

Tecnomatix

KUKA Systems do Brasil

Leading automotive line builder delivers state-of-the-art robotics production lines

Industry

Industrial machinery and equipment

Business challenges

Increase competitiveness of services offering

Improve margin on delivered projects

Keys to Success

Deploy Process Simulate Virtual Commissioning for improved production equipment utilization

Bring more line installation know-how back into the organization

Remove barriers between mechanical, electrical and control engineers

Results

Robotics workcells 98 percent ready before ever going to the shop floor

Reduced number of issues found on the shop floor

Use of Process Simulate Virtual Commissioning enables early detection of production issues

Innovative automation solutions expanding in South America

KUKA Systems Group is one of the world's leading providers of engineering services and manufacturers of flexible automatic production systems. Its customers come from a diverse array of industries, including automotive, aerospace and solar. The solutions of KUKA Systems do Brasil (KUKA Brazil) encompass comprehensive applications for the industrial processing of metallic or non-metallic materials. With approximately 3,500 employees in more

than 15 countries, each of the KUKA Systems Group's companies is focused on providing the most advanced and high-value production solutions.

KUKA Brazil was founded in 1998. Having made an important investment in engineering capacity, the company's solutions are now present at virtually every automobile manufacturer's site throughout Brazil. Recently KUKA Brazil introduced its automation technologies to small and medium-sized companies in the aerospace and general industry markets. As a result, the company doubled its size in just three years. With 170 employees, KUKA Brazil is now one of South America's top production-line integrators.



An automotive body-in-white production line delivered by KUKA Brazil.

Results (continued)

Continuously improving operational efficiency; lower costs

Outsourcing of start-up work substantially reduced

Improved profitability

“Due to the superiority of the robotics simulation tools in the Tecnomatix portfolio, we decided to use them exclusively.”

Marcio Sampaio Tubini
Digital Manufacturing
Project Leader
KUKA Brazil

“The use of Process Simulate Virtual Commissioning brings together engineers with different kinds of expertise. The fact that electrical, mechanical and control engineers sit together in the same room, working on the same scenario, is a big advantage.

Marcio Sampaio Tubini
Digital Manufacturing
Project Leader
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KUKA framing in body shop.

Moving from Robcad to Process Simulate

KUKA Brazil has been harnessing the value of solutions in the Tecnomatix® portfolio for years, including Plant Simulation and Robcad™ software, and recently Process Designer and Process Simulate for automotive robotics, body-in-white (BIW) production lines. As the advantages of Process Simulate became more evident, the company began transitioning from Robcad to Process Simulate.



A Kuka Brazil engineer using Plant Simulation to analyze production capacity.

“Due to the superiority of the robotics simulation tools in the Tecnomatix portfolio, we decided to use them exclusively,” says Marcio Sampaio Tubini, digital manufacturing project leader, KUKA Brazil. “For years we have been using Robcad, and we are very satisfied with its capabilities.

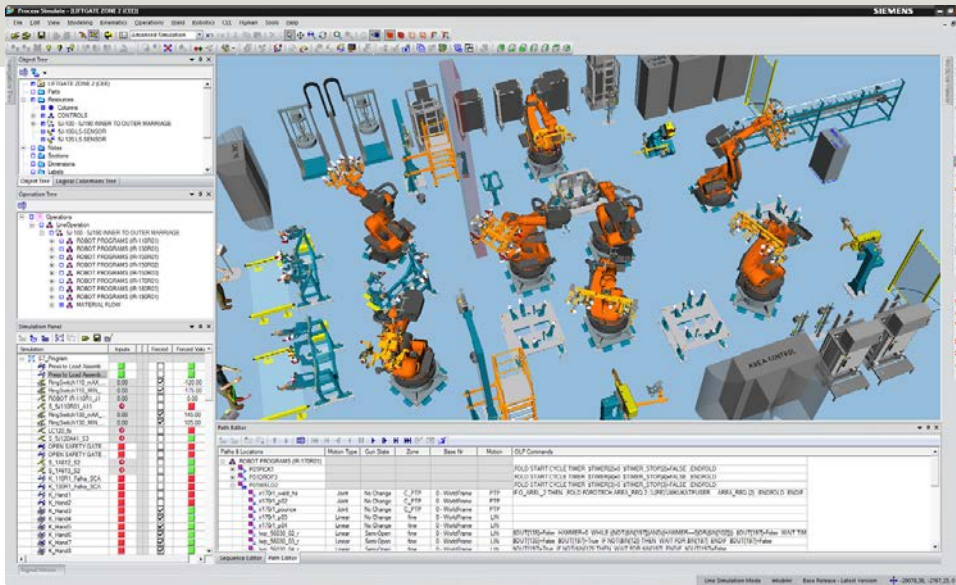
“In 2012, we delivered a project to one of the automotive OEMs (original equipment manufacturers) using Robcad. For evaluation purposes, we performed some of the work with Process Simulate, and then demonstrated its value. The customer was very pleased with the results, so we decided to deliver the next project in its entirety using Process Simulate.

