

## FLOW CONTROL

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PHOTOS: NESTE OIL

# Neste Oil puts its trust in Neles FieldCare

**With its new production line, the facility in Kilpi-lahti in Porvoo entered the age of proactive condition monitoring. Metso's automation system was complemented by Neles FieldCare, a management and condition monitoring software system for field devices that is based on open technology.**

**T**he fourth production line of Neste Oil's refinery in Porvoo started operating in the summer of 2007. The new diesel facility's field devices are managed using Metso Automation's Neles FieldCare software.

"To be perfectly honest, it means that for the first time our automation department can anticipate its maintenance needs throughout the entire production line. The system provides us with information that wasn't available in traditional automation operations," says automation engineer Misa Naumanen, who is in charge of the refinery's automation maintenance.

Neles FieldCare is Naumanen's pet project, as he likes to call his working tool. This is just as well, since a dedicated professional is exactly what is needed for the adoption of the new system. Not that the software is difficult to operate; it is more of a case of Naumanen having to sell the new way of working to his installers. Work routines that have evolved over the decades must be changed towards a more proactive approach to maintenance.

### One system for all devices

The refining of crude oil into fuels is a complicated process. Over





Photo: Tuomas Teisäsvirt

According to Jari Manninen and Misa Naumanen (left to right), the past year has made condition monitoring software an essential tool for Neste. Naumanen finds it difficult to imagine a return to the days before Neles

5,000 field devices on Line Four in Porvoo have been connected to Neles FieldCare. There are more than ten different suppliers for the devices.

Neles FieldCare is based on open FDT technology in which 63 device manufacturers participate. The web-based software enables the management of devices by using either a manufacturer-specific or a generic DTM.

With Neles FieldCare, separate tools for each device are no longer needed. It enables the integration of tools in areas where this is most needed: maintenance, diagnostics, servicing and the management of process devices.

### **The nature of work is set to change**

Neste's personnel have made exemplary efforts for the adoption of Neles FieldCare. As the person in charge of the device and system development team at the automation department, **Jari Manninen**

Neste Oil is a refining and marketing company concentrating on low-emission, high-quality traffic fuels.

knows that the real benefits of the new system must be seen in the long term. Initially, the system may even increase the amount of work. If anything, the nature of the department's work will change.

Knowledge increases pain, as Manninen puts it. "Our task is to learn to utilize the growing amount of information. During the adoption stage, we have had to parametrize field devices more accurately than before. In the long run, however, we will reap the rewards."

"What we seek with FieldCare is good usability. If we can avoid even a single large ramp-down with the system, it will have brought us considerable cost savings," says Manninen.

The highly fine-tuned process is operated at its limit capacity. Long intervals between outages are a typical feature of refineries. In Kilpilahti, the objective is to limit the standstills at the refinery to only once every five years.

"During major outages, the area has a lot of workers and a large number of devices and equipment that need maintenance. Our goal is to minimize this number. FieldCare serves as the central tool by which we can reach this goal."

### **Strategic tool**

Neles FieldCare forms part of Neste's maintenance strategy. Even the location of the workstation has been carefully considered. "The terminal is next to the coffee machine. The objective is to have people use both of them equally on a daily basis," says Misa Naumanen with a laugh.

Information technology has changed the face of an automation installer's job. Naumanen and Manninen reiterate the fact that the benefits gained from the software are largely dependent on how well its use can be marketed within the work community.

"When you have people doing things according to a certain routine for 20 years, introducing change poses the greatest challenge," says Manninen.

One thing, however, is certain: the first thing Naumanen does in the morning is to make a pot of coffee. After that he sits down in front of FieldCare. The system is used on a daily basis, as condition monitoring operations must be checked and the facility's situation charted every morning. During the day, Naumanen will return to the application depending on his tasks. "The system is beginning to control our operations. In the past, ▶

► it used to be a case of something going wrong somewhere, and us having to go there and fix it. Now we are increasingly able to start work before problems arise,” Naumanen sums up the change brought by Neles FieldCare.

### Easy to maintain

System Expert Tenho Eteläinen, who has been in charge of installing Neles FieldCare, brings the point of view of maintenance to the discussion. Now that the ap-

plication is in active use, the maintenance personnel’s experiences of the necessary and easy-to-use tool are heart-warming.

Eteläinen describes Neles FieldCare as a tool that is easy to maintain and stresses the necessity for cooperation between the supplier and the client.

