

**MAINTENANCE OF BRIDGES IN INDIAN
RAILWAYS**

**MINISTRY OF RAILWAYS
(Railway Board)**

**PUBLIC ACCOUNTS COMMITTEE
(2017-18)**

EIGHTY-SEVENTH REPORT

SIXTEENTH LOK SABHA



**LOK SABHA SECRETARIAT
NEW DELHI**

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PUBLIC ACCOUNTS COMMITTEE
(2017-18)

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(Railway Board)



Presented to Lok Sabha on:

09/02/2018

Laid in Rajya Sabha on:

09/02/2018

LOK SABHA SECRETARIAT
NEW DELHI

February, 2018/ Magha, 1939 (Saka)

CONTENTS

	<i>Page</i>
COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2017-18)	(iii)
COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2016-17)	(iv)
INTRODUCTION	(v)
REPORT	
Part-I	
Introductory	1
A Sanction of Bridge Rehabilitation/Strengthening/Rebuilding work	
B Physical Progress of Bridge Rehabilitation/ Strengthening/ Rebuilding work	
(a) Budget Allocation and Expenditure for Bridge Rehabilitation works	
(b) Time required for execution of Bridge Rehabilitation/Strengthening/Rebuilding work	
(c) Rehabilitation/Rebuilding of bridges within their codal life	
(d) Replacement of Early steel Girders/Cast iron screw pile bridge	
(e) Bridge Girder Fabrication by Civil Engineering Workshops	
C Use of Non Destructive testing equipments and modern techniques	
D Adherence to schedule for inspection of bridges	
E Bridge Management System (BMS)	
F Inadequacy of manpower for inspection and maintenance of bridges	

PART II

Observations and Recommendations

APPENDICES*

- I Minutes of the Twenty-seventh sitting of the Public Accounts Committee (2016-17) held on 17.02.2017
- II Minutes of the Twentieth sitting of the Public Accounts Committee (2017-18) held on 30.01.2018

* Not appended to the cyclostyled copy of the Report

**COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2017-18)**

Shri Mallikarjun Kharge - **Chairperson**

MEMBERS

LOK SABHA

2. Shri Sudip Bandyopadhyay
3. Shri Subhash Chandra Baheria
4. Shri Prem Singh Chandumajra
5. Shri Nishikant Dubey
6. Shri Gajanan Chandrakant Kirtikar
7. Shri Bhartruhari Mahtab
8. Smt. Riti Pathak
9. Shri Neiphu Rihh
10. Shri Abhishek Singh
11. Prof. Ram Shanker
12. Dr. Kirit Somaiya
13. Shri Anurag Singh Thakur
14. Shri Shivkumar C. Udasi
15. Dr. P. Venugopal

RAJYA SABHA

16. Shri Naresh Agrawal
17. Shri Satyavrat Chaturvedi
18. Shri Bhubaneswar Kalita
19. Shri Mohd. Ali Khan*
20. Shri Sukhendu Sekhar Roy†
21. Shri Ajay Sancheti
22. Shri Bhupender Yadav

SECRETARIAT

1. Shri A.K. Singh - Additional Secretary
2. Shri T. Jayakumar - Director
3. Shri A. K. Yadav - Deputy Secretary

* Elected w.e.f. 29 December, 2017 in lieu of vacancy caused due to retirement of Shri Shantaram Naik.

† ceased to be a Member of Committee consequent upon his retirement from Rajya Sabha on 18 August, 2017 and re-elected w.e.f. 29 December, 2017.

**COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2016-17)**

Prof. K.V. Thomas - **Chairperson**

MEMBERS

LOK SABHA

2. Shri Sudip Bandyopadhyay
3. Shri Prem Singh Chandumajra
4. Shri Nishikant Dubey
5. Prof. Richard Hay
6. Shri Gajanan Kirtikar
7. Shri Bhartruhari Mahtab
8. Smt. Riti Pathak
9. Shri Neiphiu Rio
10. Shri Janardan Singh Sigrival
11. Shri Abhishek Singh
12. Dr. Kirit Somaiya
13. Shri Anurag Singh Thakur
14. Shri Shivkumar Udasi
15. Dr. P. Venugopal

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18. Shri Bhubaneswar Kalita
19. Shri Shantaram Naik
20. Shri Sukhendu Sekhar Roy
21. Shri Ajay Sancheti
22. Shri Bhupender Yadav*

* Elected w.e.f. 09.08.2016 vice Shri Vijay Goel, MP appointed as Minister of State w.e.f. 05.07.2016.

INTRODUCTION

I, the Chairperson, Public Accounts Committee (2017-18) having been authorised by the Committee, do present this Eighty-seventh Report (Sixteenth Lok Sabha) on 'Maintenance of Bridges in Indian Railway' based on Chapter-I of C&AG Report No. 24 of 2015 (Vol.II), Union Government (Railways) related to the Ministry of Railways.

2. The above-mentioned Report of the Comptroller and Auditor General of India was laid on the Table of the House on 8 December, 2015.

3. The Public Accounts Committee (2016-17) took up the subject for detailed examination and report. The Committee took evidence of the representatives of the Ministry of Railways (Railway Board) at their sitting held on 17th February, 2017. As the examination of the subject could not be completed due to paucity of time, the Public Accounts Committee (2017-18) re-selected the subject to continue the examination and accordingly a Draft Report was prepared and placed before the Committee for their consideration. The Committee considered and adopted this Draft Report at their sitting held on 30th January, 2018. The Minutes of the Sitzings are appended 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 their predecessor Committees for taking oral evidence and obtaining information on the subject.

6. The Committee would like to express their thanks to the representatives of the Ministry of Railways (Railway Board) for tendering evidence before them 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 and the PAC Secretariat in preparation of the Report.

NEW DELHI;
01 February, 2018
12 Magha, 1939 (*Saka*)

MALLIKARJUN KHARGE
Chairperson,
Public Accounts Committee

REPORT

Part - I

I Introductory

1. This Report is based on the subject "Maintenance of Bridges in Indian Railways" contained in Chapter I of C&AG Report No. 24 of 2015 (Volume II). Across Indian Railways, there were over 1.36 lakh railway bridges, which constitute an essential part of the Railway network. The existence of a large number of very old bridges identified as due for rehabilitation/ reconstruction is a concern for safe train operations.

