus, abnormal steep increase in market prices of cement and steel, which were beyond railway's control, had caused delay in execution of work. The price variation clause has since been revised to take care of such violent fluctuations in the market prices of steel and cement to a large extent."

2.11 The Ministry further stated as under:—

"There has been no delay in sanctioning of rebuliding of bridge No. 531 as existing rail bridge with 2 line track structure is still in service. Keeping in view the line capacity requirements, railway have planned and sanctioned the third line project and rebuilding of bridge no. 531 accordingly. There has been no delay in approval of design and drawings of new bridge as this is an important bridge and design and drawings took time in according final approval no account of consideration of various design parameters such as Seismic Co-efficient, Scour depth etc. deliberated by TAG Committee, RDSO etc."

2.12 As regards the foreclosing of the work by the contractor, the Ministry clarified the position as under:—

"There was a steep rise in market prices of cement and steel just after commencement of bridge work in 2004-05. The contractor started representing for settlement of their claims/extra payment to resolve their dispute on account of abnormal hike in prices of steel and cement during the intervening period. Railway took necessary steps/action to resolve the issue at every level and also through high level committees. As it was not possible to consider the contractor's request to give higher compensation for abnormal increase in cost of steel and cement more than what is permissible under PVC (Price Variation Clause) in existing contract agreement and the contractor has stopped working at site, the contract was foreclosed in Oct. 2009 under clause 61 of GCC *i.e.* without risk and cost to the contractor."

2.13 Asked to state the difficulties in providing connectivity on the Sone Bridge, the Member (Engineering) Railway Board deposed:—

"We are completing by first week of November, the two lines which are existing on the old bridge, we have to just cut and connect the new bridge. The Commissioner of Railway Safety has been approached. The date is fixed—last week of October. Commissioner of Safety will make inspection. Then, we would need about seven hours traffic block; both the ends would be connected. Hopefully, by first week of November, that will be done. Third line is a new line between Sone Nagar and Dehri-on-Sone does not exist. So, yard remodelling would be involved and that we would try to complete by March, 2014."

2.14 In a post-evidence information, the Ministry apprising the Committee of the latest status, submitted as under:—

“So far 60% work of stone pitching work has been completed. The stone pitching work is targeted for completion before onset of Monsoon of 2014. Further, the linking of track over bridge on all three lines have been completed. In the first phase, two lines are being connected. Third line will be connected during major yard remodelling of Sone Nagar and Dehri-in-Sone yard which includes Route Relay Interlocking (RRI) work also. Work of RRI building is in progress. The major yard remodelling work of Sone Nagar and Dehri-on-Sone yard is planned for completion by March, 2015.”

2.15 Expressing concern over the delay in meeting the target, the Committee finally sought to know as to whether the work completed was as per the target spelt out and if not, the reasons therefor and the remedial measures taken in this regard. The Ministry clarified the position as under:—

“The target for stone pitching work has been the same as given earlier. However, the third line is now targeted for connection with Sone Nagar and Dehri-on-Sone station yards by March, 2015 as a separately sanctioned RRI work of these two stations is also to be completed for proper yard connectivity. The RRI work alongwith connection of third line with two stations is targeted for completion by March, 2015.”

2.16 The Committee then desired to be apprised of the details of the target date of completion of work, the percentage of work completed and the reasons for delay, if any, relating to all the nine existing important bridges across various rivers where the work was reportedly at different stages. In reply, the Ministry submitted the following details:

Sl. No.	Railway Bridge No.	Section	Proposed span	Latest Antici- pated Cost (In crores of ₹)	% of work compl- eted	Target date of completion (TDC)	Remarks		
								1	2
3	4	5	6	7	8	9			
1.	Eastern	8 across river Hooghly	Bandel- Naihati	2x135m 1x150m Through Type	334.8	65%	30.4.2014	Substructure and approach <i>via</i> duct completed. Superstructure work in progress.	
2.	Eastern	18 across river Barakar	Barakar- Kumar- dhobi	10x30.5m +5x45.7m Through Type	69.11	100% bridge work compl- eted	—	Bridge work has been completed. Approach work and station Yard remodelling is in progress for conecting the Bridge.	
3.	East Central	531 across river Sone	Mughal- sarai-Gaya	91x32.926m +32.926m +2x32.266m PSC Box Girder	445.11	100% bridge work compl- eted	—	Bridge work has been completed. Station Yards remodelling is in progress for connecting the Bridge.	

1	2	3	4	5	6	7	8	9
4.	East Central	136 across river Kiul	Kiul-Patna	10x45.7m Through type	71.41	20%	31.12.2015	Sub structure work in progress. The TDC is subject to availability of funds.
5.	Northern	249 across river Yamuna	Delhi-Shahdara	13x61m Through type	136.95	25%	31.03.2016	Part of substructure work has been completed. The work got delayed due to refusal of transferring the part of land in Salimgarh fort area by ASI. Due to the objection from ASI, the alignment has now been modified and retendering is under process.
6.	North Eastern	111 across river Ganga	Allahabad-Varanasi	40x45.7m Through type	293.5	—	31.03.2018	Detailed estimated has been prepared and under finance vetting at Railway level.
7.	North Eastern	16 across river Ganga	Manjhi-Bakulaha	18x61m Through type	204.6	10%	31.03.2017	Substructure work in progress. The TDC is subject to availability of funds.
8.	Southern	HR-1 across sea	Shoranur-Cochin Harbour Terminus	16x36.6m PSC Box girder + 1x36.6m U type girder & 1x10.6m PSC Girders	48.19	95%	28.02.2014	Work is nearing completion.
9.	South western	184 across river Krishna	Kuduchi-Ugarkhurd	14x45.7m Through type	49.41	15%	30.06.2015	Substructure work in progress. The TDC is subject to availability of funds.

