PRIMETALS TECHNOLOGIES

BLAST FURNACE NO.1 & NO.2

RASHTRIYA ISPAT NIGAM LIMITED, VISAKHAPATNAM STEEL PLANT, INDIA

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PROJECT HIGHLIGHTS OF REPAIR

Casthouse

- New casthouse equipment
- Sloping casthouse floor converted to flat round casthouse floor
- New runner system
- 5 new hot blast stoves across the both furnaces
- Davy 3 cone scrubber for gas cleaning

Instrumentation and Control

- Improved furnace top sensors
- New level 1 PLC
- Level 2 system of Primetals Technologies

THE CHALLENGE

To carry out a category 1 capital repair of blast furnace No.1 and No.2 at the Vishakhapatnam Steel Plant owned by Rashtriva Ispat Nigam Limited (RINL). The new production of the furnace had to be increased from 5,717 t/d to 7,150 t/d, while upgrading the existing ancillary equipment to meet requirements of a modern state-of-the-art blast furnace.

OUR SOLUTION

The focus of the repair was to increase the output of the furnace while maintaining large parts of the existing shell and upgrading the ancillary plants to meet the demands of the new modern blast furnace.

By utilizing latest thin stave technology and modern refractory design the furnace volume was increased to allow the demands on furnace production to be achieved.

Modernisation of all major blast furnace units e.g. stoves, stockhouse and gas cleaning plant was carried out by Primetals Technologies from conceptual design to final commissioning of the units. These new units needed to be uprated to be able to handle the higher throughputs generated by the production increase.

Both turn-key projects were completed with zero lost time incidents. This could only be met with the implementation of a strong permit-to-work system and close management of the construction and commissioning teams. It was a smooth furnace start up that was carried out by working closely with the clients operations team.

Successful shut downs were completed in July 2014 and October 2017 for blast furnace No.1 and blast furnace No.2 respectively.

SCOPE OF DELIVERY

- Conceptual design of blast furnace complex
- Full detail engineering and supply for category 1 capital repair equipment
- Engineering and supply of key equipment for furnace modernization
- Construction and commissioning responsibility

RINL Vizag Blast Furnace No.1 blow-in

Modernised RINL Vizag Blast Furnace No.1

STOCKHOUSE

- Automated stockhouse
- New weighing system
- Coke moisture monitoring

HOT BLAST STOVES

- Five new stoves (across both furnaces)
- Blast humidification system

BLAST FURNACE

- Tuyere shell replacement
- Remaining shell repaired as necessary
- Complete new furnace internals including carbon hearth and staves (copper and cast iron)
- New wind distribution system
- New cooling piping installation
- New top charging system
- Centre coke charging

CLEAN GAS SYSTEM

- Davy 3 cone scrubber
- New dustcatcher discharge system
- Gas analysis system

FURNACE DESIGN PARAMETERS

Average production	7,150 t/d
Peak production	7,865 t/d
Furnace hearth diameter	12.14 m
Furnace working volume	3,416 m^3
Furnace inner volume	3,891 m^3
Top gas operating pressure	2.44 bar g
Blast pressure at furnace	4.59 bar g
Normal productivity on inner volume	1.84 $tHM/d/m^2$
Normal productivity per hearth area	61.77 $tHM/d/m^2$
Number of tuyeres	32 off
Number of tapholes	4 off

Primetals Technologies Ltd
A joint venture of Mitsubishi Heavy Industries and partners

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