CHEMICALS

CASE STUDY

Petrochemical Production Facility Drives Value and Maximizes Return with Non-linear APC

aspentech

> **"Today, SCG has in place a very strong group to develop, apply, and maintain APC technologies, and we have plans to roll out the same implementation and solution template to other polyolefin units."**
>
> *– Srisurang Pongpaew, Process Control Engineer/Manufacturing Intelligence, SCG*

Non-linear Advanced Process Control (APC) software improved SCG's product stability and quality, while the collaborative implementation scheme prepared engineers to efficiently design and implement solutions for future projects.

The Siam Cement Group (SCG) is the second largest company in Thailand, manufacturing and supplying a full range of petrochemical products: upstream, intermediate, and downstream petrochemicals. The focus of this project was on the downstream petrochemical production lines of Thai Polyethylene Co., Ltd. & Thai Polypropylene Co., Ltd. These facilities produce a wide range of polyethylene, polypropylene, and high-value added products.

SCG sought to enhance existing production capabilities by implementing innovative non-linear APC software from AspenTech. Immediately after installation, the variation in key reaction parameters was reduced significantly — resulting in improvement of process stability and product quality. A reduction in production costs and an increase in profits ensued.

CUSTOMER PROFILE - Siam Cement Group (SCG) – *Chemicals Company*

CHALLENGE

Drive enterprise value and maximize return on assets with non-linear APC. Enable engineers to gain proficiency and extend APC applications across multiple polyolefin manufacturing units.

SOLUTION

A standardized APC design applied to all major units to utilize a collaborative implementation scheme to maximize knowledge transfer and replicate success in future developments.

BENEFITS

- Increase profits
- Improve product stability
- Minimize variation of key reaction parameters
- Enable development and commissioning of enhanced transition strategies

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Most importantly, collaborative implementation with AspenTech professionals encouraged knowledge transfer, leaving SCG engineers with the skills required to apply technology to other units in the plant. SCG has started developing and commissioning additional transition strategies, utilizing the same implementation methodology and product solution template for the remaining polymer grade transitions.

VALUE OUTSHINES EXPENSE

This particular SCG production facility consists of four high-density polyethylene units—all equipped with innovative Nonlinear Controller software from AspenTech. The software was installed on these units in order to maximize the production rate, improve product quality, minimize parameter variations, and reduce consumables and transition time.

CLOSE COLLABORATION WITH THE EXPERTS ENABLES FUTURE IMPROVEMENTS

SCG staff was intimately involved during development and commissioning, enabling engineers to obtain the skills required to design, maintain, and modify the APC controller when a process changes or new products are developed. First, a standardized Aspen Nonlinear Controller design was deployed. Then, operational best practices specific to SCG were integrated seamlessly into the controller functionalities while the controller was monitored in real-time.

SOFTWARE SUITE IS ALL ENCOMPASSING

- Aspen Non-linear Controller: installed as the reactor, quality and auxiliary controller
- Polymer Inferential Properties: utilized to predict the basic polymer properties including melt flow rate and density
- Recipe Management: assisted in creating and organizing complex sets of operating parameters
- Process Sequencer: facilitated automated transitions
- APC Performance Monitoring: monitored percent uptime and standard deviation of key control parameters

FUTURE PLANS SET FOR ADDITIONAL ADVANCEMENTS

Installation was successful; desired results were achieved. The standard deviations of the control parameters were significantly reduced. Notably, the standard deviation of H2/olefins in the gas phase reactor was reduced by 88.55%—leading to improvements in product quality and stability. The production rate was increased by 5% on average for all grades. Experience gained during the initial collaboration left engineers confident in taking on more project labor, developing and commissioning additional transition strategies, and utilizing the same implementation methodology and product solution template for the remaining polymer grade transitions. Recently, SCG acquired licenses and utilized the same methodology and product solution template to complete successful APC implementation on their remaining polyolefin units.

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AspenTech is a leading supplier of software that optimizes process manufacturing — for energy, chemicals, engineering and construction, and other industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world's leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit **www.aspentech.com**.

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