

Application for Simulation Technologies in a production process in the manufacturing industry

Scheer Group
THE INNOVATION NETWORK

PREDICT
INTELLIGENT SOLUTIONS

IS Predict GmbH

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IS Predict is powered by Scheer Group. The company is based in Saarbrücken (Germany) and realize with its staff of currently 20 employees intelligent IT solutions, which increase energy efficiency of consumers, suppliers and producers. The company's core expertise is based on "Resource Intelligence", an adaptive and self-learning IT system with predictive analytics.

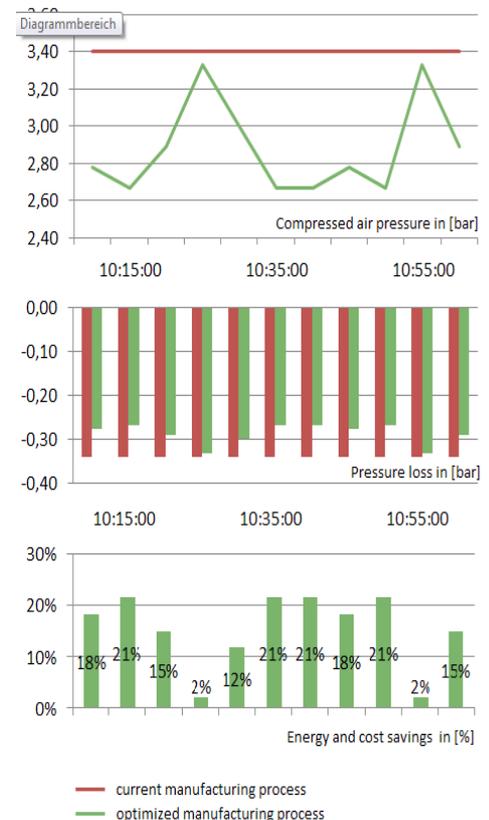
Manufacturing Scenario Description

The scenario describes a production process in the manufacturing industry. A production line produces limited numbers of products adapted to individual customer needs. Within the line, different kinds of self-organizing sensor-actuator networks are controlled by pneumatic interfaces. The system pressure value has been set much higher than the required minimum pressure, to guarantee the manufacturing of each product which means to guarantee cases of maximum pressure losses for really highly customized and complex products. The pressure regulation follows on each production process to reach again the regular, defined system pressure value.

Although compressed air is a clean resource, its production costs a lot of energy and isn't economical. This problem should be tackled. The objective must be to significant increase the energy efficiency of pneumatic control systems within this described production process.

Approach and Results with Simulation Technologies

A predictive, self-learning IT solution of IS Predict GmbH may address this problem and initiate an intelligent pressure regulation for the manufacturing system. Depending on the order data and accordingly on the particular air consumption for each product, the whole system pressure will continuously change. That means that the pumps adapt their power for compressing the air intelligently to demand and consume only as much energy as is actually needed. For this intelligent forecasting process, the self-learning IT solution calculates automatically the air consumption for each manufacturing process according to the current product characteristics. For the learning process, sensor data for each processing step will be available. This predictive, intelligent solution as an improvement step allows automatically forecasting influencing factors for energy efficiency, to produce the same output with less energy and to predict energy usage in the manufacturing environment.



Graphs showing pressure regulation

Benefits for the Company

- Automatic forecasting influencing factors for energy efficiency
- Producing the same output with less energy
- Predicting the energy usage in the manufacturing environment

Key Success Factors

- A production line with self-organizing sensor-actuator networks, which can offer current, decentralized sensor data, particularly the pressure losses for each actuator
- Predictive and simultaneous simulation during the manufacturing process
- Self-learning IT solution calculates automatically the demand of pressurized air