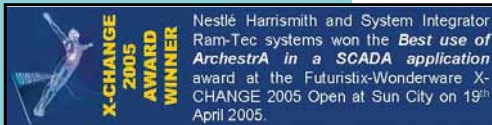


***“Rapid transition from one process to another, the ability to handle numerous implementation changes rapidly, reduced engineering costs, effective plant operation and product traceability to its constituent parts as well as greatly improved plant maintenance by using the SCADA system to monitor its own network”***

## Nestlé’s new infant formula facility uses Wonderware’s ArchestrA for tight production control

by Futuristix



Nestlé Harrismith is the third site worldwide to run a new infant formula manufacturing process devised by Nestlé. This required the factory to upgrade and convert its milk powder production facility to the new infant formula process that, in turn, involved changing and automating the factory’s existing systems. The new process comprised new powder handling processes, continuous dissolving and in-line dosing systems as well as a new evaporator and drying tower feed systems.

This project was an opportunity for Nestlé Harrismith to begin a factory-wide migration to Wonderware’s ArchestrA platform considering that Nestec, Nestlé’s Switzerland-based technical company, had previously conducted an extensive evaluation of ArchestrA and that Nestlé had standardised on Wonderware automation solutions world-wide. Nestlé Harrismith is the first Nestlé factory in the Southern and Eastern Africa Region (SEAR) to implement ArchestrA, which, in this case, was done by system integrator Ram-Tec Systems.

### Business and operational objectives

Within the context of Nestlé’s global objective of strengthening their leadership in core nutrition, there were a number of objectives:

- **Full traceability:** In conformance with Nestlé’s own stringent internal quality criteria and relevant external regulations, full traceability of all product batches to their original raw material components is an integral part of the automation concept.
- **Increase production capacity without compromising quality**
- **Develop reusable standards:** While Nestec had already developed standards applicable to plant automation entities, the practical application and modification of these standards at Nestlé Harrismith would be valuable for similar plants worldwide and would significantly reduce engineering costs.
- **Tight plant control:** Due to the size and complexity of the process, the HMI system had to be user-friendly and informative, in order to assist the operator to keep within the stringent control margins. The operators required instant messaging on process deviations as well as

#### Company Overview

Nestlé - Vevey, Switzerland

Nestlé was founded in 1867 by Henri Nestlé with nutrition as the company’s cornerstone. As the world’s largest food company, Nestlé is constantly upgrading and equipping its facilities to meet consumer demand and remain competitive in a growing global economy. With an initial project investment of over R50 million, the new facility in the Harrismith plant will manufacture the company’s infant nutrition range of products and significantly increase the company’s ability to meet consumer demand. State-of-the-art equipment has been installed to meet the specialised needs of infant formula production and to enforce the highest standards of hygiene and quality management.

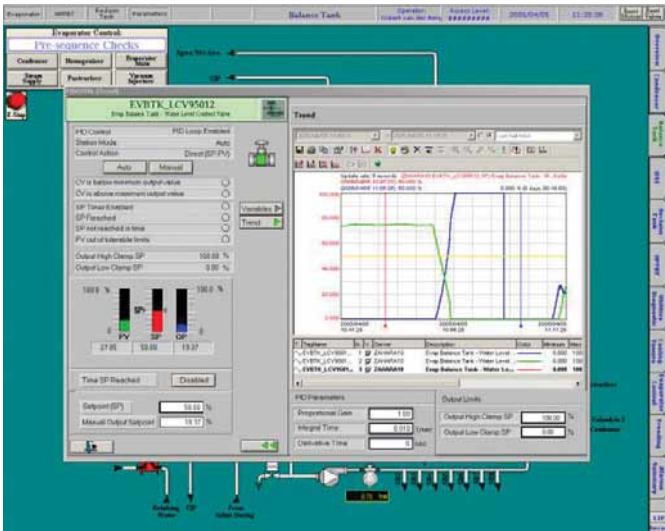


Figure 1: PID display showing ActiveFactory trending

easy access to process flow charts, operator's manuals and help files.

- **Plant Maintenance:** The system was required to be a tool for daily plant maintenance and facilitate easy fault finding. This entailed integrating PLC, network and field equipment diagnostics as well as all relevant technical documentation such as network drawings, electrical drawings as well as instrument manuals and data sheets.
- **Archestra migration:** To lay the Archestra foundation for future expansion and migration of existing InTouch SCADA systems.
- **Interconnect business and production information:** A future goal is to integrate the automation system to the SAP ERP system in order to arrive at an MES solution that optimises business needs with production capacity.

### Technology and approaches used

- Software was developed with a continuous focus on reusable standards and objects in order to facilitate process changes and future expansion. The plant was grouped into areas, sub-areas as well as control and equipment modules for ease of development, fault-finding and alarming.
- Due to the sensitivity of the process, control dials, alarming and comprehensive messaging were used to alert the operator of any process deviations or equipment failures.
- The installed automation system is based on Allen Bradley Control Logix PLCs with Ethernet, ControlNet, DeviceNet, DH+, AS-i and Modbus networks.
- The PLCs were linked via Ethernet to an Archestra server, an IndustrialSQL Server with ActiveFactory

trending and reporting application, InTouch SCADA stations as well as a SCADA development station. The Archestra platform also caters for an interface to a radio-linked barcode scanner, which is used as a critical process check.

