



## AIR LIQUIDE – HEAVY INDUSTRY

### OPTIMISATION OF PRODUCTION LAUNCH AND DISTRIBUTION OF INDUSTRIAL GAS



#### Objectives:

- For major Air Liquide customers, develop a powerful and robust optimiser for gas production planning in a plant network of interconnected pipelines
- Encapsulate it in a Web service
- Integrate the entire solution in a centralised hardware and software architecture developed by Air Liquide ISIS

#### Solution:

Eurodecision SCOP Network Design

#### Results:

- Ability to plan both short-to-medium-term and long-term production as well as to monitor flows by plant and by customer
- Schedule preparation - significant time-saving
- Improved anticipation of problems

*"We benefited from Eurodecision's extensive experience in optimisation. They were very flexible and resourceful, which enabled us to commission the system in record time. Their key strength is their ability to listen and not attempt to impose a packaged solution," said the Project Manager, Large Industries division, Air Liquide.*

*"The Eurodecision team has made our prototype adaptable. Our users' ability to adapt the tool to changes in the network together with the assured preservation of competencies represent the key features of their tool. Ultimately, their complementary types of experience have made the project a real success." Florence Boutemy, Process Control Engineer at the Air Liquide Claude and Delorme Research Centre.*

Founded in 1902, the Air Liquide group is the world leader in gases for industry—including steel, refinery, chemicals, glass, electronics, paper, metallurgy, agri-foods, and space— as well as for health and the environment. The Group offers innovative solutions based on constantly enhanced technologies and it produces air gases (oxygen, nitrogen, argon, rare gases...) as well as many other gases including hydrogen. Air Liquide is present in 72

countries. The Group has about 37,000 employees and reported €10.9 bn revenue in 2006, including nearly 80% outside France.

The Large Industries division at Air Liquide provides gases to customers in the refining, chemicals, energy and metallurgical industries. These gases are vital to the production processes of customers in such industries.

In Benelux and France, several plants produce various gases. The Large Industries coordinators must develop strategies for managing procurement contracts and must schedule production launches in order to optimise contract management according to market flexibility.

Data is so complex that it is difficult to prepare production scenarios (where to produce, in which plant, and when) by hand: a decision support tool is vital. The Large Industries division also needed to prepare daily schedules practically in real time.

Before undertaking the development of an ambitious optimisation tool, the Group needed to check its feasibility and in particular its the cost effectiveness.

To achieve this initial step, in early 2004 the Group chose CRCD (Centre de Recherche Claude Delorme)—one of Air Liquide's main Research and Development centres. CRCD defined the scope for optimisation and validated the project in terms of feasibility and cost effectiveness. It developed a prototype and then a version which addressed 80% of the specifications.

In developing the final version, the project managers wished to combine the technical skills in Air Liquide ISIS (a department dedicated to Industrial Computing) with the experience of an optimiser specialist able to ensure subsequent industrial maintenance of the product under the control of Air Liquide ISIS and future users.

Eurodecision quickly emerged as the best candidate. The company had already worked with the Air Liquide Group (the Escale project) using SCOP Network Design, a flexible, robust product using the same mathematical programming techniques as the prototype. And crucially, the Eurodecision team convinced the Group that it could understand the problem.

SCOP Network Design was integrated into a global IT environment developed by Air Liquide ISIS.

This was a bold solution requiring close collaboration between in-house teams and an outside company. It proved successful and the product went live within seven months. The optimisation platform started 15 December 2006 and is used on a daily basis.

The SCOP Network Design optimiser is configured by Eurodecision for Air Liquide and works as a Web service. It determines the production schedules for each plant in the coming days, weeks, and months, and provides daily reports concerning down- and up-time. It also tracks the flows on the Air Liquide network of plants connected to one another and to clients via pipelines.

A few months after the commissioning, Eurodecision's Air Liquide clients are completely satisfied. They emphasise the quality of the collaboration between their teams and those of Eurodecision during the product development phase as well as during integration in the Air Liquide information system. Eurodecision has demonstrated its ability to listen to customers and provide them with tailored and pragmatic solutions. The results have lived up to their expectations: Air Liquide shortened the time required to prepare schedules by 25%, improved data traceability, and has obtained more pertinent calculations. It has also become more responsive to continuous readaptation requests from markets and Air Liquide customers.