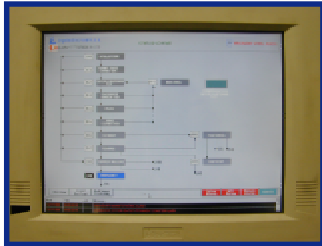


Scope of Supply

Ingeteam Power Technology, S.A., Industrial Systems Division was responsible for the complete turnkey electrical project:

- Project management
- Basic and detail engineering
- Supply of:
 - Main motors – manufactured by **INDAR (Ingeteam Group)**
 - Break-down mill drive - MOTOCON DIRECT*
 - Auxiliary DC drives - MOTOCON DC*
 - Auxiliary AC drives - MOTOCON AC*
 - Low voltage distribution center
 - AC motor control centre
 - Field sensors and peripherals
 - UPS and auxiliary voltage distribution
 - Control desks and local panels
 - Integrated control systems - SISTEAM M*
 - Control and supervision equipment - OPERATOR MT*
- Installation supervision
- Commissioning

(*) The MOTOCON DIRECT, MOTOCON DC, MOTOCON AC, SISTEAM M and OPERATOR MT is equipment designed and manufactured by Ingeteam.



Main Drive Control Mask



Duo Stand Main Drive Motor

After-Sales Services

- Hotline
- Spare parts in 24 hours
- Direct line with our technical staff
- Remote communication from our offices to the factory automation network



Auxiliaries' Drives



Duo Stand Main Drive Control

Ingeteam

TWO HIGH STAND

ARKANSAS STEEL ASSOCIATES ASA
(Arkansas - USA)



Process Description

In 1998, the BASCOTECNIA Group placed an order to **Ingeteam Power Technology S.A., Industrial Systems Division**, for two different projects:

- The complete supply of the Electrical Equipment and the Basic Automation for the Break-Down Mill
- The extension of Three Vertical Stands for the Continuous Mill

These projects are intended for the existing installation of Arkansas Steel Associates (A.S.A.) in Newport (U.S.A.), which is a leading manufacturer of supports for railroad rails with a wide range up to 35 different types.

The revamped installation consists of a bloom transfer from the furnace exit to the roller table, material transport to roughing stand through roller tables, break-down mill driven by a direct coupling synchronous motor, mill stand auxiliary systems, such as, screwdown, guide adjustment and bloom manipulator, cassette extraction, roller tables up to the CV1 vertical stand, cross transfer vertical stands CV2 and CV3, evacuation roller table, press and shear.

Ingeteam Industry scope of supply included the electrical drives, the automation and the complete commissioning of the mill.

The Break-Down Mill drive consists of a 12 poles synchronous motor of 2,200 kW, 0-50/100 rpm at 950 Vac, controlled by the cycloconverter MOTOCON DIRECT based on four-quadrant thyristor power units and digital control.

Vertical Mill Stands features: AC squirrel cage motors driven by frequency inverters MOTOCON AC type, connected to a common DC bus with regenerative feeding to the network during braking maneuvers.

The mill automation was implemented by PLCs, SISTEAM M type, with several rapid-response CPU cards, OPERATOR MT type, and operation and visualization supervision systems HMIs, integrated into a single industrial ETHERNET network.



Auxiliary Drivers



Manipulator and Guides

Technical Features

- Mill Type: **Break-Down Mill**
Extension of Three Vertical Stands

- Main Contractor: BASCOTECNIA Group (Lagun Artea)

- Entry Material: Blooms

Maximum dimensions: 460 x 230 x 7,800 mm

- Break-Down Mill Stand:

- + Number of passes: up to 27
- + Maximum diameter: 1,000 mm
- + Nominal diameter: 800 mm
- + Working diameter: 750 mm
- + Roll wide: 2,200 mm
- + Upper roll height adjustment: 570 mm max.
- + Lower roll height adjustment: 125 mm max.
- + Motor power rating: 0-2,200/2,200 kW
- + Motor speed: 0-50/100 rpm (direct coupling)
- + Max. mill speed: 5 m/seg. (approx)