2.17 The Committee enquired whether the Ministry/Railway Board were in receipt of any communication from the United Kingdom wherein any interest had been evinced to see the old and signature bridges in India so as to gauge their longevity and functioning. In reply, the Member (Engineering) Railway Board submitted in evidence:

“We have not on our record except some signature bridges. When I was in Kolkata some ten year back, then, we had got a letter, about the Hoogly bridge, they said, it was more than 100 years, we would like to see as to how it is functioning. The delegation had also come from there. We have a lot of interest in seeing signature bridges.”

CHAPTER III

SIGNAL AND TELECOMMUNICATIONS

I. Introductory

Pursuant to the adoption of Corporate Safety Plan (2002-13), Railway Board informed (2004) the Standing Committee on Railways *inter-alia* about the introduction of ACD and TPWS and also committed that the ACDs would be installed on entire Broad Gauge system by 2013. When the performance of pilot project for installation of ACD over Northeast Frontier Railway (NFR) was reported to Parliament (Report No. 26 of 2008-09 tabled on 24 July 2009), Railway Board stated that ACD had been successfully installed on trial basis on NFR and would be extended to three other Railways (Southern, South Central and South Western Railways). Further, in the White Paper on Indian Railways presented to the Parliament (2009), Railway Board indicated that based on the experience gained over NFR, revised specifications for ACD were framed and KRCL was asked to develop ACD with revised specifications for trial on three Railways. Subsequently, the Minister of Railways, in her Budget Speech (25 February, 2011) had also declared that trials for improved version of ACD had met with success and the same would be commissioned on three Railways.

3.2 Anti-Collision Device (ACD) is a train collision prevention equipment based on a microprocessor. It consists of a central processing unit, a global positioning system and a digital modem for communication with other ACDs. There are two types of ACDs equipment *viz.* mobile ACDs for locomotives and stationary ACDs for stations and level crossings. All the ACDs interact with each other and exchange information about the locations of trains when these are within their radio zones up to three kilometers. In case two trains approach each other on the same track, ACDs apply the brakes on both trains to stop them.

3.3 Train Protection and Warning System (TPWS), a variant of Auxilliary Warning system (AWS), is a train protection system. It automatically activates brakes on any train that passes a signal at danger or its over-speeding. TPWS minimize the consequences of signal passed at danger by providing the facilities of over-speed sensors and train stop. TPWS helps the Motorman of an EMU/MEMU train by automatically initiating service brakes and emergency brakes in case of over-speeding or disregarding the signals and providing various information like permitted speed, actual speed, audible warning, target distance etc.

3.4 Audit scrutiny revealed that after conducting limited trials during 2000-03 in Northern Railway (NR) and NFR, Indian Railway signed a MOU with KRCL for undertaking the work of provision of ACD. Field surveys on NFR were completed in September, 2003 and working arrangement agreement for erection and commissioning of 1018 ACDs over NFR was signed in September, 2004 (Modified in May, 2007) with KRCL. The first Site Acceptance Test (SAT-I) of ACDs on Katihar-Jalpaiguri-

Samukatala of NFR done during July to August 2005 indicated spurious detection of abnormal situations causing unwarranted applications of train brakes, mismatch of information amongst different ACDs installed on the loco, guard van, at stations and level crossings and the work was stopped on the direction of Ministry of Railways in May, 2006 pending evaluation of performance parameters by a Multi Disciplinary Team (MDT-constituted by Railway Board in November, 2006), transfer of design documents to RDSO as well as verification of selection of technology partner by KRCL. Audit further observed that the results of SAT-II of pilot project of ACD system conducted in March, 2007 by RDSO and NFR needed to be evaluated by a MDT. Audit also observed that the design documents of ACD were not made available by KRCL (who owned the system design) to the MDT for the evaluation of the system. As a result, Railway Board could not establish its own safety parameters for want of expert evaluation by MDT. Besides, during SAT-II, about 23.64 per cent ACD were either found defective or decommissioned.

3.5 In the above context, the Committee desired to be apprised of the reasons for the MDT not evaluating ACD. In response, the Ministry submitted as under:—

"KRCL was not in a position to share ACD design documents (both software and hardware) on account of need to safeguard the Intellectual Property Rights (IPR) of KRCL for ACD technology, for which the Controller of Patents of the Patent Office of Government of India caused the Patent No. 198166 to be sealed as of 24.09.1999 in favour of Konkan Railway Corporation Ltd. [who at present is in possession of an invention for 'An Anti-Collision Device (ACD) System for Trains and the like Transportation Systems'].

KRCL was not able to give any design document as requested by multi disciplinary team founded by Railway Board due to IPR related issues and the same was discussed in various meetings with KRCL. In the absence of the same, no evaluation could be carried out by MDT.