2. The Corporate Safety Plan (CSP) of IR (2003- 2013) envisaged progressive rehabilitation/ rebuilding of bridges over IR on condition basis by providing funds through normal plan outlay. The CSP also focussed on the need for modernizing bridge management system – modernization of inspection, and maintenance of bridges. The review was conducted to see whether the mechanism for identification and planning for rehabilitation/ reconstruction of railway bridges was effective and efficient; and rehabilitation of bridges was carried out as envisaged in the Corporate Safety Plan. It was also seen whether inspections for maintenance of bridges were adequate and efficient.

3. Out of 1.36 lakh bridges across Indian Railways (IR), 741 were classified as important, 10,944 as major and 1,25,035 as minor bridges. As per Indian Railway Bridge Sub-structure and Foundation Code, important bridges are those which have a linear waterway of 300 meters (m) or a total waterway of 1000 sqm. Major bridges have a total waterway of more than 18 m. or which have a clear opening of more than 12 m or more in any span. The rest are minor bridges. Out of 1,36,728 bridges over IR network, 36,470 (26.67 per cent) were over 100 years old of which 6,680 bridges located in eight zones were over 140 years, 14,324 bridges were 81 to 100 years old, while 15,637 bridges were 61 to 80 years old. The balance 70,297 bridges were less than 60 years old.

4. The CSP of IR (2003-2013), *inter-alia*, envisaged planned rehabilitation of bridges duly providing funds through normal outlay. The CSP also focussed on the need for creating a bridge management system, modernization of inspection and maintenance of bridges etc. A High Level Safety Review Committee headed by Shri Anil Kakodkar recommended (February 2012) instrumentation of all bridges and use of advanced scientific measurements and inspection for condition assessment. In this backdrop, a review was conducted by the Audit on maintenance of bridges in IR.

5. The Public Accounts Committee (PAC) took up the subject for detailed examination and report. The representative of the Ministries of Railway appeared before the Committee for tendering evidence on 17th February, 2017. Subsequently, the post-evidence replies were also received from the Ministries/Departments. Based on all these written and oral deposition by the aforesaid Ministries/Departments, the committee examined the subject in detail and identified certain critical issues which are discussed at length in succeeding paragraphs.

A. Sanction of Bridge Rehabilitation/Strengthening/Rebuilding work

6. Audit observed that Railway Board (RB) pruned down proposals of bridgeworks submitted by Zonal Railways keeping in view the monetary resources available for a particular year for bridgeworks over IR. Audit reviewed the records pertaining to proposals submitted by Zonal Railways and sanction of bridgeworks by RB and found that, during the period from 2010-11 to 2013-14, the ZRs shortlisted recommendations received from field offices and forwarded proposal for 2694 works at an estimated cost of Rs.3559.10 crore to RB for approval. As against this, RB approved 1953 bridgeworks (72.49 per cent) estimated to cost Rs.2195.85 crore (61.70 per cent).

7. Audit had further observed that-

- The system of identification of bridges for rehabilitation provides that bridges are identified for rehabilitation based on condition assessed during inspection at field level (SSE/ ADEN) and further confirmation by next higher level officials (DEN/ Sr. DEN). Despite this, restricting the proposals (at CBE i.e. zonal level and RB level) on monetary considerations defeats the very purpose of the system of identification. This led to compromising the safety of train services on the

bridges, identified for rehabilitation due to sanction not being accorded or delayed sanction.

- A sample check by Audit on 102 bridgeworks pertaining to 150 bridges revealed that, in case of 31 bridgeworks (which included category-I and category-II bridges also), on an average, RB took 43 months to sanction the bridgeworks after identification by the Zonal Railways.
- The average time taken for sanction of a bridgework was as high as 131 months in NCR followed by CR (57 months), ECoR (55 months), SER (54 months) and average delay of 30 months each in SR and WCR.
- Delay in completion of bridgeworks also caused continuation of speed restrictions on the bridges that led to extra operational cost as discussed in Para 1.6.2.5).

8. On being asked about the reasons for delay in sanctioning the bridgeworks even after identification, Ministry in their written submission furnished as under:

" In this regard, it is stated that the works proposed for sanction at Railway Board level (more than Rs 1 crore each) are examined based on the information furnished by respective Zonal Railways such as justification of the work, cost of work, existing throw forward, likely budget allotment, available time allowance etc. All the works proposed by Zonal Railways do not involve safety aspects."

9. Apprising the Committee about the present position with regard to continuation of speed restrictions on the bridges which had led to extra operational costs, besides being a safety hazard on account of running of services on technically obsolete bridges, the Ministry of Railways in the written note submitted as under:-

"Depending upon the availability of funds and resources, the works required from safety considerations are given topmost priority. The bridges are maintained to ensure safe running of trains all the time at permitted speed and if the corrective / remedial measures are expected to take a long duration due to the complexity of the site situation, etc., suitable safety measures like imposing speed restrictions and keeping such bridge under close watch are taken till the bridge is repaired / strengthened / rehabilitated / rebuilt. The safety of train operations is never compromised."

10. The reply is not acceptable as Zonal Railways themselves prioritize bridgeworks at CBE/PCE level based on safety considerations identified during the inspection and proposals are submitted to RB accordingly. Further, the work pertaining to the bridges categorized as distressed category-I & II (ORN rating 1 and 2 respectively) took

substantial time for sanction resulting in delayed execution. Imposition of speed restriction has been termed as a remedial measure to ensure safety. But it involves huge additional expenditure on account of extra operational cost as noticed during a study conducted in SCR. As such, delay in sanctioning of bridgeworks and limiting the proposals of bridgeworks based on financial constraints not only compromise the safe train operations but also result in extra financial burden.

