Success Story

Co-innovated Field Assistant Transforms the Field Maintenance Operations

Ube Corporation Europe

Location: **Castellón, Spain**
Order date: **October 2016 (Start PoC)**
Completion: **June 2019**
Industry: **Chemical (Fine & Specialty Chemical)**

Executive Summary

Ube Industries, Ltd. was established in 1897 to develop the Ube coalfield in Japan's Yamaguchi Prefecture. Later, the company grew through the mining of coal, limestone, and cement in the surrounding area, and the manufacturing of fertilizer raw materials derived from coal. Today, the company engages in the construction materials and industrial machinery businesses as well as the production of high-performance chemicals and pharmaceutical ingredients.

The Spain plant of Ube Corporation Europe (UCE), located in Castellón, produces nylon 6 for food packaging films etc., chemical fertilizers for the markets of Europe, North and South America, and Africa.

Ube Industries is committed to making the most of its facilities through the use of asset management solutions and total productive maintenance (TPM). To improve efficiency and enhance productivity at the Castellón plant, the staff at this facility worked closely with Yokogawa to build and introduce a Field Assistant mobile solution that makes use of IIoT technology. Through the use of this innovative solution, field operators at this plant are able to work more efficiently and UCE Spain has improved the performance of its plant assets.

The Challenges and the Solutions

The challenge

Francisco Falomir Arias, a manager in the Process Control Systems Department at UCE Spain, wanted to improve maintenance and other operations at the Castellón plant. In their routine inspections at this facility, field operators had to perform the following:

- Check all inspection points
- Carry out maintenance tasks
- Deal with any abnormalities and notify the central control room thereof
- Make a paper-based report and submit this to a supervisor

However, problems such as inspection omission and over-maintenance sometimes occurred. Moreover, an excessive amount of paper-based inspection and patrol reports (as many as 400 each day) made it very difficult for supervisors to keep track of inspection progress and identify problems to be addressed.

Mr. Falomir was aware, however, that these paper-based reports contained valuable information that could be used to improve on-site operational efficiency and equipment availability at this plant, and wanted to improve access to this information by digitizing it.

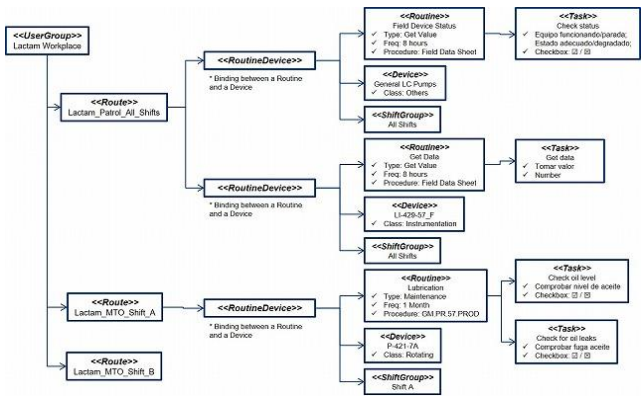
To assist him in this endeavor, Yokogawa Spain made a presentation to Mr. Falomir on a mobile solution for the digitalization of field maintenance, and he decided to work with Yokogawa to build, test, and implement this solution at his plant.

Co-creation of Field Assistant mobile solution

Yokogawa had already been working on the development of Field Assistant, a tablet-based solution for field maintenance. One aim of this solution was to improve maintenance efficiency and field operations by enabling personnel in the field to access digitized information such as task lists and related documents. It was also believed that analysis of the data input using these tablets as well as data collected by other means would facilitate maintenance planning and scheduling.

As Yokogawa Germany had already been promoting mobile solutions in Europe, it was decided that they would commence a proof-of-concept (PoC) of the Field Assistant with UCE Spain, in cooperation with the R&D Department at Yokogawa headquarters.

Following the successful completion of this PoC, information was gathered to facilitate discussions on what would be required for a practical implementation of this solution. UCE Spain provided maintenance knowledge and data that had been gathered over a long period of time and Yokogawa provided know-how on process control and industrial software applications. Yokogawa also interviewed field operators, supervisors, and the plant manager at UCE Spain, based on which it placed all maintenance tasks into a detailed work flow and created an object structure to organize the maintenance information that would need to be gathered and reported for all of the equipment on each inspection route. Based on this data, Yokogawa's Exaquantum plant information management system was configured to store daily maintenance work histories and device information.