In evaluation of the system by KRCL, TUV Germany, Lloyds Register Asia (TRA)/Hyderabad and ETDC/Chennai have been associated with expert inputs also provided by Members of Advisory Council on ACD drawn from BARC, ISRO, DOT & NCST Organizations. RDSO was involved in evaluation of performance of ACD during SAT.

It may be mentioned that evaluation of performance has been done in different phases (conceptualization development of design, manufacturing, verification and validation, testing, installation, performance and commissioning) by KRCL for the ACD system that has been provided for pilot project on NFR."

3.6 Asked to state the results of the evaluation of performance done by KRCL on the ACD system, the Ministry submitted that based upon the operations and technical problems observed during trials on NFR, an improved version of ACD called Version 1.1.2 had been developed by KRCL for deployment over NFR. ACD Version 1.1.2 had been validated by ETDC, Chennai and also provisionally cleared by RDSO for deployment on one of the Divisions of NFR (Tinsukia). The Ministry further stated that after evaluation of the performance of improved version of ACD on Tinsukia Division of NFR, its deployment on other divisions of NFR would be taken up.

II. Problems being experienced in Southern Railway Trials

3.7 In evidence, the Committee were apprised that specific operational and technical problems had been experienced in Southern Railway trials. When enquired about the nature of such problems, the Ministry informed as under:—

"ACD field trials on 43.55 kms. long Pattabiram-Arakkonam Jn. Section (RE area having automatic signaling in multiple lines suburban section on Chennai division of Southern Railway) were conducted by RDSO, KRCL & Southern Railway as under:—

- * First trial from 20.09.2010 to 02.10.2010
- * Second trial from 06.01.2011 to 21.01.2011

During these trials on Southern Railway, performance evaluation of ACD in electrified multiple lines and automatic block section was carried out.

As brought out in the Annexure attached, 50 deficiencies were identified. Main Problems encountered in ACD tested in Southern Railway were as under:

- (a) While following a train ahead in auto section, additional braking by ACD even at 20 kmph.
- (b) Even when Loco Pilot (LP) stops at red signal and moves below 20 Kmph, additional braking when collision like situation perceived.
- (c) Rear end collision could not be prevented in all cases.
- (d) Collision between two trains when any one of the trains has Track Id-Fail Safe (TID-FS) at a relative speed of 50 kmph cannot be eliminated.
- (e) Instances of spurious STN NO COMM (Station No Communication) messages received in Locomotives".

3.8 Asked to state the measures taken/proposed to deal with the problem faced in Southern Railway trials, the Ministry submitted that KRCL had analysed the above said 50 deficiencies in ACD Version 2.0 as under:—

- * 34 number of items which will be complied fully;
- * 07 number of items which will be complied partially, mainly due to removal of Guard ACD from architecture of ACD network;
- * 09 number of items for which compliance is not feasible in the present design of ACD network.

3.9 The Ministry further submitted that since the operational & technical problems experienced during the trials in Southern Railway could not be fully resolved by KRCL due to design limitation of ACD and also the Report of High Level Safety Review Committee headed by Dr. Anil Kakodkar did not clearly recommend for continuation and proliferation of ACD system on Indian Railways, KRCL had put on hold further development of ACD Version 2.

3.10 The Committee then asked whether all the recommendations as contained in the report of the High Level Safety Review Committee headed by Dr. Anil Kakodkar had been accepted and implemented by the Indian Railways. In response, the Ministry submitted that the recommendations which pertained to various Directorates were under examination by the Safety Directorate of the Ministry of Railways.

3.11 Asked to categorically state the fate of ACD system, the Ministry submitted that based on experience on SR and NFR, the KRCL has now developed an improved ACD Software Version 1.1.2m which has been validated by the Electronics Test & Development Centre (ETDC)/Chennai. Performance of the improved ACD Software Version 1.1.2m shall be jointly evaluated by RDSO & NFR with KRCL, after its deployment on Tinsukia Division of NFR by Oct. 2013.

3.12 In an updated information the Ministry apprised that since the operational and technical problems experienced during the trials in Southern Railway it cannot be fully resolved by KRCL due to design limitation of ACD, further proliferation of ACD on complicated and High Density Routes (HDN) on other Zonal Railways is not contemplated. Instead it has been planned to undertake development of Train Collision Avoidance System (TCAS) by RDSO for its deployment on Indian Railways.

III. Train Protection Warning System (TPWS)

3.13 Audit pointed out that the TPWS work in North Central Railway had not been completed despite incurring an expenditure of Rs. 41.54 crore.

3.14 In the above context, the Committee queried about the time by which the commercial trials of TPWS in nominated trains in NCR would be completed. In reply, the Ministry submitted that it had been felt necessary to also observe performance of TPWS fitted Electric Locos on Goods trains on Hazrat Nizamuddin-Agra section. It was, therefore proposed to also carry out trials in goods trains by providing TPWS on-board equipment on 10 WAG 9 Goods Locos. Fields trials on goods trains worked by the WAG 9 locos shall be monitored for their operational performance and any other technical issues. Regarding progress of work, the Ministry apprised that installation of track side equipment on H. Nizamuddin-Agra section was completed in December, 2011 while installation of on-board equipment on 35 WAP 7 locos was completed in May, 2012.

