With competition from emerging countries becoming more intense, there is a compelling need for Japanese plants to promote efficiency, as well as improve safety and productivity. For example, an increasing number of maintenance operations in domestic plants are requiring more skills due to the growing complexity of control equipment. At the same time, the lack of skilled technicians is becoming a bigger issue in plants, who are seeing a large generational shift. So, Japanese companies are now taking various measures to achieve safe and efficient operations with limited resources.

One such company is Mitsubishi Chemical Corporation, a diversified chemical manufacturer that produces petrochemical products made of naphtha (an oil derivative) at its Kashima plant. The plant is located in Kashima Industrial Complex, one of Japan’s leading petrochemical centers.

Mitsubishi Chemical planned to update its process gas chromatographic analyzers, which had been in use for a long time at the Kashima plant. However, there were several issues that could not be solved by updating the analyzers only. One concern was clogged filters in the preprocessing sample conditioning systems. Clogged filters can cause analyzer failure, measurement errors, and poor responses. Plus, the filters needed to be replaced frequently.

Another concern was that the analytical systems consisted of many parts, and the specifications were not standardized. The procedure was different at each system, and some equipment even required a specific operator. Only a few specialists were managing more than 100 analytical systems in the plant, so maintenance required a substantial investment in time and effort.

After considering these issues, Mitsubishi Chemical decided to improve the whole analytical system—including the sample lines and sample conditioning system—at the same time the analyzers would be replaced.

Swagelok® Pre-Engineered Subsystems (PrESS) Fast Loop Modules (FLM) offered the right solution.

Mr. Masaaki Kawamata of the Instrumentation Group, Maintenance and Engineering Department at the Kashima plant said, “In updating analytical systems, it would have been tough for our maintenance department to do everything from parts selection to design and assembly. Also, we needed high-quality systems to ensure optimum function. Swagelok PrESS systems, which are developed specifically for process analytical systems, provide everything we need in one neat package and, needless to say, its quality is guaranteed.”
He continued, “The system was predesigned by Swagelok and all we needed to do is just install it, which reduced a considerable amount of time and work. In addition, it was great that Swagelok could customize the PrESS system to meet our needs. We have been able to successfully optimize the preprocessing system, and analyzers will work well with the system.”

For Mitsubishi Chemical’s Kashima plant, which is aiming to become more competitive through structural reform of petrochemical operations, it was important to achieve higher levels of safety and efficiency by revisiting their system designs. Mr. Takayuki Aoyama, Group Manager of the Instrumentation Group, commented on the impact of the installation of PrESS: “The optimization of sample lines contributed to improving analyzer reliability. What’s more important, it was a huge step forward for us to be able to standardize the sample conditioning systems and sample lines that in the past required a disproportionate amount of time and energy to maintain. With manual operations for Swagelok standardized products, our maintenance operations have become safer and simpler, which has created a solid foundation that enables everybody to check and inspect the analytical systems more safely and efficiently. Our troublesome clogging filters have been replaced with the filters in the Fast Loop Modules which have a self-cleansing function, thereby reducing clogging dramatically. We look forward to seeing more results in the future.”

He added, “Aiming to be the leading company in the instrumentation industry, we will continue to adopt an innovative approach and send out valuable information from Kashima. The Kashima plant continues to work on increasing safety and efficiency for the future.”

Thank you to our communication colleagues at Swagelok Japan for contributing this story.