B. Physical Progress of Bridge Rehabilitation/Strengthening/Rebuilding work

11. An analysis of the overall position of achievement of targets for rehabilitation/reconstruction of bridges over IR, the overall status of execution of rehabilitation/reconstruction of bridges carried out during the years 2010-11 to 2013-14 indicated that –

- Against the overall target of rehabilitation works of 3433 bridges in 16 Zones over IR, 3292 bridges were rehabilitated leaving shortfall of 141 bridges. While in nine zones, shortfall in achievement of target (245 bridges) was noticed, in the remaining seven Zones, no shortfall was noticed. In five Zones ((CR, ECoR, ER, NFR and NWR), bridges were rehabilitated in excess of the target set for these Zones.
- The shortfall in achievement of target was highest in NER (52.63 per cent) followed by NR (42.78 per cent), WR (23.17 per cent), ECR (22.88 per cent), SR (21.51 per cent).
- The reasons attributed by Zonal Railway Administrations for the shortfall in achievement of targets were, paucity of funds, non-availability of line block, encroachment/ eviction problems etc.

12. Audit further noticed that across IR, three distressed category-I bridges were identified (one in 2002 and other two in July 2009) and all the three bridges were pending to be rehabilitated/reconstructed as on 31 March 2014 though as per IRBM provision the works should have been completed within a year of sanction. In regard to distressed category-II bridges, out of 45 bridges identified, four bridges (one each in ER, ECoR, ECR and SECR) remained to be rehabilitated (March 2014) beyond the period of four years after sanction (between 1999 and 2005). In other than distressed category I & II (ORN rating 1 and 2 respectively), there were 4529 bridges over IR. Out of these 4529 bridges, in respect of 3931 bridges, sanction for rehabilitation was accorded by RB. Out of these 3931 rehabilitation works on 703 bridges were not completed even after four years of sanction.

13. On being asked about aforesaid issue, the Ministry in their written reply furnished as under:

"During last five years, 3675 bridges have been strengthened/rehabilitated/rebuilt on IR. Audit in its report has mentioned that during the review period (2010-11 to 2013-14), against the overall target of 3433 bridges, 3292 bridges were rehabilitated leaving shortfall of 141 bridges. In this regard, it is stated that there has not been any shortfall in achieving the targets of bridge rehabilitation works. The actual position from 2010-11 to 2013-14 is as under:

RLY	No. of bridges rehabilitated							
	2010-11		2011-12		2012-13		2013-14	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
CR	47	41	15	23	30	31	26	26
ER	91	129	102	105	87	87	61	61
ECR	62	54	77	56	43	43	38	29
ECoR	31	48	35	39	28	40	26	40
NR	117	112	50	90	60	74	54	87
NCR	59	49	50	43	28	32	27	47
NER	5	3	6	5	3	0	4	4
NFR	71	112	70	71	30	32	27	28
NWR	51	70	66	66	66	69	33	37
SR	82	88	82	38	35	38	33	45
SCR	70	91	96	95	58	89	54	77
SER	75	110	60	47	58	86	60	106
SECR	56	72	69	69	48	46	33	33
SWR	48	62	79	72	40	50	26	23
WR	105	66	53	38	32	32	46	46
WCR	80	90	65	67	56	57	43	50
Total	1050	1197	967	924	702	806	591	739

It may be seen from above table that the period from 2010-11 to 2013-14, against overall target of 3310 bridges, 3666 bridges have been rehabilitated i.e. 356 bridges (10.75%) more than the target. Presently, 3017 bridges at a throw forward cost of Rs.3386 crores have been sanctioned for rehabilitation/rebuilding which are planned for completion within next three to four years in phased manner."

14. However, in the reply given in the table, it was shown as progressed against the stated target. As such it is not clear whether all the bridgeworks progressed, as shown in the table, were completed or not. Moreover, the figure calculated by Audit regarding shortfall in achievement of target was based on the data furnished by the Zonal Railway Administrations during audit.

(a). Budget Allocation and Expenditure for Bridge Rehabilitation works

15. Audit assessed allotment and utilization of fund by IR and observed that as against 2432 works proposed by all zonal Railways at a cost of Rs. 3453.52 crore during the review period, RB sanctioned 1691 works for a value of Rs. 2090.27 crore. During the review period, the average Budget Grant (BG) provided per year was short of average BG demanded per year, to an extent of Rs. 213.69 crore (38.65 per cent) in IR. Provision of less Budget Grant than that was demanded ranged from 0.73 crore (in respect of WCR) to Rs. 53.41 crore (in respect of ECR). The magnitude of short provision of BG has the effect of slowing down the momentum of progress of bridge works.

16. While BG provided was short of demand, on the other hand, the total average BG surrendered per year through the process of demand for less Final Grant (FG) across zones was Rs. 58.60 crore (17.28 per cent). The average surrender per year through less demand for FG was highest at Rs.10.47 crore in SER followed by ER at Rs.7.29 crore, WR at Rs.7.19 crore, SCR at Rs.6.36 crore and so on. This apart, average under-utilisation of funds per year by way of less actual expenditure was Rs. 2.35 crore ranging from Rs.0.08 crore by NFR to Rs. 4.95 crore by ECR.

17. It is evident from the above that, on one hand paucity of funds was quoted as one of the main reasons for slow progress of bridgeworks and shortfall in achievement of target for rehabilitation/ reconstruction of bridges, on the other hand, BG provided was not utilised to the tune of Rs. 60.95 crore per annum.

18. Explaining about the reasons for huge gap between demand and allocation of funds, Railway Board furnished in its written submission as under:

"In this regard it is submitted that it is true that the budget allocation has been less than the demand but funds have been allotted in bridge works based on overall availability of funds only. However, it is not true that there has been surrender in the funds allocated, to the extent indicated in Audit's contention, as can be seen from the table below:

Year	Funds (crores of rupees)			
	BE	RE	FG	Expenditure
2010-11	408.00	329.5	353.93	353.69
2011-12	330.00	336.45	340.26	319.09
2012-13	464.00	339.67	326.72	322.19
2013-14	513.00	382.69	381.34	390.19
Total	1715.00	1388.31	1402.85	1385.16

It may be seen that the funds were reduced at RE stage as compared to BE on the basis of availability of funds and the same were almost completely utilised. The funds utilisation is monitored vigorously through various means to ensure that funds are not surrendered."

(b). Time required for execution of Bridge Rehabilitation/Strengthening/Rebuilding work

19. Audit noted inordinate delay in the execution of works relating to distressed Category-I Bridges ranging from 2 to 10 years. The delay in execution of works at various stages were as under:

- there was delay of five months due to delay in the finalisation of tender and award of contract;
- change of scope of work after award of contract caused a delay of six months;
- delay in handing over of site free from encumbrances accounted for 22 months time over-run;
- termination and re-award of contracts took 24 months;
- and for various other reasons, there was time loss of 46 months.

