McNeil in Sweden chooses Proficy to increase OEE of its packaging lines

Improving OEE in the Nicorette® gum production plant in Sweden.

World Leading Product

At a location that has been manufacturing pharmaceuticals for over 90 years in Helsingborg in the south of Sweden, McNeil AB specializes in the manufacture of over-the-counter healthcare products. It is the only plant producing the world leading Nicorette family of nicotine replacement therapy products.

" We have been able to develop a customised solution, paying only for the elements we need."

— **Annette Cederhag,**
Project manager Engineering Maintenance Utility, McNeil

Introduced in 1978, Nicorette gum provides the user with a source of pure nicotine while avoiding the harmful effects of tobacco smoke. By 2005, around 18 billion pieces of gum had been produced. Current production at Helsingborg is on a 24/7 basis of between 2 and 3 billion pieces per year, exported to around 80 countries worldwide.

Research and development takes place at the Helsingborg plant. In order to satisfy differing consumer demands, Nicorette has been developed into different formats which are also produced there. As examples, Nicorette Patch entered the market in 1991 to provide a continuous nicotine supply throughout the day; 1994 saw the introduction of Nicorette Nasal Spray for quick absorption of a nicotine dose; a Nicorette Inhaler was developed in 1996 which satisfies some users' demand to have their hands occupied; in 1998 Nicorette Microtab with a slow release profile for placement under the tongue was put on the market, and in 2004 a crisp coated, sweeter and softer mint gum was added to the Nicorette family, Nicorette Freshmint Gum.

OEE Under the Microscope

McNeil is continually looking at its working practices in order to improve the way it works. This comes under its 'Right First Time' concept. Small 'Right First Time' teams are looking at a number of the processes in Helsingborg to see if they can be improved, and the Overall Equipment Efficiency (OEE) of the packaging lines has come under the microscope. This includes packaging of all the products in the Nicorette family, as well as for other products manufactured on-site, which include Microlax, an enema, and for Treo, the long established Swedish effervescent pain relief tablets. Annette Cederhag, Project Manager in the Engineering Maintenance Utility at McNeil, Helsingborg, explained: *"For many years we had used a hand-written logging system of faults on the 32 automated packaging lines for all the healthcare products we manufacture here. As we operate 3 shifts 24/7, it is very important that we minimise downtime. The packaging machines were not designed to provide a sufficient variety of error code data to give us the detailed information we needed."*

Solutions

- Production Management
- OEE
- Management reporting

Products

- Proficy Plant Applications
- Proficy Historian
- iFIX HMI/SCADA

Results

- Accurate downtime logging
- Data 'released' to improve OEE
- Downtime data available in real time
- Management reporting via intranet
- Open Proficy software enables future system enhancements

Benefits

- It helps to identify and improve areas that are causing operational inefficiencies
- It allows analyses of root causes to make data-driven decisions
- It manages operations in real-time through comprehensive reporting, which can be made accessible via the web
- Gradual implementation of new lines

"Inevitably it was very difficult to try to obtain any true analysis of downtime, so we approached several automation suppliers in Sweden for a system that would give us the capabilities we were looking for.

"The pilot projects ran in parallel for 8 months. Right from the start we consulted with our packaging operators. We have worked with them all the way from initial investigations, through the pilot projects, and through the eventual conversion to our new system. The operators' input was invaluable and, of course, they have to operate the new technology so it was important that we developed a system they understood and that they felt they could work with."

