Rail Track Foundation Repair at Visa Steel, Jajpur, Orissa
A Case Study
Railtrack Foundation Repair

Project
The Coke Oven is a key element in the overall process of the Visa Steel plant. The coke is produced in the 36 batteries and then used in the blast furnace. Furthermore, the gases generated in the Coke Oven are used to heat the boiler of the captive power plant. Due to advanced deterioration of the rail track foundation, the pusher car could no longer be operated at its designed speed and required frequent maintenance. The loss of productivity was approx. of 20%.

A detailed inspection of the existing rail track foundation showed that:
- the top part of the concrete foundation was completely damaged;
- some of the steel shifting plates were broken;
- some of the bolts were deformed due to shear action;
- there were some existing through and through cracks in the concrete foundation;

Project Requirements
From the owner perspective any shutdown period of the rail track due repair work had to be less than 15 hours to avoid a complete standstill of the steel plant (due to the discontinuation of supply of coke to the blast furnaces) and an immense cost related to the loss of production and the restart procedures. Hence the repair concept had to be worked out in such a way that after each repair sequence of 15 hours the pusher cart could move again over the just repaired section.

Sika Solution
The proposed repair concept included the following steps:
- removal of the rail track and steel shifting plates;
- removal of the loose / unsound concrete by chipping;
- injection of visible cracks in the lower part of the concrete foundation with Sikadur-53 UF;
- removal and replacement of steel rebars within the concrete foundation where required;
- removal and replacement of rail track fixing bolts where required;
- placement of permanent steel shuttering and fixing with threaded tie-bars;
- pouring of Sikadur-42 HES;

After an initial dry run, in each overnight repair session (13.5 hours) an average of 26m of rail track foundation was successfully repaired with the repair concept as specified by Sika.

Sika Products
- Sikadur-42 HES: high precision, low exothermic, pourable epoxy resin based grout
- Sikadur-53 UF: low viscous, epoxy resin based injection grout

Project Participants
Client: Visa Steel, Jajpur, Orissa
Applicator: Savcor India Pvt. Ltd, Bangalore
Initial condition of the rail track foundation.

Detail of spalled concrete at fixing bolt.

Removal of unsound concrete.

Initial condition of the rail track foundation.

Dismantling of rail track.

Cleaning of concrete substrate with compressed air.
Positioning of permanent steel shuttering.

Fixing of permanent steel shuttering with tie-bars.

Pouring of Sikadur-42 HES in multiple layers.

Finished pour of Sikadur-42 HES.

Job site overview.