3.15 Asked to state the status of the procurement of TPWS, the Ministry apprised that RITES was awarded a consultancy for recommending a low cost ATP system. Based upon the recommendations, TPWS (ETCS Level 1) works have been approved for 3330 RKM covering Automatic Signalling Sections/HDN routes. In the first phase, out of the sanctioned 3330 RKM, it was proposed to roll out TPWS (ETCS Level 1) on 1870 RKM on Automatic Signalling section of Indian Railways where EMUs, MEMUs, DEMUs and Main Line Locomotives were running.

IV. Train Collision Assistance System (TCAS)

3.16 As mentioned earlier, due to design limitation of ACD, further proliferation of ACD on complicated and High Density Routes (HDN) on other Zonal Railway was

not being contemplated. Instead, the Ministry had planned to undertake development of Train Collision Avoidance System (TCAS) by RDSO for its deployment on Indian Railways. The TCAS system incorporates train collision functionality of ACD and ATP (Automatic Train Protection) functions as available in train protection system.

3.17 During a study visit to the RDSO, Lucknow, the Committee were informed that the Research Organisation was developing TCAS, a fusion of ACD and TPWS and a multi-vendor, inter-operable and cost effective system. When the Committee desired to have the details *i.e.* need, specification, salient features of the TCAS, the Ministry submitted as under:—

"Need for TCAS

To overcome major problems noticed in ACD (Anti collision Device) due to its dependence on GPS (Global Positioning System) for location, error in Deviation Count Theory resulting in wrong Track ID (TID), not a failsafe system and need for large numbers of mid-section repeaters, RDSO finalize specification of TCAS by involving Indian vendors. TCAS system incorporates train collision functionality of ACD and ATP (Automatic Train Protection) functions as available in train protection systems. Specifications are to open standards and multiple vendors shall be able to develop the system.

Specification

The specification for the first phase *i.e.* Absolute Block System has been finalized as RDSO/SPN/196/2012 Version 3.1.1. through the process of Expression Of Interest (EOI) invited in 2011, 6 firms were shortlisted by RDSO.

Salient features

- (a) It is fusion of train collision and Automatic Train Protection (ATP) functionality.
- (b) System is also interfaced with existing Signalling system to provide feature of prevention of SPAD (Signal Passing at Danger)
- (c) Displays aspect of Signal on the route in the Locomotive on real time basis along with speed control functionality.
- (d) Continuous update of Movement Authority (MA) resulting in less operational constraints and effective stoppage before Signal at Red.
- (e) Braking model optimized for Indian Railway conditions.
- (f) Manual SOS facility both from Loco and from Station.
- (g) System presently developed is suitable for Absolute Block System.
- (h) Final system shall be validated to SIL-4.

3.18 On System Description the Ministry apprised as under:—

"System consists of loco and station equipment. Loco equipment consists of a computer which is interfaced with existing Odometry system, Braking System,

GPS Antenna, Radio Modems and RFID Reader. Station unit is interfaced with signalling system and also has GPS, Radio etc. RFID tags are installed on the track. The train keeps track of its exact location by reading the RFID tags. The Station sends the signalling related information and the position of other trains to all locos in vicinity through radio communication. Based on this, events such as collision like situation, Signal Passing at Danger, train approaching very fast to a Signal at Danger etc. are detected and speed control by automatic brake application is carried out by the system. Signalling Information between two stations is exchanged through OFC link."

3.19 As regards the advantages of TCAS *vis-a-vis* ACD and TPWS, the Ministry clarified as under:—

S.No.	Features	TCAS	ACD	TPWS (ETCSL1)
1.	Collision Prevention	Yes	No	No
2.	Collision Prevention	Yes	Not prevented in all cases	No
3.	Display of Signal Aspect on real time basis in Loco (DMI)	Yes	No	No
4.	SOS facility from Loco and Station	Yes	Yes	No
5.	SIL-4 Safety Certification	Yes	No	Yes
6.	Open Specification	Yes	No	Yes
7.	Multi Vendor, Inter-operable system	Yes	No	Yes
8.	Requirement of Repeaters in Mid-section	No	Yes	No
9.	Dependency on GPS for safety critical application	No	Yes	No
10.	Continuous update of Movement Authority	Yes	No	No

3.20 In evidence, giving an overview of the advantages of TCAS over ACD & TPWS, the representative of the Railway Board deposed:—

"Sir, I want to submit that anti-collision device was initially put as a pilot project on North-East Central Railways on 1,736 route kilometres. We had initially a lot of technical and operational problems encountered in the device. Lot of efforts were made technically to improve the device and a number of improvements in the software were also taken up. But the situation even today is that about 500 braking are taking place which are unwanted on the trains and there is no abnormality in this section. The technical solution has not been found out. They

are making efforts. We may not be able to go beyond it. So we are going for a new product called TCAS which has been developed in-house through RDSO design associating eight industries in India. Already the contract has been awarded to two firms and third is getting awarded shortly. The trials are already started. They have been done for two blocks sections. We are going to complete five block sections by December end. We will see the various aspects of it and once, it is found to be successful, it will take some more time, then a decision can be taken to cover the train protection system on the Indian Railways. This TCAS is a device which is a combination of ACD and TPWS, where, if a driver is going to exceed beyond his signal mandate, the train is braked automatically. It is a unique device which is also being appreciated by the world suppliers because they do not manufacture this device. It looks so promising but the answer will be known when the trials will be completed. So, we are in a situation to find out the alternative, if the ACD does not become successful. So, we are still making efforts."

