PAUL WURTH

SMS group

SIDMAR, Belgium

Reline of Blast Furnace "A"
2003

Blast Furnace Constructions, Rebuilds & Relines

Project Description

Introduction

Sidmar (Ghent, Belgium) is an integrated coastal steel works, located on the west bank of the Ghent-Terneuzen canal. Sidmar forms part of the flat carbon steel sector of Arcelor.

With its restart taking place on 26 June 2003 - after a shut-down period of 90 days – the blast furnace 'A' at Sidmar has begun its fifth campaign since its first blow-in in 1968.

Paul Wurth achieved an excellent reference, by using a sound mixture of proven and innovative technologies. Paul Wurth developed top services build on its experience in the field of blast furnace technologies, its high quality equipment helped again to conclude the project on schedule.

With the completion of the reline, the BF 'A' has begun a new fifteen-year campaign. Together with BF 'B' modernised in 2001, the Sidmar site will ensure for the future a high hot meal production, satisfying the present requirements.

The Challenge

The goal of this reline was to increase the furnace to its utmost, while maintaining the existing tower structure, in order to increase the production from 5100 to 7300 tons of hot metal per day. The hearth diameter of BF 'A' has been enlarged for the second time: passing from 9 m to 10 m in 1972, it reaches today 11.4 m. Such an increase of the hearth volume was possible by installing horizontal copper staves of 80 mm thickness only, a world's first achievement.

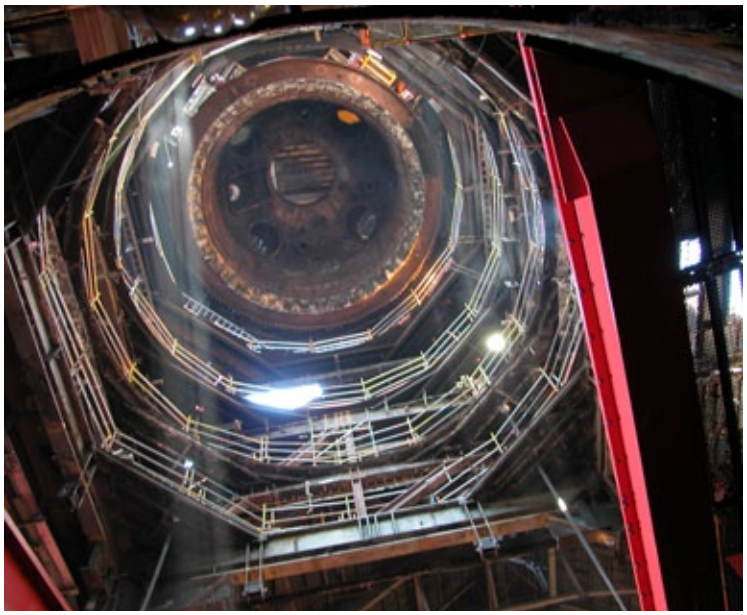
In all, 11 rows of **copper staves** and 8 rows of **cast iron staves** have been provided by Paul Wurth. Even the throat armour was replaced by a row of staves.

The **erection of the shell** was achieved by assembling 6 elements with pre-installed staves. These elements were lifted by jacks whose cables were fixed to the Bell Less Top® platform. To do so, important reinforcements had to be mounted to the existing tower structure.

Regarding the **blast furnace cooling**, Paul Wurth established the general and detailed flow sheets, the pipework layout as well as the isometrics of the rigid connections in the hearth and the water inlets of the staves in the tuyere stock area.

At the **stockhouse** level, the study on the global modification of the skip pit, due to the production increase of the furnace, was achieved. The hoist ramp, the winch and the skip cars have been replaced by devices adapted to the new requirements.

The blast furnace shell preparation area



Shell mounting

Project Data

Project overall duration (incl. basic engineering)	:	16 months
BF shutdown	:	89 days
Blow-in date	:	June 26th, 2003

The BLT® hoppers

Blast furnace gas cleaning

Blast Furnace Data

Hearth diam.	:	10 m	→	11,4 m
Daily production	:	4700 t	→	6100 t
Tape holes	:	2	→	2
Number of tuyeres	:	26	→	28
Useful volume	:	1776 m^3	→	2550 m^3
Total volume	:	2138 m^3	→	3265 m^3

As for the **gas cleaning**, certain modifications brought to the dust extraction led to the fact that the dustcatcher as well as the cyclone had to be raised by about 5 m and that the floors had to be modified in order to meet the new needs.

In the **slag granulation plant**, Paul Wurth has been charged to replace the two former granulation tanks (slurry hopper type) by water granulating tanks.

In the context of this reline, Sidmar also ordered two new hydraulic-driven **drilling machines** with pneumatic drill of the soaking bar type, similar to those installed in 2001 at BF 'B'. On the side of the second taphole, TMT* has developed a new "cam-equipped" guiding rod system, enabling a higher slewing flexibility of the chain feed. The slewing mechanisms of the **clay guns** were replaced by new standard TMT systems. Moreover, both suction hoods of the taphole have been changed and replaced by the Düsenplatte™ system, operating already since 2001 on BF 'B'.

Regarding the **Bell Less Top®** unit, Paul Wurth has supplied a new tilting hopper adapted to the skip volumes as well as a new valve casing and two new chutes. The transmission gearbox has also been reconditioned in our workshop.

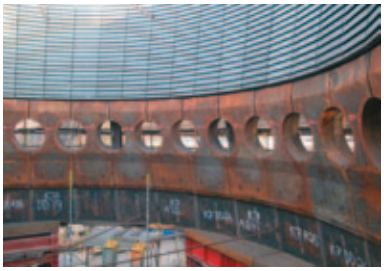
Services

- The blast furnace in general
  - Blast furnace profile,
  - Stave layout
  - Blast furnace instrumentation
  - Skip ramp, winch and cars
  - Bell Less Top® structure
  - BF shell
  - Square tower
  - Cooling circuits
  - Hot blast main and bustle pipe
- The erection concept
- Stock house
- Gas cleaning

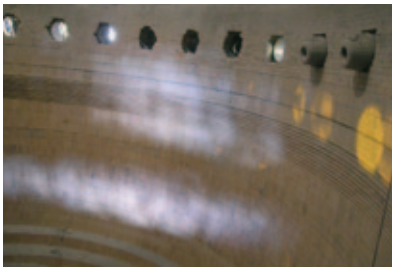
Supplies

- Copper and cast iron staves
- 2 INBA® granulation tanks with stack
- 2 hydraulic taphole drills and 2 new slewing units for clay gun.
- Bell Less Top® system:
  - Tilting receiving hopper
  - Revamping of the BLT® unit
  - BLT® distribution chutes
  - 3 skip cars

The skips in operation



Shell and staves premounting



BF hearth refractory

Technical Highlights

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*TMT – Tapping Measuring Technology, a joint company of Dango & Dienenthal and Paul Wurth.