Downtime information "released" by Proficy Plant Applications

The Downtime Information Reporting System (DIRS) that was eventually developed is based on the Efficiency module of GE Digital's Proficy Plant Applications plant performance analysis and execution software. Explaining the decision Annette Cederhag, commented: *"The local Systems Integrator, Novotek Sverige AB, proved to be an excellent partner throughout the pilot project and during the conversion to the live system. They had many good ideas which we were able to implement throughout the pilot scheme as it developed. Proficy Plant Applications provides the data analysis capability we were looking for, together with the ability to interrogate the system in real time via the McNeil intranet from any authorised location."*

The DIRS provides a tool that helps the organisation to identify the source of breakdowns, problems during shift changeovers, and other disturbances that impact the OEE, and hence productivity, of the healthcare product packaging lines. Cederhag continued: *"The packaging systems are very diverse. Over 1000 different items are used for packaging.*

They include encapsulation of Nicorette gum, Nicorette Freshmint Gum and Treo tablets, followed by boxing and wrapping. Other processes include boxing of inhalers and spray dispensers. Boxes are date stamped, etc., and encapsulated in larger batches and put in boxes for bulk delivery to locations throughout the world." At the time of writing, 15 lines had been converted to the new DIRS. With pilots originally running on 5 lines, modifications had gradually been implemented and good practice acquired so that transfer to the live system was straightforward. New lines have been going live at 5-week intervals, with plans to accelerate the changeovers to 2-week intervals for the remaining 17 lines.

The Downtime Information Reporting System was added to the existing LAN which links into the company's intranet. The operators' terminals, usually one per packaging line except where the line is particularly long when there may be two, act as thin clients to a terminal server. A second terminal server provides redundancy for immediate back up should there be a problem with the first server. Mats Blohm, Automation Engineer in Engineering, Maintenance & Utilities, explained: *"This system runs under iFIX HMI/SCADA. The thin clients act as HMI inputs with a selection of on-screen buttons appropriate to the packaging line. These touchscreen buttons provide rapid input options for logging faults on the packaging line. This data, together with time stamping provided via the packaging machine's PLC, is captured and logged on the Proficy Historian database used by the whole production facility."*
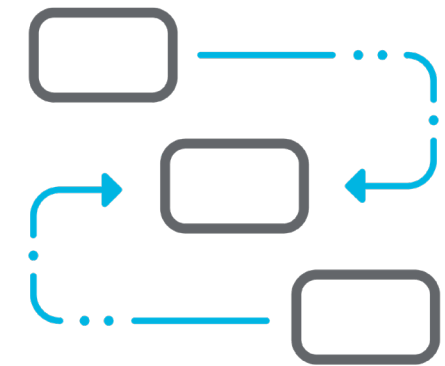
Real-time data on the intranet

"The Efficiency module of Proficy Plant Applications is now able to access this data and share it in real-time or as historical data with users at all levels on the intranet," he continued. "Each operator screen, for example, displays a table of the recent interruptions on that packaging line. Management reports can be accessed on the intranet by any authorised person. A wide range of analyses and charts is possible. For example, by packaging line, by fault type, by downtime length. From this, it is now possible to get an accurate picture of what are causing inefficiencies on each line so that the appropriate actions can be taken to increase Overall Equipment Efficiency."

As a pharmaceutical and health-care product manufacturer, McNeil follows the Good Manufacturing Practice (GMP) code of working. This ensures the overall quality of its products and is based on the positive effect, the purity, identity, strength, the production flow and procedures adopted. Standard Operating Procedures ensure that every batch of products at Helsingborg is sampled randomly, at the beginning in the middle and at the end. Stringent quality control tests have to be passed for purity, packaging, labelling, etc., before that batch is allowed to leave the plant. GMP also ensures that the company works well within the local and national environmental and health and safety requirements.

Proficy Plant Applications

The Efficiency module enables users to better utilize plant assets by providing a comprehensive view of Overall Equipment Efficiency (OEE). It is the ideal solution for managers trying to increase throughput without adding equipment, people or material costs.

"By choosing GE's software we have the reassurance of long term product support. We have been able to develop a customised solution, paying only for the elements we need. But it offers much more. Looking to the longer term, the package we are using is just one element in the complete Proficy intelligent production management suite of open programs. We can now look at our manufacturing lines with a view to easy integration using other parts of the suite."

— **Annette Cederhag,**
Project manager Engineering Maintenance Utility, McNeil

About GE

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