3.21 On the issues of concept field trial, extended field trial, latest status and the future expansion plan the Ministry submitted as under:—

"Concept field trial of TCAS has been conducted successfully in Oct. 2012 on Tandur-Nawandgi section in Secunderabad Division of SC Railway. Demonstration of TCAS trial to Chairman, Railway Board and Member, Electricals, was made by RDSO on 16.10.2012. Further, demonstration to Committee of Additional Members from Railway Board was made on 10.11.2013. By end of 2012-13, a few agencies were able to develop lab demo models.

Extended Field Trial

Extended field trials have been planned by RDSO on 250 km section Lingampalli-Extended-Wadi-Bidar Section of SC Railway for further development of TCAS with multi-vendor, interoperability features. Tenders have been awarded by RDSO to various firms for conducting extended field trials.

Present Status

Extended Field trials for testing of various types of RFIDs, radio range and display of signalling information in loco (DMI) were carried out with one station equipment and one loco equipment in Secunderabad div. from 29.08.2013 to 06.09.2013. Two field trials were conducted in Sept. 2013 during which demonstration of basic functionalities of TCAS model and basic interoperability feature between two equipments of two different vendors was successfully demonstrated.

Further plan

Full Prototype of the system shall be ready for trials by Feb. 2014 and functional trials with 40 locomotives on 250 Rkm section shall start by Feb./March' 14. Operational deployment of TCAS on Railways will be considered after successful extended field trials expected to be completed by September, 2014".

3.22 The Committee asked whether the Railway Board was periodically making any study or survey in the most accident and collision-prone sections. In response, the representative of the Ministry submitted in evidence:—

"Sir, each and every case of accident is gone into detail as you rightly said. We find out the environmental situation why repeat accidents in some sections or in some areas. We tried to study whether it is a mistake on part of some signal or some other condition which is making the driver of locomotive to commit mistake. All these factors are analysed in detail at the divisional level and then at Headquarter level and we monitor each and every case in Board and the corrective action is being taken. As you rightly said, for introduction of ATP also, we will take note of it and we will prioritise sections in such a manner that where the sections are more vulnerable, they will be prioritized."

3.23 In evidence when the Committee desired to hear the views of the Railway Board on the acceptance of the recommendations of the High Level Safety Committee Report, the representative of Railway Board deposed:—

"Sir, at present this report is under finalisation. How much we accept and how much we do not accept, what we partially accept, this process is already on. We will be able to supply this reply after some time when we finalise it."

PART II

OBSERVATIONS/RECOMMENDATIONS

Civil Engineering Workshops

The Committee note that there are ten Civil Engineering Workshops (CEWs) that were established between 1900 and 1965 and functioning on nine Zonal Railways to fulfil the needs of manufacturing bridge girders, track components and various other items such as Platform Shelters, Foot Over Bridges, Push/Motor trolleys, etc. The Eleventh Five Year Plan (2007—12) has envisaged a critical role for CEWs in view of the anticipated increased demand for fabricated steel structures for re-building/re-girding the existing bridges. The Committee are highly concerned to find that these CEWs are functioning with quite old machines whose average age profile ranged from 22 to 47 years against the expected average codal life of 15 years. As these Workshops were in urgent need of technology upgradation, a seminar of CWM/CWE held in Pune in 2009 had recommended a comprehensive modernization plan to increase automation and procure latest machines. The Committee are unhappy to find that despite the recommendations made in the Pune Seminar, no plan for modernization of the CEWs was prepared till the Audit review. The Ministry have now submitted that the existing machines which are quite old are being replaced in a phased manner as per the Machinery and Plant Programme of the Railways. Further, a Committee has been set up to undertake a holistic review of each workshop which would also include identification of the modernization/technological needs. The said Committee has already visited nine workshops and its deliberations are in progress. In view of the imperatives involved, the Committee exhort the Ministry to continue/ initiate the requisite and effective measures for comprehensive modernization and upgradation of the CEWs and complete the same in a time bound manner duly prioritizing considering the age profile of the equipments. The Committee would like to be expeditiously apprised of the specific measures initiated, based on the suggestions/recommendations of the Committee constituted by the Ministry, for providing new technology machines and augmenting the infrastructure of the CEWs.

2. The Committee are perturbed to observe that funds allocated to the CEWs are less than the demand projected. They are also unhappy to find that it takes about two to three years to procure/commission machines for the CEWs due to procedural rigmaroles. While viewing with serious concern the constraints being faced by the CEWs, the Committee impress upon the Ministry to urgently assess the requirement of funds by the Workshops and accordingly take appropriate measures so that fund constraints do not impede the modernization plan of the CEWs. The Committee also desire that the Ministry should streamline the process and procedures by incorporating e-tendering for procurement and commissioning

of modern machines so as to ensure their installation in a time bound manner and consequential increased productivity.

