Success Story

Optimization of Equipment Maintenance Using PRM: For the Stable Operation of Chlor-Alkaline Products in Southeast Asia

PT Asahimas Chemical

Location: Banten Province, Indonesia
Order date: 2023
Completion: 2023
Industry: Base Chemical

Executive Summary

PT Asahimas Chemical is Southeast Asia's leading producer of caustic soda and polyvinyl chloride (PVC). In 2016 and 2022, the company expanded production capacity at its Anyer Plant in Banten Province.

PT Asahimas production facilities use a large number of field instruments (flow meters, pressure transmitters, temperature transmitters, etc.), valves, actuators, and other devices. It takes a considerable amount of time and effort to inspect and maintain these devices, and decision making on whether a device is in need of maintenance requires a certain level of knowledge and experience. To address these needs, PT Asahimas Chemical chose Yokogawa's Plant Resource Manager (PRM), an integrated device management software package, to realize smart maintenance operations at the Anyer Plant.

The Challenges and the Solutions

Background of PRM introduction
Some of plant facilities use more than in the high hundreds of field instruments and other devices that are linked using the HART communication protocol. To efficiently check the connections between these devices and their configuration, it was decided to use Yokogawa's PRM.

At the same time, as a front-runner in Southeast Asia, PT Asahimas Chemical was intent on improving maintenance at its plants. In this, the company faced the following challenges:

- Decisions on the timing of device inspections and what kinds of maintenance should be performed depended on the knowledge and experience of the company's maintenance personnel, and this of course varied from person to person.
- The company had also long relied on a time-based maintenance approach in which maintenance was performed irrespective of the actual condition of the devices, resulting in a lot of time and effort.

Taking advantage of the digital information provided by each HART device, would it be possible to address these issues by making regular use of PRM? The Anyer Plant and Yokogawa Indonesia jointly held a workshop to discuss this possibility. The plant personnel explained the maintenance tasks that they routinely perform and pointed out issues that they had encountered and items that they wanted Yokogawa to consider. Based on this input, Yokogawa's people were able to make a case for the benefits that could be accrued by taking advantage of PRM's rich array of functions. Through lively discussions, everyone came to a clearer understanding of what could be achieved with smart maintenance operations.

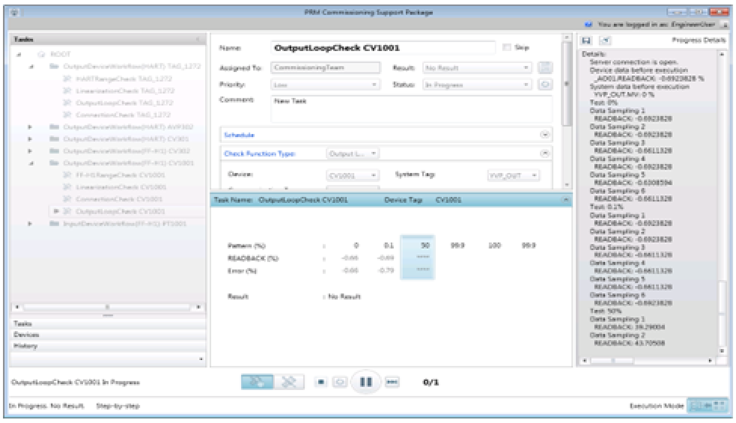
Registering devices in PRM

At some Anyer plant facilities, Yokogawa Indonesia was asked to register hundreds of HART devices in PRM. PRM provides default templates for a wide variety of devices, including those made by third parties. The templates streamline the process of making a large number of parameter settings for individual devices and enable the configuration of multiple devices with a single mouse click. Using stored parameter information, it is possible to check the parameter settings and revision history at any time. When a device is replaced, the stored parameter information is accessed by PRM to immediately configure the new device.

Shortening the commissioning period

The Anyer Plant used the PRM Commissioning Support Package (PRM CSP) to perform device connection checks and loop checks to confirm equipment readiness before plant start up. This software automatically performs the connection checks and loop checks that must be performed on each device, and generates a report on the results. The loop check results are given as numerical values, dramatically improving the accuracy of checking operations at the plant.

The PRM CSP can also perform connection checks of devices at the time of device replacement and after periodic maintenance, contributing to the efficiency of maintenance operations throughout the life cycle of the plant.

