



Eni Refining & Marketing Division Increases Sannazzaro Refinery Profitability by 10 cents Per Barrel through Advanced Control and Real-Time Optimization



Profile

Eni Refining & Marketing Division, the downstream division of Eni Group, is the largest refining company in Italy and one of the world's leading oil companies. The company operates in Italy and other markets in crude supply and trading, refining, logistics and distribution of oil products, including lubricants, oxygenates and specialties. Eni Refining & Marketing Division owns five refineries in Italy with a refining capacity of more than 30MT/y of crude oil, and is a partner in other refineries in Italy and elsewhere in Europe (Germany, Czech Republic, and Portugal).

Business Challenge

In the late 90s, Eni Refining & Marketing Division began to search for ways that its refineries could achieve higher levels of profitability. After analyzing its refinery operations, Eni determined that the highest margins for improvement would best be found through:

- increasing yield efficiency and quality
- reducing the cost of operations
- better targeting process units

It was decided that the best way to achieve these marginal improvements would be to adopt an advanced on-line solution for multi-variable control, real-time optimization, and information management. "We recognized that a control and optimization solution would enable us to push processes to their constraints and optimize single or multiple units. In addition, integrated information systems would better support refinery management business processes," said Agostino Cavanna, HQ Technology Director, Eni Refining & Marketing Division.

"The success of such a large project resulted from a combination of technology, innovation, and project methodology. The close cooperation among several groups within Eni Refining & Marketing Division and AspenTech was integral in facilitating our strategy for profit improvement and increasing refinery profitability by more than 10 cents per barrel."

Agostino Cavanna
HQ Technology Director
Eni Refining & Marketing Division

Solution

Eni Refining & Marketing Division subsequently began the search for a multivariable process control and optimization solution that could be implemented across all five of its Italian refineries. After an analysis of the competitive offerings, the company selected AspenTech's solution, which includes

DMCplus™ (advanced control), RT-Opt™ (real-time optimization), Aspen Watch™ (performance monitoring), and InfoPlus.21™ (information management).

The company pursued a phased approach that was driven by the validation of key components of the model throughout the project execution. The implementation methodology consisted of:

- creating a joint project team comprised of AspenTech and Eni Refining & Marketing Division personnel
- promoting user involvement at early stages of the implementation
- establishing a staged approach to commissioning the system to capture benefits more quickly from:
 - open loop optimization
 - linking of the planning function to the unit operation
 - closed loop commissioning

Beginning in 1998, Eni Refining & Marketing Division implemented more than 15 controllers across its five Italian refineries as part of a five year rollout plan. In June 2001, the commissioning of a closed-loop real-time optimizer for the Fluidized Catalytic Cracking (FCC) unit at the Sannazzaro refinery was completed. There were several reasons why the Sannazzaro refinery was picked as the first location to adopt a real-time optimizer, including the inherent complexity of its production (200,000 barrels per day) and its strategic location in a highly industrialized region of northern Italy. Eni chose the FCC unit because it had the highest operating margin of the units in the refinery. Eni believed benefits could be realized through improvement in yield and maximization of the use of atmospheric residue in the unit.

The closed-loop real-time optimizer routinely and automatically selects optimal process operating conditions to maximize the profit of all the major unit operations in the FCC complex, taking into account economic information, physical constraints and the degrees-of-freedom of the plant. The optimizer calculates optimal set-points approximately 18 times per day using a rigorous AspenPlus / RT-Opt model and sends eight External Targets to the DMCPlus controller each cycle.

Business Benefits

As of mid-2003, Eni Refining & Marketing has almost completed its five year rollout plan across all of its five sites in Italy, having implemented 14 Advanced Process Control (APC) and one Real-Time Optimization (RTO) application. Upon completion of the rollout, 18 controllers will have been implemented in total by the end of 2003.

A post-commissioning audit demonstrated significant economic benefits from this project. For example, audited payback for the Closed Loop Real-time Optimization project on the FCC unit at the Sannazzaro Refinery included:

- payback in less than six months for the APC application (DMCplus)
- payback in eight months for the RTO application (RT-Opt)
- 10 cents savings per barrel

Much of the success of the project can be attributed to the implementation program that supported this rapid deployment of technology. "The success of such a large project resulted from a combination of technology, innovation, and project methodology. The close cooperation among several groups within Eni Refining & Marketing Division and AspenTech was integral in facilitating our strategy for profit improvement and increasing refinery profitability by more than 10 cents per barrel," said Cavanna.

Vision

The project at the Sannazzaro refinery was completed in May 2001 and was the first part of Eni Refining and Marketing's strategy to improve profitability of its refining business at all five of its refineries in Italy. Based on the success of this project, Eni Refining & Marketing anticipates similar benefits from the implementation of AspenTech's real-time optimization technology in other refineries over the next four years.

About AspenTech

Aspen Technology, Inc. is a leading supplier of enterprise software to the process industries, enabling its customers to increase their margins and optimize their business performance. AspenTech's engineering solutions, incorporating Hyprotech's technologies, help companies design and improve their plants and processes, maximizing returns throughout their operational life. AspenTech's supply chain manufacturing solutions allow companies to run their plants and supply chain more profitably, from customer demand through to the delivery of the finished product. Over 1,200 leading companies rely on AspenTech's software every day to drive improvements across their most important engineering and operational processes. AspenTech's customers include Air Liquide, AstraZeneca, Bayer, BASF, BP, ChevronTexaco, Dow Chemical, DuPont, ExxonMobil, GlaxoSmithKline, Lyondell Equistar, Merck, Mitsubishi Chemical, Shell and Unilever. For more information, visit www.aspentech.com.



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