TURNER ENGINE CONTROL SOLUTIONS

WOODWARD Business Partner

August 2019

Turner ECS Case Study

PROCESS CRITICAL COMPRESSOR CONTROL UPGRADE

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Turner ECS Case Study | Process Critical Compressor Control Upgrade | Petrochemical Production Facility

Background

Turner ECS was invited by SABIC to perform a control system upgrade at their petrochemical production facility in the south of The Netherlands. The facility produces raw materials for the production of various plastics from refined petroleum.

Process-Critical Application

The control system is located at the heart of the facility, controlling one single extraction and one double extraction steam turbine, each driving a process-critical compressor. The originally supplied triple redundant Netcon FT control system, consisting of four chassis plus an additional distributed I/O network, has been successfully upgraded to a kernel-based single chassis MicroNet TMR by using high density I/O cards. All in all resulting in a more compact system without compromising functionality and reliability.

Hydraulic Skid Simplification

By replacing the individual I/H converters by CPC-DX skids the hydraulic control system has been greatly simplified. Each CPC-DX skid consists of two I/H converters which are high signal selected by a mechanical ball valve. The CPC-DX skid provides a compact solution and replaces the old system where a PLC was used to control complementory Maxseal valves to switch between I/H converters.

RETROFIT PROJECT

PROJECT HIGHLIGHTS

- Process critical application
- Controlling five steam valves on two turbines
- Simultaneous speed and pressure control
- Flexible redundancy

IMPROVEMENTS

- CPU upgrade
- Number of chassis reduced from 4 to 1
- Number of I/O cards reduced from 39 to 16
- Removed LinkNet distributed I/O network
- Two-line LCD display replaced by touch-screen HMI
- Individual I/H converters replaced by CPC-DX dual transfer skids

FACT SHEET

Turbines:	ABB VE50 ABB VEE50
Driven Load:	Compressors
Customer:	SABIC
Industry:	Petrochemical
Location:	Geleen, NL

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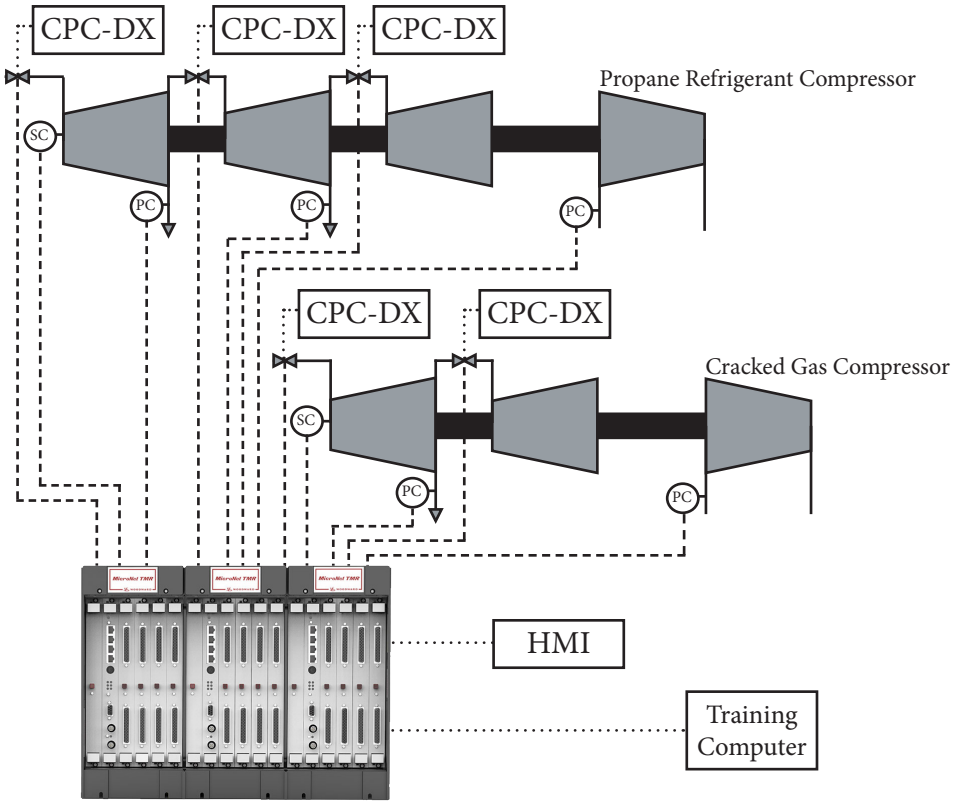
Simultaneous Speed and Pressure Control

The main goal of the control system is to regulate the suction pressure of both compressors. The suction control occurs by means of a cascade controller which works in series with the speed controller. In addition, the extraction pressures are being regulated and the control system is responsible for a controlled start-up procedure, ensuring even warm-up, preventing thermic stress and avoiding running at critical speeds.



Flexible Redundancy

Safety critical functionality like speed measurement and the master trip circuit, as well as the central processing units and internal power distribution, perform on a triple modular redundant level with the remaining I/O performing on a dual redundant level, showcasing the flexibility of the MicroNet TMR system.

