Lean ethylene production

Rayong Olefins Company, Map Ta Put, Thailand — Case story

The special Energy Task Force Team at Rayong Olefins cooperated with Alfa Laval to find new opportunities to cut energy costs. The first step was to install a Compabloc 120 heat exchanger to increase heat recovery from a cooling water stream. This led to an annual saving of 1.4 million euros in energy costs. The payback time, including costs for installation, was less than six months.

The ethylene market is very competitive and it is essential for producers to keep operating costs as low as possible.

Ethylene production requires large amounts of energy, which amounts to a substantial part of the total operating costs. Even small increases in energy efficiency have a dramatic effect on the plant's bottom line.

Energy savings initiative
In 2009, Rayong Olefins started a project to find new ways to save energy. At this point the company did not have compact heat exchangers in any of the plant's core processes, only a few in utility positions.

Associate Professor
Dr Arnat Watanasungsuit,
Hydrocarbon Solutions Ltd.

Alfa Laval and local agent Hydrocarbon Solutions (Thailand) Co., Ltd / Associate Professor Dr Arnat Watanasungsuit presented its range of fully welded compact heat exchangers. Once the technology had been approved, engineers from the two companies started investigating possibilities for using compact heat exchangers in the plant.

Recovering heat from quench water
The engineers discovered it would be possible to recover more heat from hot quench water. Quench water cools the process gas after the cracker and contains large amounts of energy.

Quench water heat was already being recovered and used for preheating

About the company

Rayong Olefins Company
Rayong Olefins Company started constructing its plant in the Map Ta Put Industrial Estate in 1995 and started operations in 1998. The company has grown to become the second largest petrochemical company in Thailand. It produces various base chemicals, such as ethylene, propylene, mixed C-4, benzene and toluene. The company's ethylene cracker has a capacity of 800,000 tonnes per year.

Rayong Olefins is part of the Siam Cement Group, Thailand's largest industrial business conglomerate with more than 100 companies. SCG started in 1913 following a royal decree to produce cement. The company has since diversified into three core sectors: chemicals, paper and cement-building materials.

boiler feedwater. But this was done in a shell-and-tube heat exchanger with poor performance, resulting in a lot of wasted energy.

By installing a Compabloc 120 in series with the existing shell-and-tube, heat recovery increased by 5.5 MW.

Short payback time

As a result, the boiler feedwater has a higher temperature when entering the deaerator and the amount of heat that needs to be added for the oxygen to be released from the water is therefore much lower.

Aromatic Section Manager Wirasak Sonamthiang says steam consumption in the deaerator dropped by 43%, from 35 tonnes/hour to 20 tonnes/hour after installing the Compabloc 120.

“We are also very pleased with the compact size and small footprint of the Compabloc”, he says.

The payback time, including installation costs, was less than six months.

Minimum maintenance

The highly turbulent flow and the size of the channels make Compablocs less prone to fouling than shell-and-tubes.

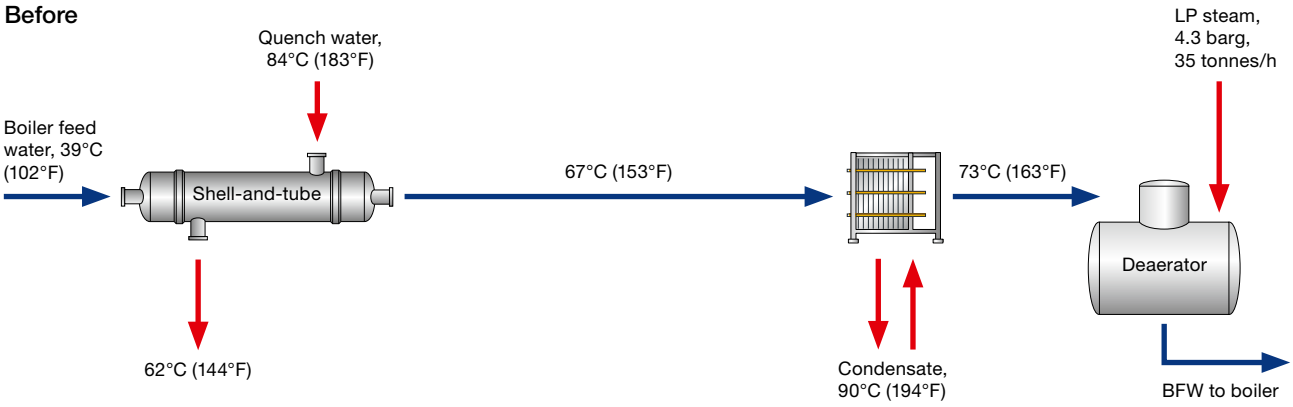
If cleaning is required, this can be performed using CIP equipment, or mechanically with a hydro jet. All channels are accessible for mechanical cleaning.

Two years after the installation there was still no need to clean the Compabloc.

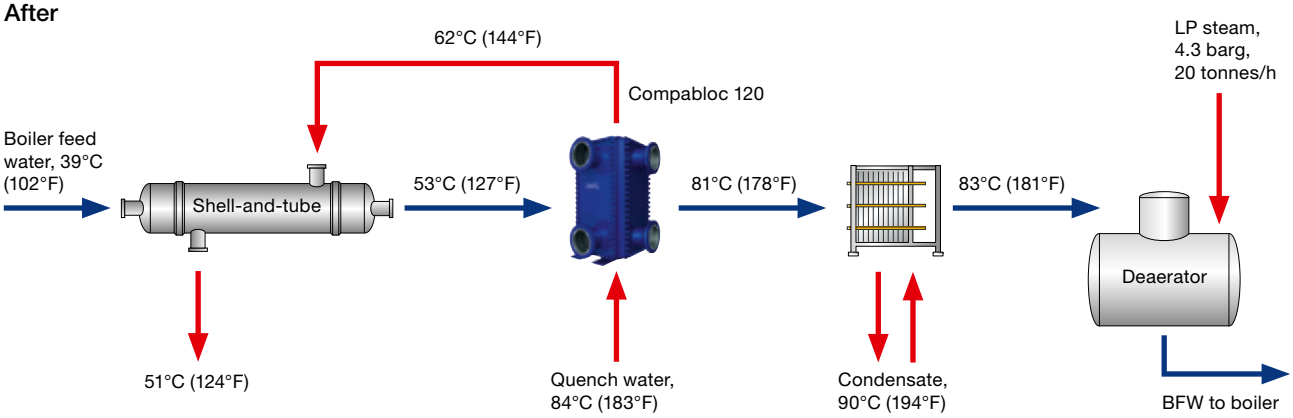
“The unit is absolutely maintenance free”, concludes Production Engineer Supachai Kengsamut.

Process overview

Before



After



Rayong Olefins Company increased heat recovery from a quench water stream by 5.5 MW by installing a Compabloc 120 heat exchanger in series with an existing shell-and-tube. The recovered energy is used for preheating boiler feed water and saves the company 1.4 million euros annually thanks to a 43% lower steam consumption in the deaerator. The payback time, including costs for installation, was less than six months.

How to contact Alfa Laval

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