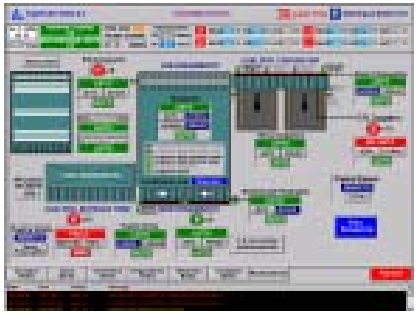
Scope of Supply

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:
  - ❖Medium voltage switchgears 22 kV (basic engineering).
  - ❖Power transformers (basic engineering).
  - ❖Power factor compensation equipments 22 kV.
  - ❖Low voltage distribution centres.
  - ❖Main motors - manufactured SIEMENS.
  - ❖Main DC drives - SIMOREG DC.
  - ❖ AC auxiliary drives - MICROMASTER AC/AC.
  - ❖AC Motor control centres.
  - ❖Field sensors.
  - ❖UPS and voltage distribution.
  - ❖Control desks and local panels.
  - ❖Integrated control equipment SIMATIC S7-400.
  - ❖Control and supervision equipment OPERATOR OCS.
- Electrical installation supervision.
- Commissioning.

Mill's Main Pulpit



Entry/Exit - Furnace's Kinematic

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's General Overview

Ingeteam

Bar and Wire Rod Mill

YNNA STEEL - CASABLANCA (Morocco)

www.ingeteam.com
industry@ingeteam.com

Ingeteam

Ingeteam
industry

Process Description

During the second half of 2006 Ynna Steel, located in Casablanca (Morocco) placed an order with Bascotecnia Steel, for the turnkey supply of a Bar and Wire Rod Rolling Mill. With a rolling capacity of approximately 370,000 Tn/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:

- 22/0,4 kV Indoor Electrical Substation, power distribution and power factor correction at 22 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 2008.

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 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:

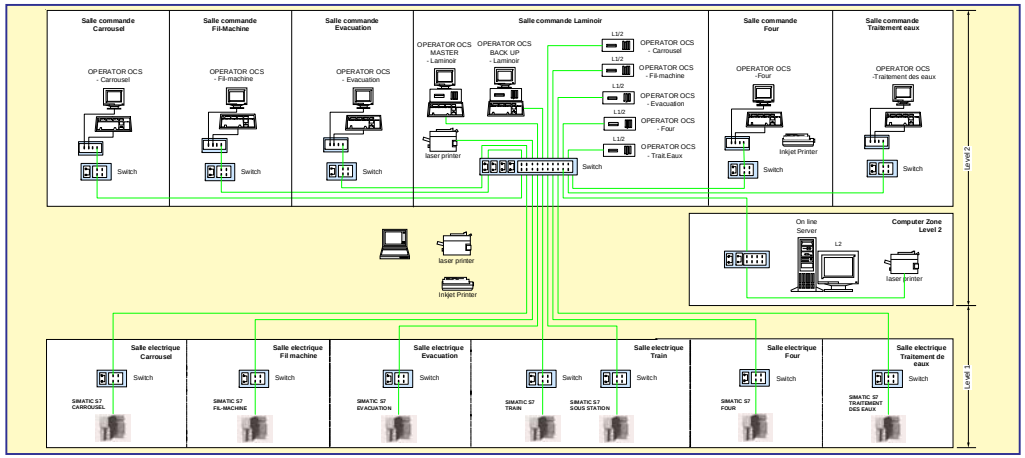
- Speed reference for stands / other motors.
- Minimum tension between Rolling Mill Stands.
- Regulation of loop position between stands.
- Impact speed reference..
- Speed reference in jogging mode (slow).
- Master speed reference.
- Speed adjustments in simple or cascade mode.
- Continuity control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

Technical Features

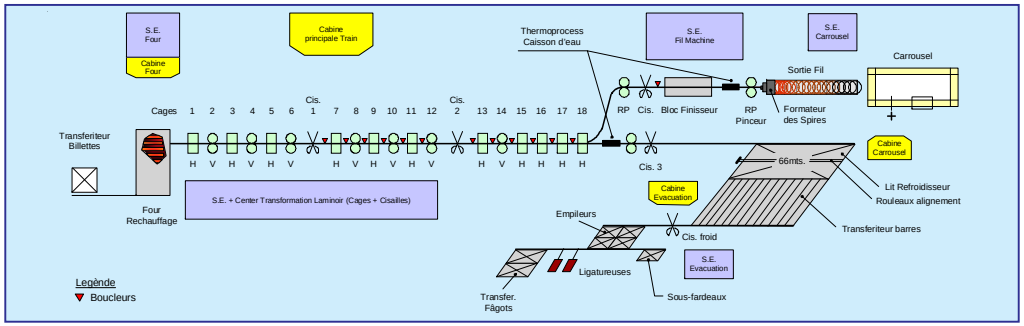
- Type: Continuous Mill of 18 Mill Stands, an outlet to cooling bed and bar evacuation and a second outlet to wire rod block and coils carroussel. The Mill is composed of:
  - 1 Heating furnace of 80 Tn/h
  - 6 Roughing mill stands 3H & 3V
  - 6 Intermediate mill stands 3H & 3V
  - 6 Finishing stands 5H & 1V
  - 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, mechanical equipment by Lagun Artea and electrical equipment by Ingeteam Power Technology, S.A., Industrial Systems Division - Steel Solutions.
- Incoming material: square
  - 150 x 150 x 12000 mm
- Finished product:
  - Bar: 8 to 32 mm, diameter
  - 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/sg

Evacuation Pulpit

Control Diagram



Mill Lay-out



Power Distribution Single Line Diagram