- The SmartSymbol technology embedded in Wonderware's InTouch 9 was used extensively.
- A recipe manager that accesses an MS SQL database was also incorporated into the final solution.
- Embedded Active X Objects were used to view on-line documentation, recipe information and trends.
- Wonderware's ActiveFactory, in combination with IndustrialSQL Server was used for system analysis as well as reporting and trending. ActiveFactory Live View is used to display graphical information on the office network.
- A radio-linked barcode scanner is used as a critical process check that provides information as to any attrition that may have occurred between the input and output of the process.

Due to the stringent hygiene and quality standards involved in infant formula manufacturing, the control and monitoring of plant cleanliness and sterility had to be carefully considered in order to reduce the element of human error. A flagging system was implemented to provide alerts on whether equipment was dirty, clean or sterile. Certain key parameters related to food safety had to be permanently monitored and it was the system's responsibility to take immediate corrective action if con-

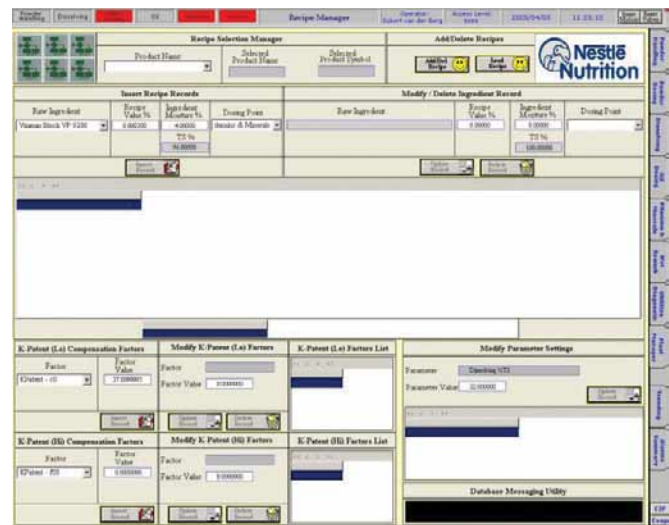


Figure 2: Recipe Manager screen

formance to these parameters was not being maintained. While the great majority of the plant had new hardware and software, provision was also made to integrate existing PLC hardware and software.

The total development time for automation development was very short and the changeover from milk powder to infant formula production required a complete factory shutdown. The changeover time had to be kept to a minimum, which resulted in a very tight commissioning period (over Christmas 2004/5). There were occasions when civil, mechanical and electrical installations were being done simultaneously, with software commissioning hot on their heels.

Due to the fact that the process technology was so new and that this was a pilot site, there was no shortage of interesting challenges.

InfoWorks wrote a small application that interfaces the system to the RF barcode scanner and a recipe manager was developed, using Archestra and InTouch, to create and store recipes in a Microsoft® SQL database. In the future, Archestra will need to exchange relevant information with the SAP business system thereby ensuring a single source of guidelines for recipe management.

## Results and business objectives achieved

- **Reduced engineering costs:** Archestra, in combination with InTouch's SmartSymbols, provided a great deal of flexibility and reduced development and commissioning time dramatically. This contributed to the successful completion of the project within the original tight time constraints in spite of changing operational parameters.
- **Migration path:** The Archestra infrastructure has been successfully implemented thereby facilitating future migration of existing InTouch systems onto the Archestra environment.

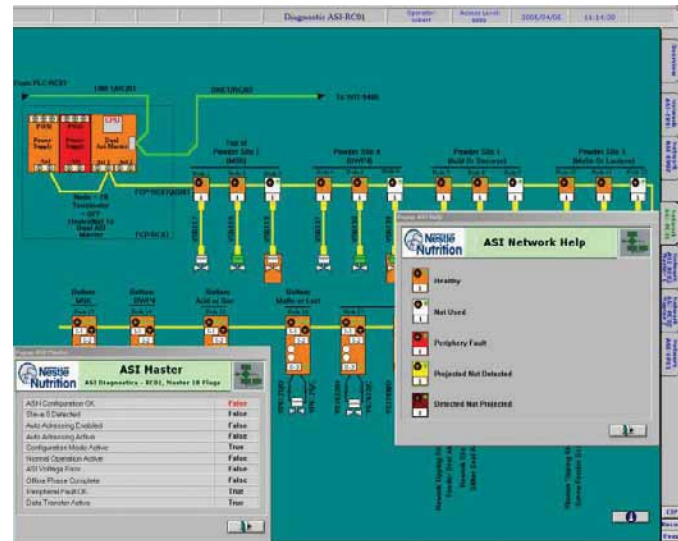


Figure 3: ASI network diagnostic screen

- **Traceability:** The IndustrialSQL Server with ActiveFactory provides product traceability and daily operational reports.
- **Effective plant operation:** The InTouch HMI system is user-friendly and informative providing comprehensive messaging on process deviations as well as easy access to process flow charts, operator's manuals and help files. Easy to read control dials on HMI screens assist operators to see if the process is conforming to its strict control parameters.
- **Plant maintenance:** The system facilitates fault finding on PLCs, networks and field equipment through diagnostic screens. All relevant technical documentation such as network and electrical drawings, instrument manuals and data sheets are available on the SCADA system.