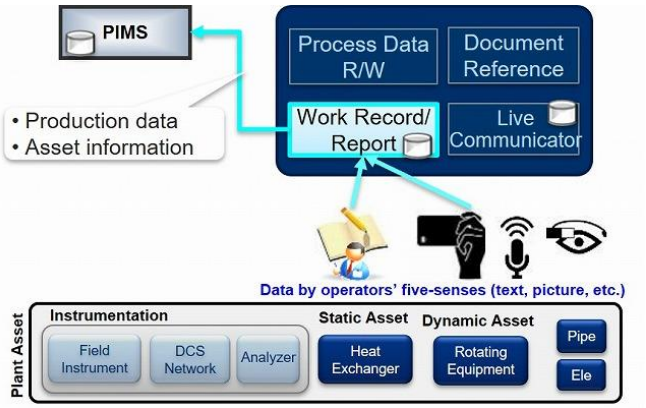


Object structure of plant information

Sophisticated UX design

The user interface for Field Assistant included a tablet screen used by field operators and a custom-made dashboard for supervisors to check maintenance progress. The development of this interface was coordinated by the user experience (UX) design team at Yokogawa headquarters, and the UX team met frequently with Mr. Falomir and other plant staff to create a better design.

During the development phase, UCE Spain provided much feedback on functionality and usability as well as ideas for brushing up the solution, and these ideas were incorporated by Yokogawa. As a result of this collaboration between UCE Spain and Yokogawa, the development of Field Assistant was successfully completed and UCE Spain decided to introduce it for use throughout its plant.



Overview of Field Assistant

Field Assistant changes field operation

Today, field operators at UCE Spain perform inspections as follows:

- Download task list and documents to a tablet for access during a field inspection.
- As directed by a task list on the tablet, inspect equipment on a specified route, perform maintenance as necessary, and fill out digital forms using the tablet. The task list prevents omissions in the inspection of equipment and the preparation of reports. The information in the reports can also be used at shift handover.
- While performing maintenance, refer to past maintenance logs and setting values. The ability to access logs and setting values helps to ensure that maintenance tasks such as lubrication are performed at the right time (and not when they are not necessary).
- Using the tablet, take photos and record audio and video of any abnormalities. After each inspection round, field operators can upload the recorded content to the server. The photos, audio, and video of abnormalities can also be useful in training younger operators.

Inspection patrol with Field Assistant

Innovative management with Field Assistant

Before the introduction of Field Assistant, supervisors at UCE Spain had to go through a large number of maintenance and patrol reports each day to monitor the progress of field maintenance work and find out if there were any equipment problems that needed to be addressed.

Now, by viewing a dashboard that displays Field Assistant data, supervisors can easily identify whether field operators have missed any checks on their maintenance rounds and get information on any equipment issues. While supervisors will have access to a huge amount of data from throughout the plant, they also can use a filtering function to zero in on the most essential information.

Thanks to Field Assistant and features such as the dashboard, the workload for supervisors has been significantly reduced and the overall efficiency of field maintenance operations and quality of on-site operations have been improved.

Custom-made dashboard screen for Field Assistant

O&M data utilization

The visualization of information leads to innovation. At UCE Spain, history data on field operations and devices, including sensor data from rotating equipment, are digitized and can be downloaded for access from a tablet running the Field Assistant software. By analyzing collected operation and maintenance (O&M) data, it is possible to spot devices that are in need of maintenance and take preemptive action. Condition-based preventive maintenance helps to prevent unplanned plant shutdowns by decreasing the likelihood of device failures and giving more lead time for the ordering of replacement parts (which can take anywhere from two weeks to six months to arrive).

The integrated handling of information on field operations also aids in the identification of wasteful maintenance practices and improves the overall efficiency of maintenance operations throughout a plant.

Benefits

UCE Spain expects the following benefits from the introduction of Field Assistant.

Reduction of maintenance costs

A 10 ~ 15% reduction in maintenance costs is anticipated thanks to changes such as the lengthening of the device lubrication interval.

Improved uptime and quality, and reduced costs

The early detection of abnormalities through the shift to condition-based maintenance (CBM) will improve plant uptime, ensure consistent production quality, and eliminate the need for costly and wasteful corrective maintenance procedures.

Improvement of on-site operation quality

Field Assistant provides operators the information they need to reliably perform field operations not only when things are running normally, but also during operations such as start-ups and emergency shutdowns. And by enabling field operators to analyze the history of actual operations, it is expected that UCE Spain will be able to eliminate wasteful maintenance practices and reduce costs around 10%.

Decision support to maximize manufacturing performance

The use of Field Assistant to analyze collected O&M data and visualize conditions gives process engineers and supervisors insights into plant operations that are needed to make the right maintenance decisions. This also will enable the elimination of wasteful maintenance practices.

Customer Satisfaction

Developed in collaboration with UCE Spain, Yokogawa's Field Assistant has been formally commercialized as a digital transformation solution that will dramatically increase the efficiency of field operations.

Mr. Falomir:

"Field Assistant was completed as a result of deep collaboration with Yokogawa. Since we worked on PoC and UX design together with Yokogawa, the Field Assistant software is really user-friendly and easy to use. Field operators and supervisors find it very convenient to use. Field Assistant is a nice plant information management system that connects field operations with actual plant information. We can understand what is happening in our plant and identify where the problems are. It makes it possible to properly plan and improve plant operation schedules and maintenance plans."

For more Information and Contact

Field Assistant

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