STATISTICA™ Case Study

Unipetrol RPA – Using *STATISTICA Automated Neural Networks* for estimations during the manufacturing process

StatSoft® STATISTICA   Unipetrol ORLEN GROUP

SUMMARY

STATISTICA Enterprise provides Unipetrol, a leading Czech petrochemical company, with a multi-user software platform to analyze and ensure quality during the product manufacturing and inspection processes.

ABOUT UNIPETROL

Unipetrol RPA, Ltd. is a leading Czech producer in the field of refinery, petrochemical and agrochemical raw materials. The company supplies the market with motor fuels, heating oils, asphalts, liquefied petroleum products, oil hydrogenates, olefins and aromatics, agrochemicals, soot and sorbents, polyolefins (high density polyethylene, polypropylene), and other refinery products.

INITIAL STATUS & PROBLEM DESCRIPTION

For Unipetrol's products to be of highest quality, sustaining the products' prescribed composition is a must. To achieve this, Unipetrol RPA regularly carries out analyses for operational needs and final inspection during the manufacturing process. This process of collecting the samples and their analysis in laboratories is challenging in terms of time, human resources, and costs.

UNIPETROL RPA REQUIREMENTS

Unipetrol RPA was looking for a software solution to enable immediate prediction of quality parameters for both final products and works-in-progress based on routinely available process

THE SOLUTION: *STATISTICA ENTERPRISE*

STATISTICA Enterprise was integrated into an automated system that virtually analyzes the product throughout the manufacturing process and at final inspection, enabling technicians to take immediate action when an issue is discovered. Unipetrol expects to save millions of Czech crowns each year.

parameters. The necessary tool, a so-called "virtual sensor," needed to be in the form of an automated system, such as automated neural networks, with a strong emphasis on its ability to export the calculation algorithm (a trained network) in the form of code to other programs, such as Micosoft Excel. Only StatSoft offered a solution that met the parameters defined by Unipetrol, enabling Unipetrol to choose StatSoft CR as the supplier of this "virtual analyzer," which is based on a *STATISTICA Automated Neural Networks* + Code Generator software license.

IMPLEMENTATION

The software installation was a simple process, handled by Unipetrol RPA representatives. The installation was preceded by a two-day Neural Networks module training session, which took place during the data selection process. "The selection of data that the neural network will work with is the most difficult process," said Ing. Jiří Schöngut, CSc., head of Unipetrol RPA's process development department.

COOPERATION WITH STATSOFT

"Cooperation with [StatSoft] was, I should say, exemplary," stated Ing. Schöngut, adding: "During testing there were only a few minor issues at the export, such as bad syntax during code generation. The [StatSoft] team's reaction and intervention to correct this issue was immediate and extremely friendly. The overall support was completely satisfactory as well."

RESULTS

STATISTICA, as a tool for the creation of a neural networks model used for an immediate estimate of the composition of the manufactured product, plays a major role in helping the company to reduce the frequency of sample collection and provide quality stabilization while maximizing production. The procedure is as follows: a neural networks model is created in *STATISTICA* based on historical data and is subsequently implemented in Excel, which uses the available process data and calculates the prediction of quality parameters (e.g., composition) of the monitored stream. Based on these predictions, the operator can immediately take appropriate steps for process correction instead of waiting for the lengthy process of laboratory analysis. Early reaction thus significantly reduces losses during the process. For Unipetrol RPA, *STATISTICA*'s *Automated Neural Networks Cz* + Code Generator saves several million Czech crowns per year.

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ABOUT *STATISTICA* AND STATSOFT

StatSoft is one of the world's largest providers of analytics software, with 30 offices around the globe and 1 million+ users of STATISTICA software. StatSoft provides Enterprise Manufacturing Process Intelligence software solutions to help companies in a variety of industries better meet the high standards of control, monitoring, and documentation mandated by strict regulatory frameworks and to improve product and process outcomes. With its STATISTICA suite of quality control and analytics tools, StatSoft is a trusted partner of the world's largest Life Sciences companies, helping them reduce the time and cost of analyses, improve accuracy, reduce risk, and streamline workflows.