

Tenova developed a new Flexible Modular Furnace (FMF) for JSPL in India

A great success for an EAF revamped into a “FMF base module” at JSPL’s Raigarh Steel Plant. An innovative technology that allows JSPL to reduce production costs while maintaining high performances

Milan, June 28, 2016 – Tenova, one of the world's major suppliers of technologies, advanced engineering products and services for the mining and metallurgical industries, has developed the new furnace concept, the **Flexible Modular Furnace (FMF)**, for **JINDAL Steel and Power Limited (JSPL)** Raigarh Steel Plant, in India.

This innovative technology is designed for steelmakers that currently use a significant amount of hot metal in their charge mix yet ready to move or return to scrap based steelmaking.

In the JSPL steel plant, the steelmaker converted the existing Electric Arc Furnace (EAF) into a Tenova FMF. Adopting the new Tenova technology, JSPL gained a saving on the production costs of around 15-18 USD per tons of steel, resulting in a year saving of approximately 15-20 million USD – achieving a ROI in less than 4 months. The same new furnace can easily produce 32 heats with 89% guaranteed yield, and has the potential of producing 36 heats with operation excellence. Moreover, it succeeded in producing 42 heats-through on November 14, 2015 - a world record!

The project was commissioned on August 31st and successfully completed in a short span of six months from the effective start of the project. With efficient planning and collaborative teamwork, the project was accomplished in just 10 days of Furnace Shutdown against 28 days as expected.

“This project shows the results of integrated cooperation between Tenova different centers of expertise: an international team of Indian, Chinese and Italian professionals perfectly synchronized brought an excellent result to the customer, who will benefit of our cutting edge technology. Furthermore, it represents a milestone for the launch of the FMF solution in the Asian market” said **Silvio Reali, Tenova Senior Vice President**.

Thanks to the extremely good performance - a mix of delivery, quality, price parameters - Tenova has been rated as “GRADE A vendor” by the customer, and obtained the Final Acceptance Certificate in a record time.

“Despite many challenges, Tenova fully accomplished the objectives of this project and the contractual schedule” said **Alessio Lorenzi, Tenova Project Manager**. “Our partner, JSPL, has greatly appreciated both the high technological content of our solutions and our professionalism, defining the whole a real added value. This success was also due to the great cooperation between Tenova professionals and the project & operation team of JSPL, a partner who demonstrated to share our same industrial vocation.”

The FMF solution is also suitable for those steelmakers that are looking for a transition from Basic Oxygen Furnace (BOF) to an EAF based steelmaking and for those EAF steel shops that aim to increase the hot metal percentage in their charge mix.

Tenova FMF is a modular concept of smelting furnace that can be developed from core equipment called base module with specific add-ons and has the flexibility of converting various charge mix of raw material (scrap, DRI, liquid hot metal, Pig Iron, etc.). Each module is designed with specific features in order to fit the requirements of the charge mix.

There are clear opportunities and application for FMF. Full range of metallic charges can be smelted with capital costs reduced to the minimum level. Flexibility is clearly the greater advantage of this solution for all the markets that are developing toward lower footprint steelmaking operations, and FMF fits certain specific charge mixes becoming even more convenient than classical solutions.

This project marks an important milestone in the launch of FMF in Asian markets. In India, high energy cost and inconsistent/poor availability of raw material has necessitated the industry to explore cost effective steel making methods. Alternative methods to build flexibility in furnace for charging different types of raw materials – such as the one offered by FMF – are the need of the hour, and very much essential to control the cost of steel. In China, FMF can be the first step for the modernization of Oxygen steel plants offering a smoother transition to the scrap era.