TNT Crust reduces energy consumption by enhancing refrigeration control with Movicon.NExT™ SCADA software

RESULTS

- Modernized and optimized refrigeration
- Reduced energy consumption
- Remote monitoring and timely notifications prevent downtime
- Intuitive and easy to use graphical interface

APPLICATION
Supervisory control and data acquisition for refrigeration system.

CUSTOMER
TNT Crust - Green Bay, Wisconsin, USA

TNT Crust annually produces 200 million refrigerated and frozen pizza crusts for frozen pizza manufacturers, national chains and food service distributors worldwide.

CHALLENGE
TNT Crust wanted to update its ammonia-based refrigeration systems that were installed in 1994. If not managed correctly, cooling systems can consume a lot of electrical power, add unnecessary wear and tear to the equipment, and potentially become a safety hazard — all of which can reduce production and increase costs if the systems become inoperable. In addition, mechanical timers, sequencers, and manual controls require constant intervention.

SOLUTION
Industrial refrigeration specialist Bassett Mechanical was asked to modernize the existing system and apply industrial automation concepts that would optimize the system. Programmable automation controllers (PACs) and programmable logic controllers (PLCs) were implemented and offer full control of the plant's engine room and various system components throughout the facility.

Emerson's Movicon.NExT was selected as the supervisory control and data acquisition (SCADA) software for the refrigeration system. Movicon.NExT communicates to the PLCs via the software's native EtherNet/IP driver. The PACs and PLCs control and sequence the large ammonia refrigeration compressors, system pumps and condensers, monitors and controls the ambient temperature of various rooms within the plant and provides individual evaporator management, including scheduled defrost control.

> *"Emerson's Movicon.NExT software has excellent features that allows us to manage processes in a manner consistent with our customer's unique needs."*
>
> **Brad Nutting**
> PLC controls manager, Bassett Mechanical

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The upgraded control system can more effectively stage resources as the load requires, resulting in an overall reduction in electrical power consumption and equipment wear and tear, and improved safety as maintenance personnel can view the entire system through an easily navigated graphical application.

The Movicon.NExT software provides operators with an intuitive graphic representation of the entire refrigeration system and information including setpoint control and alarms. An Alarm Dispatcher feature allows the system to be monitored remotely, sending alarm notification emails to the remote service support providers, to notify the on-call staff in a timely manner of any anomaly or failure in the system.

The supervision system collects and stores data in a Microsoft SQL Server Express 2016 database. Movicon.NExT allows the examination of the system data with trends, reports, and data analysis tools embedded in the platform. The alarm management tool stores alarm records in the database for statistical and chronological analyses, helping to understand possible improvements and plan maintenance.

RESOURCES
Programmable Automation Controllers
www.Emerson.com/PACSystems

Movicon
www.Emerson.com/Automation-Software

"If the plant experiences an ammonia or refrigerant leak or high-pressure condition, the alarm dispatcher feature of Movicon.NExt enables plant personnel to be notified immediately while off site and take necessary actions to remedy the problem, avoiding costly shutdowns and loss of time."

Brad Nutting
PLC controls manager, Bassett Mechanical

The architecture of the plants refrigeration control system

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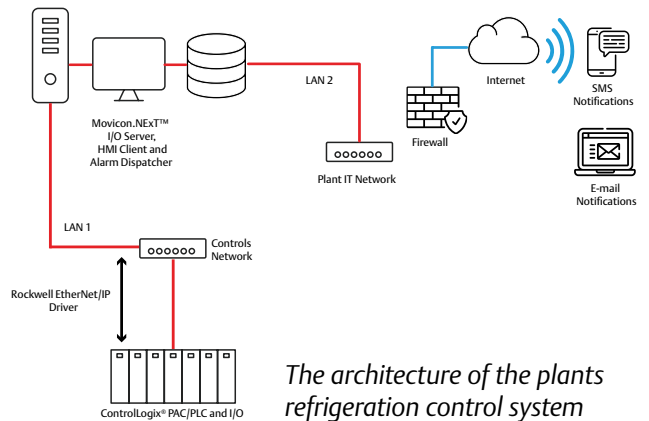No.43 Electronics City Phase I,
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