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SUCCESS STORY

Plant Information Management System (PIMS) Enables Advanced Product Management/ Nihonkai Oil, Japan

Location: Toyama City, Japan
Order Date: August 2001
Completion: September 2002
Industry: Oil and Petrochemical

About Nihonkai Oil Company, Ltd.

Nihonkai Oil Company, Ltd. (Nihonkai Oil) was established in 1967 and is affiliated with Nippon Oil Corporation, Japan's largest oil corporation. Nihonkai Oil has its headquarters in Toyama, a port city on the Sea of Japan that is 400 km northwest of Tokyo. The company's Toyama refinery processes 60,000 barrels of crude oil per day into propane, butane, naphtha, gasoline, kerosene, gas oil, heavy oil, and other fuels, and it sells these products as a representative supplier throughout Japan's Hokuriku region.

Reasons for Selecting Yokogawa's Exaquantum

To come out ahead in today's highly competitive petroleum product marketplace, Nihonkai Oil has been focusing on improving the productivity and efficiency of its refinery operations. Nihonkai Oil is in the process of migrating from its existing CENTUM-V and CENTUM-XL systems to the CENTUM CS 3000. To make full use of the CENTUM CS 3000's capabilities, Nihonkai Oil decided to replace its existing plant data gathering system (connected to another computer) with Yokogawa's Exaquantum plant information management system (PIMS).

The Challenges and the Solutions

(1) Calculating process values and supplementing the DCS functions

Nihonkai Oil had challenges that went beyond the capabilities of a DCS. These included calculation of the dew point in the tower section, the total amount of fuel oil used by the furnace in each process, and the yield for each product. With the introduction of Exaquantum, these process values can be calculated accurately. In addition, Exaquantum enables the calculation and display of the average process values by hour, day, or month. These data from the CENTUM CS 3000 can be converted for display in an Exaquantum window.

(2) Facilitating plant startup and shutdown

Before the introduction of Exaquantum, operators referred to a progress schedule chart when starting up or shutting down the plant. This chart showed the furnace temperature curve and the operator instructions required at points along the curve. By using Exaquantum, the historical process data for important process variables collected at the previous plant startup and shutdown can be linked to this chart and this information can be displayed in an MS-Excel spreadsheet. Operators are thus given ready access to the process data from the previous plant startup and shutdown, and this has contributed to the reduction of operator errors.

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(3) Keeping track of equipment operation

A daily operating record for equipment such as pumps and burners can be displayed in an MS-Excel spreadsheet using the average daily values for each device's status flags. This information is useful in the maintenance of the equipment.

(4) Providing data for scaled-down training simulator

Exaquantum enables historical process data from the previous plant startup and shutdown to be displayed in the Exaquantum plant overview window, either automatically (at specified intervals) or manually. This data can then be utilized by a scaled-down training simulator.

Results

Nihonkai Oil has implemented a PIMS for the advanced control of plant and production operations. Akashi Hamatani, a programmer and developer who worked on this Exaquantum project at Nihonkai Oil, has commented on the successful outcome as follows:

(1) Project members can monitor both current and historical process data in an Exaquantum window at their own PCs. This makes it easier for operators to keep informed and make decisions.

(2) Both current and historical process data can be easily brought into an MS-Excel spreadsheet. In addition, operators can use and modify this data as they please.

(3) As Exaquantum can gather and save not only process data but also event data, operators can easily review their operations and correctly analyze problems which occurred in the previous shift by checking event log with historical process data at a shift meeting.

(4) Process data can be collected in one-second cycles, and this can be utilized in PID tuning.

System: Exaquantum
System Configuration: CENTUM CS 3000, CENTUM-XL, CENTUM-V