

## Scope of Supply

Ingeteam Power Technology, S.A, Industrial Systems Division is responsible for the complete turnkey electrical project, with a 18 MVA installed power, comprising:

- Project management
- Basic and detail engineering
- Supply of:
  - ✓ External substation 60/20 kV
  - ✓ Medium voltage switchgears 20 kV
  - ✓ Power transformers
  - ✓ Power factor compensation equipments 34.5 kV
  - ✓ Low voltage distribution centre
  - ✓ Main motors - manufactured by INDAR -
  - ✓ Main DC drives - MOTOCON DC\*
  - ✓ AC auxiliary drives - MOTOCONAC\*
  - ✓ AC Motor control center.
  - ✓ Field sensors
  - ✓ UPS and auxiliary control voltage distribution
  - ✓ Control desks and local panels
  - ✓ Integrated control equipment SISTEAM OCS\*
  - ✓ Control and supervision equipment OPERATOR OCS\*
- Electrical installation supervision.
- Commissioning.

(\*) The SISTEAM OCS, MOTOCON DC, MOTOCONAC, OPERATOR OCS are equipment designed and manufactured by Ingeteam Power Technology, S.A, Industry Division - Steel Solutions.



Kinematic Entry - Furnace Exit

## After-Sales Services

- 24-hour / 365-day Hotline service
- Spare parts in 24 hours
- Technological improvements
- Direct line with our technical staff
- Remote communication from our offices to the factory automation network.

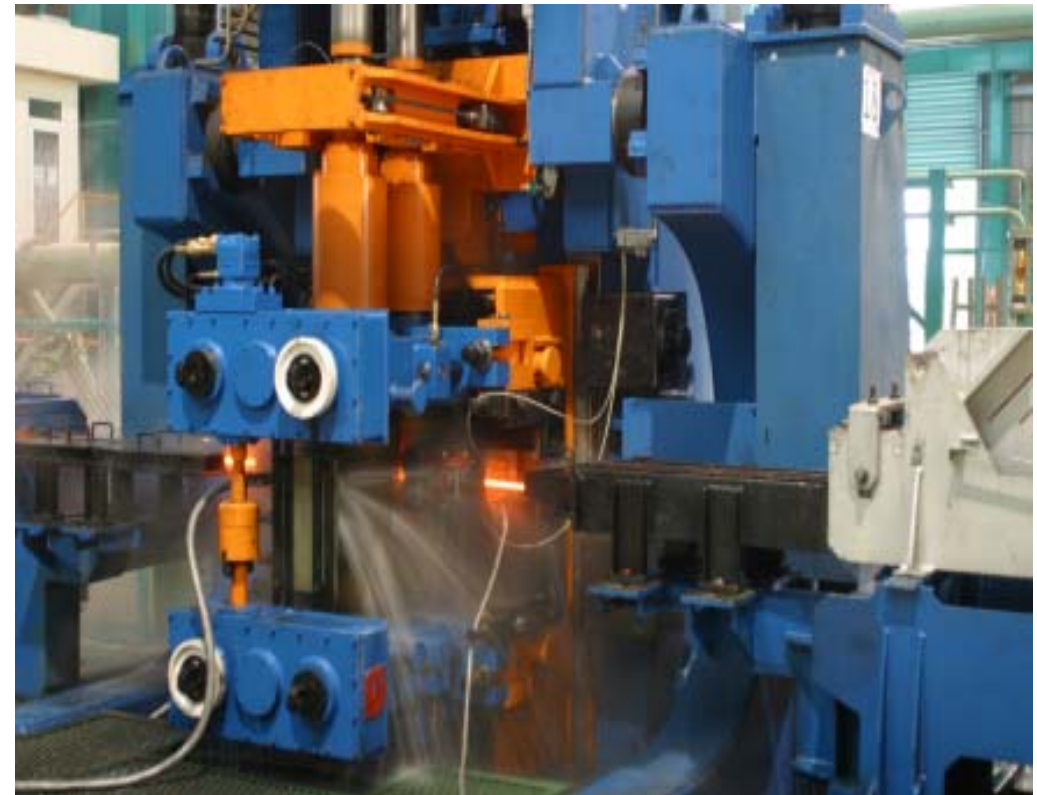


Furnace General Overview

# Ingeteam

Bar and Wire Rod Mill

ACIERIE DE L'OUEST - M'SILA (Algeria)



[www.ingeteam.com](http://www.ingeteam.com)  
[industry@ingeteam.com](mailto:industry@ingeteam.com)

# Ingeteam

**Ingeteam**

Industry

## Process Description

During the first trimester of 2004 Acierie de L'Ouest located in Algeria placed an order, with Bascotecnia Steel, for the turnkey supply of a Bar, Small Profiles and Wire Rod Rolling Mill. With a rolling capacity of approximately 450.000 T/year, depending on the "product mix" selected.

- Ingeteam Power Technology, S.A, Industrial Systems Division was selected as the main supplier of the electric and automation equipment to be installed in said plant, including the following main sections:
  - 60/20 kV Outdoor Electrical Substation, with 2 incoming feeders, bus-tie switch and outgoing supply to transformer. Control, remote control and remote tripping connected to Sonelgaz.
  - 20/0,4 kV Indoor Electrical Substation, power distribution and power factor correction at 20 kV.
  - AC and DC equipment, drive equipment with corresponding motors, digital technology DC thyristor converters for the mill stands and shears main drives. AC/AC converters for variable speed auxiliary drives.
  - Automation Systems: Control PLC's, remote I/O units, HMI operator stations, control desks.
  - Auxiliary equipment: field sensors, etc.
- Commissioning is scheduled for the first half of 2006.
- The Integrated Control System topology is configured as a flexible distributed control incorporating PLC's, I/O's remote units, operator stations and HMI displays, interfaced through an industrial TCP-IP Ethernet network of 100 Mb/s and local networks type INTERBUS, PROFIBUS, etc.

