

SOUTH EASTERN RAILWAY

Office of the G.M. (Engg.)  
Garden Reach, Kolkata-43

**CE's Circular No.262**

**Sub: Prevention of Corrosion of rails and Welds**

**1.0 General :-**

The corrosion of rails can be broadly classified in to two categories from the track maintenance point of view.

**1.1 General Rail Corrosion :-**

The general corrosion in the rail happens due to aggressive environmental conditions and it happens mostly in the coastal areas due to salinity, in the tunnels & cuttings due to dampness, in the industrial belts due to chemical pollution and in the sidings where corrosive goods are handled. There is normally reduction in the in the overall cross section of the rail because of general corrosion and sometimes abnormal reduction in some parts of the web & foot leading to stress concentration and failure.

**1.2 Rail corrosion at Fastening locations :-**

Apart from the general corrosion mentioned above, sometimes in the yards due to drainage problems, which causes dampness conditions, there is corrosion mainly in the rail foot area. In addition in stretches where passenger trains run in the early morning hours, due to toilet droppings, there is reduction in the rail foot in the area which is in contact with the liner. The remaining section of the rail is normally not affected in such cases.

**2.0 Identification/Inspection of corrosion prone area :-**

2.1 IRPWM para 249(1) list out the areas generally prone to heavy corrosion i.e. platform lines, sidings where saline or corrosive goods are handled, areas near sea coast, Industrial belts, tunnels, damp cuttings, stretches where passenger trains run in the early hours of the day etc.

2.2 Accordingly, the specific corrosion prone locations/stretchers must be identified and recorded in the section register by SSE/SE-in-charge in under mentioned format :

S.N.	Between Stations	Line Up/Dn/SL/Stn yard	Km Details From To	Intensity moderate/severe	Type of corrosion Genl/CFL*	Reason for rail corrosion

\* Corrosion at Fastening Location

### 3.0 **Measurement of rail corrosion :**

A separate register shall be opened for corrosion prone locations under each SSE/SE(PW) in-charge with two sub sections viz. (i) For stretches with General Corrosion & (ii) For stretches with Corrosion at fastening locations. Details for two types of corrosion locations shall be recorded in the proforma given in para 3.1 & 3.2 respectively. For each stretch of corrosion prone area one separate page shall be kept.

- 3.1 In case of general corrosion, the percentage loss in the rail section shall be determined by actual weighment by representative sample taken at every 500 m or part thereof once in two years. The format for this shall be as given below :-

Date of Inspection	KMs & Up/Dn/SL	Rail Section & UTS	Year of Rolling	% loss in the rail section	Remarks on corrosion and its location

- 3.2 In case of rail corrosion at fastening Location, the measurement of rail corrosion in rail foot is to be done at every 500 m or part thereof once in a year. The format for this measurement. Shall be given as below:

Date of Inspection	KMs & Up/Dn/SL	Rail Section & UTS	Thickness of Rail foot under Liner		Remarks
			LR	RR	

- 3.3 The inspections shall be carried out between Sept. & Nov., so that timely action for metallization of rails for areas with severe corrosion may be taken for the renewal works to be taken up in the next year.

### 3.4 **Identification of areas considered prone to Severe Corrosion :-**

Locations where rate of corrosion is so severe that replacement of rails becomes necessary within 5-6 years on account of corrosion shall be considered to be areas prone to severe corrosion. Severe corrosion prone areas shall be identified by Dec. based on periodic inspections. Areas so identified shall be submitted for approval of CTE giving full reasons for considering the areas as prone to severe corrosion. Only after approval of CTE, an area is to be considered as prone to severe corrosion.

- 3.5 Sr.DEN/DEN/ADEN should inspect these records during their inspections of their section and record instructions for action to be taken.

### 4.0 **Preventive measures to control Rail corrosion:**

Para 250 of IRPWM lays down the precaution/maintenance practices to be observed for reducing the rails deterioration. Action to be taken for minimizing the corrosion has been defined in RDSOs letter No. CT/ACP, dt. 24.2/1.3.2006. Main features of the instructions have been incorporated herewith for implementation in field.

#### 4.1 **General corrosion**

##### 4.1.1 **Areas of Severe Corrosion**

For locations identified as prone to severe corrosion as per para 3.3 above, rails with Zinc metallization are required to be used at the time of rail renewal. However, as creating the necessary facility for Zinc metallization may take some time, in the intervening period, treatment as prescribed for corrosion prone areas in para 4.1.2 below may be followed for these areas also.

##### 4.1.2 **Other Corrosion prone areas**

New rails to be laid in the locations identified to be prone to general corrosion shall be painted with bituminous paint conforming to IS 9862 prior to these being laid in the track. In the case of rails that are already laid in track subject to corrosion, the rails should be given the treatment in the track itself.

The procedure for painting of rails and frequency to be followed as given in CE's Circular No.259.

Note :- In case of track work being executed by construction organization in proximity of the open line sections, it shall be the responsibility of sectional DEN/Sr.DEN to advise construction organization, well in advance, the corrosion prone locations/stretch, so as to ensure that anti corrosive treatment is given to the rails before laying in the track.

#### **Rail corrosion at fastening Location:-**

4.2.1 To minimize the occurrence of this problem, as a preventive measure, at the time of initial provision as well as at the time of periodic cleaning of central leg of elastic rail clips, Graphited grease grade '0' to IS:408 shall be applied on the underside of liners as also the corresponding areas of rail foot. To avoid ingress of toilet droppings as well as moisture to the surface of the liner and rail foot, grease shall be applied along the boundary of the liner to seal the liner boundary. Frequency and procedure for greasing be followed as per procedure laid down in CE's Circular No.156 (revised) and 260, dt.16.12.2007.

4.2.2 In case of locations identified to be prone to this corrosion, normally the corrosion is observed mainly near the liner location on the gauge face side, therefore shifting of rail from its position by distressing will result into stopping of further development of corrosion at the same location and will result into increase in life. By shifting of rail from its position, the reduced foot section due to corrosion gets shifted away from the liner. Thus, its further reduction in foot thickness at same location due to corrosion gets eliminated and new location with normal thickness comes under the liner to accept further corrosion. Thus the reduction of foot thickness at one location gets stopped. This is to be done when the rail is relatively new and reduction in rail foot area is less, i.e. reduction in rail foot is less than 1.5 mm.

4.2.3 As this type of corrosion is observed more on gauge face side, changing/turning of rail will result into making the gauge face as non gauge face which will result into increase in life of rail as the reduction of foot thickness at same location will get stopped. This should be done when the rail is relatively old and sufficient wear in rail foot area has already taken place i.e. wear in rail foot area is about 5 to 6 mm and it is unsafe to have such a worn out rail location unsupported between sleepers. This activity shall be planned along with distressing in case of LWR track.

## 5.0 **Weld Collar Painting**

Weld collar painting should be done as per CE's Circular No.259.

## 6.0 **Responsibility**

It should be noted that any proposal received from divisions for premature TRR on account of corrosion of rails & welds should accompany the various measures taken by divisions for prevention of corrosion of rails. For better appreciation of problem the photographs of corrosion to be taken and preserved and record of rail/weld fractures taken place in corrosion prone areas should also be submitted to HQ's at the time of processing for track renewals of the corrosion prone stretches. In case the need of premature renewals arises due to corrosion, where the division has taken no preventive action, the responsibility shall be fixed, before submitting the proposal.

Sd/-  
**(Sanjay Rastogi)**  
**CHIEF TRACK ENGINEER**  
**For General Manager (Engg.)**

No. TC/Painting/

Dated: 11/02/2009

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