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## Technical Circular No 4

El 3.6.4/SHED

Dated 15.05.97

The Secretary (Elec.)/ TRS  
Railway Board,  
Rail Bhawan,  
New Delhi 110 001

**Sub :** Holding capacity of electric loco sheds.

**Ref. :** Board's letter No. 95/Elect (TRS)/480/1 dated 21/2/97 and subsequent discussion in CELE's conference held at Western Railway at Mumbai on 25,26/4/97

RDSO has issued a standard shed layout for AC electric locomotive vide RDSO Report No. EL/PR-19 dated Oct. 1972 . In this report, the standard layout has been designed to cater for 100 AC Electric Locomotives with a scope to handle 120 locos. Further, as per the report the heavy lifting bay and the inspection pits provided for the maintenance schedules as well as unscheduled repairs of the locomotives requires 9 Nos. of inspection pits and 8 Nos. of pits in the heavy lifting bay with the following inspection schedules :-

- I. Fortnightly inspection.
- II. Monthly inspection (IA).
- III. Two monthly inspection (IB).
- IV. Four-monthly inspection (IC).

In view of the increased availability of locomotives and reduction in statistical percentage ineffective of locomotives from 14 % in 1985-86 to as low as 6.3% in 1996 -97, the revised berthing capacity for repair of 120 locos has been calculated and details are enclosed in annexure - I. It has been found that the existing shed layout for 100 locos is able to meet the requirement for 120 locos if the fortnightly inspection schedule is carried out in the out pit, which is presently the practice in most of the Railways, instead of the base shed as per the original report.

The additional machinery and plants required for 120 locos have been suggested in annexure-II. Basically the machinery and plants have been increased to cater for the increased holding of locomotives by providing the efficiency multipliers such as better communication, computerization of data, mechanised store handling etc. These additional machinery and plants are going to help the shed management in keeping a close watch on the locomotive failures, equipments type defects, stores management etc. and avoid loco ineffective due to lack of facilities. Most of these have either been provided or proposed for the loco shed by the Railways.

Since the cost of providing additional unit exchange spares shall be much less than the cost of providing additional M&P to repair them at each shed, it is recommended that atleast two loco-sets of motorised bogies in each shed is provided to avoid the locos waiting for motorised bogies.

**Conclusion** : RDSO is of the view that the existing shed capacity may be increased form 100 to maximum of 120 locos with the above mentioned additional facilities. Loco holding beyond 120 is not at all recommended.



(R. P. Srivastava)

for Director General (Elec.)

**Encl: as above.**

**ANNEXURE - I**

**Berthing Capacity required for 120 locos based shed**

S. No.	Type of sch.	No of working days/ sch.	No. of sch. due / day	No. of locos undergoing sch. simult.	No. of berths
1.	5 <sup>th</sup> Yr AOH (POH every 6th year)	06	20/310 = .064	.064 * 6	0.38
2.	4 <sup>th</sup> Yr. AOH	06	20/310 = .064	.064 * 6	0.38
3.	3 <sup>rd</sup> Yr. IOH	15	- DO-	.064 * 15	0.98
4.	2nd Yr. AOH	06	- DO-	.064 * 6	0.38
5.	1st Yr. AOH	06	- DO-	.064 * 6	0.38
6.	Non schedule lifting repairs				3.00
Provision for bunching and variation of AOH IOH working days from Rly. To Rly. At the rate of 20%				TOTAL	2.48
				TOTAL	0.50
				TOTAL	3.00
7.	Total No. of pits in heavy lifting bay = Scheduled repair + Non-schedule lifting repair				6.00
8.	Pits for keeping motorised bogies (2 loco set)				2.00
				Total	8.00

**Inspection pits :-**

S.No.	Type of sch.	No of working days/ sch.	No. of sch. due / day	No. of locos undergoing sch. / simult.	No. of berths reqd.	No. of Pits
1.	Quarterly Schedule (IC)	1/2	240/310=.77	.77*.5	0.39	1
2.	Two monthly (IB)	1/3	360/310=1.16	1.16*1/3	0.39	1
3.	Monthly	1/4	720/310= 2.32	3.10*1/4	0.58	1
	Total pits for schedule inspection = 1A + 1B + 1C					= 3.0
	Bunchig factor at the rate of 50%					= 1.5
						Total = 4.5 pits

Unscheduled repairs of running locos including awaiting repairs, testing time etc. = 4.5 pits

(Taking unscheduled repairs to scheduled repairs as 50:50 in most of the sheds on Indian Railways)

TOTAL, PITS OF INSPECTION SHED = 4.5 + 4.5 = 9 pits

**Summary:-**

1. Therefore total inspection pits needed for 120 locos is 9 against availability of 9 pits as per shed layout vide RDSO Report No. EL/PR-19 of 1972.
2. Similarly, lifting pits needed 8 Nos. against availability of 8 pits as per the shed layout. Vide RDSO report No. EL/PR-19 of 1972.

## ANNEXURE - II

### LIST OF ADDITIONAL M&P FOR INCREASING SHED CAPACITY FROM 100 LOCOS TO 120 LOCOS

**(A) Communication Facilities: -**

1.	Fax machine	-	1 No.
2.	Telex machine	-	1 No.
3. (a)	Intercom facility (With electronic exchange of 100 lines)	-	1 No.
(b)	Linkage of shed computer with zonal head quarter and divisional headquarter.		
(c)	V.H.F. SETS (Walkie-Talkie)	-	20 Nos.
4.	Laptop P.C.	-	1 Nos.
5.	P.C. based computer system with tape drive, printer etc. and linked with shed stores computer.	-	1 Nos.

**(B) Stores handling facilities :-**

1.	Fork lifter (5 tonne capacity)	-	2 Nos.
2.	Store computer system with printer	-	2 Nos.
3.	Material handling van fitted with crane	-	1 No.

**(C) Measuring /Testing Instruments:**

1.	Ultrasonic Hardness Tester	-	1 No.
2.	Dissolved Gas Analysis Apparatus	-	1 No.
3.	Air Brake Testing Rig	-	1 No.
4.	Horizontal Tensile Testing Machine (40 tonnes)	-	1 No.
5.	Test Rig For V.C.B.	-	1 No.
6.	Bearing Room With Ultrasonic Cleaning Facility	-	
	1 No.		
7.	Surge Comparison Tester For T.M., Armature & Aux Machine	-	
	1 No.		
8.	Shock Pulse Metre For Bearing	-	1 No.

**(D) General purpose machine :-**

1	Welding Sets (Electric)	-	5 Nos.
2.	Portable generator -cum welding set	-	1 No.
3.	Rain Water Leakage Testing (Shed Made)	-	1 No.

4. Oil centrifuging and filtering plant.	-	1 No.
5. Facility for mechanised Washing of loco body for coaching locos	-	1 No.
6. Floor scrubber	-	5 Nos.
<b>(E) Lifting And Handling Facility:-</b>		
15 tonne EOT Crane for lifting bay for auxiliary machines, traction motors etc.	-	1 Nos.