Interface Modernization

To achieve a more user-friendly operator interface, the monochrome LCD based two-line display was replaced by a full colour touch-screen HMI mounted in the cabinet door. Woodward Toolkit was used to create a graphical interface to ensure effortless communication with the control system for both operators and maintenance engineers.

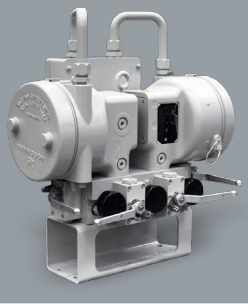
HARDWARE USED

WOODWARD MICRONET TMR

- Speed Control
- Extraction Pressure Control
- Suction Pressure Control
- Touchscreen HMI

WOODWARD CPC-DX

- Redundant I/H converters
- Dual transfer skid
- High tolerance to dirty oil



HARDWARE REPLACED

WOODWARD NETCON FT

WOODWARD CPC

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Turner Range of Services

LSTK Projects, Retrofits & Upgrades
Turner ECS delivers reliable retrofit solutions for a wide range of prime movers and other applications. This includes lump sum turnkey projects on turbines and compressors.

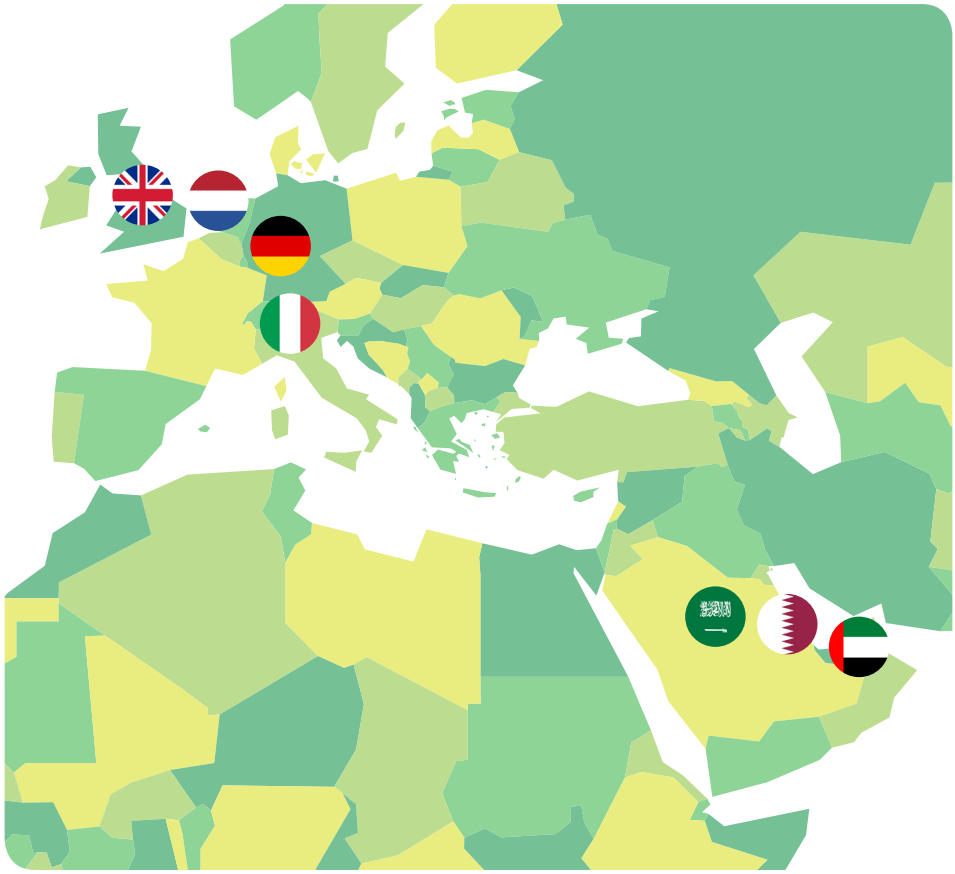
Genuine Parts & Service Exchange
Turner ECS has the largest stock of parts, service exchange governors and electronics in Europe and can provide a fast turnaround service.

Product Training
Turner ECS can provide official Woodward product training covering both theoretical and practical training on a wide range of Woodward products.

Electronic Repair & Mechanical Governor Overhaul Service
Turner ECS provides a comprehensive overhaul and repair service for electronic, mechanical and hydraulic governors.

World Wide Field Service
Turner ECS field service engineers and technicians provide comprehensive solutions for commissioning and on-site repair.

Service Contracts
Turner ECS provides long term service contracts to support users with Woodward governors and/or control products and electronic control systems.



ROTATING EQUIPMENT CONTROL SOLUTIONS DELIVERED ACROSS EUROPE & THE MIDDLE EAST

Turner ECS is an official Woodward Channel Partner with offices located in:

- The Netherlands
- England
- Germany
- Italy
- Abu Dhabi
- Qatar
- Saudi Arabia

Turner ECS also operates and manages an extensive network of official agents throughout Europe & the Middle East

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