20. Audit had further highlighted that the execution of works relating to distressed Category-II and "other than distressed category-I & II" bridges was also delayed. RB stated

(June 2008) in its Action Taken Note on Audit Para of Report No. 9 of 2003 on 'Rehabilitation/ rebuilding/ strengthening of Railway Bridges in Indian Railways' that the rehabilitation/ reconstruction of these category of bridges would be completed within a period of four years after sanctioning of works. Execution of 82 bridgeworks pertaining to rehabilitation/ reconstruction of eight distressed category-II bridges and 141 bridges of "other than distressed category-I & II" category were reviewed by Audit in detail. Audit commented that-

- The average time taken per work in the commencement of work was assessed by Audit as 33 months. Average time taken per work for commencement was highest in ECR (82 months) followed by SR (55 months), NCR (51 months), CR (41 months), WR (37 months), SER (36 months), ER (30 months), WCR (15 months), NR (11 months) and so on.
- Average time taken per work for finalization/ approval of plans and drawings was seven months per work (NWR, ECoR, WCR, NR and NCR).
- Average time per work taken in the finalization of tenders and award of contract was 12 months in CR, NWR, NCR, SWR, ECoR, NR, ER and WCR.
- Average time lost per work was assessed by Audit as three months due to award of contract without properly assessing the capability of contractor (SR and SER). Termination and re-award of contract led to average loss of five months per work in ECR, NR, ER, SR and WCR.
- Change in the scope of work after award of contract resulted in an average time loss of 9 months per work in NCR and NR and two months per work in NFR.
- Failure to hand over site free from encumbrances to contractor caused average delay of one month per work in NR.
- Paucity of funds led to average delay of two months per work in NWR, ECoR and WCR.

21. During evident the representative of the Railway Board further informed as under:

"For reconstruction and rehabilitation, there are a large number of issues. All the works are being managed through contracts. Sometimes in case of contract fails, then we are supposed to terminate the contract and we give to the new agency for rebuilding. We also need traffic blocks for replacement of bed blocks, bearing and super structure. For rebuilding, we also need imposition of speed restriction for carrying out the rehabilitation works."

22. In this regard, Ministry of Railways in their reply furnished as under:

"After sanction of bridge work, several activities are involved in bridge rehabilitation work such as preparation and finalization of General Arrangement Drawing (GAD), preparation and sanction of detailed estimate, land acquisition in some cases, obtaining CRS sanction, finalization of tenders, execution of work etc. Generally, the time required for completion of bridge rehabilitation/rebuilding work, after its sanction in budget, is about three to four years. However for important bridges, time required may be more due to various complexities involved in the work. Presently, 3017 bridges are sanctioned for rehabilitation/rebuilding and it is planned to rebuild/rehabilitate them within next three to four years in phased manner."

(c) Rehabilitation/Rebuilding of bridges within their codal life

23. During the inspection by Zonal Railways during 2010-11 to 2013-14, 42 bridges were found to have become due for rehabilitation within their codal life. Out of these 42 bridges, 37 were located in SWR alone and in other five zones (NR, ECoR, SER, SR and WR) there was one bridge in each zone. This indicates to premature rehabilitation necessitated due to poor maintenance of bridges.

24. The Ministry in their reply regarding codal life of bridges, their maintenance and reason for high number of instances of maintenance, have stated as under:

"As per Indian Railway Finance Code, for the purpose of the Annual Sinking Fund payment, the normal life (Codal life) of the various classes of Railway assets pertaining to Bridges should be taken as in the table below:

Class of Asset	Average life in years
Bridge Work - Steel Work	60 years
Bridge Work - Masonry	100 years
RCC Bridge Work	60 years
Prestressed Concrete Bridge Work	40 years

These guidelines are for making financial provisions to enable accumulation of sufficient funds for future renewals. The age of the bridge however, does not have direct relevance on the physical condition of the bridge and the repair/strengthening

/ rehabilitation / rebuilding is undertaken whenever so warranted by its physical condition and not on the basis of age.

As compared to the total no of bridges on Indian Railways (1, 40,919) and number of bridges sanctioned for rehabilitation (2827), there are very few cases of bridges being rehabilitated / rebuilt before expiry of codal life (42 Nos. as mentioned by Audit). These cases are not due to poor maintenance but for other reasons such as increased loading standards necessitating strengthening/rehabilitation of existing bridges, inadequate water way due to change of pattern of flow in the catchment area, excessive corrosive conditions due to proximity to sea/station yards etc. During annual meetings held with zonal railways and at several other forums, emphasis is given on proper maintenance of bridges to enhance the life of bridges. It may be appreciated that most of bridges are being rehabilitated much after expiry of the codal life because of systematic inspection, maintenance and monitoring of the bridges.

In order to enhance the life of bridge girders and to increase the life of paints at reduced life cycle cost, the long life painting system having life of 15 years or more is being developed. Trials of three type of long life painting system are in progress. Expression of Interest (EOI) is being invited for more type of painting system for exploring more options."

25. The reply is contradictory in itself as on one hand it was stated that premature rehabilitation was not due to poor maintenance, on other hand one of the reasons stated was excessive corrosion. Continuous excessive corrosion needs to be tackled by effective measures of maintenance. Audit pointed out that out of 42 bridges found to have become due for rehabilitation within their codal life, 37 were located in South Western Region alone. This is a serious matter to be enquired into and action taken against the delinquent officials.

(d) Replacement of Early steel Girders/Cast iron screw pile bridges:

26. According to Corporate Safety Plan (CSP) 2003-13, all early steel girders/screw pile bridges were planned to be replaced by 2013 however still 96 such bridges remained to be rehabilitated as of March 2014.