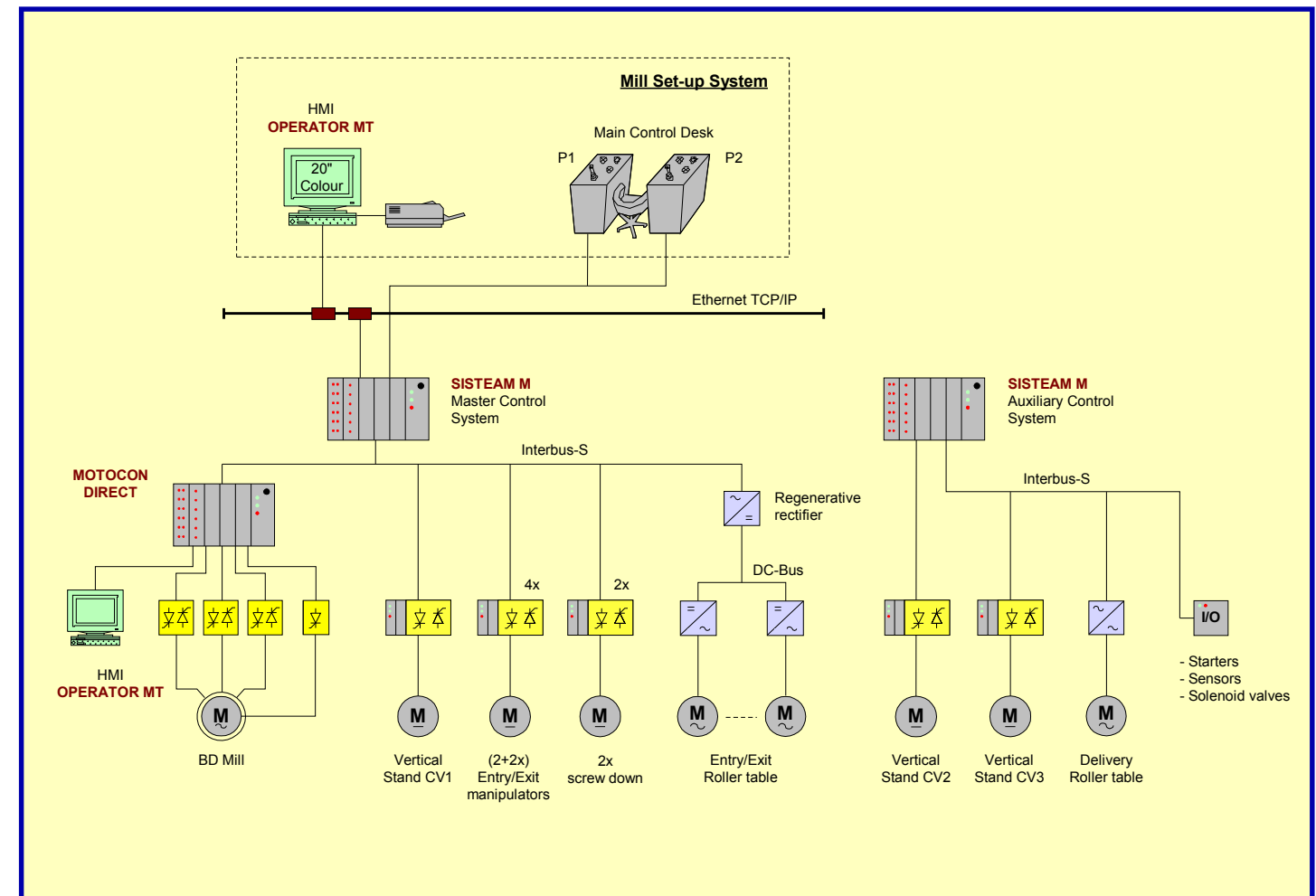
- Break-Down Mill Auxiliaries:

- + 2 electrical DC drives for upper/lower screwdown
- + 4 electrical DC drives for entry/exit guides
- + 1 electrical AC drive for tilter

- Vertical Stands:

- + Cartridge type
- + Maximum diameter: 545 mm
- + Minimum diameter: 500 mm
- + Working diameter: 520 mm
- + Roll wide: 700 mm
- + Axial and height adjustment: hydraulic
- + Pinion gearbox
- + Motor power:
 - 1x DC motor of 350 kW (CV1)
 - 2x DC motor of 220 kW (CV2-3)
- + Motor speed: 0-800/1,600 rpm

Automation Control Diagram



Mill Lay-out

