

Advanced Process Control: Raising Production Standards

Manufacturers can now compete effectively in a dynamic marketplace and maximize profits

Capitalizing on the full potential of modern control techniques is vital to enhance production and remain competitive for any industry with complex processes. Advanced Process Control (APC) is a cutting-edge technology that maximizes operational performance and process profitability, thus enabling companies to gain more from their assets.

Modern process plants are becoming more complex. With commercial pressures to optimize product quality and maximize profits, refineries, ethylene and chemical plants, etc., face operational problems and constant changes in terms of feedstock, temperature and operational targets. In this scenario, protecting assets becomes vital to ensure that the production runs smoothly and engineering time is used efficiently.

Advanced process control

The advent of APC that delivers the perfect combination – maximizing throughput and saving energy costs while meeting operational constraints resulting in significant increase in profitability – has brought about a revolution in the process industry. Previously, if a company selected APC, it had to heavily



Source: AspenTech

Adaptive Process Control improves long-term profitability by reducing process variability and allows plants to be operated optimally

rely on highly experienced specialists to perform time-consuming tasks for maintaining and utilizing the technology. These engineers also had to spend a huge amount of time with less sophisticated tools in an attempt to better control plant behavior, which was not optimal because of the lack of leading-edge software. The scenario has changed today; with the help of APC manufacturers can independently and optimally maintain the running of plants by using intuitive and highly advanced software.

The need for control techniques

While it is critical to operate a plant safely and prevent production disruption, optimizing operation is equally important. Change occurs constantly as feedstock composition and ambient conditions alter. Each change that occurs makes an impact on production, and hence the aim is to manage variables to achieve the right quality and quantity of the

product required. If the predictive behavior of a plant is known, one can take appropriate measures on time to keep the plant at the optimal target.

The plant operators are not in a position to manually react to such changes and conduct corrective actions on a minute-by-minute basis and in an optimal way. APC enables manufacturers to resolve these issues. It can be applied to any process where outputs can be optimized on-line and in real-time, and any shop floor that has a distributed control system or programmable logic circuit in place and where it is possible to model the dynamic predictive behavior of the plant.

APC implementation offers several benefits; for example, it improves process safety and reduces environmental emissions. Moreover, by reducing process variability, it will be possible to operate plants at their designed capacity. The software automatically improves operational efficiency; maximizes



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process profitability and business competitiveness; reduces cost, maintenance time and disruption through real-time asset optimization; and delivers improved visibility and decision support.

The smart technology differentiator

APC applications deliver large operational benefits immediately after commissioning, but plant performance degradation will occur over time. This is mainly due to the constant changing conditions within the plant itself as opposed to problems with the technology.

Recent innovations in APC deliver significant improvements to both controller sustainability and initial application development. Hence, today there is an intelligent technology differentiator that delivers continuous APC sustainability. Adaptive Process Control developed by AspenTech is a revolutionary breakthrough technology that eliminates the need to approach APC maintenance as a project and creates a continuous process of assessing model quality, collects current data and generates new models as the behavior of the plant changes over time. This smart software can detect, isolate and correct problems without increasing the burden on engineering staff.

There is a crucial difference between the traditional approach to controller maintenance (sustained value) and Adaptive Process Control. With sustained value, revamping the controller is typically carried out as part of a lengthy and costly project. Under Adaptive Process Control, however, the clever controller is modified over time in more of a continuous process. The update of the model occurs without the need to take the controller off-line and enables a company

to reap the benefits of control and optimization while the model is under maintenance. Model quality analysis, which continually runs and assesses the accuracy of the model, can detect when performance degradation occurs. It can pinpoint a specific part of a controller, thereby helping engineers to determine the underlying cause of the degradation.

Over a long period, companies lose substantial profits because the plant conditions change. The additional benefit of Adaptive Process Control is the ability to squeeze every possible gain in monetary terms from the asset on a continuous basis. Crucially, the software permits engineers to take decisions when new models replace existing ones in on-line applications.

Time to join the revolution

Many refineries and chemical companies struggle to improve their margins. Notwithstanding capital investments that may provide a medium to long-term return, executive decision-makers seek quicker return on investment and reduced costs. Even today, many manufacturing facilities are still operated by unsophisticated or primitive control schemes. Fortunately, the process industry has witnessed significant technological changes in recent years, which have yielded tremendous business benefits. Adaptive Process Control, in particular, improves long-term profitability by reducing process variability and allows plants to be operated optimally. Refiners and chemical companies have reaped returns in terms of product yield improvement and minimized energy costs with financial pay-back within short time.



Source: AspenTech

The smart technology can detect, isolate and correct problems without increasing the burden on engineers

For key decision-makers across an enterprise, the software is becoming more accessible to non-experts as the inclusion of knowledge, best practices and workflow automation within the software enables smoother APC deployments in organizations where it was earlier considered costly. This is because APC has now become affordable even for smaller plants. Overall, APC software is an intelligent technology that delivers sustainable, measurable benefits and allows companies to operate their facilities with better autonomy, cost-effectiveness, reliability and compliance with environmental regulations. Adaptive Process Control has raised production standards and enabled manufacturers to compete effectively in a dynamic marketplace. ●



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