27. The Ministry in their written submission stated as under:-

"In regard to eliminating these types of bridges, it is stated that the work of phasing out of early steel girders / cast iron pile bridges has largely been completed. The

work of these bridges has been executed keeping in view the availability of funds, the condition of the bridge, etc. Priority being accorded on the condition basis. As far as 69 bridges in NFR is concerned, the early steel girders were situated on meter gauge route and they have been replaced in gauge conversion work of Lumding - Badarpur line in 2015. Presently, only 18 early steel bridges are existing on BG on Indian railways which are planned for elimination during 2017-18 except one bridge on ER for which rebuilding is sanctioned. The work of rebuilding of remaining screw pile bridges (4 on WR & one on WCR) is in progress, out of which two are planned for completion during 2017-18 and remaining are planned to be completed by 2018-19."

(e) Bridge Girder Fabrication by Civil Engineering Workshops

28. Audit had noticed that during review period, as against the indent placed by Civil Engineering department for fabrication of 45847 MT of steel girders, the Workshops turned out 12360 MT of steel girders. i.e. a shortfall of 66.09 per cent. In SWR, out of 37 technically obsolete bridges taken up for rehabilitation, the rehabilitation of 12 bridges got delayed due to delay in supply of bridge girders by the CWE at Arakkonam/Sr. Progress of work in these cases ranged from 0 to 14 percent as on March 2015.

29. In this regard, Ministry in reply to the query of the Committee furnished as under:

"It may be appreciated that the work orders / indents placed on the workshops are always in excess of the production capacity of the workshops. It is desirable that the workshops are having work orders of about three times the production capacity of the workshop as lot of time is required for procurement of raw material such as steel etc. after work order is placed on the workshop. Moreover, during the review period, the total production of bridge girders across all the workshop was 45217 MT. The breakup is as under:

Rly	Workshop	2010-11	2011-12	2012-13	2013-14
CR	Manmad	3205	3131	4085	4367
ECR	Mughalsarai	2505	2508	1715	1673
NR	Lko/JUC	2296	1690	1676	2429
NER	Gorakhpur	793	166	302	540

NFR	Bongaigaon	95	310	325	313
SR	Arakkonam	873	951	157	30
SCR	Lallaguda	223	256	0	0
SER	Sini	27	116	59	201
WR	Sabarmati	2125	1875	2108	2093
Total		12142	11003	10426	11646

In order to increase the output of the workshops, it has been decided to augment and modernise the workshops with modern machines/technologies in a time bound manner. A work of modernisation of Bridge Workshop, Lucknow costing approx Rs. 40 crores has been sanctioned in Works Programme 2016-17 and the work is in progress.”

30. It is a fact that delays in supply of girders by the Bridge Workshops affect timely execution of the relevant bridgeworks. As such, Railways need to enhance the capacity of the workshops to ensure adequate supply as absence of it ultimately impacts the safety aspects on account of delay in execution of bridgeworks identified for rehabilitation.

C. Use of Non Destructive testing equipments and modern techniques

31. Audit noticed that 290 equipment of five types (on an average) have been procured in different Zones over IR. Utilization of these equipments during inspection of bridges was only 7.07 per cent. Some of the equipments were not used even once as ascertained from the log book maintained by the Zonal Railways.

32. In this regard, Ministry in their written submission has stated as under:

“Non-Destructive Testing (NDT) of railway bridges for assessment of condition/ quality of the material is carried out wherever considered necessary with the help of non-destructive testing equipments. The procurement of non-destructive testing equipments and training of railway staff for using these equipments is a continuous process on Indian Railways. These equipments are procured by zonal railways and Research Design and Standards Organization (RDSO) regularly on need basis. Audit has pointed out that NDT equipments procured by Zonal railways are grossly underutilized. In this regard, it is stated that the NDT

equipments available in zonal railways are being used regularly to assess various parameters related to condition of bridge. These equipments are being used as per requirement.”

33. The reply of Railway Board is incorrect as based on the data collected by Audit from the log books relating to use of NDT equipments, the overall average utilization of the same stood at 7.07 per cent only. The NDT equipments procured at an approximate cost of Rs.12.99 crore over IR remained grossly underutilized, defeating the very purpose of strengthening of inspection techniques.

D. Adherence to schedule for inspection of bridges

34. The objective of conducting bridge inspection is to assess the condition of bridges and to take corrective remedial measures needed if any. There was shortfall in adherence to scheduled inspection of bridges by various levels of inspection authority. The Committee observe that Bridge inspections to be carried out by SSE/SE-Works were not carried out in many zones, citing non-availability of staff and infrastructure as reasons. Shortfall in conduct of inspection at the level of SSE/Works (35.42 per cent) and SSE/ Permanent Way (28.96 per cent) that may result in shortfall in the timely identification of defects in bridges and this may lead to serious consequences. The shortfall may result in a serious bridge condition going unnoticed. Against 156 bridges due for Under Water Inspection during the review period, Under Water Inspection was carried out on 112 bridges leaving a shortfall of UWI on 44 bridges. Lack of trained manpower was cited among reasons for large scale shortfall in conduct of inspection of bridges.

35. However, Railway Board stated (April 2015) that by and large, the inspection schedules are being adhered to by the designated officials and remedial actions are being taken and instructions have been reiterated by the Zonal Railways to the field officials for adhering to the inspection schedule, making good the shortfall if any, and also recording the observations/ furnishing certificates.

36. The complete adherence to inspection schedule at each level was not ensured by Zonal Administrations. However, Railway Board stated that they have instructed

(July 2007) Zonal Railways to implement Centralized Bridge Organization at the zonal level under the Chief Bridges Engineer (CBE).

37. During evidence a representative of the Railway Board deposed in this regard as under:

"We have a very well laid out system of keeping the record of bridge inspections. It starts even from the year when the bridge is constructed and every year whatever inspection notes are there, they are recorded in the register. That register also contains all drawings and important photographs. Subsequently, the track management system was adopted in the Indian Railways in which one of the modules was bridge management system. In it all important parameters of the bridge are uploaded. In 2016-17, we have also sanctioned a new work for bridge management system at the cost of Rs.7.4 crore. We are developing this system."

38. The Creation of separate Bridge Cell was intended to provide specialized attention on inspection and maintenance of bridges and also in the effective monitoring of bridgeworks. The policy guidelines for implementation of centralized bridge organization at zonal level were prepared in April 2009. However, out of 16 zones, only in ten zones 20 separate bridge cell has been formed. Audit found that where Bridge Cells were established, details of inspection and identified bridges due for rehabilitation were recorded in the Bridge Cell for better monitoring of bridgework.