Tubini notes that his team is especially impressed that migrating data from Robcad to Process Simulate is a non-issue.

Virtual commissioning for higher competitiveness

KUKA Brazil had been looking for ways to increase its competitiveness. As part of this initiative, it evaluated Process Simulate Virtual Commissioning in the Tecnomatix portfolio, which enables connecting a 3D robotics simulation with a physical cell controller. Use of Process Simulate Virtual Commissioning provides the ability to control a virtual simulation using the operator’s human machine interface (HMI), exactly as it is done on the shop floor.

“There is substantial benefit in doing the robotics cell optimization, as much as possible, at the engineer’s desk, rather than doing it on the shop floor,” notes Gilmar Miranda, engineering manager, KUKA Brazil. Using Process Simulate Virtual



A BIW production line simulated using Process Simulate Virtual Commissioning.

Commissioning proved to be beneficial in several ways. Miranda explains, “With Process Simulate Virtual Commissioning, we can get the robotics workcells 98 percent ready before ever going to the shop floor.

“Typically, after the initial production-line installation, we outsource the line start-up to suppliers. We estimate that approximately 70 percent of the start-up work is robotics and control-programs tuning; we believe that by using Process Simulate Virtual Commissioning we can reduce that by 20 to 30 percent. This results in two significant benefits. First, a financial savings, as the amount of work outsourced is smaller; in fact, we have created a table that maps those tasks that are moved from the line installation team to the virtual commissioning team. Second, KUKA Brazil is now much more knowledgeable regarding such scenarios. Greater start-up know-how means improved operations and fewer issues on the shop floor from project to project.”

Another important benefit is a more efficient start-up in terms of equipment operation. Tubini explains, “The use of Process Simulate Virtual Commissioning brings together engineers with different kinds of expertise. The fact that electrical, mechanical and control engineers sit together in the same room, working on the same scenario, is a big advantage. Instead of troubleshooting the cell control program by reviewing lines of code, the control engineer can now easily visualize any scenario.

“In the past, many of our technical discussions took place only on the shop floor; now they are conducted in a virtual-line environment. Using our previous approach, sometimes we encountered physical collisions, resulting in damage to equipment (such as robots and grippers) and the prototype part itself. When using Process Simulate Virtual Commissioning, the risk of such incidents is significantly reduced. For example, in a recent project using Process Simulate Virtual Commissioning, we identified a problem in the sequential plan: a clamp was not opening on time, thus causing the part to crash into the equipment.

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Gilmar Miranda
Engineering Manager
KUKA Brazil

“Process Simulate Virtual Commissioning also enables a higher level of cycle-time productivity, as the robotics cell interlocks are optimized. This means producing more units with the same equipment or, as the experts in the automotive companies say, ‘higher jobs per hour (JPH),’ which is a huge benefit for our customers.”

Marcio Sampaio Tubini
Digital Manufacturing
Project Leader
KUKA Brazil



Glass material handling.

Solutions/Services

Tecnomatix

- Robcad
- Process Designer
- Process Simulate
- Process Simulate Virtual Commissioning
- Plant Simulation

www.siemens.com/tecomatix

Customer's primary business

KUKA Systems Group (KUKA) concentrates on advanced solutions for the automation of industrial production processes. Since the company's founding more than 100 years ago, KUKA solutions have been known for quality and innovation. KUKA, with its Robotics and Systems divisions, is one of the world's leading companies in the field of mechanical and systems engineering.

www.kuka-systems.com/brazil

Customer location

São Bernardo do Campo
Brazil

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Gilmar Miranda
Engineering Manager
KUKA Brazil

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Kuka Brazil engineers use Process Simulate in the company's virtual commissioning lab.

"Process Simulate Virtual Commissioning also enables a higher level of cycle-time productivity, as the robotics cell interlocks are optimized. This means producing more units with the same equipment or, as the experts in the automotive companies say, 'higher jobs per hour (JPH),' which is a huge benefit for our customers. For instance, robotics hemming processes require maximum interlocks optimization, because the robots are working simultaneously very close to each other.



Automatic measurement.

"We were also impressed that we can engage Process Simulate Virtual Commissioning perfectly with non-Siemens controllers – for example, Allen Bradley controllers – using an OPC (OLE for Process Control) server. This highlights Siemens PLM Software's strength as a solutions provider with open tools."



An automotive body-in-white production line tested by KUKA Brazil prior to shipment.

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