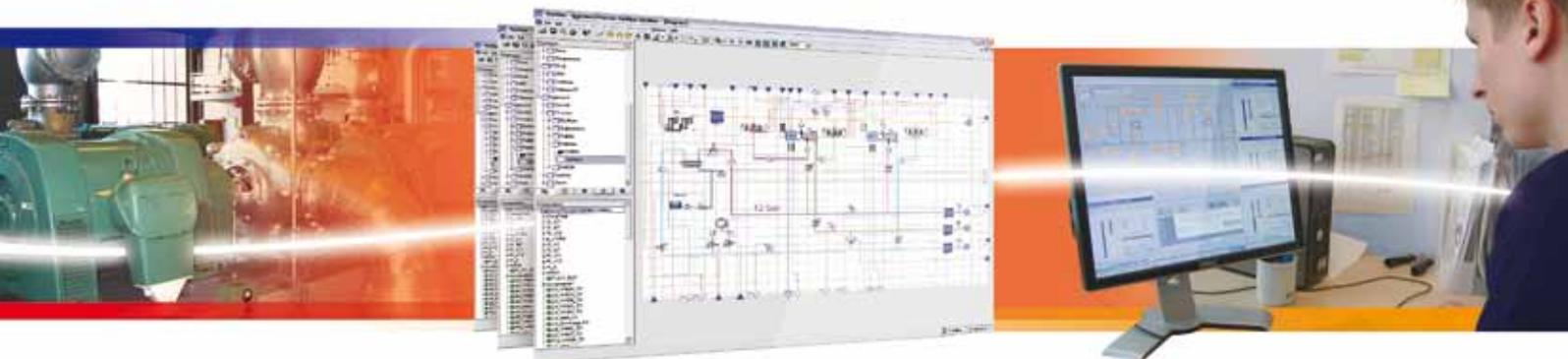


Solvina

Achieving optimum control with Dymola from Dassault Systèmes



Overview

■ Challenge

Solvina needed to develop efficient control strategies for its customers' power plants to maximize output while minimizing energy consumption.

■ Solution

Solvina uses Dymola from Dassault Systèmes to model and dynamically simulate the way a controller should function for optimal plant productivity and energy use.

■ Benefits

Customers are ensured optimum operation from the start since Solvina can test its control strategies through simulation before any physical modifications or installations are made to the plant.



"Without Dymola, we simply could not do our job. It's the best way to help plant owners achieve enhanced performance and plant availability."

Veronica Olesen
Specialist in Automatic Control
Solvina

Solvina
Energy Excellence

Expertise for optimized process control

Solvina is a Swedish technical consulting company and leading supplier of energy system design, system integration and control engineering for the power and process industry. Its 38 highly qualified engineers in three divisions - process engineering, electrical engineering, safety and quality - provide customers in the chemical, pulp and paper, power, energy and nuclear power industries with the know-how and methods needed to achieve enhanced performance and availability of a power plant.

Energy is optimized with the right control technology

Poorly configured control systems can lead to excessive energy consumption and production inefficiency. At many Solvina customers, demand for energy optimization is very high, for example, in the pulp and paper industry. Control technology must be developed to optimize the system for minimum energy consumption and maximum energy output from plant steam

turbines. "In a pulp mill, steam pressure must be at a constant level regardless of the consumption at that pressure level. At the same time we need to optimize the electrical energy output. This is a very complex control problem," said Veronica Olesen, Specialist in Automatic Control, Solvina.

Model based programming speeds up the modeling process

To tackle this type of challenge, Solvina uses Dymola, Dassault Systèmes multi-engineering modeling and simulation solutions, to define the optimal controller strategy and configuration to improve plant productivity and energy usage and to dynamically test, evaluate and adjust control algorithms through simulation before commissioning. Solvina adopted Dymola in 1994 because of its object-oriented technology based on the Modelica language and its comprehensive library of components that can be reused in its various projects. Its fast approach to modeling makes Dymola the ideal solution for all its projects.



“The advantage with Dymola is its model-based approach, which enables us to represent the plant with our pre-built components with few adjustments,” said Olesen. “From this model, we can test different control strategies much faster than if we had to program all the plant details in a new model each time.

Verification with Dymola is also fast, which is a considerable advantage when testing changes to a controller. Because many processes are, in reality, slow, Solvina uses Dymola to virtually speed up and test these processes faster than if they had to test them in real life. “When we change certain control parameters, we need to test the impact these changes would have on the entire process. Instead of waiting hours for the process to finish, we save time by simulating it with Dymola,” said Veronica Olesen. “This speeds up testing and we are confident that if the controller works in the virtual world, it will work in the physical plant.”

After purchasing new steam turbines, Solvina pulp mill customer Södra Cell Mörrum asked Solvina to optimize its control systems for steam production and consumption, as well as for overall energy production. Solvina used Dymola to model

the entire energy production unit, test all changes through simulation, and train the plant operators on the new control system. “For this project, the improved optimized control resulted in power savings of 20 MWh/day and approximately €500k annually,” said Olesen.

High level competitiveness

Using Dymola, Solvina has developed generic simulators for different types of power plants to demonstrate the benefits for process optimization and training. “Having a readymade generic simulator speeds up the process of customizing it for a particular plant,” said Olesen. Solvina has simulation models for most energy and power applications. “One example is our training simulator platform, SolvSim Power Plant, SSPP, which enables training in a realistic, yet safe, environment and helps prepare operators and other personnel to handle difficult scenarios.”

Today, Dymola enables Solvina to address the most complex process control challenges and to provide customers with the most efficient solutions. “Without Dymola, we simply could not do our job. It’s the best way to help plant owners achieve enhanced performance and plant availability,” concluded Olesen.

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