E. Bridge Management System (BMS)

39. The BMS, which was mentioned in CSP as one of the thrust areas in technology improvement in regard to bridge inspection and maintenance, targetted to be completed by 2006-07, was still in nascent stage. Out of the 20 modules proposed, only one module relating to creation of central structured Bridge Data Base was finalized and in that too, feeding of data relating to bridges was completed to an extent of 61.38 per cent only across 14 zones.

40. In reply to the query of the Committee in this regard, the Ministry of Railways submitted as under:

"Initially, it was envisaged to develop Bridge Management system (BMS) as a separate module of Track Management System (TMS). However, due to capacity

constraint of the software, it was decided to develop a separate Bridge Management System and accordingly the work was sanctioned at a cost of Rs 10.14 crores in Budget 2016-17. The work is being executed by CRIS. The work of master feeding of bridge data in Bridge management system has been completed. Further, the bridge inspection proforma of bridge management system is under development and gradually it is planned to do away with the bridge registers physically. In the BMS, there will be a facility for uploading GAD of the bridge, photographs, videos etc."

41. On being asked about the bridge rehabilitation management the Ministry in its written submission stated that-

"As far as management of bridge rehabilitation is concerned, there is a separate application IRPSM on which the progress of each sanctioned work is updated and monitored every month. This is web based application."

42. The fact remains that in its recommendations, CSP envisaged that the BMS had to be fully functional by 2006-07. But even after expiry of ten years, the same is yet to be made fully functional/operational.

F. Inadequacy of manpower for inspection and maintenance of bridges

43. There was an acute shortage of staff in skilled category Group 'C' (40.48 percent) and unskilled category Group 'D' (28.91 per cent) required for inspections and maintenance of bridges. It is seen that out of 444 posts of Senior Section Engineers (SSEs) and Junior Engineers (JEs), as many as 109 posts were vacant, as of March 2014. Similarly, Out of the sanctioned strength of 2,681 skilled staff, as many as 1,095 posts were vacant, as of March 2014. In the case of unskilled staff, 1,086 posts out of 3,756 were vacant. The shortage of staff in northern railway, north frontier railway and north Central railway is more pronounced. This clearly indicates that sufficient and suitable manpower required to carry out the important safety functions viz., inspection and maintenance of bridges was not available in most of the Zonal Railways.

44. The Railway Board accepted the audit comments and stated that the bridge staff works in safety related circumstances and efforts are being made to put bridge staff in safety category and the vacancies are being filled through departmental promotions, direct recruitments etc.

PART II

OBSERVATIONS AND RECOMMENDATIONS

1. C&AG in its earlier Report No. 9 of 2003 had highlighted substantial delays in rehabilitation of identified bridges. Shortfall in scheduled inspections was also pointed out in the audit. Railway Board (RB) in their Action Taken Note (June 2008) stated that rehabilitation of distressed bridges other than category I would normally require 3 to 4 years for completion after sanctioning bridge works. The Railway Board had assured that all bridgeworks of over 4 years after sanction are specially monitored upto highest level. However, the latest audit (2015) of C&AG reveals the inordinate delays in sanctioning/executing and monitoring of bridgeworks. This resulted in unpardonable delays in achieving target date for completion of bridges. Thus the non serious approach of the Railways leads to the possibility of compromising passenger safety during operation of train service on those indented bridges.

2. Delay in sanctioning the bridgeworks even after identification for rehabilitation by Railway Board and speed restrictions

The Committee note that out of 102 bridge works pertaining to 150 bridges, in the case of 31 bridge works which included Category (I) and Category (II) bridges also, on an average, Railway Board took 43 months to sanction the bridge works after identification by the Zonal Railways. It is also brought out that the average time taken for sanction of a bridge work was to the extent of 131 months in North Central Railway (NCR), followed by Central Railway (CR)(57 months), East Cost Railway (ECoR) (55 months), South Eastern Railway (SER)(54 months) and an average delay of 30 months in Southern Railway (SR) and West Central Railway(WCR). The audit, brought to light that during the period from 2010-11 to 2013-14, the Zonal Railways shortlisted the recommendations received from the field officers and forwarded proposals for 2,694 works. Against this, the Railway Board approved 1,953 bridge works, i.e. 72.49%. The Committee note that delay in completion of bridgeworks resulted in continuation of speed restrictions on the bridges which ultimately led to additional operational costs,

besides being a safety hazard on account of running trains on technically obsolete bridges. The extra expenditure incurred due to continued operation of speed restrictions on 87 bridges in 13 Zonal Railways, of which 31 located in important routes worked out to be Rs.103.40 crores during the period from 2010-11 to 2013-14. However, the Railway Board stated that depending upon the availability of funds and resources, the works required from safety considerations are given top most priority, which implies monetary considerations was given precedence over safety requirement. In response to speed restrictions, the Railway Board stated that speed restrictions on bridges are imposed within available time allowance and that extra expenditure, alleged by audit was only "notional". The Committee are distressed to note that even in this era of fast paced developments, Railway Board takes a substantial period of time to sanction the bridgeworks. The Committee are of the view that speed restrictions and delaying crucial bridge work at zonal levels and RB level simply on monetary considerations defeats the very purpose of the system of identification for rehabilitation, besides compromising the safety of passengers as well as train services on the bridges. The Committee desire that a strategic management system be developed for fast tracking sanction of rehabilitation/reconstruction of bridges within a time frame based on priority for safety.