The control systems incorporate state-of-the-art Pentium processing units with high dynamic response designed to suite the process requirements.

The master speed control system (master mill) is a dedicated PLC that calculates the speed references for each one of the continuous rolling mill's drives (stands, pinch-roll, shears, roller tables, etc). This system executes the following main control functions:

- Speed reference for stands / other motors
- Minimum tension between Rolling Mill Stands
- Regulation of loop position between stands
- Impact speed reference
- Speed reference in jogging mode (slow)
- Master speed reference
- Speed adjustments in simple or cascade mode
- Continuity control between stands
- Control of dummy bar (testing)
- Elaboration of cutting commands (trimmings, cut to length)
- Cut optimization

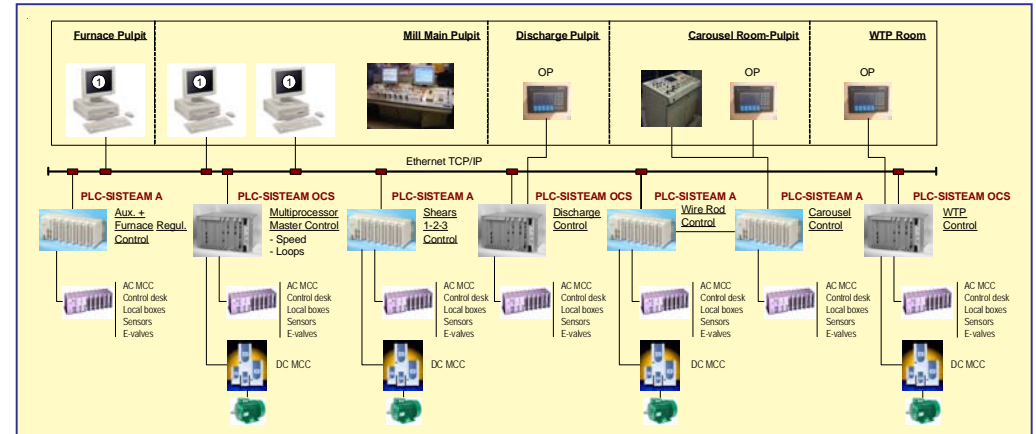
## Technical Features

- Type: Continuous Mill of 18 mill stands, an outlet to cooling bed and bar evacuation and a second outlet to wire rod block and coils carroussel. The mill is composed of:
  - ❖ 1 Heating furnace of 80 Tn/h
  - ❖ 6 Roughing mill stands 3H & 3V
  - ❖ 6 Intermediate mill stands 3H & 3V
  - ❖ 6 Finishing stands 3H & 31+V
  - ❖ Cutting shears
  - ❖ Outlet roller table, cooling bed and bar evacuation system
  - ❖ Wire rod block, laying forming device, lay cooling R.T and coil carroussel handling.
- Supplier: Bascotecnia Steel, mechanic equipment by Lagun Artea and electrical equipment by Ingeteam Power Technology, S.A., Industrial Systems Division.
- Incoming material: Square
  - ❖ 120 x 120 x 12000 mm
  - ❖ 130 x 130 x 12000 mm
  - ❖ 140 x 140 x 12000 mm
- Finished product:
  - ❖ Bar: 8 to 20 mm, diameter
  - ❖ Profile: IPE 80 to 100
  - ❖ Wire rod: 5,5 to 8 mm
- Product length:
  - ❖ Bars and profiles: 6, 8, 10 and 12 mts
  - ❖ Rebars (corrugated): 12 mts
  - ❖ Wire rod: 2 ton max
- Product speed:
  - ❖ Bar: 12 m/s
  - ❖ Wire Rod: 80 m/s (5,5 mm)

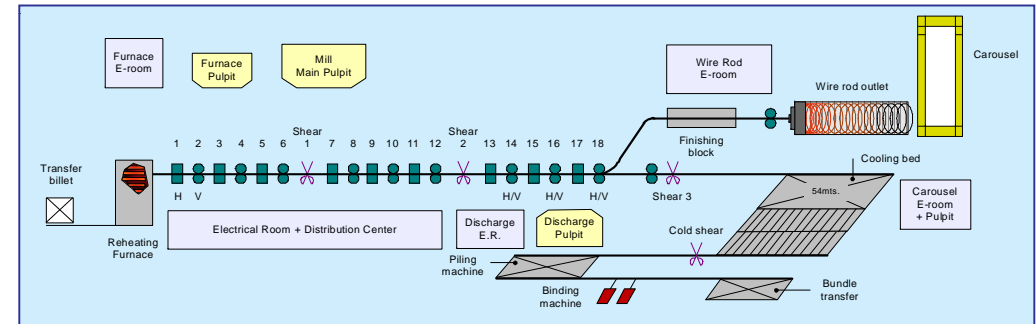


Main Control Pulpit

## Control Diagram



## Mill Lay-out



## Power Distribution Single Line Diagram