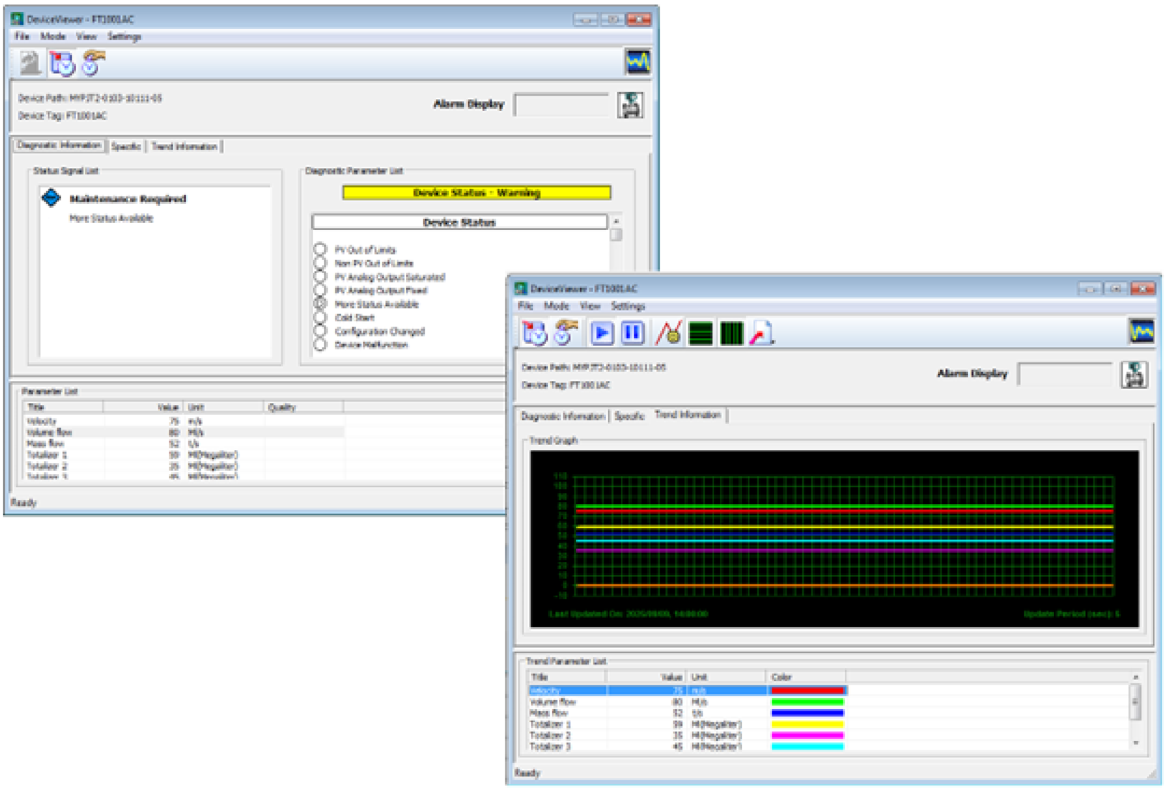


PRM CSP screen

Visualizing and sharing device information

In a list format, PRM's Device Viewer shows all the plant equipment that is registered in the PRM database. Based on device status information periodically collected by PRM, the icon for each device changes to reflect the current status of the device, allowing personnel to identify at a glance when an error has occurred.

When a device malfunctions, PRM issues an alarm along with action guidance information, and the details of the alarm can be checked on the PRM screen. As the alarm includes a code that identifies an issue such as a measured value that exceeds a high or low range limit, a clogged lead tube, a sensor malfunction, or a failure of an internal component such as a capsule or amplifier, the cause of a malfunction can be ascertained without having to directly access the device. This enables personnel at the Anyer Plant to respond quickly and appropriately to any device issues. In addition, this information can be accessed 24 hours a day by anyone in the maintenance, so PRM can achieve PRM users can share ideas on actions that can be taken and advise each other on how to respond, thereby improving efficiency and achieving even better maintenance results.



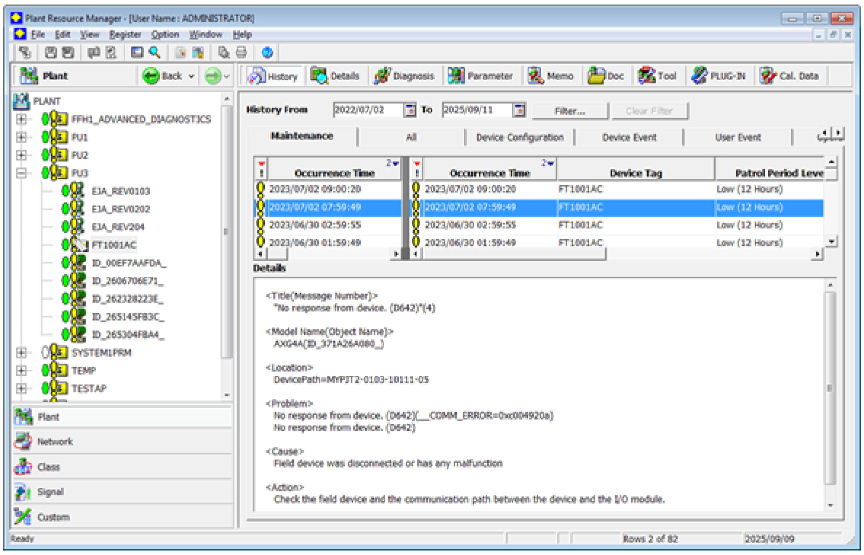
Device Viewer screens

The Device Viewer can also relay guidance messages to CENTUM DCS human interface stations (HIS).