3. The Committee observe that the Research Design and Standard Organisation (RDSO) has been advised by the Railway Board to review the Consortium of Bridge Workshops and organize regular meetings as a result of which RDSO has discussed several issues pertaining to the modernization/mechanization and improvements of workshops, repairs to workshop infrastructure and machinery, procurement of steel, inspection schedule of girders etc. The conclusions/suggestions of RDSO are reportedly under the consideration of the Railway Board. In view of the scarce private participation in the manufacture/supply of girders etc. and the excellent job rendered by the Workshops in meeting the immediate and unforeseen requirements, as candidly admitted by the Chairman, Railway Board, the Committee urge the Ministry to take time bound action on the suggestions of RDSO to explore the possibility of increased private participation so that the CEWs meet the growing requirements more effectively. The Committee also desire that a comprehensive study be carried out to assess the capacity utilization of the Workshops *vis-a-vis* the installed capacity so as to ensure effective utilization of both manpower and machinery.

4. The Committee are dismayed to find that there are 1406 vacancies in various cadres in the ten CEWs as against the combined sanctioned strength of 6546 personnel. Worse, no target date has been fixed for filling up the vacancies on the plea that creation and filling up of vacancies is a continuous process and manpower availability and requirement will be assessed by the Committee set up to undertake a holistic review of the Workshops. The Committee are not satisfied with the reasonings of the Ministry for not prescribing a target date for filling up the vacancies. They would like to emphasize that, till such time the manpower requirement is pending consideration by the Committee constituted for the purpose, the Ministry should take urgent requisite measures to fill up the vacancies so as to obviate any adverse effect on the productivity and output of the Workshops. The Committee further desire that a study on the rationalization of the CEWs be undertaken so as to ensure that there is optimum utilization of human resources with no idle manpower in the Workshop. The Committee also desire that the Railway Board should meticulously follow the instructions issued by the DoPT in drafting an annual Recruitment Plan.

5. In view of the fact that there are no exclusive Railway Engineering Colleges in the country, the Committee would like the Ministry, in consultation with the appropriate authorities, explore the feasibility of establishing such exclusive university and colleges so that skilled specialised professionals are available to effectively cater to the various technical activities undertaken by the Railways at different points of time.

Delay in Building the new Rail Bridge over River Sone

6. The Committee note that in order to cater to the increasing traffic load on the Sone Nagar (SEB) - Mughalsarai (MGS) section (124 kms) which is a vital

corridor for movement of coal, other minerals and goods from Bengal-Bihar-Jharkhand fields to North India, it was planned to lay on additional line between SEB-MGS which necessitated a three line Bridge over River Sone. The Committee find that while the work of the construction of the third line between Dehri-on-Sone (DoS) and Mughalsarai was sanctioned in 1990-91 and the work was progressively completed and opened to traffic between 1997-2000 at a cost of ₹ 262.24 crore, the Bridge work was neither sanctioned nor progressed simultaneously. The administrative sanction for the Bridge work was accorded only in 1997-98; sanction for detailed estimates of ₹ 248.64 crore was given in December 1999; contract was awarded in April 2003; and the work is still in progress. The Ministry have submitted that due to technical reasons and constraints of funds and resources, the third line work was divided into two phases. The Ministry have further contended that though somewhat more time was taken, keeping in view the complex nature of work involved, it can not be considered as excessive. The Committee are not satisfied with the contention of the Ministry as apparently there has been inordinate delays at various stages in the executions of the work, notwithstanding the complex nature of the job which is obvious in construction of new Rail lines/bridges. The Committee while cautioning the Ministry to guard against procedural delays such as late administrative approval, delayed sanction of funds and award of contract, impress upon the Ministry to take requisite and effective measures to ensure the completion of the Bridge work in a fixed time frame for smooth movement of minerals and goods from the Bengal-Bihar-Jharkhand fields to North India. The Committee also desire that a strict and robust monitoring mechanism be put in place not only to enforce the contractual obligations on the part of the contractor but also to take periodical stock of the progress so as to avoid any further delay in the completion of the work.

7. The Committee note that at present work relating to nine important bridges across various rivers is at different stages of completion under the Eastern, East Central, Northern, North Eastern, Southern and South Western Railways. The target date for the completion of these bridges range between 2014 and 2018. The Committee recommend that the Railway Board should evolve a robust and foolproof mechanism to monitor the periodical progress of the ongoing work pertaining to the nine bridges under various Zonal Railways as well as NFR so as to ensure their completion within the respective target dates.

Signal and Telecommunications

8. The Committee note that pursuant to the adoption of the Corporate Safety Plan (2002-13), the Railway Board decided to introduce Anti-Collision Device (ACD) and Train Protection and Warning System (TPWS) in Indian Railways. However, after the successful trials of ACD in North East Frontier Railway, its operational and technical problems were experienced during the trials in Southern Railway. Thus, due to the design limitation of ACD and the reservations expressed in the Report of the High Level Safety Review Committee headed by Dr. Anil Kakodkar for continuation and proliferation of the ACD system in Indian

Railways, further development of ACD has been withhold. The Committee note that the introduction of the TPWS in the North Central Railway is under experimentation and based on the field trials and performance of the system it would be extended to other Zones. Thus, due to the uncertainty surmounting the effective performance of ACD and TPWS because of a lot of technical and operational problems, the Railways have planned to undertake development of another safety system called Train Collision Avoidance System (TCAS) which is a fusion of ACD and TPWS besides being a multi-vendor, inter-operable and cost effective system. The Research, Design and Standard Organisation (RDSO) has been assigned the job to develop TCAS for deployment on Indian Railways. The Committee find that the concept field trial of TCAS has been successfully conducted in October 2012 and extended field trials have been planned by RDSO after which operational deployment of TCAS on Railways would be considered. In view of the many advantages of TCAS over ACD and TPWS, as reported, the Committee would like the Ministry to resort to periodical monitoring of the progress of the development of TCAS by RDSO so that the momentum towards developing and proliferating an effective collision prevention system on Indian Railways is maintained unabated.

