Nidec
All for dreams

Project Summary

Project: Cycloconverter control upgrade
Application: Automation and control system design and installation

Nidec's Role

An Italian steel manufacturer chose Nidec Industrial Solutions to design and install an automation and control system for a cycloconverter modernization project.

Scope of Suppy

• ARTICS Control System cabinet
• Automation PLC porting activities
• System and installation engineering
• Erection and commissioning
• Project documentation and training

The challenge:
To upgrade and automate the cycloconverter in an Italian steel company's hot strip mill

An Italian steel company wished to replace the original analog control system in its hot strip mill's cycloconverter with a new, state-of-the-art digital control system. The cycloconverter – a Nidec SILCOVERT C drive originally commissioned in 2001 - powers the Nidec synchronous motor that drives the mill's slab sizing press. This cycloconverter was originally selected because it provides the high-power, relatively low variable frequency three-phase currents needed to operate the variable speed motor used to power the press.

The steel company wanted to install and commission the new automation and control system with the motors left in place during a planned outage. It selected Nidec Industrial Solutions to perform the turnkey assignment.

The solution:
ARTICS automation and control systems

While operationally obsolete, the 15-plus-year old cycloconverter in the hot strip mill still had significant life remaining. Nidec improved its long-term performance with a state-of-the-art ARTICS control system.

Nidec's services included system and installation engineering, system erection, commissioning the Automation PLC Porting and training staff on the system's operation. The completed system today provides stable and reliable performance, while working near the cycloconverter's maximum admissible frequency – 20.66 Hz.

The new ARTICs control system offers multiple advantages over the older analog system:

Original Control System	ARTICS Control System
Distributed configuration, with 5/8 CPUs	Centralized configuration with 1 CPU
20 MHz CPU Clock Frequency	400-500 MHz Clock Frequency
Customized electronic cards	Commercial and customized electronic cards
Keypad controls	Panel PC controls
1 PC connection	Ethernet connection accessible by multiple PCs
Control source code in 80C166 assembler	Control source code in Visual C++ and ISAGRAF
Diagnostic with low-performance MS-DOS-based HMI	Diagnostic with high-performance Visual Basic HMI
No event analysis	Event analysis using external software tool, ArtTD Viewer