“During the adoption stage, support and advice were always within easy reach. As a system, FieldCare has proven itself as a good tool. Obviously, as we use

the system more and more, there will be certain functions which we would like to expand or modify. These observations and needs have provided the basis for a good discussion with Metso personnel working on FieldCare.”

### Interpretation of information

Tenho Eteläinen shares Manninen’s hope of avoiding ramp-downs. According to Naumanen, Neles FieldCare has helped avoid many threatening situations.

“Our condition monitoring has detected deficient devices. In the case of valves, this means that the slightest shift in a process could have caused large problems. Now we have been able to notify the production team of faulty parts or equipment and advise that we would replace them,” he says, pointing out that in a demanding process, even the operator cannot be aware of each measurement result.

Neles FieldCare’s user interface displays, in real time, the statuses of field devices as small squares. A green square indicates that the device is functioning properly. Yellow serves as a warning, while red indicates an alarm. When the alarm limit has been set correctly, a device will send an alarm before it breaks down.

### Neste Oil’s Porvoo refinery

- The Kilpilahti industrial area is the largest uniform cluster of the chemical industry in the Nordic countries.
- About 2,000 oil refining professionals work at Neste Oil’s production facility in Porvoo.
- The facility’s refining capacity is approximately 11 million tonnes annually.
- The facility manufactures about 150 different products and product components.
- The main products are sulfur-free fuels for traffic and basic oils used as raw material for lubricants.
- The first unit manufacturing the renewable NExBTL diesel, located in connection with the refinery, was completed in 2007, with a capacity of 170,000 tonnes annually. A second similar unit will be completed in 2009.
- In addition to the oil refinery, the production facilities include a large container area, a harbor and a technology center.

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Over 5,000 field devices on Line Four in Porvoo have been connected to Neles FieldCare.

### Neles FieldCare's properties

- Operation of devices manufactured by various suppliers using manufacturer-specific or generic DTMs
- Reporting of maintenance history
- Network configuration
- Device navigation in a network environment
- Management of device-specific DTMs
- Monitoring of users' procedures
- Management of user rights
- Document management
- Condition monitoring during runs

Manninen adds that it is not just a question of devices indicating that they are developing a fault. "There is always room for interpretation. You have to consider whether the device is really deficient, or whether we are running the process in a way that causes the fault."

Neste's automation department has always been very familiar with its own processes. Misa Naumanen expects the new way of working to pose increasing challenges to knowledge in this area. "In order to interpret alarms, we must be even more familiar with how the process functions and behaves. The majority of alarms originate from the process. If we can't detect them here, we'll waste a lot of time trying to find them in the field."

#### Neles FieldCare facilitates work

From the facility's point of view, anticipating problems helps cut costs. For the individual installer, the benefits of Neles FieldCare are much more concrete. Adopting new technologies is much easier when they reduce your own workload. FieldCare saves time and ef-

fort in the maintenance and configuration of devices.

"In the traditional method, we would hook up a laptop to a device. Simply finding the point where to connect to a field device in a cross-connect equipment room with an area of hundreds of square meters takes some time," Naumanen points out.

The distance from the central control room to the connection room is over a kilometer and, on top of that, the installer has to find the device. Naumanen reminds us that, unlike other industrial sectors, production at a refinery takes place outside.

"In the worst case, we have to climb a ladder up to a 90-meter tower. In the winter cold, especially, it will be a great advantage to be able to locate the device from the control room."

#### Support for production

The emergency shut-off valves controlled by the Neles ValvGuard safety system are a prime example of proactive condition monitoring. These valves are not in everyday use, but as they are located at critical points in the plant, they must

operate perfectly in the rare case that they are needed.

Misa Naumanen explains the operating condition of the emergency shut-off valves at the old units could be ensured only with regular tests carried out during outages. But up-to-date self-diagnostics helps to keep the safety features functioning at a high level for a longer time.

The past year has made condition monitoring software an essential tool for Neste. Naumanen finds it difficult to imagine a return to the days before Neles FieldCare. "By keeping our adjustments and measurements in working order, we are able to give considerable support to production."

According to Naumanen, the greatest benefit from the new tool is reaped in the monitoring of valves. However, he reminds us that the majority of the refinery's field devices measure various temperatures. The longer the list of devices and device suppliers, the better Neles FieldCare, which is based on open technology, can showcase its advantages. ■

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