9. In view of the fact that international exposure to the Officers/Professionals is very meager/inadequate in the RDSO, as reported to the Committee during their field visit, the Committee recommend that the DG, RDSO should be delegated the powers to depute RDSO personnel for training abroad for the requisite exposure to new technology/developments which can be gainfully utilized for undertaking research activities on Indian Railways. The Committee also desire that autonomy with financial powers to function within the sanction budget for award of consultancy contracts and placement of orders be accorded to RDSO so that the assigned task to the Research Organisation is accomplished seamlessly.

10. Having said that, the Committee also desire that a critical assessment of the utility and performance of RDSO be periodically undertaken so as to ensure optimal and gainful utilization of the entire infrastructure, including real estates, belonging to the Research Organisation.

11. The Committee note that the recommendations of the High Level Safety Committee Report are under consideration of the Government. In view of the apt concerns and suggestions of the High Level Committee, it is imperative that the Ministry urgently consider them and apprise the Committee of the details of acceptance and action taken to implement them.

NEW DELHI;
24 November, 2014
03 Agrahayana 1936 (Saka)

PROF. K.V. THOMAS
Chairperson,
Public Accounts Committee.

APPENDIX I

MINUTES OF THE SECOND SITTING OF SUB-COMMITTEE-I (RAILWAYS) OF THE PUBLIC ACCOUNTS COMMITTEE (2013-14) HELD ON 11TH OCTOBER, 2013

Sub-Committee-I (Railways) of the Public Accounts Committee (2013-14) sat on Friday, the 11th October, 2013 from 1100 hrs. to 1300 hrs. in Room No. 'G-074', Parliament Library Building, New Delhi.

PRESENT

Shri Prakash Javadekar — *Convenor*

MEMBERS

Lok Sabha

2. Shri Jayaprakash Hegde

Rajya Sabha

3. Shri Prasanta Chatterjee

SECRETARIAT

1. Shri Devender Singh — *Joint Secretary*

2. Shri D.R. Mohanty — *Deputy Secretary*

Representatives of the Office of the Comptroller and Auditor General of India

1. Ms. Divya Malhotra — Director General (Railways)

2. Ms. Ila Singh — Director General (Railway Board)

3. Shri Purushottam Tiwary — Principal Director of Audit (PAC)

Representatives of the Railway Board Ministry of Railways

1. Shri Arunendra Kumar — Chairman, Railway Board

2. Shri Rajendra Kashyap — Financial Commissioner,
Railway Board

3. Shri Subodh Jain — Member Engineering, Railway Board

4. Shri D.P. Pande — Member Traffic, Railway Board

5. Shri Kul Bhushan — Member Electrical, Railway Board

6. Shri Sudhir Mital — Addl. Member (Mech. Engg.),
Railway Board

7. Shri Tribhuvan Gupta	—	Adviser (Bridges), Railway Board
8. Smt. Saroj Rajware	—	Adviser (Finance), Railway Board

2. At the outset, the Convenor, Sub-Committee-I welcomed the representatives of the Office of the C&AG of India and the Ministry of Railways (Railway Board) to the sitting of the Sub-Committee. Observing that the sitting had been convened for taking oral evidence of the representatives of the Ministry of Railways (Railway Board) on the subjects: (i) 'Civil Engineering Workshops in Indian Railways'; (ii) 'Delay in Building the New Rail Bridge Over River Sone'; (iii) 'Signal and Telecommunications'; (iv) 'Rail Link to Kashmir'; and (v) 'Environment Management in Indian Railways—Stations, Trains and Tracks' based on various Audit Paras/Reports, the Convenor impressed upon the witnesses not to disclose the deliberations of the Sub-Committee to any outsider, especially the Print and Electronic media. The Convenor then asked the Chairman, Railway Board to give an overview of the subjects under examination, with special reference to the Audit findings and the Ministry's response thereon.

3. The Chairman, Railway Board, accordingly briefed the Sub-Committee on the aforesaid five subjects highlighting the measures taken to upgrade and modernize the Civil Engineering workshops; the status of the Rail Bridge over River Sone; the introduction and expansion of the anti-Collision Devices; various initiatives undertaken towards Environment Management in Indian Railways and the progress of various stretches in the project Rail Link to Kashmir.

4. The representatives of the Ministry of Railways thereafter responded to various queries raised by the Members. As some queries required detailed and statistical reply, the Convenor asked the Chairman, Railway Board to furnish written reply on the same in due course.

5. The Convenor thanked the representatives of the Ministry for depositing before the Sub-Committee and furnishing the available information on the subjects. He also thanked the representatives of the Office of the C&AG of India for extending assistance to the Sub-Committee in the examination of the subjects.

The witnesses, then, withdrew.

A copy of the verbatim proceedings of the sitting was kept on record.

The Sub-Committee, then, adjourned.