Optimizing maintenance operations

PRM can be used to maintenance activity, and users can shift the judgements of individual operators to a quantitative judgement, this benefit leads equipment can be kept in a healthier state, plant operations are stabler, and productivity is enhanced.

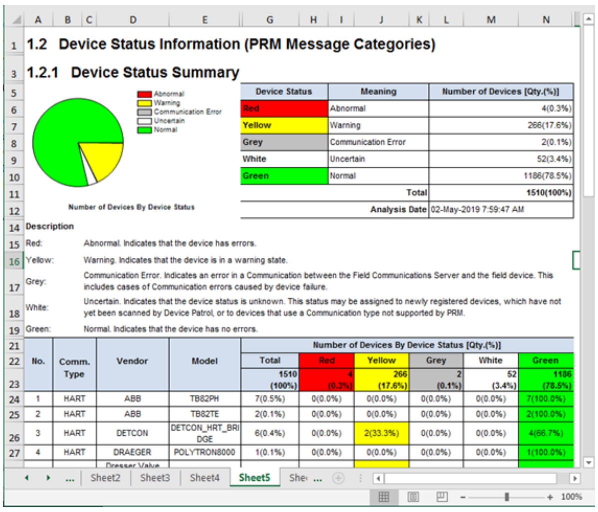
In addition, the issuance of action guidance messages along with alarms when abnormalities are detected gives maintenance personnel the information is needed to respond quickly and accurately, and also helps users improve their knowledge and skills.

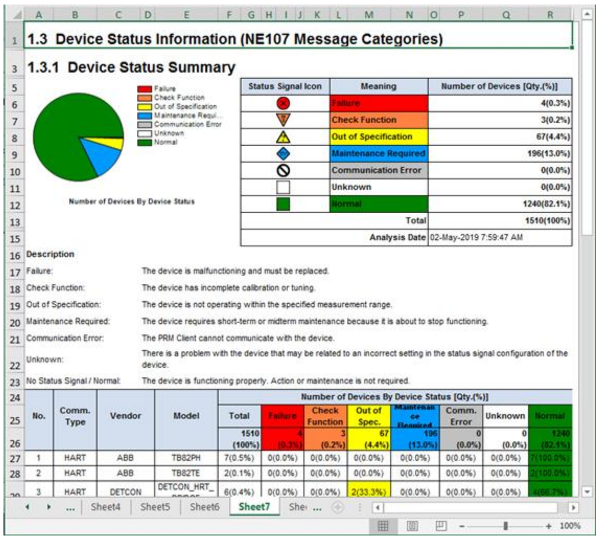


Action guidance screen

Support for optimal maintenance planning

Thanks to PRM's enhanced visualization of plant equipment information, PRM's issuance of field asset KPI reports is also a powerful tool for visualizing abnormal trends in devices and surrounding processes.





Field asset KPI reports

Aiming for a transformation to condition-based maintenance

By entering maintenance log data in the PRM database, users can share information and help each other improve their know-how. In the Anyer plant, personnel often discuss inspection timing and maintenance items with each other, and skill levels are constantly improving throughout the plant workforce.

As data is gathered and experience is gained, the Anyer Plant aims to implement Condition-Based Maintenance (CBM). Based on the device information, maintenance history, and diagnostic information provided by PRM, maintenance is being done in an accurate manner, thereby improving maintenance efficiency, reducing costs, ensuring safe and stable plant operations, and maximizing production efficiency.

Customer Satisfaction

In interviews with members from the Anyer plant, we learned that the use of cutting-edge technologies like PRM was relatively unusual in Indonesia and surrounding countries, and that they at first had no idea what PRM could contribute or how to use it. However, once they actually got experience using it, they learned that it saved them a lot of time and effort with maintenance by limiting this work to devices that truly needed it. By looking at the data, they were able to check the status of a device without having to go its location and could discuss with each other which devices should be maintained and how they should be maintained, and in so doing this helped them to improve their skills.

Plant personnel also expressed appreciation for the support provided by Yokogawa Indonesia, including the workshop. Although this was their first experience with using PRM CSP, they were able to start it up smoothly and learned many different things not covered in manuals about precautions that should be taken with field work. Daily operations were much improved, and they expect to see even greater results when the plant is next shut down to perform major maintenance.

We also learned that, with the introduction of PRM, they could easily access data without having to turn to others for help. In a corporate group whose slogan is “Look Beyond,” they told us that they could not remain a leader in their industry without continuing to improve what they do each day on the job. Fortunately, they find it very rewarding to address and correct whatever issues they encounter, and they will continue to use PRM to further optimize their maintenance operations. They believe that this will contribute to growth in Southeast Asia by enabling the stable region-wide provision of high-quality products.

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