3. Underutilization of Funds

The Committee observe that even though paucity of funds was cited as a reason for shortfall in achievement of targets for bridgeworks, substantial surrender of funds was noticed in various Zonal Railways. The Budget Grant provided to individual Zonal Railways per year was short of average Budget Grant demanded per year to the extent of Rs. 213.69 crores (38.65 %) in Indian railways. Provision of less Budget Grant than the demand ranged from Rs.0.72 crores in respect of WCR to Rs. 53.41 crores in respect of ECR. The magnitude of short provision of Budget Grant has the effect of slowing down the momentum of the

progress of bridge works. The Committee further note that on the one hand, the Budget Grant provided was short of demand, whereas, on the other hand, the total average Budget Grant surrender per year through the process of demand for less final grant across the Zones was Rs. 58.60 crores, i.e. 17.28 per cent. Thus, on the one hand, paucity of funds was quoted as the main reason for slow progress of bridge works and short fall in achievement of target for rehabilitation/reconstruction of bridges, whereas, on the other hand, the Budget Grant provided was not utilized to the tune of Rs. 60.95 crores per annum. However, the Railway Board has claimed that the funds have been allotted based on overall availability. The RB have claimed that the funds were actually utilized and that there was no under utilization. Nevertheless, the contention of the Railway Board is not acceptable because the audit had collected the figures from certified appropriation accounts of various Zonal Railways. The Committee feel that there are some serious flaws in budget planning and it exposes the lack of seriousness on the part of railways which needs to be rectified. The Committee, therefore, desire that proper planning, execution and effective mechanism of monitoring should be set up at both Zonal and RB levels to ensure optimum utilization of funds.

4. Underutilization of modern equipments for bridge inspection

The Committee note that even though for conducting objective inspection of bridges 290 equipments of five types have been procured at different Zones over IR on the recommendations of the High Level Safety Review Committee headed by Shri Anil Kakodkar, it has been found that the utilization was woefully only 7.07%. The Committee further observe that these equipments procured at an exorbitant approximate cost of Rs.12.99 crore. While Zonal Railway administrations replied that the reasons for non/underutilization of these equipments for inspections was due to absence of trained staff, vacancy in Group D category staff, lack of skills and logistics etc. The Railway Board stated (April 2015) that the equipments available in Zonal Railways are being used regularly to

assess various parameters related to condition of bridges. The log book entries, however, showed that the utilization of various equipments were insignificant since their procurement. The Committee are of the view that underutilization of equipments procured after spending crores of rupees is defeating the very purpose of timely strengthening of bridges. The Committee, are surprised to observe the unjustified decisions of the officers of Indian Railways in procuring costly equipments without any proper planning, cost analysis, assessing the actual need and its effective utilisation. The Committee, therefore, desire that accountability should be fixed at of Zonal as well as RB levels against the officers who have procured equipments at exorbitant, rates which are lying underutilized.

5. Inordinate delay in execution of sanctioned bridgeworks

The Committee are shocked to note that out of 3979 bridgeworks, sanctioned by the Railway Board, works of 710 bridges remain to be completed as on March 2014 even after expiry of prescribed period of one/four years. The Committee further observe that the audit in its test checked cases of 102 bridgeworks pertaining to 150 bridges, pointed out average delay of 41 months, ranging between 8 months (SECR) and 105 months (ECR). The Railway Board contended that the rehabilitation/rebuilding may take several years and also it can't be generalized. Some isolated cases may take more than four years also because of reasons beyond the control of Railway administration. The Committee, however, are of the view that poor planning and improper contract management on the part of Zonal Railway administration caused inordinate delay in execution of bridge reconstruction projects. The Committee, therefore, desire the Railways to set timelines for the execution and completion of bridgeworks with effective planning and proper monitoring so as to ensure that safety of human lives is not compromised and railway assets protected.

6. Need for rehabilitation/reconstruction of bridges within their codal life

The Committee note that during inspection by Zonal Railways during 2010-11 to 2013-14, 42 bridges were found to have become due for rehabilitation within their codal life. Out of these 42 bridges, 37 were located in SWR alone and in other five zones (NR, ECoR, SER, SR and WR) there was one bridge in each zone. These are ample evidences highlighting the fact that poor maintenance of railway bridges lead to the need for its rehabilitation/reconstruction within their codal life. Railway Board stated that these cases of rehabilitation within the codal life are not due to poor maintenance but other reasons such as increased loading standards, inadequate water way due to change of pattern of flow in the catchment area, excessive corrosive conditions etc. The reply of the RB is contradictory in itself as on one hand it was stated that premature rehabilitation was not due to poor maintenance, on other hand one of the reasons stated was excessive corrosion. The Committee are of the view that continuous excessive corrosion needs to be tackled by effective measures such as timely maintenance, monitoring and ensuring good quality materials used in the construction work etc. The Committee are shocked to note that out of 42 bridges found to have become due for rehabilitation/reconstruction within their codal life (normal life), 37 of them were located in South Western Region alone. The Committee are, therefore, of the view that the matter may be enquired into, action taken against the officers responsible for the lapse and report the same to the Committee within six months of presentation of this report in Parliament.

7. Need for creation of Bridge Cells in remaining Railway Zone

The Senior Sections Engineers (SSE)/SE-Works is expected to inspect superstructure and steel works and bearings of all girders less than 2.2 m clear span once in 5 years. In addition, foundation, sub-structure and bed block of all bridges should be inspected once in a year prior to monsoon. The objective of conducting bridge inspection is to assess the condition of bridges and to take corrective remedial measures needed, if any. The Committee observe that Bridge

inspections scheduled to be undertaken by SSE/SE - Works were not carried out in many Zones, citing non-availability of staff and infrastructure as reasons. Shortfall in conduct of inspection at the level of SSE/SE- Works (35.42 per cent) and SSE/ Permanent Way (28.96 per cent), as pointed out in C&AG report, may result in shortfall in timely identification of defects in bridges and this may lead to serious consequences. The, Railway Board stated (April 2015) that by and large, the inspection schedules are being adhered to by the designated officials and remedial actions are being taken. Railway Board's instructions have been reiterated by the Zonal Railways to the field officials for adhering to the inspection schedule, making good the shortfall, if any, and also recording the observations/ furnishing certificates. The Committee are of the view that complete adherence to inspection schedules at each level should be ensured by Zonal Administrations. In this regard Railway Board instructed (July 2007) Zonal Railways to implement Centralized Bridge Organization at the Zonal level under the Chief Bridges Engineer (CBE). Creation of separate Bridge Cell was intended to provide specialized attention on inspection and maintenance of bridges and also in the effective monitoring of bridgeworks. The policy guidelines for implementation of centralized bridge organization at zonal level were prepared in April 2009. However, out of 16 zones, only in ten zones 20 separate bridge cells have been created. Audit found that where Bridge Cells were established, details of inspection and identified bridges due for rehabilitation were recorded in the Bridge Cell for better monitoring of bridgework. The Committee, therefore, recommend that Bridge Cells be created in the remaining six Railway Zones for better monitoring of inspections and execution of bridgeworks over IR and action taken in this regard intimated to the Committee within three months of the presentation of this Report to Parliament.