APPENDIX II

MINUTES OF THE THIRD SITTING OF SUB-COMMITTEE-I (RAILWAYS) OF THE PUBLIC ACCOUNTS COMMITTEE (2013-14) HELD ON 14TH MARCH, 2014

The Sub-Committee sat on Friday, the 14th March, 2014 from 1130 hrs. to 1200 hrs. in Room No. 'G-074', Parliament Library Building, New Delhi.

PRESENT

Shri Prakash Javadekar — *Convenor*

MEMBERS

Rajya Sabha

2. Dr. V. Maitreyan

SECRETARIAT

1. Shri D.R. Mohanty — *Deputy Secretary*

2. Shri A.K. Yadav — *Under Secretary*

Representatives of the Office of the Comptroller and Auditor General of India

1. Ms. Divya Malhotra — Director General (Railway)

2. Shri Purshottam Tiwary — Principal Director (PAC)

2. At the outset, the Convenor, Sub-Committee-I (Railways) of PAC (2013-14) welcomed the Members and the representatives of the Office of the C&AG of India to the sitting of the Sub-Committee. The Convenor then apprised that the meeting had been convened to consider and adopt three Draft Reports of Sub-Committee-I (Railways). Thereafter, the Sub-Committee took up the following Draft Reports one by one for consideration:

(i) Draft Report on "Civil Engineering Workshops in Indian Railways", "Delay in Building the New Rail Bridge Over River Sone" and "Signal and Telecommunications" based on Paras 3.2 and 3.4 and Chapter V respectively of the C&AG Report No. 32 of 2011-12;

(ii) Draft Report on "Rail Link to Kashmir" based on the C&AG Report No. 19 of 2012-13; and

(iii) Draft Report on "Environment Management in Indian Railways—Stations, Trains and Tracks" based on the C&AG Report No. 21 of 2012-13.

3. After due deliberations, the Draft Reports were adopted with some modifications/Amendments.

4. The Convenor thanked the Member for his participation in the consideration of the Draft Reports and the representatives of the Office of C&AG of India for assisting the Sub-Committee in the examination of the subjects.

The Sub-Committee, then, adjourned.

APPENDIX III

MINUTES OF THE SEVENTH SITTING OF THE PUBLIC ACCOUNTS COMMITTEE (2014-15) HELD ON 19TH NOVEMBER, 2014

The Committee sat on Wednesday the 19th November, 2014 from 1100 hrs. to 1400 hrs. in Committee Room 'C', Parliament House Annexe, New Delhi.

PRESENT

Prof. K.V. Thomas — *Chairperson*

MEMBERS

Lok Sabha

2. Shri S.S. Ahluwalia
3. Shri Ranjit Singh Brahmpura
4. Shri Nishikant Dubey
5. Shri Bhartruhari Mahtab
6. Shri Ramesh Pokhriyal "Nishank"
7. Shri Janardan Singh Sigiwal
8. Shri Anurag Thakur

Rajya Sabha

9. Shri Satyavrat Chaturvedi
10. Shri Vijay Goel
11. Dr. Satyanarayan Jatiya
12. Shri Shantaram Naik
13. Shri Sukhendu Sekhar Roy

SECRETARIAT

1. Shri A.K. Singh — *Joint Secretary*
2. Smt. Anita B. Panda — *Director*
3. Shri Jayakumar T. — *Additional Director*

Representatives from the Office of the Comptroller and Auditor General of India

1. Smt. Suman Saxena — Dy. CAG
2. Shri P. Mukherjee — Dy. CAG

3. Shri P. Shesh Kumar	—	Director General
4. Shri S. Nandeolkar	—	Director General (Rlys.)
5. Shri A.M. Bajaj	—	Principal Director
6. Shri B.P. Yadav	—	Principal Director
7. Shri P. Tiwary	—	Principal Director

2. At the outset, the Chairperson welcomed the Members and the representatives of the Office of the C&AG of India to the Committee. The Chairperson then apprised the Members that the meeting has been convened to consider and adopt two Draft Reports, further selection of five subjects for examination during the year and to take oral evidence of Ministry of Petroleum and Natural Gas on the subject 'Performance Audit of Hydrocarbon Production sharing Contracts' based on C&AG Report No. 19 of 2011-12.

3. The Committee, thereafter, took up the following Draft Reports for consideration:

- (i) Draft Report on the subject '**Civil Engineering Workshops in Indian Railways**', '**Delay in building the new Rail Bridge over River Sone**' and '**Signal and Telecommunication**' based on C&AG Report No. 32 of 2011-12.
- (ii) Draft Report on Action Taken by the Government on the Observations/Recommendations contained in the Seventy-Ninth Report (Fifteenth Lok Sabha) on '**Service Tax on Banking and Other Financial Services**'.

4. After some discussions, the Committee adopted the Draft Report on the subject 'Civil Engineering Workshops in Indian Railways', 'Delay in building the new Rail Bridge over River Sone' and 'Signal and Telcommunication' with modifications/amendments. The Draft Report on Action Taken by the Government on the Observations/Recommendations contained in the Seventy-Ninth Report (Fifteenth Lok Sabha) on 'Service Tax on Banking and Other Financial Services' was adopted without any modification.

5. The Committee, then, authorized the Chairperson to finalise the two Reports adopted by them, in light of their suggestions and factual verifications received from the Audit and present the same to the House on a date convenient to him.

A copy of the verbatim proceedings was kept on record.

The Committee, then, adjourned.

***Not related with the Report.