

FUTURE

Driving the optimization of infant formula

Yashilli Dairy Factory
Pokeno, Waikato, New Zealand



New Zealand's newest infant formula production facility - the China-owned Yashili plant at Pokeno – uses Schneider Electric process control technology to optimize the manufacturing of six different products.

The \$200 million facility began operating earlier this year. Measuring some 30,000m², it produces six types of infant formula for export to China, each requiring different recipes with specific ingredients. At full production the plant will have an annual capacity of around 52,000 tonnes.

Auckland's GEA designed the plant and its process engineering infrastructure, and to meet the brief Schneider Electric's team presented a variety of technology options and advice for the different plant segments, allowing GEA to select an overall, optimum solution.

Technology supplied includes the components for harmonics mitigation, medium-voltage switchgear, the MCC and its switchgear, distribution boards, a SCADA system (Wonderware), PLCs, HMIs and a UPS and different-sized VSDs for motor control.

Kerry Morrison, the plant's Services Manager says the manufacturing process involves reconstituting powder back into milk, mixing it with ingredients such as whey, lactose, oils, vitamins and minerals to make the infant formula products – and then re-drying these in the plant's 8.5 tonnes-an-hour dryer.

"Manufacturing six sophisticated products in the same facility – each with a different recipe – demands great accuracy in terms of mixing ingredients in the right quantities, especially as the entire process is fully-automated.

Goal

Develop a state of the art infant formula production facility

Solution

Schneider Electric M580 PLCs, LV equipment, variable speed drives, power quality solution

Story

A multi-million dollar state of the art facility development project which tied together the process engineering and technology requirements of multiple plant segments.

Results

- A unique sitewide diary solution in Pokeno, Waikato, provided by main contractor GEA Process Engineering

“From a process control perspective an infant formula plant is fairly complex. The flexibility required for quickly switching between different recipes added significantly to the number of I/O, for example (it’s around 7,200). We also needed some 170 variable speed drives to manipulate and synchronise the various processes around the plant.”

To cope with the additional level of complexity, the plant uses eight of Schneider Electric’s new generation M580 PLCs. Not only are they equipped with much faster processors, they also boast a much smaller footprint than their predecessors.

Speedy PLCs allow the plant to switch between different products easily and quickly. The recipes for the various infant formulas are downloaded directly from an ERP system (Microsoft’s Dynamics NAV).

“Having an ERP communicating directly with the PLCs,” says Kerry, “helps to minimise any possibility of the human error factor when the different ingredients are mixed.”

Easy Monitoring

The plant is equipped with a Schneider Electric Wonderware InTouch SCADA system, and Kerry says the technology offers benefits such as superior control and smaller operational crews.

“In effect, the SCADA oversees the entire process. It monitors production in real time – we are running the facility from two screens. And because the system’s also equipped with Historian, it provides an invaluable trending tool.

“Having Historian in place from Day 1 has given us a benchmark for measuring production and introducing tweaks for improvement. It quickly identifies any aberrations, which means we can identify faults and implement any corrective action immediately. It all adds up to better consistency.”

Cleaner Power

As with any large electricity user equipped with numerous variable speed drives, the Yashili site is obliged to implement power quality and harmonic filter measures.

Among the site’s 170 Altivar variable speed drives are a 315kW unit for the dryer’s extractor fan and two 250kW drives for each of the evaporator fans. Collectively, the drives present a significant harmonic load for the local network. Keeping the harmonics in check falls to ten 300 Amp AccuSine active filters.

Auckland’s MGE, one of Schneider Electric’s panel-builder partners, manufactured the main switchboard for the plant, while Macro Automation was responsible for integrating the technology.



One of the plant control rooms

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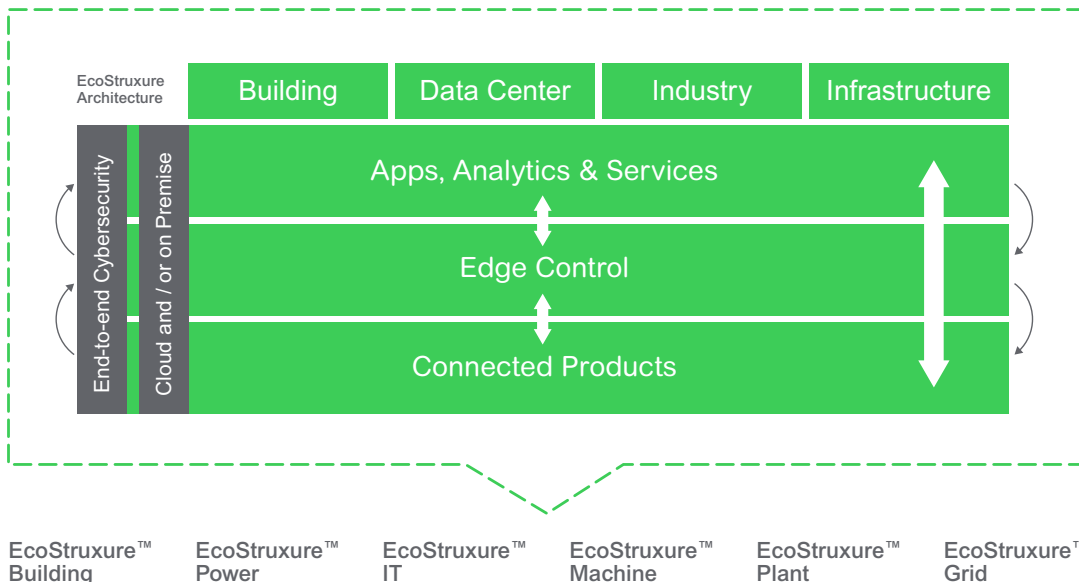
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September 2015

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