8. Inadequacy of manpower for inspection and maintenance of bridges

The Committee observe that there is an acute shortage of staff in Group 'C' and Group 'D' cadres telling upon the quality of inspections and maintenance of

bridges. It is seen that out of 444 posts of Senior Section Engineer(SSE) and Junior Engineer (JE), as many as 109 posts were vacant, as of March 2014. Similarly, Out of 2,681 skilled staff sanctioned, as many as 1,095 posts were vacant, as of March 2014. In the case of unskilled staff, 1,086 posts out of 3,756 were vacant. The shortage of staff in Northern Railways, North Frontier Railways and North Central Railways is more pronounced. This clearly indicates that sufficient and suitable manpower required to carry out the important safety functions viz., inspection and maintenance of bridges was not available in most of the Zonal Railways. Railway Board accepted the audit comments and stated that the vacancies are being filled through departmental promotions, direct recruitment etc. The Committee are of the view that such large scale vacancies exposes the lack of seriousness on the part of railways to carry out the much needed inspection of railway Bridges. The Committee, therefore, recommend that urgent steps be taken to fill up vacant posts, expedite holding of DPCs and conduct of recruitment of requisite manpower.

9. Implementation of Bridge Management System (BMS)

The Committee note that the BMS, which was mentioned in Corporate Safety Plan (CSP) as one of the thrust areas in technology improvement in regard to bridge inspection and maintenance, scheduled to be completed by 2006-07, is still in nascent stage. Out of the 20 modules proposed, only one module relating to creation of central structured Bridge Data Base was finalized and in that too, feeding of data relating to bridges was completed to an extent of 61.38 per cent only across 14 Zones. However, Railway Board stated that the feeding of master data for bridges is in advance stage and is planned to be completed during 2015-16. They further stated that bridge inspection proforma is under development and will be available to railways by May 2015. The fact remains that in its recommendations, CSP envisaged that the BMS had to be fully functional by 2006-07. But even after expiry of seven years, the same is yet to be implemented completely. The Committee desire that Railway Board give updated information

on the functioning of the BMS. As BMS will help Ministry of Railways in keeping track of all kinds of maintenance and inspection issues related to Railway Bridges, the Committee emphasize the imperative need for making the BMS system fully operational within six months of the presentation of this Report.

10. Replacement of early steel/cast iron/screw pile bridges

The Committee note that Bridges made of Early Steel/ Crew Pile/ Cast Iron were considered to be prone to brittleness and hence had to be phased out by end of 2013 as per Corporate Safety Plan (CSP) projections. The audit report however, revealed that as on March 2014, out of 147 bridges due to be phased out, 96 bridges of these types still existed over five Zonal Railways. Railway Board stated that the work of technically obsolete bridges has been executed keeping in view the availability of funds, the condition of the bridge etc. They further stated that the obsolete bridges, falling on Broad Gauge route in five zonal Railways (NR, WR, ER, NFR and WCR) would be replaced by March 2017 and other bridges, falling in Meter Gauge route of NFR would be replaced in gauge conversion work. They audit contended that target fixed by Railway Board for replacement of technically obsolete bridges, falling on Broad Gauge route as March 2017 was not as per the recommendations of CSP, wherein it was envisaged that these bridges would be phased out by 2013. The Committee further note that Railway Board have not fixed any target for replacement of 69 such bridges on Meter Gauge route in NFR. Moreover, it is pertinent to mention here that at the time of inspection, these bridges were declared technically obsolete ones as it, contain higher proportion of Sulphur, making bridges prone to brittleness. The Committee, therefore, desire that keeping in view the safety of passengers, technically obsolete bridges need to be replaced in a time bound manner at the earliest. The Committee may be apprised in this regard within a period of three months of presentation of this report in Parliament.

11. Nexus between Railways and Contractors

The Committee note that while certain railway bridges constructed during British rule are in good condition, railway bridges constructed/reconstructed after independence are of inferior quality and need frequent repair. Nexus between railway officials and few contractors severely affect the quality and life of its construction. Delays in construction leads to cost overrun, speed restrictions on trains, heavy loss to the exchequer and ultimately safety of passengers/trains are put to risk/danger. The Committee are of the view that tender for construction/rehabilitation of bridges be done through e-tendering so as to make the system transparent and to attract large number of reputed and competent construction companies in the tendering process. The Committee also desire that construction companies/contractors who fail to ensure quality and long life of bridges be debarred from participating in future tenders and penalized/earnest money forfeited. The Committee further desire that the officials found lacking in their duties to ensure good quality work or colluded with contract be punished in an exemplary manner.

12. Slow progress of the fabrication of girders for bridgeworks by Civil Engineering Workshops:

The Committee note that delay in timely supply of steel girders by the Civil Engineering Workshops (CEWs) resulted in delay of rehabilitation of railway bridges. There was a shortfall to the extent of 66.09 per cent in the supply of steel girders by Civil Engineering Workshops (CEWs) in CR, ECR, NR, SCR and SR during 2011-12 to 2013-14. In SWR, out of 37 technically obsolete bridges taken up for rehabilitation, the rehabilitation work of 12 bridges got delayed due to delay in supply of bridge girders by the CWE at Arakkonam/SR. Progress of work in these cases ranged from 0 to 14 per cent as on March 2015. The Railway Board, however, stated that the work orders/indents placed on the workshops are always in excess of the production capacity of the workshops and a lot of time is required for procurement of raw material such as steel etc. after work order placed on the workshop. The Committee observe that delays in supply of girders

by the Civil Engineering Workshops affect execution of the relevant bridgeworks. The Committee, therefore, desire that Railways need to modernize/ enhance the number and capacity of the workshops and augment advance procurement of raw materials to avoid the delay in supply of steel girders as it ultimately impacts the safety of passengers on account of non-completion of bridgeworks identified for rehabilitation.

NEW DELHI;
01 February, 2018
12 Magha, 1939 (*Saka*)

MALLIKARJUN KHARGE
Chairperson,
Public Accounts Committee

