A Project Report on Re-heating Furnace

by

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Under the guidance of

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सेल SAIL

STEEL AUTHORITY OF INDIA LIMITED

BHILAI STEEL PLANT

BAR & ROD MILL

Abstract

This project report presents a detailed account of the industrial training undertaken at the Bhilai Steel Plant (SAIL), with a primary focus on the Walking Beam Reheating Furnace located in the Bar and Rod Mill (BRM) section. The internship provided hands-on exposure to one of the most vital components in the steel manufacturing process—the reheating furnace, which plays a key role in heating steel billets uniformly before hot rolling operations. The furnace at BRM is designed with six distinct heating zones and equipped with 24 burners, which ensure efficient and consistent heat distribution. These burners operate on a combination of Blast Furnace Gas (BFG) and Coke Oven Gas (COG), supported by preheated combustion air supplied through a recuperator to enhance fuel efficiency and reduce energy consumption.

The walking beam mechanism, operated via a hydraulic system, ensures smooth, damage-free billet movement through the furnace by lifting and advancing the billets in a synchronized manner. The report also covers the automation and instrumentation systems used for temperature regulation, movement control, and process optimization. In addition, utilities such as nitrogen purging, steam circuits, cooling water systems, and instrumentation air supply are discussed. Emphasis is also laid on safety features including gas leak detection, emergency shut-off systems, and interlocking mechanisms that ensure safe and reliable operation of the furnace.

Overall, the internship offered valuable practical knowledge of integrated thermal, mechanical, and automation systems. It provided real-time experience in understanding the complexity of large-scale industrial operations, emphasizing the significance of efficiency, precision, and safety in steel production processes.

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सेल SAIL

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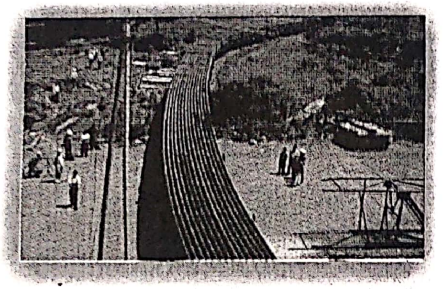
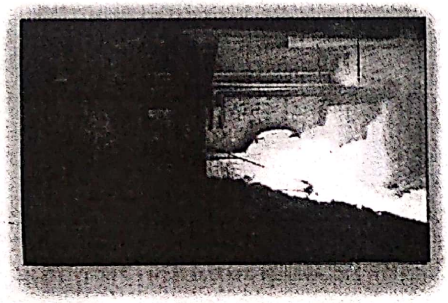
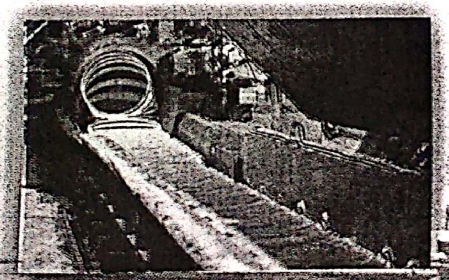
मानव संसाधन विकास विभाग
HUMAN RESOURCES DEVELOPMENT DEPARTMENT

प्रमाणपत्र
CERTIFICATE







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प्रमाणित किया जाता है कि श्री / कुमारी
This is to certify that Shri / Ku. *Akash Das Mahant*

सेमेस्टर विद्यार्थी — कालेज / संस्थान
Sixth Sem., student of *B.Tech (Mechanical)* of *GGV, Bilaspur* College / Institute

ने अवकाश कालीन प्रशिक्षु के रूप में दिनांक — से — तक प्रशिक्षण प्राप्त किया ।
has undergone project based training from *28/04/2025* to *24/05/2025*

प्रोजेक्ट
Project *Report on "Re-Heating Furnace"*

इस अवधि में उनका कार्य निष्पादन — रहा ।
His / her performance during the training period has been *Excellent*

भिलाई, दिनांक
Bhilai, Dated *24/05/2025*

24/05/25

प्रभारी (प्रशिक्षण)
Incharge (Training)

सुश्मिता पात्रा / Sushmita Patra
DM (HR-L&D)
SAIL (सेल) BSP (भि.इ.सं.)